12/27/98

NOTE TO: NRC Document Control Desk Mail Stop 0-5-D-24 FROM: Virgil Quilley, Licensing Assistant Operating Licensing Branch, R_ SUBJECT: OPERATOR LICENSING EXAMINATION ADMINISTERED ON Mard 22, 23-25 99. AT Brave Velley (Mail 2 DOCKET #50-412

On $\underbrace{\sum 23 - 25}_{4\%}$ Operator Licensing Examinations were administered at the referenced facility. Attached, you will find the following information for processing through NUDOCS and distribution to the NRC staff, including the NRC PDR:

- Item #1 (a) Facility submitted outline and initial exam submittal. designated for distribution under RIDS Code A070.
 - b) As given operating examination, designated for distribution under RIDS Code A070.
- Item #2 Examination Report with the as given written examination attached, designated for distribution under RIDS Code IE42.

PDR ADack 05000412-

A072

To:	John Caruso- USNRC
From:	Rich Brooks, Duquesne Light Co.
Date:	February 5, 1999
Subject:	Beaver Valley Power Station, Unit 2 - Initial Exam Materials

The following materials are being submitted to you for review, comment, and approval for the BVPS Unit 2 NRC Initial License Examination scheduled for the week of March 22, 1999.

This submittal is in accordance with the instructions in Rev 8 of NUREG-1021, "Operator Licensing Examiner Standards."

- 1. Operating Test Drills (4)
- 2. Operating Test JPMs (14 JPMs & 1 set of Admin questions.)
- 3. Exam Materials History (page 2 of this memo)

The QA checklists will be submitted after the exam materials have been validated by the operating crew and specific scenarios, with candidate rotations, decided.

We request that these materials be withheld from public disclosure until after the completion of the examination.

If you have any questions or require further information, please contact me at (412) 393-5755.

ADJO

Answer Distribution - Written Exam 2LOT 2B Beaver Valley RO Exam

A	В	С	D
26	27	24	23

Classification for Level

Knowledge	Comprehension	Application
45	32	23

Complies with minimum Higher Level for NUREG 1021

New Questions - 97

Number requiring supply of reference:

24

The following is a list of changes and the reasons for the changes to Written Exam Outline:

Page 5 - Tier 2 Group 1

Original K/A 001 - 2.12 contained a concept of multiple rod drop on start up that is NOT allowed configuration at Beaver Valley.

Original K/A 004 K6.01 did not fit concept changed on review by IDT

Original K/A 022 2.01 Power supplies to CAR fan concept did not reflect reference material available.

Original K/A 068 6.10 original question concept did not match as built condition of plant on further review

Page 6 - Tier 2 Group 2

Original K/A 075 A2.01 is typo error system should be 076 Original question Topic altered due to overlap with JPM.

Original K/A 086 K1.01 The equipment addressed in original concept no longer operational at Beaver Valley Unit 2. Retired in place

Page 7 Tier 2 Group 3

K/A 005 A2.04 added to replace K/A 034 K1.04

Original K/A 007 A1.02 did not fit concept on review by IDT

Original K/A 034 K1.04 is not within scope of RO job at Beaver Valley.

Page 8 - Tier 3

Original K/A 2.1.11 original concept was not testable under current Ops Standards for operator performance. OPS Standards would produce reactor trip

Original K/A 2.4.1 did not fit concept on review by exam author.

PWR RO Examination Outline

(Follows Form ES-401-4)

Facility: BVF	PS Unit 2]	Date	of Ex	am:	<u> </u>			<u></u>	Exar	n Lev	el: RO
	<u> </u>				K/	A Ca	tegor	y Poi	nts				
Tier	Group	K	K	K	K	K	K	A	A	A	A	G	Point
		1	2	3	4	5	6	1	2	3	4		Total
1.	1	4	3	6				0	2			1	16
Emergency	2	5	4	3				1	3			1	17
& Abnormal	3	1	0	1				0	0			1	3
Plant Evolutions	Tier Totals	10	7	10				1	5			3	36
2.	1	3	1	3	3	3	1	2	3	1	2	1	23
Plant	2	3	1	2	4	1	1	3	3	0	1	1	20
Systems	3	0	0	1	1	1	1	1	2	0	1	0	8
	Tier Totals	6	2	6	8	5	3	6	8	1	4	2	51
3. Ge	neric Knowle	dge ai	nd		Ca	nt 1	Ca	at 2	Ca	at 3	C	at 4	13
	Abilities				· · ·	4		3		1		5	
 Note: - Attempt to distribute topics among all K/A categories; select at least one topic from every K/A category within each tier. - Actual point totals must match those specified in the table. - Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities. - Systems/evolutions within each group are identified on the associated outline. - The shaded areas are not applicable to the category tier. 													

		PWR	RO Exa	minatio	on Outli	ne	(Follows Form I	ES-401-4)	
Emerge	ency ar	nd Abno	ormal P	lant Eve	olutions	- Tier 1	/Group 1		
E/APE # / Name / Safety Function	К 1	К 2	К 3	A 1	A 2	G	K/A Topic(s)	Imp.	Point
000005 Inoperable/Stuck Control Rod / I	1.03						Operational implications of Xenon Transient	3.2	1
000015/17 RCP Malfunction / IV			3.03				Sequence of events for tripping Rx and RCPs	3.7	1
W/E09 & E10 Natural Circ. / IV		2.2					Relationship between heat removal systems	3.6	1
W/E09 & E10 Natural Circ. / IV			3.1				Operating Characteristics during transient conditions	3.3	1
000024 Emergency Boration / I	1.02		1				Relationship between boron addition and Rx power	3.6	1
000026 Loss of Component Cooling Water / VIII	x	x			2.03		Determine lineup to restore CCW	2.6	1
000027 Pressurizer Pressure Control System Malfunction / III		2.03					Relation of pressure control failure and controllers	2.6	1
000040 (W/E12) Steam Line Rupture - Excessive Heat Transfer / IV			3.2				EOPs associated with uncontrolled depressurization of all SGs	3.3	1
W/E08 RCS Overcooling - PTS / IV			3.2				Reasons for EOP responses to PTS	3.6	1
000051 Loss of Condenser Vacuum / IV	1.01	X					Relation of Condenser Vacuum to CW flow (LER)	2.4	1
000055 Station Blackout / VI						2.4.1	Knowledge of EOP entry conditions	4.3	1
000057 Loss of Vital AC Elec. Inst. / VI				†	2.19		Impact of loss of Vital AC bus on SG level control	4.0	1
000067 Plant Fire On-site / IX		x	3.02		+	1	Steps called out in site Fire Plans, etc.	2.5	1
000068 Control Room Evacuation. / VIII		1	3.06				Local operation of dumps to control Tave	3.9	1
000069 (W/E14) Loss of CTMT Integrity / V	1.01	1	+		1		Effect of containment pressure on leak rate	2.6	1
000076 High Reactor Coolant Activity / IX		2.01	+	†			Relation of RCS activity to radiation monitors	2.6	1
									_
K/A Category Totals:	4	3	6	0	2	1	Group Point Total:	1	16

		PWR	RO Ex	amina	tion Ou	tline	(Follows Form	ES-401-4)	
Emer	gency a	nd Abn	ormal F	Plant E	volutio	ns - Tier	1 /Group 2		
E/APE # / Name / Safety Function	К 1	К 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Point
000003 Dropped Control Rod / I			3.04				Reasons for actions in the AOP	3.8	1
000007 Reactor Trip Stabilization Recovery / I						2.4.8	How event-based EOPs are used	3.0	1
000008 Pressurizer Vapor Space Accident / III					2.25		Expected leak rate for open PORV or Code Safety	2.8	1
000011 Large Break LOCA / III		2.02					Relation of pumps and a Large Break LOCA	2.6	1
W/E04 LOCA Outside Containment / III		2.2					Interrelation between LOCA ORC and Heat Removal	3.8	1
W/E11 Loss of Emergency Coolant Recirc. / IV	1.3						Indications of a Loss of Recirculation	3.6	1
W/E02 SI Termination / III		2.1					Interlocks and auto features associated with SI Termination	3.4	1
000025 Loss of RHR System / IV			3.02				Isolation of RHR due to pressure increase	3.3	1
000029 Anticipated Transient w/o Scram / I					2.09		Interpret Main Turbine Trip as related to ATWS	4.4	1
000037 Steam Generator Tube Leak / III		X	3.02				Check of Condenser Air Ejector exhaust monitor	3.2	1
000038 Steam Generator Tube Rupture / III	1.02		1				Leak rate vs. Pressure change	3.2	1
000038 Steam Generator Tube Rupture / III	1.01						Consequences of PTS	4.1	1
000054 Loss of Main Feedwater / IV					2.03		Reasons and conditions for AFW pump startup	4.1	1
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / IV	1.2						EOPs associated with Loss of Heat Sink	3.9	1
000059 Accidental Liquid Rad Waste Rel. / IX		2.01					Relationship of Accidental release and liquid radiation monitor	2.7	1
000061 ARM System Alarms / VII	1.01						Detector Limitations	2.5	1
W/E16 High Containment Radiation / IX				1.2			Ability to monitor operating characteristics of the facility	2.9	1
K/A Category Totals:	5	4	3	1	3	1	Group Point Total:		17

			O Exam				(Follows Fo	orm ES-401	-4)
	rgency and	Abnor	7	nt Evolu	itions -	Tier I/G			
E/APE # / Name / Safety Function	K 1	К 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / II						2.4.4	Ability to recognize AOP entry conditions	4.0	1
000036 Fuel Handling Accident / VIII	1.01						Radiation exposure hazards	3.5	1
000056 Loss of Offsite Power / VI			3.02			1	Actions in EOP for loss of Offsite Power	4.4	1
						1			
- · · · · · · · · · · · · · · · · · · ·									
									1
·····			1						
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		<u> </u>							
		<u> </u>				<u> </u>			
K/A Category Totals:	1		1				Group Point Total:		3

			PWR I						<u></u>			(Follows Form ES-401	l-4)	
			Plant S	ystem	s - Tier	2 /Gro	up 1							
System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive	1.05											Relation between CRD & RPS	4.5	1
001 Control Rod Drive						6.08						Purpose of High Flux at Shutdown alarm	2.9	1
001 Control Rod Drive					<u>5.04</u>							Knowledge of rod insertion limits	<u>4.3</u>	1
003 Reactor Coolant Pump	1.03											Relationship of Seal Bypass	3.3	1
003 Reactor Coolant Pump		1		4.07								Minimizing mechanical seal leakage	3.2	1
004 Chemical and Volume Control								2.32				Predict impact of valving in an unborated bed	3.4	1
004 Chemical and Volume Control										<u>4.15</u>		Use of heater for uniform boron concentration	<u>3.6</u>	1
004 Chemical and Volume Control					5.09							Operational implications of thermal shock	3.7	1
013 Engineered Safety Features Actuation		2.01										Power supplies to ESF equipment control	3.6	1
013 Engineered Safety Features Act.									3.02			Monitor auto operation	4.1	1
013 Engineered Safety Features Actuation			3.01									Effect on fuel of a loss of ESFAS	4.4	1
015 Nuclear Instrumentation								2.02				Erratic IR compensation	3.1	1
015 Nuclear Instrumentation	-			4.01	1							Design Feature; SR shutoff	3.1	1
017 In-core Temperature Monitor				4.01							·	ITM input to subcooling	3.4	1
022 Containment Cooling			<u>3.01</u>			X			1			Signals to stop CAR fans	<u>4.1</u>	1
056 Condensate	1	-			X	$\frac{1}{x}$	X	2.12				Impact of bypassing LP heaters	2.8	1
059 Main Feedwater		X	1		X	X	1.03					Power level restrictions	2.7	1
059 Main Feedwater		X	3.02	1	X	X			1			Effect of loss of MFW on AFW	3.6	1
061 Auxiliary/Emergency Feedwater	1.01	-	1		1		1		1			Relation of AFW to SG	4.1	1
061 Auxiliary/Emergency Feedwater			1				1.05					Changes in Flow/motor amps	3.6	1
068 Liquid Radwaste		X	X			1	X				<u>2.3.11</u>	Control of release setpoints	<u>2.7</u>	1
071 Waste Gas Disposal		X		1		X				4.29		O ₂ limits in waste gas tank	3.0	1
072 Area Radiation Monitoring		X			5.01	X						ARM sources		1
K/A Category Point Totals:	3	1	3	3	3	1	2	3	1	2	1	Group Point Total:		23

				PWR	RO Ex	aminati	ion Outl	ine	-			(Follows Form ES-401-	4)	
				Plant	Systen	ns - Tier	2 /Grou	ıp 2						
System #/Name	К 1	К 2	К 3	K 4	K 5	К 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp	Poin
002 Reactor Coolant	1.13											Relationship of RCS and RCPs	4.1	1
006 Emergency Core Cooling							1.16					Determine subcooling	4.1	1
010 Pressurizer Pressure Control	1.03											Impact of RCP loss on Spray Valve Ops	3.6	1
011 Pressurizer Level Control				4.01							1	Operation of PZR heater cutout	3.3	1
012 Reactor Protection					5.01					-		Operational implications of DNB	3.3	1
014 Rod Position Indication							1.02		Χ			Impact of DRPI switches on indication	3.2	1
016 Non-Nuclear Instrumentation	1.03					1	X					Effect of NNIS on SDS	3.2	1
026 Containment Spray			3.02									Effect of loss of CCS on RSS	4.2	1
029 Containment Purge				4.02	X							Design features for negative pressure	2.9	1
033 Spent Fuel Pool Cooling		X			X	X				X	2.2.30	New fuel movement	2.6	1
035 Steam Generator		-				6.02						Effect of PORV failure	3.1	1
039 Main and Reheat Steam							1.05					Effect of MS controls on RCS Tave	3.2	1
055 Condenser Air Removal		X	3.01									Effect of a loss of CARS on the Main Condenser	2.5	1
062 AC Electrical Distribution		2.01			1		1					Bus power supplies to major loads	3.3	1
063 DC Electrical Distribution					X			2.01				Impact of grounds	2.5	1
064 Emergency Diesel Generator								2.16				Impact of loss of offsite power in TEST	3.3	1
073 Process Radiation Monitoring		X		4.01	1	X			X			Termination of release on high activity	4.0	1
076Circulating Water		1			1	X	X	2.01	X			Service Water Start-UP	<u>2.9</u>	1
079 Station Air		X	X	4.01	X	X	X		X	Î		Cross-connect with instrument air	2.9	1
086 Fire Protection	 				1			1		<u>4.04</u>		CO2 Discharge Warning	<u>3.1</u>	1
······································		1	1	1										
	1	1	1		1	1		1						
K/A Category Point Totals:	3	1	2	4	1	1	3	3	0	1	1	Group Point Total:		2

		PW	R RO E	Examina	tion O	utline						(Follows Form ES-401	-4)	
		Plan	nt Syste	ms - Tie	er 2 /G	roup 3								
System #/Name	К 1	К 2	К 3	K 4	K 5	К 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp	Points
005 Residual Heat Removal			3.01						X			Flow limits at reduced inventory	3.9	1
005 Residual Heat Removal								<u>2.04</u>				Effects of a loss of RHR on the RCS	<u>2.9</u>	1
007 Pressurizer Relief/Ouench Tank		X				X				<u>4.01</u>		Maintaining PRT pressure	<u>2.6</u>	1
027 Containment Iodine Removal			X	X	5.01	X	X		X			Purpose of charcoal filters	3.1	1
028 Hydrogen Recombiner and Purge Control				X	1	1		2.02	X			LOCA hydrogen concerns	3.5	1
034 Fuel Handling Equipment	<u>1.04</u>	X	X		X							Relation with NIS	2.6	<u><u>+</u></u>
041 Steam Dump/Turbine Bypass Control			-			6.03						How Loss of CRDS affects SDS	2.7	1
045 Main Turbine Generator		X		4.12								Auto turbine runback	3.3	1
103 Containment		X					1.01					Changes in containment pressure	3.7	1
				[
	-												_	
						<u> </u>				1				
	-		1										1	<u> </u>
								+		<u> </u>				
	-		1	ļ	1				1	ļ	1		1	1
		<u> </u>		<u> </u>										
K/A Category Point Totals:	0	0	1	1	1	1	1	2	0	1	0	Group Point Totals:	-	10

ES-401

Generic Knowledge and Abilities Outline (Tier 3)

Form ES-401-5

Facility:		Date of Exam:	Exam Lev	/el:
Category	K/A	Торіс	Imp.	Points
	2.1.1	Conduct of operations requirements	3.7	1
	2.1.7	Evaluate plant performance	3.7	1
Conduct of	2.1.2	Operator Responsibilities during all modes of plant operation	<u>3.0</u>	1
Operations	2.1.22	Determine mode of operation	2.8	1
	Total	J		4
	2.2.4	Explain variations in systems between units	2.8	1
	2.2.13	Tagging and Clearance Procedures	3.6	1
Equipment Control	2.2.22	LCOs and Safety Limits	3.4	1
	Total			3
<u> </u>	2.3.1	10 CFR 20 and facility Radiological Control Requirements	2.6	1
Radiation				
Control				-
	Total			1
	2.4.2	EOP entry requirements and immediate actions	<u>3.9</u>	1
	2.4.4	Ability to recognize AOP entry requirements	4.0	1
Emergency	2.4.6	Symptom based EOP mitigation strategy	3.1	1
Procedures	2.4.9	Low power/shutdown mitigation strategy	3.3	1
and Plan	2.4.25	Knowledge of Fire Protection Procedures	2.9	1
	Total			5
Tier 3 Target Poin	t Total (RO)			13

ES-301

Individual Walk-Through Test Outline Form ES-301-2

Facility: <u>BVPS2</u>_____

Date of Examination: _3/22/99_

Exam Level (circle one): <u>**RO**</u> / SRO(I) / SRO(U) Operating Test No.:

System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description
1. 001/ Recover Dropped RCCA/ D,S	1.	 a. 003AK1.07 - 3.1- affect of dropped rod on Shutdown Margin
		 b. 003AK1.03 - 3.5 - How reactor power responds after rod drop
2. 002/ Respond to Shutdown LOCA/ D,S,A,L	2.	 a. 009EK3.04 - 4.1 - Determine High Head Safety Injection Requirements
		 b. 009EA1.01 - 4.4 - Determine Cold Overpressure Protection Setpoint
 006/ Makeup to the Refueling Water Storage Tank (RWST)/ N,S 	3.	a. 033K1.05 - 2.7 - Alternate source of Makeup to the RWST
		b. 011EK3.12 - 4.4 - Strategy of ECA-1.1 (cooldown and depressurize)
 061/Reset Terry Turbine Trip and Throttle Valve/ D,P,R 	(4,)	a. 061K4.02 - 4.5 - Turbine driven AFW pump autostart signals
-		 b. 061K4.01 - 3.9- Alternate Source of water to AFW (Service Water)
 003/ Restore Reactor Coolant Pump (RCP) Seal Cooling / N,S 	(4.)	 a. 003K1.12 - 3.0 - Effects of RCS leakage through the Thermal Barrier Heat Exchanger
		 b. 003A2.01 - 3.5 - Effect of sudden Seal Injection on an overheated RCP seal
 076/ Startup Standby Service Water System (SWS) / D,S 	4.	 a. 076K4.02 - 2.9 - Automatic actions on low SWS header pressure
		 b. 076K1.16 - 3.6 - Effect of Containment Isolation Signal on the SWS

System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description
 103/ Perform Containment Isolation Phase A (CIA) checklist / D,S 	5.	a. 013K1.01 - 4.2 - Identify signals which cause a CIA
		 b. 103K4.06 - 3.1 - How to override CIA to obtain Samples
8. 064 / Start #1 Diesel Generator (DG) using local relays / D,P,M	6.	 a. 064K1.01 - 4.1 - Is ground fault protection available while running in Emergency Mode?
		b. 064A4.01 - 4.0 - Requirements for local manual start of DG
9. 015 / Perform a Quadrant Power Tilt Factor (QPTR) (unsatisfactory result) / N,S	7.	a. 001K5.07 - 3.3 - Effect of control rod drop on QPTR
		 b. 015K5.12 - 3.2 - Implication of excessive QPTR on power peaking
10. 078 / Start an Instrument Air (IA) Compressor / D,P	8.	a. 078K3.02 - 3.4 - Is IA required for a safe shutdown?
		 b. 067AK3.04 - 3.3 - Use of Filtered Water (as backup compressor cooling)

room, (S)imulator, (L)ow-Power, (P)lant, (R)CA

		2/3/99
ES-301		Administrative Topics Outline Form ES-301-1
	/: <u>BVPS2</u>	Date of Examination: <u>3/22/99</u>
Exami	nation Level (circle c	one): <u>RO</u> / SRO Operating Test Number:
-	Administrative Topic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
	2.1.20, Ability to execute procedure steps	1. New JPM, fill out an operating Manual Change Notice.
A.1	2.1.21, Ability to Obtain a controlled copy and make a working copy of a procedure	1. New JPM. Obtain controlled copy and make a working copy of a procedure. T.S. M cut Spue instrument
A.2	2.2.22, Knowledge of LCOs and Safety Limits	 Determine pressures and temperatures at which safety limit curve would be violated. Guitaces JPM Actions required if safety limit curve is violated.
A.3	2.3.9, Knowledge of process for performing a Containment Purge	1. New JPM, Perform a Containment Purge. Nalse liseup Map Nalse Survey Map Josh at Rost ask question About Story fine
A.4	2.4.6, Symptom based EOP mitigation strategies.	 New JPM, determine highest priority critical safety function from simulator control board indications.
ę		

SCENARIO OVERVIEW

Facility: <u>Beaver Valley Power Station Unit 2</u> Scenario No.: _1_ Op-Test No.: <u>2LOT2B</u>					
Examiners:	Examiners: Operators:				
<u>Response pr</u>	ocedures to raise	power and respo	o use Normal, Abnormal, Emergency and Alarm and to a VCT problem, a steam flow problem, a		
			outside containment, coincident with one charging		
pump trippin	ig and one chargi	ng pump failing t	o auto start.		
Charging Pu	mp and one Moto	or Driven AFW pu	eady state conditions. Rods are in auto. One mp are out of service. One PZR PORV is isolated. ue to tube leak on SG "B".		
steps. [2CH	S*P21B] and [2F	WE*P23B] are C	oron 982 PPM. Rods in auto with CBD at 190 OOS. 2FWE*38 shut, 2FWE*P22 aligned to 'B' header		
	-		mplete to step 18 due to 20 gpd tube leak on SG "B".		
Tornado wate	ch in effect. AOP	75.1 complete th	rough step 5.		
	-				
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	N RO/PO/ SRO	Raise power at 10%/hr		
2	XMT LDS3	I RO/SRO	VCT level transmitter 2CHS*115 fails high		
	1,100,120,0 ,D		diverting letdown and loss of auto makeup		
3	ХМТ	I PO/SRO	SG "B" steam flow transmitter 2MSS*FT485		
	2MSS22		fails as is		
	1,2.8,0,0,D				
4	MAL ACT	R RO/SRO	Load rejection, 15% (Governor valve #2 fails		
	EHC1B	C PO	closed)		
	0,30,0,D MAL ACT	C RO			
5	CRF8A	N PO/SRO	Stuck rod, H2 (Preload)		
	H2,1,0,D				
6	MAL ACT	M RO/	Steam line break outside containment on SG		
	MSS2B	PO/	"B"		
	1,5E ⁶	SRO			
	,300,0,D				
7	PMP CHS1	C RO/SRO	2CHS*P21A trips on SI initiation (Preload)		
	2,0,C,PPLSI				
	А				
8	MAL PPL7B	C RO/SRO	2CHS*P21C fails to auto start (Preload)		
	2,0,D	l			
* (N)ormal,	(R)eactivity, (I)n	strument, (C)om	ponent, (M)ajor		

Scenario #1 Summary Description.

Unit 2 is at 75% power. System has requested that power be raised to 100% at 10%/hour. During the power escalation VCT level transmitter 2CHS*LT115 fails high causing letdown to divert to liquid waste and loss of VCT auto makeup. Manual makeup and dilution are available. SG "B" steam flow transmitter 2MSS*FT485 fails as is causing a level error following the upcoming load rejection. Turbine Governor Valve #2 fails closed resulting in a 15% load rejection. Rod H2 remains at its original position as rods step in due to RCS temperature rising. After AOP 2.1.8 complete and Technical Specification 3.1.3.1.c.3 actions are addressed a steam break from SG "B" outside containment occurs. Pre-loaded is a trip of HHSI Pump "A" on SI actuation and HHSI Pump "C" fails to auto start. After the faulted SG is isolated, transition is made to E-1. The scenario is terminated when normal charging and letdown are established in accordance with ES-1.1.

SCENARIO OVERVIEW

Facility: <u>Be</u>	aver Valley Pow	ver Station Unit 2	Scenario No.: _2_ Op-Test No.: <u>2LOT2B</u>		
Examiners			Operators:		
	<u></u>				
procedures to high, 2RCS*F 2FWE*P23A Initial Conditi	Objectives: <u>To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm Response</u> procedures to respond to a charging pump sheared shaft, impulse pressure transmitter failure, 2RCS*PT444 failing high, 2RCS*PCV455C sticking open with 2RCS*MOV435 failing to close, ATWS, 2CHS*MOV350 fails to open, 2FWE*P23A fails to auto start. Initial Conditions: <u>IC-47, 75% power, BOL, steady state conditions. Rods are in Manual. 2CHS*P21B and</u> 2FWE*P23B are OOS. 2RCS*PCV456 is isolated. Tornado Warning in effect. Tube leak on SG "B".				
Turnover: <u>Th</u> [2CHS*P21B	e plant is at 75% po and [2FWE*P23B]	ower. BOL, RCS bo are OOS. 2FWE*3	ron 982 PPM. Rods in Auto with CBD at 190 steps. 38 shut, 2FWE*P22 aligned to 'B' header 2FWE-36 shut;		
2FWE-102 of	pen. AOP 6.4 is co	mplete to step 18 du	ue to 20 gpd tube leak on SG "B". Tornado watch in effect. remove 2FWS-P21B from service.		
		T			
Event No.		Event Type*	Event Description		
1	N/A	R RO N PO/SRO	Lower power to remove 2FWS-P21A from service		
2	PMP CHS1 4,0,D	C RO/SRO	Operating Charging Pump sheared shaft resulting in loss of all charging and seal injection flow		
3	XMT MSS42 1,0,20,D	I PO/SRO	Impulse pressure transmitter 2MSS*PT446 fails low		
4	XMT RCS30 1,2500,5,0,D	I RO/SRO	RCS pressure transmitter fails high causing spray valves and PORVs to open and heaters to turn off		
5	VLV RCS32 4,75,0,C,RR CH455C.GT. 0.05	C RO/SRO	PZR PORV 2RCS*PCV455C fails to 75% open (Preload)		
6	VLV RCS11 2,0,D	M ALL	PORV Block valve 2RCS*MOV535 fails to close causing RCS pressure to lower (Reactor trip and SI) (Preload)		
7	MAL PPL1A & B 2,0,D	M ALL	ATWS (Preload)		
8	MAL PPL7A 6,0,D	C PO/SRO	2FWE*P23A fails to auto start, will manually start (Preload)		
9	VLV BAT14 3,0,D	C RO/SRO	2CHS*MOV350 fails closed, must alternate emergency borate (Preload)		
* (N)ormal,	(R)eactivity,	(I)nstrument, ((C)omponent, (M)ajor		

Scenario #2 Summary Description.

Unit 2 is at 75% power with a planned power reduction to 65% to remove 2FWS-P21B from service using Normal Operating Procedures. After power has been reduced > 5% the operating charging pump shaft shears causing a loss of charging and seal injection flow. After the standby charging pump is started and normal letdown established/stabilized, turbine impulse pressure transmitter fails low. When steam dumps in Pressure Mode and AMSAC is re-armed the controlling RCS pressure transmitter fails high causing PZR spray valves and PORVs to open and heaters to turn off. PZR PORV 2RCS*PCV455C sticks at 75% open and its block valve fails to close resulting in a reduction of RCS pressure. An ATWS occurs. Pre-loaded are an auto start failure of AFW Pump "A", the Emergency Borate valve is failed closed (must alternate emergency borate per FR-S.1. EOP progression is E-0, FR-S.1, E-0, E-1. Terminate scenario upon transition from E-1 or E-1, step 18 complete.

SCENARIO OVERVIEW

Facility: <u>Beaver Valley Power Station Unit 2</u> Scenario No.: _3_ Op-Test No.: <u>2LOT2B</u> Examiners: ______ Operators: ______

Objectives: <u>To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm</u> <u>Response procedures to respond to a plugged boric acid filter, MFW pump trip, LOOP, one</u> <u>EDG trips, one EDG breaker fails to close (loss of all AC power), TD AFW pump trips on</u> overspeed (able to reset), <u>RCP "C" #1 seal leak (50 gpm).</u>

Initial Conditions: <u>IC-49, 20% power, BOL, steady state conditions. Rods are in Manual.</u> <u>2CHS*P21B and 2FWE*P23B are OOS.</u> <u>2RCS*PCV456 is isolated</u>. <u>Tornado Warning in effect.</u> <u>Tube leak on SG "B".</u> <u>Shutdown in progress.</u>

Turnover: <u>The plant is at 20% power. BOL, RCS boron 1333 PPM. Rods in Manual with CBD at 149 steps.</u> [2CHS-P21B] and [2FWE*P23B] are OOS. 2FWE*38 shut, 2FWE*P22 aligned to 'B' header 2FWE-36 shut; 2FWE-102 open. AOP 6.4 is complete to step 18 due to 75 gpd tube leak on SG "B". Tornado watch in effect. AOP 75.1 complete through step 5. 2OM52.4.C complete to step 20. Continue shutdown.

Malf. No.	Event Type*	Event Description
N/A	N	Continue plant shutdown IAW 2OM-52.4.C
MAL LDS30 95,0,D	C RO/SRO	F21, Boric Acid Filter to Blender plugs
BST CFW24 1,0,D	I PO/SRO	2CNM-PS118B, MFW Pump suction pressure fails low causing trip of running MFW pump
MAL NIS4A 0.51,0,D	I RO/SRO	IR N35 loss of compensating voltage, must manually energize both source ranges when power drops to less than P-6
MAL SWD1 0,D	M ALL	LOOP
MAL DSG1A 0,D BKR HIV13 2,D	C ALL	EDG 2-1 trips (Preload) EDG 2-2 output breaker trips (Preload) Loss of ALL AC power
MAL AFW3A 5440,0,D	C RO/PO/ SRO	TD AFW Pump trips (able to reset) (Preload)
MAL RCP1B 50,300,30,D	M ALL	RCP "C" #1 seal leak (50 gpm)
	N/A MAL LDS30 95,0,D BST CFW24 1,0,D MAL NIS4A 0.51,0,D MAL SWD1 0,D MAL SWD1 0,D BKR HIV13 2,D MAL AFW3A 5440,0,D MAL RCP1B	N/ANMAL LDS30 95,0,DC RO/SRO 95,0,DBST CFW24 1,0,DI PO/SRO 1MAL NIS4A 0.51,0,DI RO/SRO 0MAL SWD1 0,DM ALL 0MAL DSG1A 0,DC ALL 0,DMAL AFW3A 5440,0,DC RO/PO/ SROMAL RCP1BM ALL

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario #3 Summary Description.

Unit 2 is at 20% power with a unit shutdown in progress in accordance with normal operating procedures. After a 5% power reduction the boric acid filter to blender plugs stopping normal boration until the filter is locally bypassed. MFW Pump "B" trips due to a failure of its suction pressure transmitter. After the Start-up Feed Pump is started and SG levels stabilized, Intermediate range N35 will lose compensating voltage this will require AOP entry. This loss will require the operators to manually energize the source ranges after the reactor trips. A loss of offsite power (LOOP) occurs. EDG 2-1 trips and EDG 2-2 output breaker fails to close resulting in a loss of all AC power and ECA-0.0 entry. Pre-loaded are a trip of the TD AFW Pump (FR-H.1 <u>NOT</u> entered due to ECA-0.0 being in effect). Five minutes after the LOOP a 50 gpm leak develops in RCP "C" #1 seal causing transition to ECA-0.2 when AC power is restored. After an appropriate delay power is restored to 4 kv emergency bus DF by placing EDG's 2-1 output breaker in the EDG 2-2 breaker cubicle. The scenario is terminated when RCP seal cooling has been established.

SCENARIO OVERVIEW

Facility: <u>B</u>	eaver Valley Po	wer Station Unit	2 Scenario No.: _4_ Op-Test No.: <u>2LOT2B</u>	
Examiners			Operators:	
Response compensat pressure co Initial Conc 2CHS*P21 Tube leak o Turnover: <u>1</u> steps. [2C 2FWE*38 s complete to	Objectives: <u>To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm</u> <u>Response procedures to respond to a failure of the controlling steam flow channel pressure</u> <u>compensation for SG "C", the flow totalizer does not terminate dilution flow at the setpoint, PZR</u> <u>pressure control problem, and a SGTR with loss of PZR pressure control</u> Initial Conditions: <u>IC-50, EOL, 48% power, steady state conditions.</u> Rods are in auto. <u>2CHS*P21B and 2FWE*P23B are OOS.</u> <u>2RCS*PCV456 is isolated.</u> <u>Tornado Warning in effect.</u> <u>Tube leak on SG "B".</u> <u>Ready to raise power to 100%.</u> Turnover: <u>The plant is at 48% power.</u> <u>RCS boron 318 PPM.</u> <u>Rods in auto with CBD at 171</u> <u>steps.</u> [2CHS*P21B] and [2FWE*P23B] are OOS. <u>2FWS-MOV152 de-energized shut.</u> <u>2FWE*38 shut, 2FWE*P22 aligned to 'B' header, 2FWE-36 shut; 2FWE-102 open.</u> <u>AOP 6.4 is</u> <u>complete to step 18 due to 10 gpd tube leak on SG "B".</u> <u>Tornado watch in effect.</u> <u>AOP 75.1</u> <u>complete through step 5.</u>			
	1	1		
Event No.	Malf. No.	Event Type*	Event Description	
Event No.	Malf. No. N/A	Event Type* R RO N PO/SRO	Event Description Raise power at 10%/hr	
[ļ <u> </u>	R RO		
1	N/A XMT MSS47	R RO N PO/SRO	Raise power at 10%/hr Steam flow pressure compensation failure	
2	N/A XMT MSS47 1,10,10,0,D OVR BAT8A	R RO N PO/SRO I PO/SRO	Raise power at 10%/hr Steam flow pressure compensation failure 2MSS*PT486 fails low Total makeup flow totalizer fails to terminate	
1 2 3	N/A XMT MSS47 1,10,10,0,D OVR BAT8A 2,0,D MAL RCS4C	R RO N PO/SRO I PO/SRO I RO/SRO	Raise power at 10%/hr Steam flow pressure compensation failure 2MSS*PT486 fails low Total makeup flow totalizer fails to terminate dilution at setpoint (Preload) Start as small leak that progressively worsens until	
1 2 3 4	N/A XMT MSS47 1,10,10,0,D OVR BAT8A 2,0,D MAL RCS4C 600,60,0,D CNH PCS10	R RO N PO/SRO I PO/SRO I RO/SRO M ALL	Raise power at 10%/hrSteam flow pressure compensation failure 2MSS*PT486 fails lowTotal makeup flow totalizer fails to terminate dilution at setpoint (Preload)Start as small leak that progressively worsens until SGTR SG "B" (600 GPM)	
1 2 3 4 5	N/A XMT MSS47 1,10,10,0,D OVR BAT8A 2,0,D MAL RCS4C 600,60,0,D CNH PCS10 5,0,20,0,D VLV RCS11	R RO N PO/SRO I PO/SRO I RO/SRO M ALL C RO/SRO	Raise power at 10%/hrSteam flow pressure compensation failure 2MSS*PT486 fails lowTotal makeup flow totalizer fails to terminate dilution at setpoint (Preload)Start as small leak that progressively worsens until SGTR SG "B" (600 GPM)PZR Master Pressure Controller fails highPORV Block valve 2RCS*MOV535 fails closed	
1 2 3 4 5 6	N/A XMT MSS47 1,10,10,0,D OVR BAT8A 2,0,D MAL RCS4C 600,60,0,D CNH PCS10 5,0,20,0,D VLV RCS11 3,0,C VLV RCS13	R RO N PO/SRO I PO/SRO I RO/SRO M ALL C RO/SRO C RO/SRO	Raise power at 10%/hrSteam flow pressure compensation failure 2MSS*PT486 fails lowTotal makeup flow totalizer fails to terminate dilution at setpoint (Preload)Start as small leak that progressively worsens until SGTR SG "B" (600 GPM)PZR Master Pressure Controller fails highPORV Block valve 2RCS*MOV535 fails closed after manual closePORV Block valve 2RCS*MOV537 breaker trips	

Scenario #4 Summary Description.

Unit 2 is at 48% power, steady state conditions. While power is being raised >5% the makeup totalizer fails to stop at its setpoint requiring dilution to be manually terminated. SG "C" steam flow channel IV pressure compensation fails requiring manual feed control until an alternate channel is selected. The corresponding SG level channel must also be declared inoperable and its bistables tripped. A small S/G tube leak occurs requiring AOP entry for S/G tube leak. Leak will get progressively worse requiring crew to initiate AOP for emergency shutdown. During emergency shutdown, PZR Master controller fails resulting in an RCS pressure transient. The transient results in the loss of several pressure control components. S/G leakage escalates to SGTR. "C" RCP trips when the reactor trips, this removes the last remaining component that can be used in E-3 to depressurize the RCS. The loss of PZR pressure control results in ECA-3.3 entry. The crew must use auxiliary spray to depressurize the RCS. The scenario is terminated when E-3, is re-entered from ECA-3.3 and step 16 b is complete.

^o Prepare fear of Sheets fn all JPM's & questions JUST INITIAL Conditions of Cues No other infor.

ES-301		Administrative Topics Outline Form ES-301-1	1
Facilit	y: <u>BVPS2</u>	Date of Examination: <u>3/22/99</u>	
Exami	ination Level (circle	one): <u>RO</u> / SRO Operating Test Number:	
	Administrative Topic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions	
	2.1.20, Ability to execute procedure steps	1. New JPM, determine highest priority critical safety function from list of parameters.	
A.1			
	2.1.12, Ability to apply TS for a system	1. New JPM, Determine Tech Spec requirements for a failed PZR pressure transmitter.	
A.2	2.2.22, Knowledge of LCOs and Safety Limits	1. New JPM, determine if safety limit was exceeded during event based on chart recorder traces	
A.3	2.3.10, Ability to perform procedures to reduce excessive levels of radiation	1. New JPM, Determine maximum stay time in high radiation area Becf up in Mybre GET line	
A.4	2.4.29, Knowledge of the Emergency Plan	1. New Question Which emergency facility should you report to for an Alert	
		2. New Question Which emergency facility should you report to prior to entry into PAB when being dispatched from OSC.	Tsec ₁

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BEAVER VALLEY JOB PERFORMANCE MEASURE EVALUATOR COVER SHEET

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JPM Number: A JPM Title: De								Kmitter
K/A Reference								
JPM Application	_	Requal					П та	raining
Evaluation Me	form llate		OCATION lant Si imulato lassroo	te r		OJT Initial	Requal.	Exam or Exam
BV-T NRC Other:								
Evaluation Re Performe Results	er: Name	: SAT UNSAT [*]		Allot Time	ted: Crit	Time (n	ninutes) _ Actua D Yes	1:No
Comments (Re	quired fo	or UNSAT						
Evaluation Re Observer Observer Observer Observer	1: Nam 2: Nam 3: Nam 4: Nam	າe າe າe T	ime (mi	nutes)		Employe Employe Employe Employe	ee No: ee No: ee No: Result	
Question #1 Employee No:			Allotte N/A		Act:	ual	SAT	UNSAT [*]
Question #1 Employee No:			N/A					
*Comments (Re	quired fo	or UNSAT	Evaluat					·····
Evaluator (Pr Evaluator Sig						-		

BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: Determine TS Requirements for Failed PZR Pressure Transmitter

INITIAL The plant is operating at 100% power all system CONDITIONS: NSA. Pressurizer pressure transmitter 2RCS*PT45 low. All other PZR pressure transmitters are op	5 fails
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INIT. CUE:	Your supervisor directs you to identify all required Tech Spec actions for this failure. Include any	
	applicable time limits.	

At this time, ask the evaluator any questions you have on this _____ JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".



Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been met, announce "I have completed the JPM". Then hand back this sheet to the evaluator.

RIL #A5.635.J BEAV	ER VALLEY JOB PERFORMANCE MEASURE
	EVALUATOR DIRECTION SHEET
JPM NUMBER:	ADM-IF TS (2LOT2B NRC)
JPM TITLE:	Determine TS Requirements for Failed PZR Pressure Transmitter.
TASK STAN:	Identify All TS Requirements for Failed PZR Pressure Transmitter, including time limits.
RECOMMENDED STARTING LOCATION:	Control Room/Simulator
DIRECTIONS:	Determine TS Requirements for Failed PZR Pressure Transmitter
INIT. CONDITIONS:	The plant is operating at 100% power all systems in NSA. Pressurizer pressure transmitter 2RCS*PT455 fails low. All other PZR
INIT. CUE:	pressure transmitters are operable. Your supervisor directs you to identify all required Tech Spec actions for this failure. Include any applicable time limits.
REFERENCES:	Tech Specs
TOOLS:	None

HANDOUT:

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NUMBER	TITLE
	Determine TS Requirements for Failed PZR Pressure Transmitter.

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
Churche Church	START TIME: EVALUATOR NOTE: The candidate may begin the JPM by referring to various references to make an evaluation of the functions served by the failed transmitter. The specific reference used is not important, rather that the correct functions are
La reference	identified. The JPM is written using the figure on page 22 of 20M-6.4.IF
1. Locates reference.	1. Candidate locates page 22 of 2OM-6.4.IF
2. Identify functions fed from transmitter	2. Identifies transmitter feeds:
	Rx Trips OTDT
	PZR Press Low PZR Press High
	ESF ACT PZR Press Low(SI) P-11
	AND
	SDP indication
	Comments:

NUMBER	TITLE
ADM-IF TS (2LOT2B	Determine TS Requirements for Failed PZR
NRC)	Pressure Transmitter.

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
3. Checks Tech Specs for applicability	3.1 Candidate reviews TS 3.3.1.1 table 3.3-1 and determines the following items are applicable:
	Item 7 OTDT Item 9 PZR Press low Item 10 PZR Press High
	Comments:
	3.2 Candidate reviews TS 3.3.2.1 table 3.3-3 and determines the following items are applicable: Item 1.d PZR Press Low(SI)
	Comments:
	EVALUATOR NOTE: P-11 is NOT applicable since the minimum channels operable is still met.
	3.3 Candidate reviews TS 3.3.3.5 table 3.3-9 and determines the following items are applicable:
	Item 7 PZR Press

Page 2of 3

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NUMBER	TITLE
ADM-IF TS (2LOT2B	Determine TS Requirements for Failed PZR
NRC)	Pressure Transmitter.

STEP	STANDARD (Indicate "S" for Sat. or "U"
("C" denotes critical step)	for Unsat.)
4.C Determine Tech Spec requirements.	<pre>4.1.C Identifies that bistables for the failed channel must be placed in the tripped condition within 6 hours for: Rx Trips OTDT PZR Press Low PZR Press High ESF ACT PZR Press Low(SI)</pre>
	Comments:
	EVALUATOR NOTE: SDP action is NOT applicable since the minimum channels operable is still met.
	Comments:
	STOP TIME

BEAVER VALLEY JOB PERFORMANCE EVALUATOR COVER SHEET				
JPM Number: ADM-S TREES (2LOT2B NRC)Rev:0 JPM Title: Determine FRPs to Enter and Priori				
K/A Reference: 2.1.20 [4.3] Task ID #: 30	14440601			
JPM Application: Requal X Initial H	Exam 🗖 Training			
Evaluation Method LOCATION	TYPE			
🗙 Perform 🗖 Plant Site 🗖	Training			
🗖 Simulate 🗖 Simulator 🗖	Annual Requal. Exam			
🔀 Classroom	OJT			
X] Initial Operator Exam			
Administered By:	_			
	· · · · · · · · · · · · · · · · · · ·			
× NRC				
Other:				
Evaluation Results Performer: Name: Results SAT Time (minutes) UNSAT* Allotted: 20 Actual: Time Critical: Yes No Administrative JPM Faulted *Comments (Required for UNSAT Evaluation):				
Evaluation Results	as above			
Observer 1: Name:	Employee No:			
Observer 2: Name Observer 3: Name	Employee No: Employee No:			
Observer 4: Name	Employee No:			
~	Results tual SAT UNSAT*			
Question #1 N/A Employee No:				
Fmplovee No:				
*Comments (Required for UNSAT Evaluation):				
Evaluator (Print):	Organization:			
Evaluator Signature				

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BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

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Task: Determine FRPs to Enter and Priority

INITIAL CONDITIONS:	The plant was operating at 100% power all systems in NSA. A large break LOCA occurred, the EOPs have been entered, Procedure E-1 "Loss of Reactor or Secondary Coolant" is being implemented. The following plant conditions exist:
	CNMT pressure 16.5 PSIG All core exit T/Cs 752 F All RCPs are OFF RVLIS Full range 46% ALL Power Range NIS 0% IRs Startup rate is minus .3 DPM SRs NIS are deenergized ALL RCS cold leg temps 573 F RCS pressure 0 PSIG All S/Gs NR levels 18% Total AFW flow to S/Gs 300 GPM PZR level 0%

	informs you that the STA has been
injured, and re	equests you to perform EOP Status Tree
1	plete the review of the Status Trees the procedures that should be entered
and their order	

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been completed, announce "I have completed the JPM". Then hand back this sheet to the evaluator.

RIL #A5.635.J BEAV	ER VALLEY JOB PERFORMANCE MEASURE
	EVALUATOR DIRECTION SHEET
JPM NUMBER:	ADM-S TREES (2LOT2B NRC)
JPM TITLE:	Determine FRPs to Enter and Priority
TASK STAN:	All FRPs identified and properly prioritized.
RECOMMENDED STARTING LOCATION:	Control Room/Simulator
DIRECTIONS:	Determine FRPs to Enter and Priority
INIT. CONDITIONS:	The plant was operating at 100% power all systems in NSA. A large break LOCA occurred, the EOPs have been entered, Procedure E-1 "Loss of Reactor or Secondary Coolant" is being implemented. The following plant conditions exist:
	CNMT pressure 16.5 PSIG All core exit T/Cs 752 F All RCPs are OFF RVLIS Full range 46% ALL Power Range NIS 0% IRs Startup rate is minus .3 DPM SRs NIS are deenergized ALL RCS cold leg temps 573 F RCS pressure 0 PSIG All S/Gs NR levels 18% Total AFW flow to S/Gs 300 GPM PZR level 0%
INIT. CUE:	Your supervisor informs you that the STA has been injured, and requests you to perform EOP Status Tree monitoring. Complete the review of the Status Trees and report back the procedures that should be entered and their order of entry.
REFERENCES:	Status trees
TOOLS:	None
HANDOUT:	

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NUMBER	TITLE
ADM-S TREES (2LOT2B NRC)	Determine FRPs to Enter and Priority

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	START TIME:
1. Locates Status Trees.	1. Candidate locates Status Trees
2. Checks Subcriticality	2. Candidate determines Subcriticality tree is GREEN/SATISFIED
	Comments:
3. Checks Core Cooling	3.1 Candidate determines Core Cooling tree is ORANGE with FR-C.2 indicated
	Comments:
4. Checks Heat Sink	4.1 Candidate determines Heat Sink tree is RED with FR- H.1 indicated
	Comments:

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NUMBER	TITLE	٦
ADM-S TREES (2LOT2B NRC)	Determine FRPs to Enter and Priority	

5.1 Candidate determines Integrity tree is GREEN/SATISFIED
Comments:
4.1 Candidate determines Containment tree is ORANGE with FR-Z.1 indicated
Comments:
7.1 Candidate determines Inventory tree is YELLOW with FR-I.2 indicated
Comments:
EVALUATOR NOTE: The
identification of FR-I.2 in the next step is NOT critical since yellow path procedures are only optionally entered at the discretion of the NSS/ANSS.

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Rev. 0

NUMBER	TITLE
ADM-S TREES (2LOT2B NRC)	Determine FRPs to Enter and Priority

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STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
8.C Prioritizes Procedures to be entered.	<pre>8.1.C Candidate reviews status tree results and determines order of procedure entry to be: 1. FR-H.1 2. FR-C.2 3. FR-Z.1 4. FR-I.2 Comments:</pre>
9. Report results	9. Candidate reports results to supervisor. Comments:
	STOP TIME

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BEAVER VALLEY JOB PERFORMANCE MEASURE EVALUATOR COVER SHEET

						: (2LOT2B 1 Spec Sa					em #:2.2 Lated.
] Tasl					
	Appli				Requal				am '		Training
Eval	luatio	n Met	hod			LOCATIO	V		TYPE		
	X	Perfo	orm			Plant S	ite		Traini	ng	
		Simul	late			Simulato	or		Annual	Requa	l. Exam
					X	Classro	om		OJT		
								X	Initia	l Oper	ator Exam
Admi	iniste	red B	v:								
	BV-T		-								
X	NRC										
		:									
		•									
Eval	luatio	n Res	ults								
	Perf	Eormer	: N	ame:				_	Employ	ee No:	
	Resi	lts			SAT				Time (1	ninute	s)
					UNSAT	*	Allot	ted:	20	Actu	ual:
							Time	Crit	ical:	D Y	es 🗵 No
						Admini			M X		
*Con	ments	(Requ	uire	d for	UNSA	AT Evalua	tion):				
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Rev. 0

BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: Determine If Tech Spec Safety Limit has been Violated.

INITIAL	The plant had been operating at 100% power all systems
CONDITIONS:	in NSA. A loss of feedwater induced ATWS occurred.

INIT. CUE:	Using these control room strip charts for wide range RCS pressure and wide range Tc and Th, determine if a Tech Spec safety limit has been violated, including
	any applicable actions and time limits. Assume that Rx power was 40% during the period of the strip chart recordings.

4.1

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been completed, announce "I have completed the JPM". Then hand back this sheet to the evaluator.

RIL #A5.635.J BEAN	VER VALLEY JOB PERFORMANCE MEASURE
	EVALUATOR DIRECTION SHEET
JPM NUMBER:	ADM-Safety Limit (2LOT2B NRC)
JPM TITLE:	Determine If Tech Spec Safety Limit has been Violated.
TASK STAN:	Identify TS for Safety Limit was violated, including actions and time limits.
RECOMMENDED STARTING LOCATION:	Control Room/Simulator
DIRECTIONS:	Determine If Tech Spec Safety Limit has been Violated.
INIT. CONDITIONS:	The plant had been operating at 100% power all systems in NSA. A loss of feedwater induced ATWS occurred.
INIT. CUE:	Using these control room strip charts for wide range RCS pressure and wide range Tc and Th, determine if a Tech Spec safety limit has been violated, including any applicable actions and time limits. Assume that Rx power was 40% during the period of the strip chart recordings.
REFERENCES:	Tech Specs
TOOLS:	None

HANDOUT:

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NUMBER	TITLE				
ADM-Safety Limit	Determine If Tech Spec Safety Limit has been				
(2LOT2B NRC)	Violated.				

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	START TIME:
	EVALUATOR NOTE: Candidate may check steps 1- and in any order.
1. Locates reference.	1. Candidate locates Tech Spec 2.1 and figure 2.1-1
2. Calculate hottest loop Tavg	2. Using the numbers taken from the strip charts, candidate calculates hottest loop Tavg to be \pm F
	Comments:
3.C Checks Reactor Core Safety limit Tech Spec for applicability	3.1.C Candidate reviews TS 2.1.1 and determines that the Reactor Core Safety Limit Tech Spec has been violated.
	Comments:
	3.2.C Candidate determines that the action required is to be in HOT STANDBY within 1 hour
	Comments:

Rev. 0

NUMBER	TITLE					
ADM-Safety Limit (2LOT2B NRC)	Determine If Tech Spec Safety Limit has been Violated.					

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
3.C Checks Reactor Coolant System Pressure Safety limit Tech Spec for applicability	3.1.C Candidate reviews TS 2.1.2 and determines that the Reactor Coolant System Pressure Safety limit Tech Spec has NOT been violated. Comments:

		NRC)Rev:0 ime in High Rad		#:2.3
)] Task ID #		01
JPM Applicatio	n: 🗖 Requa	l 🛛 Initia	al Exam	Train:
Evaluation Met	hod	LOCATION	TYPE	
X Perfo	orm 🗖	Plant Site	🗖 Trair	ning
🗖 Simul	late 🗖	Simulator	🗖 Annua	al Requal. Exa
	X	Classroom	- OJT	
			🗙 Initi	ial Operator H
Administered B	y:		Other	r:
BV-T				
× NRC				
□ *Comments (Requ	uired for UNS.			Faulted
	ults C 1: Name: 2: Name 3: Name 4: Name	Administrati AT Evaluation): neck here if sar Time (minutes)	ve JPM X me as above _ Emplo _ Emplo _ Emplo	Faulted Faulted Pyee No: Dyee No: Dyee No: Results
*Comments (Requ Evaluation Resu Observer Observer Observer Observer	ults C Ch 1: Name: 2: Name 3: Name 4: Name Question ID	Administrati AT Evaluation): neck here if sar Time (minutes) Allotted	ve JPM X me as above _ Emplo _ Emplo _ Emplo	Faulted Faulted Pyee No: Dyee No: Dyee No: Results SAT UNS
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*Comments (Requ Evaluation Resu Observer Observer Observer Observer	ults Ch 1: Name: 2: Name 3: Name 4: Name Question ID	Administrati AT Evaluation): heck here if sar Time (minutes) Allotted N/A	ve JPM X me as above _ Emplo _ Emplo _ Emplo	Faulted Faulted Pyee No: Dyee No: Dyee No: Results SAT UNS
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*Comments (Requ Evaluation Resu Observer Observer Observer Observer Observer Question #1 Employee No: Question #1 Employee No:	ults Ch 1: Name: 2: Name 3: Name 4: Name Question ID	Administrati AT Evaluation): neck here if sar Time (minutes) Allotted <u>N/A</u> <u>N/A</u>	ve JPM X	Faulted Faulted Pyee No: pyee No: pyee No: Results SAT UNS C C

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BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: Determine Stay Time in High Rad Area

INITIAL	The plant is operating at 100% power all systems in
CONDITIONS:	NSA. It is necessary close valve A-1 on Training
	pump A-1 located in training pump A-1 cubicle on
	the 755' level of the PAB. Your annual year to date
	radiation exposure is 3.25 REM TEDE. Your RADOS
	limit is 750 mR. You are meter qualified to perform
	your own monitoring.

INIT. CUE:	As part of your pre-job brief, your supervisor directs you to use the posted map of the area (given) to
	determine your maximum allowable stay time, at the valve.

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At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been completed, announce "I have completed the JPM". Then hand back this sheet to the evaluator.

BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

- JPM NUMBER: ADM-RAD (2LOT2B NRC)
- JPM TITLE: Determine Stay Time in High Rad Area

TASK STAN: BVPS Dose guide limits not exceeded.

RECOMMENDED Control Room/Simulator STARTING LOCATION:

- **DIRECTIONS:** Determine Maximum stay time in high radiation area.
- INIT. CONDITIONS: The plant is operating at 100% power all systems in NSA. It is necessary close valve A-1 on Training pump A-1 located in training pump A-1 cubicle on the 755' level of the PAB. Your annual year to date radiation exposure is 3.25 REM TEDE. Your RADOS limit is 750 mR. You are meter qualified to perform your own monitoring.
- INIT. CUE: As part of your pre-job brief, your supervisor directs you to use the posted map of the area (given) to determine your maximum allowable stay time, at the valve. REFERENCES: Map of area

TOOLS: None

HANDOUT:

RIL #A5.635.J

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NUMBER	TITLE
ADM-RAD (2LOT2B NRC)	Determine Stay Time in High Rad Area

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	START TIME:
	EVALUATOR NOTE: It may be necessary to help orient the student to the location of valve A-1 on the map.
 Determine dose rate at the valve. 	 Candidate reviews map and determines that the dose rate at the valve is 1250 mR/hr.
	Comments:
2.C Calculate maximum stay time.	2.C Candidate determines maximum ștay time :
	750mR = 1250mR/60min X (x) 750 = 20.83 X (x) 750/20.83 = x
	36 min. = x Comments:
	STOP TIME

Rev. 0

RTL #A5.640E

DUQUESNE LIGHT COMPANY Nuclear Power Division Training Administrative Manual

OJT CHECKLIST/JPM COVER PAGE

PROGRAM TITLE: Licensed Operator Training

SUBDIVISION: On-the-Job Training

OJT CHECKLIST/JPM TITLE: Determine TS Requirements for Failed PZR Pressure Transmitter

JPM NO.:

ADM-IF TS (2LOT2B NRC)

COMPUTER CODE: N/A

Revision No.	Date

Revision No.	Date

PREPARED BY: R. J. Brooks DATE:_____

APPROVED FOR IMPLEMENTATION:

_____ DATE: _____

Director, Operations Training, or Designee RTL #A5.640E

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DUQUESNE LIGHT COMPANY Nuclear Power Division Training Administrative Manual

LESSON PLAN AND OJT REVISION APPROVAL SHEET

DOCUMENT TITLE: Determine TS Requirements for Failed PZR Pressure Transmitter

Revision			Approv	val
No.	Brief Description	Revised by:	Signature	Date

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REACTOR POWER 100%			
SURVEY DATE _Current	TIME 0800		
SURVEYED BYRandy Rad	Itech		
BADGE #7777			
RWP #399-8000			
INST. TYPE _RO2	SR # 1234		
INST. TYPE _RM-14	_SR #5678		

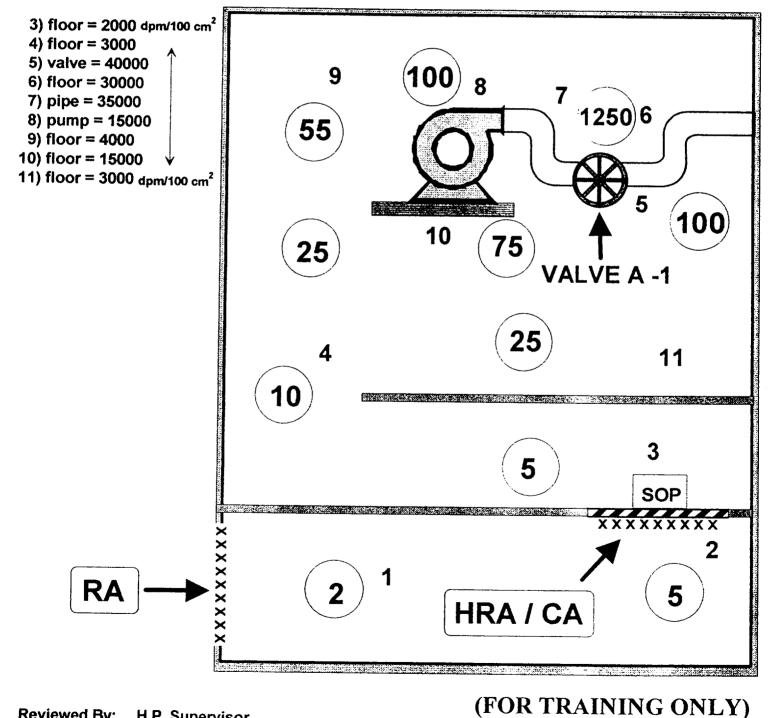
* ALL AREAS ARE POSTED RCA UNLESS OTHERWISE NOTED.

- * CIRCLED NUMBERS ARE RADIATION LEVELS IN mR/hr.
- * NUMBERS ARE SMEAR LOCATIONS.

* ALL SMEARS ARE LESS THAN 1000dpm/100cm² EXCEPT:

TRNG. A - 1 PUMP CUBICLE 755'

RCA = Radiologically Controlled Area **RA = Radiation Area Boundry** CA = Contaminated Area Boundry HRA = High Radiation Area X X X X X X X = Boundry **CANANA** = Contaminated Area Boundry



Reviewed By: ___H.P. Supervisor

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

The Emergency Plan has been implemented in response to a Large break LOCA. As an extra NCO for the shift, you had been assigned the PAB tour. The standby alarm is sounded, and an announcement made that an "ALERT has been declared, all onsite emergency response personnel and facilities should begin to activate". To which emergency response facility should you report?

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RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

The Emergency Plan has been implemented in response to a Large break LOCA. As an extra NCO for the shift, you had been assigned the PAB tour. The standby alarm is sounded, and an announcement made that an "ALERT has been declared, all onsite emergency response personnel and facilities should begin to activate". To which emergency response facility should you report? ANSWER: Operations Support Center (OSC located below the Unit 1 CR in the process instrument room).)

TIME ALLOTTED: 3 minutes 2.4.39 3.3/3.1 2.4.43 2.8/3.5 KSA #: REF: EPP Vol 1 section 7 page 7-2 item 7.1.2 rev. 11 COMMENTS:

Rev. 0

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

The Emergency Plan has been implemented in response to a Large break LOCA. As a member of the Operations Support Center, you are being dispatched to the PAB to realign the valves in the HHSI system. Which emergency response facility should you report to when leaving the OSC?.

12.15

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

The Emergency Plan has been implemented in response to a Large break LOCA. As a member of the Operations Support Center, you are being dispatched to the PAB to realign the valves in the HHSI system. Which emergency response facility should you report to when leaving the OSC?. ANSWER: Radiological Operations Center (ROC)

TIME 3 minutes ALLOTTED: 2.4.34 3.8/3.6 KSA #: REF: EPP Vol 1 section 2 page 5-9 item 5.2.7.3 rev. 11 COMMENTS:

200

ES-301 Facility: <u>BVPS2</u>			ugh Test Outline Date of Examination: _3/2	Form ES-301-2
	-	(I) / SRO(U)	Operating Test No.:	
System / JPM	Title / Type Codes*	Safety Function	Planned Follow-up (K/A/G - Importance -	
1. 001/ Recove D,S JP OK	r Dropped RCCA/	1.	a. 003AK1.07 - 3.1 - Expla dropped rod on Shutdov	
IN OK	ÿ		b. 003AK1.02 - 3.1 - Expl turbine/reactor power rod control	
2. 002/ Respon LOCA/ D,S(A	d to Shutdown	2.	a. 009EK3.04 - 4.1 - Deter Safety Injection Require	•
)	pet form		b. 009EA1.01 - 4.4 - Dete Overpressure Protection	
	o to the Refueling ge Tank (RWST)/	3.	a. 033K1.05 - 2.7 - Find flo Alternate source of Mak RWST (Spent Fuel Poo	eup to the
OKay	~		b. 011EA1.11, 4.2 - Priori core covered during L	
4. 061/Reset To and Throttle	erry Turbine Trip Valve/ D,P,R	4.	a. 061K1.03, 3.5 - determ avoid steam binding o	nine how to of supply valves
	FeA		b. 061K4.01 - 3.9- Find flo Alternate Source of wat (Service Water)	· ·
	Reactor Coolant Seal Cooling /	4.	a. 003K1.12 - 3.0 - Analyz RCS leakage through th Barrier Heat Exchanger	ne Thermal
Dolle			b. 003A2.01 - 3.5 - Prector sudden Seal Injection o RCP seal	
	Standby Service n (SWS) / D,S	4.	a. 062AA1.02 - Contrast at BOL with that at EC	
Thut CK2	γ		b. 076K1.16 - 3.6 - Deduc Containment Isolation S SWS and Liquid Discha	Signal on the

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System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description	
7. 103/ Perform Containment Isolation Phase A (CIA) checklist / D,S	5.	a. 103A2.03 - 3.5 - Predict results of failure to isolate Containment after fuel damaging accident	
		b. 103K4.06 - 3.1 - Determine how to override CIA to obtain Samples	
8. 064 / Start #1 Diesel Generator (DG) using local relays / D,P,M-	6. metifiel	a. 062A2.12 - 3.2 - Predict impact of reenergizing a faulted bus	
p:6-4		b. 064K1.02 - 3.1 - Develop plan to mitigate reduction of cooling water	
9. 015 / Perform a Quadrant Power Tilt Factor (QPTP) (unsatisfactory result) (N,S	7.	 a. 001K5.07 - 3.3 - Evaluate effect of control rod drop on QPTR 	. n (
		b. 015K5.12 - 3.2 - Relate excessive power peaking to power distribution Technical Specifications	Deteli
10. 078 / Start an Instrument Air (IA) Compressor / D,P)	8.	a. 078K3.02 - 3.4 -Prediet affect of loss of IA on Safe Shutdown capability.	Deletti
plant		 b. 067AK3.04 - 3.3 - Determine why Domestic water is needed as backup air compressor cooling. 	
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)Iternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (P)Iant, (R)CA			

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Explanation of changes to JPM Followup Questions

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JPM #1 Question b.	The former question "b" was determined to be too closely related to question "a", <u>if</u> question "a" was answered using a reactivity balance including negative reactivity from the dropped rod. The new question "b" explores a different aspect of the rod control circuit (development of the temperature error signal).
JPM #3, Question b	The former question "b" was determined to be potentially low cognitive level (if candidate knew the high level actions in ECA 1.1 from memory); also, the question did not elicit the particular major actions required by the key.
	The replacement question is a higher cognitive level because it requires application of a general principle ("keep the core covered") to make a choice which is not explicitly set out in the procedure.
JPM #4 Question a	The former question "a" was chosen for its high importance rating in the K/A catalogue, but was too low in cognitive level ("list autostart signals for the Terry Turbine").
	The replacement question is a higher cognitive level because it requires combining information from two references (the P&ID/VOND and the Operating Manual) to determine which steam supply valve is upstream and that the upstream valve must be closed first.
JPM #6 Question a	The previous question "a" was determined to be too low in cognitive level (essentially "knowledge of automatic actions on low discharge pressure). This knowledge was also found to be measured by the written portion of the exam.
	The replacement question is at a higher cognitive level in that it requires integrating the affect of power history on RCS decay heat rate and the dependence of Spent Fuel Pool heat load on time after refueling. (This knowledge would be operationally significant during the mitigation of a Loss of Service Water event.)

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JPM #7 Question a	The former question "a" was determined to be of a low a cognitive level ("know which signals cause a phase A Containment Isolation").
	The replacement questions requires applying knowledge of the effects of fuel damage (increased RCS activity levels) and extrapolating normal radiation levels to identify hazards to chemists during sampling. Recent plant concerns with awareness of radiological conditions during transit to work locations are also tested.
JPM #8 Question a	The original question "a" required combining the knowledge that the ground sensing transformer is disconnected on an emergency start with the fact that this removes ground protection from the
	Diesel Generator.
	To increase the cognitive level, the replacement drawing requires the use of two circuit schematics (or two logic drawings) to determine the effect of an overcurrent condition on the 4160V Emergency Bus and the DG output breaker. It also tests awareness of the consequences of reenergizing a fault while DG electrical protection is minimized due to operation in the Emergency Mode.
JPM #8	The original question "b" was also determined to be a combination of two knowledges (panel is normally in REMOTE control and the pushbuttons
Question b	only start the DG in LOCAL).
	The replacement question is much higher in cognitive level because it requires use of knowledge of the removal of engine trips in Emergency Mode to extrapolate the results of DG operation without sufficient cooling. It also requires the formulation of an original plan to minimize DG overheating, which is not explicitly directed by the procedure.

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RTL #A5.640U BEAVER VALLEY JOB PERFORMANCE MEASURE EVALUATOR COVER SHEET				
JPM Number: 2CR-090 Rev:3 JPM Title: Recover a Dropped RCCA	System #:003			
K/A Reference:003 AA1.02 3.6/3.4	Task ID #: 0000070401			
JPM Application: 🔀 Requal 🗵 Initia	l Exam 🔲 Training			
	TYPE Training			
Classroom	 Annual Requal. Exam OJT Initial Operator Exam 			
Administered By: BV-T NRC Other:	Other:			
Time	Time (minutes) ted: <u>15</u> Actual: Critical: Yes 🗵 No tive JPM 🗌 Faulted 🔲			
Evaluation Results Check here if sate Observer 1: Name: Observer 2: Name Observer 3: Name Observer 4: Name Time (minutes) Question ID Allotted	Employee No: Employee No: Employee No: Employee No: Results			
Question #1				
Question #2 Employee No: *Comments (Required for UNSAT Evaluation				
Evaluator (Print):	Organization:			
Evaluator Signature	-			

RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER: 2CR-090

JPM TITLE: Recover a Dropped RCCA

TASK STANDARD: 1. Control Rod P-8 has been recovered and restored to alignment with Control Bank D. 2. All control rods are left operable. 3. The RIL alarm is left operable.

RECOMMENDED

STARTING LOCATION: Simulator

DIRECTIONS: You are to perform the task: Recover a dropped RCCA

- INITIATING A plant startup was in progress. Control CONDITIONS: Bank D rods were at 131 steps when rod P-8 dropped to the bottom of the core. The actions of AOP 2.1.8 have been completed and the crew has transitioned to 20M-1.4.P. The cause for the dropped rod has been identified and corrected. The GMNPO has directed withdrawing the dropped rod.
- INITIATING CUE: The ANSS directs you, as RO, to recover control rod P-8 and align the rod with the other rods in Control Bank D using procedure 20M-1.4.P, section IV.D. You are to perform steps D.1 through D.11.
- REFERENCES: 20M-1.4.P, " RCCA or RCCA Group Misalignment", Issue 4, Revision 2

TOOLS: None

HANDOUT: 20M-1.4.P " RCCA or RCCA Group Misalignment", Issue 4, Revision 2

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

Question; The plant is at 100% power steady state operation, with rod control in manual. A control rod drops; the reactor does <u>not</u> trip. Assume no operator action. Briefly, describe the effect of the dropped control rod on shutdown margin.

ANSWER: The Shutdown Margin will not change. The negative reactivity added by the dropped control rod will be equalized by positive reactivity from a decrease in Tavg. (Tavg no longer on program.) Therefore, upon a reactor trip, less positive reactivity will be added by a decrease in Tavg to 547°F. This decrease in the affect of the cooldown will cancel out the reduced trip reactivity worth of the rods.

> (Alternate reasoning; since SDM is defined as the amount the Reactor <u>would</u> be shutdown with all rods inserted, the actual insertion of a rod does not change SDM.)

TIME ALLOTTED: 3 Minutes

ov or for Ro

KSA #: 003 AK1.07 3.1/3.2

REF: 20ST-49.1

COMMENTS:

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL OUESTION #2

The plant is at 100% power with rod control in OUESTION: automatic. Bank D is at 215 steps.

> Briefly, explain the effect of a dropped rod in the vicinity of Power Range Channel N44 on automatic rod control (assume that the reactor does not trip).

The dropped rod will appear to N44 as a decrease ANSWER: in Reactor Power. The power mismatch circuit of the Automatic Rod Control Unit will sense Reactor Power less than Turbine Power and will withdraw the Bank D rods. (NOTE: Bank D rods will only withdraw to the C-11 permissive setpoint) (The Tavg decrease will also cause rods to withdraw, but this will not occur until after the power mismatch has anticipated the cooldown.)

Grand Juwalt TIME ALLOTTED: 4 Minutes

KSA #: 003 AK 1.02 3.1/3.4

20M-1.1 REF:

COMMENTS:

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

The plant is at 100% power with rod control in automatic. Bank D is at 215 steps.

Briefly, explain the effect of a dropped rod in the vicinity of Power Range Channel N44 on automatic rod control (assume that the reactor does not trip).

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

The plant is at 100% power steady state operation, with rod control in manual. A control rod drops; the reactor does <u>not</u> trip. Assume no operator action. Briefly, describe the effect of the dropped control rod on shutdown margin.

RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: Recover a dropped rod and restore the rod to proper alignment with it's bank.

INITIAL CONDITIONS:	A plant startup was in progress. Control Bank D rods were at 131 steps when rod
	P-8 dropped to the bottom of the core. The actions of AOP 2.1.8 have been completed and the crew has transitioned to 20M-1.4.P.
	The cause for the dropped rod has been identified and corrected. The GMNPO has directed withdrawing the dropped rod.

The ANSS directs you, as RO, to recover control INITIATING rod P-8 and align the rod with the other rods in CUE: Control Bank D using procedure 20M-1.4.P, section IV.D. You are to perform steps D.1 through D.11.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and . announce your observations.

After determining the Task has been met, announce "I have completed the JPM". Then hand back this sheet to the evaluator.

NUMBER	TITLE	
2CR-090	Recover a Dropped RCCA	
STEP ("C" denotes critical step)		STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
EXAMINER NOTE: Candidate should perform Section D of 20M-1.4.P. 1.C Place Rod Control Selector Switch to bank which has dropped rod.		EXAMINER NOTE: Simulator IC- 24 (25% power rods at 131 steps). Activate Malf CRF 3A P8, 1,0 0,D, Act. Then clear malfunction. (OR, for exam, IC 69) Start time: 1.C Candidate places the switch to the Control Bank "D" position. COMMENTS:
2.C Align Disconnect Switches for Rod Recovery		2.C Candidate places all disconnect switches for Bank D to the Rod Disconnected Position except for rod P-8 which is left in CONNECT. COMMENTS:

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NUMBER	TITLE		
2CR-090	Recover a Dropped RCCA		
STEP ("C" denotes critical step)		STANDARD (Indicate "S" for Sat. or "U" for Unsat.)	
3. Record Step Pos dropped Rod Gro Counter.	sition for oup Step	 3. Candidate Records: 3.1 Bank with dropped RCCA (D). 3.2 Group with dropped rod (Group 1). 3.3 Position of rods in group with dropped rod (131 steps). 3.4 Dropped rod designation (P-8). 3.5 Dropped rod position (0 steps). 	
4. Reset Dropped Counter to zer		 4. Candidate resets the Step Counter by: 4.1 Opening glass cover on dropped rod Group Step Counter. 4.2 Reset counter to zero. 4.3 Close glass cover. COMMENTS: 	

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NUMBER	TITLE		
2CR-090	Recover a Dropped RCCA		
STEP ("C" denotes critical step)		STANDARD (Indicate "S" for Sat. or "U" for Unsat.)	
5. Contact GMNO and Reactor Engineering to determine rate of rod withdrawal		5. Candidate ask for rate of rod withdrawal as determined by GMNO and Reactor Engineering. EXAMINER CUE: Acting as GMNO and Reactor Engineering inform candidate that there is no limitation on the rate of rod withdrawal. COMMENTS:	
6.C Move Rod Motion lever to the OUT position.		 6.1.C Candidate places the Rod Motion lever in the OUT position. 6.2 The moving control rod is stepped out at 5 step increments or less. 6.3 Candidate verifies that Tavg remains equal to Tref. EXAMINER NOTE: When candidate demonstrates compliance with 5 step increments in two or three rod pulls, cue the candidate that they may pull continuously to 120 steps as a time compression tactic. At 120 steps, stop and finish alignment in 5 step increments. COMMENTS: 	

NUMBER	TITLE
2CR-090	Recover a Dropped RCCA

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
7. Verify Annunciator A4-8A "ROD CONTROL SYS URGENT ALARM" is lit.	7. Candidate indicates that alarm A4-8A is expected when rod movement starts COMMENTS:
8. Monitor DRPI to verify dropped rod is being withdrawn.	8. Candidate monitors DRPI and verifies rod P-8 is being withdrawn. EXAMINER CUE: DRPI lights for Rod P-8 indicate the rod is being withdrawn from the core. COMMENT:

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NUMBER	TITLE	TITLE	
2CR-090	Recover a Dr	Recover a Dropped RCCA	
STEP ("C" denotes critical step)		STANDARD (Indicate "S" for Sat. or "U" for Unsat.)	
dropp Step previ	nue to move ed rod until Group Counter indicates ous position ded in procedure D.3.	<pre>9.C Candidate withdraws the rod until the Group Step Counter indicates 131 steps. EXAMINER CUE: Group Step Counter for CBD both indicate 131 steps. COMMENTS:</pre>	
now a posit	y dropped rod is t the same ion as other rods nk by observing	<pre>10. Candidate verifies Rod P-8 indicates same as other rods in CBD on DRPI.</pre> EXAMINER CUE: DRPI indicates all rods in CBD at 131 steps. COMMENTS:	

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NUMBER		TITLE		
2CR-090		Recover a Dropped RCCA		
L				
STEP ("C" denotes critical step)		STANDARD (Indicat for Unsa	e "S" for Sat. or "U"	
		<u> </u>		
2	Replace all switches to position.	disconnect ROD CONNECT	11.C	Candidate places all switches for CBD to ROD CONNECT position.
			COMMENT	S:
12.C Clear urgent failure alarms on power cabinet.		12.1.C	Candidate clears urgent alarm using reset P/B on BB-B.	
			12.2	Candidate verifies Ann. A4-8A clears.
			COMMENT	PS:

NUMBER	TITLE		
2CR-090	Recover a Dropped RCCA		
	<u>]</u>		
STEP ("C" denotes critical step)		STANDARD (Indicate "S" for Sat. or "U" for Unsat.)	
13.C Resets P/A Converter		13.C Directs local operator to reset P/A converter for Bank D to 131 steps To reset the P/A converter. LOA CRF 2 1,0,D LOA CRF 3 131,0,D LOA CRF 2 0,0,D (OR, set MCRFPA(4)=131) To reset the plant computer: (X= rod that is dropped) CIH MCRFGNSC(X)=MCRFPA(4) CIH MCRFB1PC(X)=MCRFPA(4) Comments;	
14. Verifies Core Power distribution normal.		<pre>14.1 Performs NIS Channel Check 14.2 Verifies ΔI in band 14.3 Checks rods > RIL 14.4 Checks Incore Thermocouples (PSMS) 14.5 Verifies Tavg deviation <u>Annunciator clear.</u> Comments;</pre>	

NUMBER	TITLE	
2CR-090	Recover a Dropped RCCA	
STEP ("C" denotes critical step)		STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
15. Restores Rod Conselector Switch		15. Candidate places the Rod Control Selector switch in MANUAL. EXAMINER CUE: Inform candidate that the JPM is complete. If asked, direct candidate to place rod control in MANUAL. Comments;
		Stop Time:

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* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

The plant is at 100% power with rod control in automatic. Bank D is at 215 steps.

Briefly, explain the effect of a dropped rod in the vicinity of Power Range Channel N44 on automatic rod control (assume that the reactor does not trip).

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

The plant is at 100% power steady state operation, with rod control in manual. A control rod drops; the reactor does <u>not</u> trip. Assume no operator action. Briefly, describe the effect of the dropped control rod on shutdown margin.

RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

THIS SHEET TO BE GIVEN TO CANDIDATE

Read:

Task: Recover a dropped rod and restore the rod to proper alignment with it's bank.

INITIAL CONDITIONS:	A plant startup was in progress. Control Bank D rods were at 131 steps when rod
	P-8 dropped to the bottom of the core.
	The actions of AOP 2.1.8 have been
	completed and the crew has transitioned
	to 20M-1.4.P.
	The cause for the dropped rod has been
	identified and corrected. The GMNPO has
	directed withdrawing the dropped rod.

The ANSS directs you, as RO, to recover control INITIATING rod P-8 and align the rod with the other rods in CUE: Control Bank D using procedure 20M-1.4.P, section IV.D. You are to perform steps D.1 through D.11.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been met, announce "I have completed the JPM". Then hand back this sheet to the evaluator.

RTL #A5.640U <u>BEAVER VALLEY JOB PERFORMANC</u> EVALUATOR COVER SHEE	
JPM Number: 2CR-620 Rev:4 JPM Title: Respond to a Shutdown LOCA	System #: 006
K/A Reference: 009EA1.13 4.4/4.4 JPM Application: I Requal Initial Exam	
Classroom	TYPE Training Annual Requal. Exam OJT Initial Operator Exam
□ BV-T	other: alternite
UNSAT* Allotte	Aidube chrechy pland in Employee No: pricedune Time (minutes) ed: Actual: ritical: [] Yes [X] No ive JPM [] Faulted [X] :
Evaluation Results Check here if same Observer 1: Name: Observer 2: Name Observer 3: Name Observer 4: Name Time (minutes) Question ID Allotted Ad	Employee No: Employee No: Employee No: Employee No: Results
Question #1 Employee No: Question #2 Employee No: *Comments (Required for UNSAT Evaluation)	
Evaluator (Print):	Organization:
Evaluator Signature	Date:

RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER:	2CR-620
JPM TITLE:	Respond to a Shutdown LOCA
TASK STANDARD:	 RCS isolated and HHSI flow established.

RECOMMENDED

STARTING LOCATION: Simulator

DIRECTIONS: You are to perform the task "Respond to a Shutdown LOCA".

- INITIAL The plant was in Hot Shutdown, Mode 4, on CONDITIONS: RHS, with the normal charging pathway being the declared Boration Flowpath. PZR level rapidly dropped from 25% to 0% and PRT alarms were received. The NSS has decided to enter AOP 2.6.5 "Shutdown LOCA" to stabilize plant conditions.
- INITIATING CUE: The NSS/ANSS directs you to perform the first six steps of AOP 2.6.5 "Shutdown LOCA" to establish HHSI flow.
- REFERENCES: 20M-53C.4.2.6.5 (ISSUE 1A Rev 8) "Shutdown LOCA"

TOOLS: None

HANDOUT: AOP 2.6.5

NUMBER 2CR-620	TITLE Respond to a Shutdown LOCA- Faulted
STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
EXAMINER NOTE: Candidate may secure the RCP during this JPM due to seal leakoff, Vibration, ect., but this is not required by the AOP.	Start time:

1.1 Candidate locates AOP 2.6.5 "Shutdown LOCA".

MANUAL at 50% open.

Write snap. OR IC-66 for exam.

Activate Malf RHR1A=100% and CLF RHR VLV13=2 (RHS suction relief open & MOV 750A open) Have Shorting Bar available.

COMMENTS:

1.Candidate locates procedure.

NUMBER	TITLE
2CR-620	Respond to a Shutdown LOCA- Faulted
2CR-620	rauiceu

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
2. Check Safety Injection; not actuated.	2.1 Candidate verifies annunicator A12-1D off 2.2 Candidate checks other Safety Injection Annunciators not lit COMMENTS:
	EXAMINER CUE: No safety Injection Signal exists. No Annunciators are lit (repeat cue as asked throughout this JPM).
3.C Isolate RCS Letdown.	 3.1 Candidate verifies closed Letdown Orifice Isolation Valves 2CHS*AOV200A, B, C. 3.2 Candidate verifies closed Regen Heat Exchanger Letdown Inlet vlvs. [2CHS*LCV460A, B]. 3.3.Candidate attempts to close RHS Train A, B Cross connect Isol Vlv 2RHS*MOV750A 3.4.C Candidate closes HCV 142. COMMENTS:
	EXAMINERS CUE: All valves are closed.

NUMBER	TITLE Respond to a Shutdown LOCA-
2CR-620	Faulted

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
4. Check if charging flow is adequate.	 4.1 Candidate adjusts 2CHS*FCV122 as necessary to maintain PZR Level 4.2 Candidate checks if PRZR level greater than 4%. 4.3 Candidate checks if PRZR level stable or rising. 4.4 Candidate verifies PRZR <u>level <4% and dropping.</u> COMMENTS:
	EXAMINER CUE: PRZR level is offscale low.
5. Alert Plant Personnel of the Shutdown LOCA.	 5.1 Candidate sounds standby alarm. 5.2 Candidate announces Unit 2 Shutdown LOCA. 5.3 Evacuates nonessential personnel from containment. 5.4 Candidate notifies NSS/ANSS to evaluate for <u>EPP initiation.</u> COMMENTS:
	EXAMINER CUE: NSS will evaluate for EPP, no personnel are in CNTMT.

NUMBER	TITLE
2CR-620	Respond to a Shutdown LOCA- Faulted

STEP		STANDARD
((Indicate "S" for Sat. or "U"
("C"	denotes critical step)	for Unsat.)
6.	Check SI equipment status.	6.1 Candidate verifies two Charging/HHSI pumps <u>available.</u> COMMENTS:
		EXAMINER CUE: "A" HHSI pump is "available" but in PTL
7.	Check [2SIS*MOV867A-D] High Head SI Cold Leg Isol Vlvs - None energized.	7.1 Candidate verifies NO High Head SI Cold Leg isolation valves are energized.
		COMMENTS :
8.C	Establish alternate SI flowpath.	8.1 Candidate verifies only one Charging/HHSI pump running.
		8.2 Candidate opens/verifies [2CHS*LCV115B and/or D].
		8.3 Candidate closes/verifies [2CHS*LCV115C and/or E].
		8.4 Candidate locates shorting bar and inserts it into receptacle on 'VB' A for [2SIS*MOV836].

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NUMBER	TITLE
2CR-620	Respond to a Shutdown LOCA- Faulted
2CR-620	

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STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
·	<pre>8.5.C Candidate opens [2SIS*MOV836]. EXAMINER NOTE: Use of valves 868A & 840 is acceptable in 8.5 8.6.C Candidate closes [2CHS*MOV289]. 8.7 Candidate dispatches operators to re-<u>energize [2SIS*MOV867A-D]. COMMENTS:</u></pre>
	EXAMINER CUE: Other operators will reenergize the valves EXAMINER NOTE: Terminate the JPM at this point.

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

Assume that you have progressed in AOP 2.6.5, "Shutdown LOCA" to Step 11. The following conditions exist following a LOCA in MODE 4:

Containment radiation level is 100R/hr Containment pressure is 2 psig Pressurizer level = 22% RCS Pressure = 285 psig RCS Temperature (based on Core Exit T/Cs) = 380°F Subcooling by the PSMS is 40°F

Determine if the second charging pump should be started, and explain your answer.

ANSWER: The containment conditions are adverse. The PZR level is less than that required for adverse conditions. Therefore, the second charging pump should be started.

TIME

ALLOTTED: 5 minutes

KSA #: 009 EK3.04 4.1/4.3

REF: AOP 2.6.5 Attachment 3

COMMENTS:

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

Question;

Assume you are at Step 26 of AOP 2.6.5, "Shutdown LOCA. The following conditions exist:

OPPS is armed.

All RCS Cold leg Temperatures are = 320°F

All RCS Hot leg Temperatures are = $320^{\circ}F$

All RCS Wide Range Pressures are = 375 psig

Determine if the Cold Overpressure Protection System lift setpoint for either OPPS PORV is exceeded. Explain how you reached your conclusion.

ANSWER: No. By applying the graph for the existing conditions,

(2RCS*PCV455C = 475 psig)

(2RCS*PCV456 = 555 psig)

TIME

ALLOTTED: 5 minutes

KSA #: 009 EA1.01 4.4/4.3

REF: AOP 2.6.5 Attachment 1

COMMENTS:

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

Assume you are at Step 26 of AOP 2.6.5, "Shutdown LOCA. The following conditions exist:

OPPS is armed.

All RCS Cold leg Temperatures are = 320°F

All RCS Hot leg Temperatures are = 320°F

All RCS Wide Range Pressures are = 375 psig

Determine if the Cold Overpressure Protection System lift setpoint for either OPPS PORV is exceeded. Explain how you reached your conclusion. * * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

Assume that you have progressed in AOP 2.6.5, "Shutdown LOCA" to Step 11. The following conditions exist following a LOCA in MODE 4:

Containment radiation level is 100R/hr Containment pressure is 2 psig Pressurizer level = 22% RCS Pressure = 285 psig RCS Temperature (based on Core Exit T/Cs) = 380°F Subcooling by the PSMS is 40°F

Determine if the second charging pump should be started, and explain your answer.

RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE

Read:

Task: Respond to a Shutdown LOCA.

INITIAL CONDITIONS:	The plant was in Hot Shutdown, Mode 4, on RHS, with the normal charging pathway
	being the declared Boration Flowpath. PZR level rapidly dropped from 25% to 0% and PRT alarms were received. The NSS has decided to enter AOP 2.6.5 "Shutdown LOCA" to stabilize plant conditions.

INITIATING. CUE:	The NSS/ANSS directs you to perform the first six
	steps of AOP 2.6.5 "Shutdown LOCA" to establish
	HHSI flow.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining that the Task has been completed, announce "I have completed the JPM", then hand this sheet back to the evaluator.

JPM Number: 2CR-New #3 Rev:0 System #: 006 JPM Title: Makeup to the RWST K/A Reference: 006A2.02 Difficulty: 3.9/4.3 Task ID #:0060100101 JPM Application: X Requal Initial Exam Training Evaluation Method LOCATION TYPE X Perform Plant Site Training Simulate X Simulator Annual Requal. Exam Classroom OJT X Initial Operator Exa Administered By: Other: BV-T X NRC Other: MRC Evaluation Results Performer: Name: Employee No: Results SAT Time (minutes)
K/A Reference: 006A2.02 Difficulty: 3.9/4.3 Task ID #:0060100101 JPM Application: Image: Constraining in the image: Constrene:
JPM Application: Imitial Exam Training Evaluation Method LOCATION TYPE Imitial Perform Plant Site Training Imitial Simulate Simulator Annual Requal. Exam Imitial Operator OJT Imitial Operator Exam Imitial Operator Imitial Operator
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Evaluation Results Performer: Name: Employee No:
Image: SAT Image: SAT Image: UNSAT Allotted:15Actual: Time Critical: Image: Yes Administrative JPM Image: Faulted *Comments (Required for UNSAT Evaluation):
Evaluation Results Check here if same as above Observer 1: Name: Employee No: Observer 2: Name Employee No: Observer 3: Name Employee No: Observer 4: Name Employee No: Time (minutes) Results Question ID Allotted Actual
Question #1
Employee No: *Comments (Required for UNSAT Evaluation):

BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER:	2CR-New#3
JPM TITLE:	Makeup to the RWST
TASK STANDARD.:	Blended makeup is established to the RWST at between 2000 and 2100 ppm Boron
RECOMMENDED STARTING LOCATION:	Simulator
DIRECTIONS:	You are to makeup to the RWST using blended flow
INITIAL CONDITIONS:	Following a Large Break LOCA while at 100% power, Recirculation from the Containment sump has been lost. ECA 1.1 has been performed up to step 5.
INITIATING CUE:	The ANSS directs you, as an extra licensed operator, to make up to the RWST at 120 GPM per 20M-7.4.O.
REFERENCES:	ECA 1.1 20M-7.4.0
TOOLS:	NA
HANDOUT:	ECA 1.1 pgs. 1 through 5, 2OM 7.4.0

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

- QUESTION; If blended flow is unavailable for RWST makeup in ECA 1.1, what is the alternate source of makeup? Trace the alternate flowpath on the VOND and discuss the driving head used.
- ANSWER: Transfer (of borated water) from the Spent Fuel Pool Purification Pumps to the RWST. The flowpath is shown on VONDS 20-1 and 13-2. (The path is from the Spent Fuel Pool, through valve #2 to either Purification Pump, then through filter 21A or 21B and valve 35 or 36 to valve 47 and the RWST.)

TIME ALLOTTED: 10 minutes

OK is but fring low lovel

KSA #:033K1.05-2.7, 006A1.15-3.3

REF: ECA 1.1, 20M-7.4.0

COMMENTS: _____

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

During the performance of ECA 1.1, all sources of borated makeup water, including the RWST, have been exhausted. Should makeup continue with unborated (primary grade) water, or should makeup flow be secured until borated water is again available? Explain the basis for your choice.

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

Trace the alternate flowpath for makeup to the RWST in ECA 1.1 on the VOND and discuss the driving head used.

BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

*THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task:	Makeup to the RWST
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INITIAL CONDITIONS:	Following a Large Break LOCA while at 100% power, Recirculation from the Containment sump has been lost.
	ECA 1.1 has been performed up to step 5.

INITIATING CUE: The ANSS directs you, as ar RWST at 120 gpm per 20M	extra licensed operator, to make up to the 7.4.O.
--	---

At this time, ask the evaluator any questions you have about this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".



Perform the required task. Point to any indicator or component you verify or check and announce your observations.

After completing the task, announce "I have completed the JPM", then hand this sheet back to the evaluator.

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

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STEP	STANDARD -
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)
	<pre>Start time:</pre>
<pre>1.C Directs local valve lineup. EXAMINERS CUE: Aux. Bldg operator reports; 2FNC-35,-36,&-38 verified closed 2FNC-47 has been opened</pre>	1.C Directs local opening of 2FNC-47. COMMENTS:
2.Stops the Makeup System	2. Places Makeup Control Switch in STOP COMMENTS:
	EXAMINER CUE: If requested, inform candidate that the accident occurred in Mode 1 (dilution valves are unlocked).

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

STEP	STANDARD -
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)
3.C Selects Manual mode of makeup	3.1C Places Makeup Mode Selector switch in MANUAL.
· .	COMMENTS:
4.C Aligns Makeup valves.	 Puts the following control switches to CLOSE;
	4.1C 2CHS FCV113B, BA blender disch to Chg Pumps
	4.2C 2CHS FCV114B, Blender outlet to VCT
	4.3 2CHS SOV206, Alt. Emergency Boration Vlv
	4.4 2CHS MOV350 Emergency Boration Isolation Vlv
EXAMINER NOTE: Emergency valves are not critical because they are initially closed and will not receive an open signal	COMMENTS:
· · · · · · · · · · · · · · · · · · ·	

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

STEP	STANDARD -
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)
5.C Adjusts Boric Acid flow to the blender.	<pre>EXAMINER CUE: ANSS desires 120gpm flow at 2050 ppm. BAT "A" is in service at 7480 ppm. 5.1 Calculates ~ 33 gpm desired (32.08 to 33.69 gpm). 5.2C Sets 2CHCS FCV 113A between 8.02 and 8.42 COMMENTS:</pre>
	<pre>EXAMINER NOTE: If the flow is initially mis-set, but corrected in step 17 of the procedure, that constitutes satisfactory completion of this step. Allowable settings are based on a concentration of 2000 to 2100 ppm if total flow is exactly 120 gpm.</pre>

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

STEP		STANDARI	D _
("C" denotes critical step) (Indicate "S" for Sat. or "U" for Unsat.)		5" for Sat. or "U" for Unsat.)	
6.C	Adjusts total makeup flow.	6.1C	Sets 2CHS FCV168 to ~ 7.5 (7.32 to 7.68)
		6.2C	Sets 2CHS FCV114A pot. to ~ 7.5 (7.32 to 7.68)
		COMMENT	'S:
		initi corre const compl Accep based 2000 exact flow. Steps satis	ER NOTE: If the flow is ally mis-set, but cted in step 17, that itutes satisfactory etion of this step. table settings are on a concentration of to 2100 ppm with ly 32.89gpm boric acid 5 and 6 are both factory as long as
			p concentration is en 2000 and 2100 ppm.

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

STEP	STANDARD
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)
7.C Sets Boric acid totalizer	7.C Sets Boric acid totalizer <u>to at least 267 gallons.</u> COMMENTS:
	EXAMINER CUE: ANSS directs an initial addition of 1,000 gallons.
	EXAMINER NOTE: Totalizer may be set much higher due to anticipated continuous addition. Critical element is not to interrupt addition during the course of the JPM.
8.C Sets Total Makeup totalizer	EXAMINER CUE: ANSS directs an initial addition of 1,000 gallons. 8.C Sets Total Makeup flow totalizer to at least <u>1000</u> gallons. COMMENTS:
	EXAMINER NOTE: Totalizer may be set much higher due to anticipated continuous addition. Critical element is to not interrupt addition during the course of the JPM.

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

STEP	STANDARD -
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)
9. Records Total Makeup Flow reading	9. Records Total flow reading. COMMENTS: EXAMINER NOTE: This step may not be performed due to urgency of EOP initial conditions
10.C Directs operator at blender room to lineup to the RWST	<pre>10.1C Directs opening 2CHS 87, Blender to Refueling Cavity Isolation 10.2C Directs opening 2CHS 89, Blender to RWST Isolation EXAMINER CUE: In Expert Mode, type Set RCHV87 = 2 COMMENTS:</pre>

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

STEP	STANDARD
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)
11.C Initiates makeup	11.C Places the Makeup Control <u>Switch to START</u> COMMENTS:
12. Verifies expected flows	<pre>12. Checks red and green pens on 2CHS-FR113. COMMENTS:</pre>

Evaluation Method Perform Administered By: BV-T Other: Evaluation Results Performer: Name Results		Site Lator sroom Nul Allo Time	□ □ □ Y ₹	TYPE Training Annual Requa OJT Initial Oper Other: Other: Employee No: Time (minute Actu	rator Exar grup ± =
Performer: Name Results 🗌	SAT UNSAT*	Allo Time	otted:	Time (minute	es)
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Evaluation Results C Observer 1: Name Observer 2: Name Observer 3: Name Observer 4: Name Question Question #1 Employee No:	e: e e Time n ID Allo	(minute:		Employee No: Employee No: Employee No: Employee No: Resu nal SAT	 lts
Question #2 Employee No: *Comments (Required f		valuatic			

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RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER:	2PL-004
JPM TITLE:	Reset the Terry Turbine Trip and Throttle Valve
TASK STANDARD:	2FWE*P22 trip and throttle valve is reset.

RECOMMENDED

STARTING LOCATION: In Plant

- DIRECTIONS: You are to simulate the task "Reset the Terry Turbine Trip and Throttle Valve".
- INITIAL The plant is in Mode 1 at 50% power. The turbine driven auxiliary feedwater pump has tripped due to an overspeed condition. The problem has been corrected. A plant operator has verified that the trip and throttle valve is closed. No start signal exists for [2FWE*P22] and the pump is stopped. The pump is not required to feed the steam generators.
- **INITIATING CUE:** Your supervisor directs you to reset the trip and throttle valve for [2FWE*P22].
- REFERENCES: 20M-24.4R Issue 1 Revision 13

TOOLS: None

HANDOUT: 20M-24.4R

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NUMBER	TITLE
2PL-004	Reset Terry Turbine Trip Throttle Valve

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
3.C To open the trip and throttle valve, turn the handwheel in the clockwise direction until it is fully down (CLOSED).	3.C Simulates turning handwheel in the clockwise direction to raise the latch to engage the valve.
	COMMENTS :
	EXAMINER CUE: Latch (crossbar) rises to the full up position (oil trip latch is engaged)

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NUMBER	TITLE
	Reset Terry Turbine Trip Throttle Valve

STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
4. Candidate simulates resetting overspeed trip device by:
4.1.C Pulling overspeed trip connecting rod to the left.
4.2 Ensuring overspeed tappet washer flat side lines up with the overspeed trip lever (scribe mark on washer is aligned with punch mark on tappet housing)
EXAMINER CUE: The washer is aligned with the linkage.
4.3.C Release connecting rod, allowing spring tension to maintain reset condition.
4.4 Ensuring washer flat edge is flush against vertical side of overspeed trip lever.
COMMENTS:

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NUMBER	TITLE
	Reset Terry Turbine Trip Throttle Valve

STEP ("C"	denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
5.	Verify the valve is latched by observing the latch on the right side of the valve.	5. Candidate: 5.1 Verifies that it has engaged the latch hook. 5.2 Calls ANSS to tell him that this requires an independent verification. EXAMINER CUE: The ANSS will assign another operator to perform independent verification. COMMENTS:
		EXAMINER CUE: The Terry Turbine did trip due to an overspeed condition. There is NO auto start signal present.

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NUMBER	TITLE
2PL-004	Reset Terry Turbine Trip Throttle Valve

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
6.C Reopen the trip throttle valve by turning the handwheel counter clockwise.	<pre>6.Candidate 6.1 Simulates turning it counter clockwise 6.2.C Continues turning until the valve stops in the full open position. 6.3 Inform ANSS of need for independent verification. EXAMINER CUE: The ANSS will assign another operator to perform independent verification. COMMENTS:</pre>

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NUMBER	TITLE
2PL-004	Reset Terry Turbine Trip Throttle Valve

STEP ("C" denotes critic	al step)	STANDAR (Indica for Uns	ate "S" for Sat. or "U"
7.C To prevent th of Trip Throt crack valve o seat by 1/4 t	tle valve, ff its back	7.C	Candidate Simulates turning handwheel 1/4 turn clockwise to prevent thermal binding
		COMMEN	NTS:

NUMBER	TITLE
2PL-004	Reset Terry Turbine Trip Throttle Valve

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
8.C Push both pushbuttons to dump oil from the governor to preclude overspeed of the Terry Turbine on a restart. Observe governor linkage until movement ceases or hold for 15 seconds.	<pre>8. Candidate: 8.1.C Simulates depressing both pushbuttons simultaneously. 8.2 Holds pushbuttons until linkage movement ceases or 15 seconds has elapsed. COMMENTS: EXAMINER CUE: All governor linkage movement has stopped. (15 seconds has elapsed, if asked). EXAMINER CUE: 2FWE*P22 is not needed to control steam gen. level. Stop Time:</pre>

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

- Question: The plant is in Mode 3 with all conditions stable. The Terry Turbine has been started by manually opening 2MSS*SOV105A and D to feed the steam generators. Explain the correct sequence by which the steam supplies should be closed in order to secure the Terry Turbine and the reason for this sequence.
- ANSWER: First close 2MSS*SOV105A, then 2MSS*SOV105D. The SOV closest to the Main Steam header must be closed before the downstream SOV, in order to avoid steam binding of the downstream SOV pilot valve, which could cause the downstream SOV to be incapable of reopening. The VOND must be consulted to determine that SOV105A is the upstream valve, then the caution in the OM applied.

TIME

- ALLOTTED 5 minutes
- KSA #: 061 K1.03 3.5/3.9
- REF: Caution in 20M-24.4K for securing an AFW pump. VOND 21-2

COMMENTS:

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

Question:

If demineralized water was not available to supply auxiliary feed, show on the applicable VONDs how another source of water can be aligned to the auxiliary feedwater pump suction. -

The service water system is aligned as follows; ANSWER: from the "B" SWS header through valves 103B,98, and valve 90, 91, or 92.

TIME ALLOTTED:	5 minutes	Not tend
KSA #:	061K4.01 3.9/4.2	Kay challer
REF:	20M-24.1 VOND 24-3 VOND 30-3 VOND 30-1	Jund Von Value
COMMENTS:		

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

If demineralized water was not available to supply auxiliary feed, show on the applicable VONDs how another source of water can be aligned to the auxiliary feedwater pump suction.

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

The plant is in Mode 3 with all conditions stable. The Terry Turbine has been started by manually opening 2MSS*SOV105A and D to feed the steam generators. Explain the correct sequence by which the steam supplies should be closed in order to secure the Terry Turbine and the reason for this sequence.

RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: Reset the Terry Turbine Trip and Throttle Valve

INITIAL CONDITIONS:	The plant is in Mode 1 at 50% power. The
	turbine driven auxiliary feedwater pump
	has tripped due to an overspeed
	condition. The problem has been
	corrected. A plant operator has verified
	that the trip and throttle valve is
	closed. No start signal exists for
	2FWE*P22, and the pump is stopped. The
	pump is not required to feed the steam
	generators.

INITIATING CUE:

Your supervisor requests that you reset the trip and throttle valve for 2FWE*P22.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate the required task. Point to any indicator or component you verify or check and announce your observations. Do not operate any equipment.

After completing the task, announce "I have completed the JPM", then hand this sheet back to the evaluator.

Replacement JPM

RTL #A5.640E

DUQUESNE LIGHT COMPANY Nuclear Power Division Training Administrative Manual

OJT CHECKLIST/JPM COVER PAGE

PROGRAM TITLE:

Licensed Operator Training (Retraining)

<u>SUBDIVISION</u>: On-the-Job Training

OJT CHECKLIST/JPM TITLE: Respond to RCP Oil Leak

JPM NO.: New #5

COMPUTER CODE: N/A

Revision No.	Date
0	2/15/99

Revision No.	Date

<u>PREPARED_BY</u> :	DATE:
W. Brickenstein	
APPROVED FOR	
IMPLEMENTATION:	DATE:

Director, Operations Training, or Designee

NRC # 5

. RTL #A5.640E

DUQUESNE LIGHT COMPANY Nuclear Power Division Training Administrative Manual

LESSON PLAN AND OJT REVISION APPROVAL SHEET

DOCUMENT TITLE: New JPM #5, Respond to RCP Oil Leak

Revision			Approv	ral
No.	Brief Description	Revised by:	Signature	Date
0	Developed for initial exam use; exercises more references and "gray areas"/higher cognitive levels than 2CR-513.	Brickenstein		

	00 <u>BEAVEF</u>		<u>EY JOB PERF</u> LUATOR COVE		ASURE	
JPM Number:	: New #5		Rev: 0	System	n #: 003	
JPM Title: R	espond to RC	CP Oil L	eak			
K/A Reference	e: 003 A	3.04	3.6/3.6	Task	ID #:0030010	0101
JPM Applicati	ion:	X Rec	lual 🗵	Initial Exam] Tra
Evaluation	Method		LOCATION	TYI	PE	
X Pe	erform		Plant Site	e 🛛 Tra	aining	
	imulate	X	Simulator	🗖 Anı	nual Requa	1. :
			Classroom	D OJ	Г	
				X In:	itial Oper	ato
Administer	ed By:			🗖 otl	ner:	
D BV-T		X	NRC			
Other:						
Perform Results	_	SAT			ployee No: e (minutes)	
		UNSA	.т* А	llotted:	10 Actual:	
			т	ime Critical:	Yes	
			Administ	rative JPM	🔲 Fai	
*Comments (R	lequired for UN	ISAT Ev			🗌 Fau	
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RTL#A5635J	BEAVER VALLEY JOB PERFORMANCE MEASURE
	EVALUATOR DIRECTION SHEET
JPM NUMBER:	New # 5
JPM TITLE:	Respond to RCP Oil Leak
TASK STANDARD:	The "A" Reactor Coolant Pump is stopped before Thrust Bearing temperature reaches 300°F.
RECOMMENDED STARTING LOCATI	ION: Simulator
DIRECTIONS:	You are to start the "A" Reactor Coolant Pump.
INITIAL CONDITION	NS: The plant is in Mode 3. Plant startup procedures have led you to 2OM 6 Procedure A, Reactor Coolant Pump Startup, Steps IV.A.12.c through 22. Assume all steps and conditions to this point are satisfied.
INITIATING CUE:	Your supervisor directs you to perform Step IV.A.12.c of Procedure 20M-6.4.A for 2RCS*P21A.
REFERENCES:	20M-6.4.A Issue 4, Rev. 7 20M-6.4.AAC, Issue 4, Rev. 1
TOOLS:	Plant Computer, Stopwatch
HANDOUT:	20M-6.4.A and 20M-6.4.AAC

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NUMBER	TITLE: Respond to RCP Oil Leak
New # 5	

STEP ()C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
BOOTH NOTE; monitor variables (MONV) TRCPUTB(1), XA40018R, JRCXRCS8, and JRCP417H.	Start time: EXAMINER NOTE: Simulator setup Init IC-5. Stop 2RCS*P21A. Open Reactor Trip Breakers. Malf RPC8A, 5,0,120,C =JRCP417H. (RCP oil leak starts 120 seconds after lift pump starts).
 Candidate obtains a copy of OM-6, Procedure A, "Reactor Coolant System Startup". 	<pre>1. Candidate locates OM- 6, Procedure A. (Allow time to review the procedure.) COMMENTS:</pre>
2. Place the 21A reactor coolant pump control switch to START (BB-A)	<pre>2. Takes switch to the START position. COMMENTS:</pre>

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NUMBER	TITLE: Respond to RCP Oil Leak
New # 5	

STEP ("C" denotes critical step)		STANDARD (Indicate "S" for Sat. or "U" for Unsat.)	
3.	Verify the oil lift pump running light (red) energizes. (BB-A)	 Candidate verifies the red light is LIT. 	
		EXAMINER CUE: Oil lift pump running light (red) is energized.	
		COMMENTS:	
		EXAMINER CUE: If asked, notify the candidate that the No. 1 seal leakoff flow is about 1 gpm before and 3 gpm after the lift pump start and the differential pressure is greater than 212 psid. The lift oil pump is still running.	

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RTL #A5.635.J	
NUMBER	TITLE: Respond to RCP Oil Leak
New # 5	

	STANDARD Indicate "S" for Sat. or "U" for Unsat.)
4. Verify that the 2RCS*P21A running light (red) illuminates approximately 2 minutes after placing the control switch to start. (BB-A)	4. Candidate verifies that the red light is energized. EXAMINER CUE: After a 2 min. time delay the red light is energized. BOOTH CUE: Check Malf. RCP8A has actuated. COMMENTS: BOOTH CUE: expert; RAMP TRCPUTB(1),300,500,0 after the Low Bearing Oil reservoir alarm is received.

RT	L #A	5.6	35.J	

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NUMBER	TITLE: Respond to RCP Oil Leak
New # 5	

STEP ("C" denot	tes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)	
5.	Verify that the RCP amps drop off 10 to 30 seconds after the RCP breaker closes. (VB-A)	 5.1 Candidate locates the pump current (amps) (2RCS*II21A). 5.2 Candidate checks that the RCP amps drop off within 30 seconds. 	
		EXAMINER CUE: Inform the candidate that RCP amps return within 30 seconds. Also annunciator A2-5C is in alarm. Shaft vibration is at 30 mils, frame vibration is at 5 mils.	what co
6.	Obtain a copy of ARP A2-4F.	6. Candidate locates a copy of A2-4F. COMMENTS:	
		EXAMINER CUE: The computer alarm for the first A2-4F alarm is "RCP OIL COLL TK 23A LVL LS103A HIGH". The annunciator reflashed on "RCP 21A BRG LO LVL 71- RCAAX LOW".	

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RTL #A5.635.J	
NUMBER	TITLE: Respond to RCP Oil Leak
New # 5	

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
7. Verify that RCP bearing temperatures are increasing.	 7.1 Candidate monitors RCP "A" bearing temperatures using the recorder and/or the Plant Computer (PCS). 7.2 Verifies that upper thrust bearing temperature is increasing. COMMENTS: COMMENTS: EXAMINER NOTE: The candidate may deduce that he has an "actual" low reservoir level and trip the RCP at this point. (However, spurious level alarms sometimes occur on RCP start, so he may investigate further.)
	EXAMINER CUE: "A" upper thrust bearing temperature is rising from ~ 75°F at 30°F/min. "B" and "C" upper thrust bearings are stable at about 150°F.

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NUMBER	TITLE: Respond to RCP Oil Leak
New # 5	

STEP ("C" denote	es critical step)	STANDARI (Indicate "S	D " for Sat. or "U" for Unsat.)
8.C	Operator stops RCP due to oil leak/high bearing temperature.	8.1	Candidate determines, from recorder or PCS, that bearing temperature is above 200°F.
		8.2.C	Places control switch to STOP.
		8.3	Verifies white light is lit.
		for Hig receive tempera increas White 1	CR CUE: Computer alarm the Temperature is ad at 195°F; "A" bearing ture is continuing to se. RCP control switch light illuminates when a stopped.
		EXAMINI termina	ER CUE: Examiner ates JPM at this point
		Stop Ti	lme:

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* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

One of the Initial conditions prior to starting the **first** reactor coolant pump is to establish a bubble in the pressurizer. What is the reason for establishing a bubble prior to starting a RCP? (Include a discussion of the sequence of events that would occur in the RCS if a RCP were started in a solid RCS with SG secondary side temperature more than 40°F above the lowest RCS cold leg temperature.)

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

- QUESTION: One of the Initial conditions prior to starting the first reactor coolant pump is to establish a bubble in the pressurizer. What is the reason for establishing a bubble prior to starting a RCP? (Include a discussion of the sequence of events that would occur in the RCS if a RCP were started in a solid RCS with SG secondary side temperature more than 40°F above the lowest RCS cold leg temperature.)
- ANSWER: There is the potential to over-pressurize the reactor coolant system when the pump is started (which could actuate the OPPS).

The sequence of events would begin with the cold water being pumped (through the Reactor Vessel) to the primary side of the SG. The cold water in the RCS would pick up heat from the relatively warmer water in the SG and expand. The expansion of the water in the solid RCS would cause a large, rapid pressure increase (up to 100 psig for each degree the RCS heated up).

- TIME ALLOTTED: 5 minutes
- KSA #: 003 K1.10 3.0/3.2
- REF: 2OM-6.4.A precaution II.B,K, 2OM-6.2 precaution 17

COMMENTS: _____

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

QUESTION: Discuss the affects of a gradually worsening leak in the Thermal Barrier Heat Exchanger with the plant in Mode 1 NSA. Include the expected alarms and any automatic actuations that might occur.

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

QUESTION: Discuss the affects of a gradually worsening leak in the Thermal Barrier Heat Exchanger with the plant in Mode 1 NSA. Include the expected alarms and any automatic actuations that might occur.

ANSWER: 1) CCP surge tank level will increase (prior to 2CCP AOV107 actuation)

- 2) CCP radiation monitor alarms
- 3) CCP value in the discharge from the Thermal Barrier Heat Exchanger will close (on high flow at 58 gpm or high pressure at 122 psig)
- 4) (Pressurizer level drops slightly until charging flow increases)

(The fourth item is not required for credit. Completion may be prompted, i.e. "Will there be any other effects or actuations?")

(If candidate assumes that 2CCP AOV107 closes immediately, prompt "what indications would occur if the leak were too small to cause automatic isolation?")

TIME ALLOTTED: 5 minutes

KSA #: 003K1.12, 3.0/3.3

REF: 20M-15.1.d pg. 14 of 26

COMMENTS: _____

BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: You are to start the "A" Reactor Coolant Pump

INITIAL CONDITIONS:	The plant is in Mode 3. Plant startup procedures have led you to 2OM 6 Procedure A, Reactor Coolant Pump Startup, Step IV.A.12.c. Assume all steps and conditions to this point are satisfied.
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INIT. CUE:	Your supervisor directs you to perform Steps IV.A.12.c through 22 of Procedure 2OM-6.4.A for 2RCS*P21A.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".



Perform the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been completed, announce "I have completed the JPM", then hand this sheet back to the evaluator.

BEAVER VALLEY JOB PER EVALUATOR COV	
JPM Number: 2CR New #5 Rev: 0	System #: 003
JPM Title: Restore RCP Seal Cooling	
K/A Reference: 003A3.01 Difficulty;3.3/3	2 Task ID #: 3010060601 0830010101
JPM Application: 🗵 Requal 🗵 In	itial Exam Training
Evaluation Method LOCATION Image: Second structure Perform Image: Simulate Simulate Image: Simulate Simulate Image: Simulate Simulate Image: Administered By: Image: Simulate Image: BV-T Image: Simulate Image: Other: Image: Simulate Evaluation Results Performer: Name: Results SAT	Annual Requal. Exam
	Allotted: 15 Actual:
	Time Critical: Yes INo
*Comments (Required for UNSAT Evaluation):	strative JPM Faulted JPM
/	/
Evaluation Results Check here if sar Observer 1: Name: Observer 2: Name Observer 3: Name Observer 4: Name Time (minute: Question ID Allotted	Employee No: Employee No: Employee No: Employee No:
Question #1	
Employee No:	
*Comments (Required for UNSAT Evaluation):	
Evolution (Drint)	
Evaluator (Print):	
Evaluator Signature	Date:

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BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER:	2CR-New#5
JPM TITLE:	Restore RCP Seal Cooling -
TASK STANDARD:	CCP and Seal Injection are restored, in the correct order
RECOMMENDED STARTING LOCATION:	Simulator
DIRECTIONS:	You are to perform the task "Restore RCP Seal Cooling"
INITIAL CONDITIONS:	RCP Seal Cooling was lost due to a Station Blackout. ECA-0.0 was performed through step 18 to isolate Seal Injection and CCP flow to the Thermal Barrier Heat Exchanger. Bus 2AE has been reenergized from offsite power (control power is not available to the CCP return AOVs from "B" and "C" RCPs. ECA-0.1/is complete through step 12.
INITIATING CUE:	The ANSS directs you to perform attachment A-1.2, Establishing RCP CCP Cooling and Seal Injection, for the "A" RCP only.
REFERENCES:	EOP Attachment A-1.2
TOOLS:	Plant Computer
HANDOUT:	EOP Attachment A-1.2

NUMBER	TITLE
2CR-New #5	Restore RCP Seal Cooling
· ·	
STEP	STANDARD
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)
2.C Opens CCP Pump Return Header Isolation	<pre>2.1 Opens 2CCP MOV 157-1. 2.2C Directs local opening of 2CCP MOV 156-1 COMMENTS:</pre>
	EXAMINER NOTE: set CLF VLV CCP 58 to 100% by handwheel (open 156-1, 30 second ramp) EXAMINER CUE: 2CCP 156-1 and 157-1 are open (by report and indication)
	EXAMINER CUE: MOV 157-1 indicates open, MOV 156-1 is reported open
3.C Opens Thermal Barrier Outlet Isolation Valves	 3.1C Opens 2CCP AOV107A. 3.2 Monitors lower bearing temperatures on the plant computer. COMMENTS:
	EXAMINERS CUE: AOV 107A indicates open. AOVs 107B&C will be opened when power is available.

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NUMBER	TITLE
2CR-New #5	Restore RCP Seal Cooling

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STEP	STANDARD
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)
4.Checks Seal Injection Lineup.	4.1 Verifies VCT temperature indicator 2CHS-TI116 is less than 235°F.
	EXAMINER CUE: TI 116 reads 95°F.
	4.2 Directs local operator to check 2CHS 178, 179, & 180 closed.
	EXAMINER CUE: Seal Injection throttle valves are closed
	4.3 Checks Seal Injection isolation valves 2CHS- MOV 308A,B,&C are open.
	4.4 Checks Seal Injection controller 2CHS HCV186 set to 0% (open).
	COMMENTS:

NUMBER	TITLE
2CR-New #5	Restore RCP Seal Cooling

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STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	J
5.C Directs Opening of Seal Injection throttle valves	5.1C Directs opening of A RCP seal injection valve 2CHS 179
	EXAMINER CUE: Increase LOA SEA 2 in small increments (~0.01 in LOA magnitude = "one turn on valve") as directed
	5.2 Monitors seal injection flow on 2CHS-FI130A.
	5.3 Monitors lower bearing temperature on the plant computer.
	COMMENTS :
EXAMINER NOTE: Examiner stops JPM at this point.	
	Stop time:

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

QUESTION: Discuss the affects of a leak in the Thermal Barrier Heat Exchanger. Include the expected alarms and any automatic actuations that might occur.

ANSWER: 1) CCP surge tank level will increase

- 2) CCP radiation monitor alarms
- 3) CCP value in the discharge from the Thermal Barrier Heat Exchanger will close (on high flow at 58 gpm or high pressure at 122 psig)
- 4) (Pressurizer level drops slightly until charging flow increases)

(The fourth item is not required for credit. Completion may be prompted, i.e. "Will there be any other effects or actuations?")

TIME ALLOTTED: 5 minutes

KSA #: 003K1.12, 3.0/3.3

REF: 20M-15.1.d pg. 14 of 26

COMMENTS: _____

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

QUESTION: What would be the effects of suddenly restoring seal injection to a seal which had lost seal cooling for an extended period?

ANSWER: RCP damage would result (due to failure of the #1 seal from thermal shock or bending of the RCP shaft due to uneven temperature distribution).

TIME ALLOTTED: 5 minutes

KSA #: 003A2.01, 3.5/3.9

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REF: 20M-53B.5.GI-6 pg. 46

COMMENTS: _____

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

QUESTION; What would be the effects of suddenly restoring seal injection to a RCP seal which had lost seal cooling for an extended period?

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

QUESTION: Discuss the affects of a leak in the Thermal Barrier Heat Exchanger. Include the expected alarms and any automatic actuations that might occur.

BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: Restore RCP Seal Cooling

the CCP return AOVs from "B" and "C" RCPs). ECA-0.1 is complete through step 12.	INITIAL CONDITIONS:	RCP Seal Cooling was lost due to a Station Blackout. ECA-0.0 was performed through step 18 to isolate Seal Injection and CCP flow to the Thermal Barrier Heat Exchanger. Bus 2AE has been reenergized from offsite power (control power is not available to the CCP return AOVs from "B" and "C" RCPs). ECA-0.1 is complete through step 12.
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INITIATING CUE:	The ANSS directs you to perform attachment A-1.2, Establishing RCP
<u></u>	CCP Cooling and Seal Injection, for the "A" RCP only.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".



Perform the required task. Point to any indicator or component you verify or check and announce your observations.

After completing the task, announce "I have completed the JPM", then hand this sheet back to the evaluator.

BEAVER VALLEY JOB PERFORMANCE MEASURE #6 EVALUATOR COVER SHEET
JPM Number:2CR-126 Rev: 3 System #: 076 Faulted: □ JPM Title: Startup the Standby Service Water System
K/A Reference: 076000A2.02 2.7/3.1 Task ID #:076AAA0121 JPM Designation: INO RO SRO JPM Application: INRC Initial Exam Initial Exam
Evaluation Method LOCATION TYPE Image: Simulate Plant Site Training Image: Simulate Image: Simulator Annual Requal. Exam Image: Classroom OJT Image: Simulator Image: Simulator
Administered By: □ Other: □ BV-T ⊠ NRC □ Other: □
Evaluation Results Performer: Name: Employee No:c Results SAT Time (minutes) UNSAT* Allotted: 15 Actual: Time Critical: Yes No *Comments (Required for UNSAT Evaluation):
Evaluation Results □ Check here if same as above Observer 1: Name: Employee No: Observer 2: Name Employee No: Observer 3: Name Employee No: Observer 4: Name Employee No: Time (minutes) Results Question ID Allotted Actual
Question #1
Evaluator (Print): Organization:
Evaluator Signature Date:

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BEAVER VALLEY JOB PERFORMANCE MEASURE RIL #A5.635.J EVALUATOR DIRECTION SHEET 2CR-126 JPM NUMBER: Startup the Standby Service Water System JPM TITLE: RECOMMENDED Simulator STARTING LOCATION: You are to perform the task "Startup the **DIRECTIONS:** Standby Service Water System". The plant is at 100% power. The "A" Train INITIAL Service Water Pump [2SWS*P21A] has just CONDITIONS: tripped. Train "A" standby service water is in TASK STANDARD: service and pressurizing the SWS system. Your Supervisor directs you to QUICKLY INITIATING CUE: supply water to the SWS header from the SWE system, using the normal operating procedure, 20M-30.4G. Assume all Initial Conditions are SAT. 20M-30.4.G Issue 4 Rev. 2 **REFERENCES:** None TOOLS:

HANDOUT: 20M-30.4.G

NUMBER	TITLE
2CR-126	Startup the Standby Service Water System
	· · · · · · · · · · · · · · · · · · ·
STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
 Locate the procedure to startup the standby service water system. 	Start time: EXAMINER NOTE: Simulator Setup. Init. IC-18. CLF PMP SWS 6, 2, 0, D to trip the "21A" SWS pump. (Or IC-51 for exam.) 1. Candidate locates 20M- 30.4.G. COMMENTS:
	EXAMINER CUE: Your supervisor desires that you perform the applicable steps of the procedure to quickly establish SWE flow (header will not be flushed).
2. Place discharge valve on SWE pump to CLOSE.	<pre>2.1 Places control switch for 2SWE*MOV116A to CLOSE. 2.2 Verifies green light illuminates. COMMENTS:</pre>
	EXAMINER CUE: Green light is lit.

RTL #A5.635.0	RTL	5.J
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NUMBER	TITLE
2CR-126	Startup the Standby Service Water System
STEP ("C" denotes critical step)	STANDARD . (Indicate "S" for Sat. or "U" for Unsat.)
3.C Place Standby Service Water Pump [2SWE*P21A] control switch to START.	3.1.C Places control switch to START.
	3.2 Verifies red light illuminates.
	COMMENTS:
	EXAMINER CUE: Red light is lit.
4.C Check that Standby Service Water Pressure [2SWE-PI114] is not less	4.1 Compares the two pressure indications.
than 5 psig below Service Water System pressure [2SWS-PI113A]. Then place discharge valve [2SWE*MOV116A] in AUTO, and verify that the valve opens.	4.2 Determines that pressure requirement is satisfied.
	EXAMINER CUE: [2SWE-PI114] indicates 140 psig. [2SWS- PI113A] indicates 50 psig.

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RTL #A5.635.J

NUMBER	TITLE	
2CR-126	Startup the Standby Service Water System	
STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)	
	4.3	Locates control switch for [2SWE*MOV116A].
·	4.4.C	Takes control switch to the AUTO or OPEN position.
	4.5	Verifies red light illuminates.
	4.6	Notifies NSS of T.S. 3.7.4.1.
	COMMENT	'S :
		<u>ER CUE</u> : Act as NSS. wledge Tech Spec t.

NUMBER	TITLE
	Startup the Standby Service Water System

STEP ("C"	denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
5.	Check 2SWE-II21A pump Amps are Normal, between 115 and 135 amps.	5.2 Verifies meter indicates between 115 and 135. COMMENTS:
		EXAMINER CUE: Pump current is currently 90 amps. EXAMINER CUE: Red light lit.
6.	If A1-4G "Service Water Header Pressure Low" is on, then refer to 20M- 30.4.AAB.	6. Verifies alarm window not illuminated. COMMENTS:
		EXAMINER CUE: A1-4G did not alarm.

NUMBER	TITLE	
2CR-126	Startup the Standby Service Water System	
STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)	
7. Verify SWE System is operating properly in accordance with 1/2 OM- 54.3A "Outside Plant Log".	7. Candidate dispatches another operator to perform 1/2 OM- 54.3A. COMMENTS:	
	EXAMINER CUE: The outside operator will perform 1/2 OM-54.3A EXAMINER NOTE: The following steps may be omitted.	
 Verify [2SWS*MOV107A,C] are open. 	8. Verifies valve open (Red) lights are lit.	
	COMMENTS: <u>EXAMINER CUE</u> : Red lights are lit for both valves. It is desired to place 2SWS*P21A in pull-to-lock.	

NUMBER	TITLE
2CR-126	Startup the Standby Service Water System
STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
9. Place the SWS A Header Pump [2SWS*P21A] to STOP then PULL-TO-LOCK.	9.1 Places control switch for P21A to STOP.
	9.2 Places control switch to PULL-TO-LOCK.
	COMMENTS:
<pre>10. Verify 2SWS*MOV102A is closed and log time SWS pump removed from service.</pre>	10.1 Verifies closed (Green) light is lit for MOV102A.
	10.2 Logs time pump removed from service.
	COMMENTS:
	EXAMINER CUE: Valve 2SWS*MOV102A is shut, green light lit.

MINICIPA	
NUMBER	TITLE
2CR-126	Startup the Standby Service Water System
STEP	STANDARD (Indicate "S" for Sat. or "U"
("C" denotes critical step)	for Unsat.)
11. Verify SWE operating properly in accordance with Outside Plant Log 1/2 OM-54.3A	<pre>11. Candidate requests status of log 1/2 OM- 54.3A. EXAMINER CUE: All Standby Service Water parameters are SAT. COMMENTS:</pre>
	Stop Time:

ORAL OUESTION #1

- QUESTION: Compare the severity of a total loss of Normal and Standby service water (both trains) at the Beginning of Life (fist day at full power) compared to the End of Life (16 months at full power). Include a discussion of which heat loads would be higher after shutdown in each case.
- ANSWER: The loss would be more severe at EOL due to the higher decay heat load from the core on the RHS and CCW systems. While the heat load on the Spent Fuel Heat Exchangers would be higher at BOL, this heat load (from the 1/3 of the core NOT New Bowertester offloaded) is smaller than the equilibrium decay heat for the whole core.

TIME

- ALLOTTED: 5 minutes
- KSA #: 062AA1.02 3.2/3.3

REF: AOP 2.30.1

COMMENTS:

Revision 7

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL OUESTION #2

The plant is at 100% power. An inadvertent Train OUESTION: "A" CIA signal has been generated. How would this signal affect a Liquid Waste discharge, if one were actions of in progress, and the signal could not be reset? What actions of le Irhen

> Since Secondary Component Cooling Water (CCS) is isolated by the Phase "A" signal, less water will be returning to the Cooling Tower. This decrease in water flow to the tower in turn reduces cooling tower blowdown, which is the dilution flow for the Radwaste Discharge. The discharge should be manually terminated until the Discharge Permit can be recalculated for the lower dilution flow.

TIME

ANSWER

- ALLOTTED: 5 minutes
- 076K1.16 3.6/3.8 KSA #:

20M-30.1.0 REF:

COMMENTS:

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

The plant is at 100% power. An inadvertent Train "A" CIA signal has been generated. How would this signal affect a Liquid Waste discharge, if one were in progress and the signal could not be reset

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* THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

Compare the severity of a total loss of Normal <u>and Standby</u> service water (both trains) at the Beginning of Life (fist day at full power) compared to the End of Life (16 months at full power). Include a discussion of which heat loads would be higher after shutdown in each case.

RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE '

Read:

ask:	Startup	the	Standby	Service	Water	System
------	---------	-----	---------	---------	-------	--------

INITIAL CONDITIONS:	The plant is at 100% power. The "A"
	Train Service Water Pump [2SWS*P21A] has just tripped.

INITIATING CUE:	Your Supervisor directs you to QUICKLY supply water to the SWS header from the SWE system, using
	the normal operating procedure, 20M-30.4G. Assume all Initial Conditions are SAT.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".



Perform the required task. Point to any indicator or component you verify or check and announce your observations.

After completing the task, announce "I have completed the JPM", then hand this sheet back to the evaluator.

BEAVER VALLEY JOB PERFORMANCE EVALUATOR COVER SHE	
JPM Number: 2CR-046 Rev: 04 System #:	- Jan I
JPM Title: Perform ESF Checklist - CIA	(
K/A Reference: 013A4.01 4.5/4.8 To	ask ID #: 0130010101
103K1.08 3.6/3.8 103K1.08 3.6/	3.8 3010010601
JPM Designation: 🗌 NO 🗵 RO 🖸	SRO Faulted:
JPM Application: 🗵 NRC 🗵 Initial	Exam Training
Evaluation Method LOCATION	ТҮРЕ
] Training
	Annual Regual. Exam
	Other:
BV-T X NRC	
U Other:	
Evaluation Results	
Performer: Name:	Employee No:
Results SAT	Time (minutes) ed: <u>15</u> Actual:
Time C *Comments (Required for UNSAT Evaluation)	ritical: 🗌 Yes 🗵 No
Comments (Required for ONSAT Evaluation)	•
Evaluation Results Check here if same	as above
Observer 1: Name:	Employee No:
Observer 2: Name	Employee No:
Observer 3: Name Observer 4: Name	Employee No: Employee No:
Time (minutes)	Results
Question ID Allotted A	ctual SAT UNSAT*
Question #1	
Employee No: Question #2	
Employee No:	
*Comments (Required for UNSAT Evaluation)	:
Evaluator (Print):	Organization:
	-
Evaluator Signature	Date:

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Revision 4

RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER: 2CR-046

JPM TITLE: Perform ESF Checklist - CIA

RECOMMENDED

- STARTING LOCATION: Simulator
- **DIRECTIONS:** You are to perform the task "Perform ESF Checklist CIA".
- INITIATING The plant has had a reactor trip and a safety injection. Operators have proceeded to Step 21 in OM-53A, Procedure E-O, 'Reactor Trip and Safety Injection." The plant computer is not available. Another operator has verified and signed for all valves except for the ones on Pages 6 and 7.
- **TASK STANDARD:** Seal Return containment penetration is isolated.
- **INITIATING CUE:** Your supervisor directs you to review the instructions for and then perform Attachment A-0.2, "Containment Isolation Phase A Checklist" starting at Page 6 and report back on the status of Containment Isolation Phase A.

REFERENCES: OM-2.53A.1, E-0, Issue 1B, Revision 3.

TOOLS: None

HANDOUT: 0M-2.53A.1, Attachment A-0.2, Issue 1B, Revision 1, signed off through page 5.

NUMBER	TITLE
2CR-046	Perform ESF Checklist - CIA

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
 Obtain copy of Attachment A-0.2. 	<pre>Start time:</pre>

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NUMBER T	TITLE
2CR-046 P	Perform ESF Checklist - CIA

<pre>component required p components position, "2CHS*MOV Cnmt Return has neithed light illu MOV381 wh: light lit</pre> 2.1 Candid valve or in the 2.2 Candid	E: Prove s for each to support osition. All
COMMENTS: (Cont. on n	are required in except 78 RCP Seal Water n Isol Vlv" which ar green nor red minated and 2CHS- ch has its red ate checks each ate checks each Attachment A-0.2 required condition. ate initials each at on checklist.

NUMBER	TITLE
2CR-046	Perform ESF Checklist - CIA

STEP ("C" denotes critical step)	STANDARD . (Indicate "S" for Sat. or "U" for Unsat.)
	(Cont. from Previous Page) <u>EXAMINER NOTE</u> : Candidate may initiate routine diagnostics such as change indicating lamps, have local operator cycle MCC Breaker, reset thermal overload, etc.
	EXAMINER CUE: If candidate asks you as local operator to check MCC Breaker, tell him it will take at least 10 minutes.
	2.3 Candidate places control switch for 2CHS*MOV378 to the CLOSED position.
	2.4.C Candidate places control switch for 2CHS*MOV381, to the CLOSED position.
	COMMENTS :

NUMBER	TITLE
2CR-046	Perform ESF Checklist - CIA

STEP ("C" denotes critical step)	STANDARD - (Indicate "S" for Sat. or "U" for Unsat.)
3. Reports Status of the CIA system to supervisor.	3. Candidate reports all Components in the required position, except "[2CHS*MOV378] RCP Seal Water Return Cnmt Isol Valve" which has neither green nor red lights illuminated and 2CHS*MOV381 which needed to be closed manually. COMMENTS: COMMENTS: EXAMINER CUE: Tell the candidate to stop after he verifies all components on BB-A. Stop Time:

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

Question: Given; A Main Steamline Break inside containment has occurred inside containment. A failure of one control rod to insert has resulted in the bursting of many fuel rods in the vicinity of the stuck rod.

> Discuss the consequences of a failure of the Containment Isolation Phase A signal to isolate the RCS sample lines under these conditions.

ANSWER: The bursting of the fuel rods would greatly increase the activity in the Reactor Coolant System.

The failure to isolate the sampling lines could result in substantial overexposures of the primary chemist and increased general area radiation levels in the auxiliary building near the sampling lines. (Completion may be prompted, i.e. "how would your ability to transit the auxiliary building be affected?".)

How K Man

TIME ALLOTTED: 5

ALLOTTED: 5 minutes

KSA #: 103A2.03 3.5/3.8

REF: 20M-53A.1.ECA-1.2

COMMENTS:

to the OPEN position) after a time delay. TIME 4 minutes ALLOTTED unil le igner the Will 103K4.06 (3.1/3.7) KSA #: 013K4.02(3.9/4.2)20M-14A.1.D (I&C) page 9 REF: Logic drawing 12241-LSK-14-15F Electrical Schematic COMMENTS:

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

How can the primary coolant hot leg sample line containment isolation valve [2SSR*SOV128A1] can be opened with a CIA signal present? Explain using the applicable drawing.

ORAL QUESTION #1

Given; A Main Steamline Break inside containment has occurred inside containment. A failure of one control rod to insert has resulted in the bursting of many fuel rods in the vicinity of the stuck rod.

Discuss the consequences of a failure of the Containment. Isolation Phase A signal to isolate the RCS sample lines under these conditions.

RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: Perform ESF Checklist - CIA

INITIAL CONDITIONS:	The plant has had a reactor trip and a
	safety injection. Operators have proceeded to Step 21 in OM-53A, Procedure
	E-0, "Reactor Trip and Safety Injection."
	The plant computer is not available.
	Another operator has verified and signed
	for all valves except for the ones on
	Pages 6 and 7.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Perform the required task. Point to any indicator or component you verify or check and announce your observations.

After completing the task, announce "I have completed the JPM", then hand this sheet back to the evaluator.

RTL #A5.640U BEAVER VALLEY JOB PERFORMANCE MEASURE EVALUATOR COVER SHEET	
JPM Number: 2PL-506 Rev: 3 System: 064	
JPM Title: Locally Start the No. 1 Emergency Diesel Generator	
K/A Reference: 055 EA1.02 4.3/4.4 Rev. 1 Task ID #: 0640020104	
000055EA1.02 4.3/4.4 000055G06 3.8/4.1	
JPM Application: 🛛 Requal 🖾 Initial Exam 🗖 Training	
Evaluation Method LOCATION TYPE	
🗌 Perform 🛛 Plant Site 🗍 Training	
🖾 Simulate 🔲 Simulator 🗌 Annual Requal. Exam	
Classroom OJT	
🗵 Initial Operator Exam	
Administered By: Other:	
BV-T NRC	
Other:	
Evaluation Results	
Performer: Name: Employee No:	
Results 🔲 SAT Time (minutes)	
UNSAT* Allotted: 20 Actual:	
Time Critical: 🗍 Yes 🗵 No	
Administrative JPM 🔲 Faulted 🗵	
*Comments (Required for UNSAT Evaluation):	
	_
Evaluation Results 🛛 Check here if same as above	_
Observer 1: Name: Employee No:	
Observer 2: Name Employee No: Observer 3: Name Employee No:	
Observer 4: Name Employee No:	
Time (minutes) Results Question ID Allotted Actual SAT UNSAT [*]	
Question #1	
Question #2	
Employee No: *Comments (Required for UNSAT Evaluation):	•
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Evaluator (Print): Organization:	
Evaluator Signature Date:	

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RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER:	2PL-506
JPM TITLE:	Locally Start the No. 1 Emergency Diesel Generator -
TASK STANDARD:	The No. 1 Diesel Generator is started and ready to energize the 2AE Emergency Bus.

RECOMMENDED

STARTING LOCATION: Plant

DIRECTIONS: You are to simulate the task "Locally Start the No. 1 Emergency Diesel Generator"

INITIAL A station blackout has occurred. OM 53A CONDITIONS: Procedure ECA-0.0 "Loss of All AC Power" has led to step 16, which requires local actions to be taken to restore power. Service water pump 2SWS*P21A is in AUTO.

- INITIATING CUE: Your supervisor directs you to use Attachment A-1.5 of ECA-0.0 to start the No. 1 Diesel Generator. You have been given the keys for the No. 1 Diesel Generator.
- REFERENCES: OM 2.53A ECA-0.0 Attachment A-1.5 Issue 1B Revision 2
- TOOLS: Plant Page, Flashlight, Key 138 for Excitation Cabinet

HANDOUT: OM 2.53A ECA-0.0 Attachment A-1.5

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

QUESTION: Given; an Emergency Diesel Generator has been restarted following a Station Blackout with very limited cooling water flow (estimated 50 gpm through temporary hoses).

1) Discuss the likely sequence of events if the EDG is fully loaded with insufficient cooling water flow.

2) How could the consequences of the limited cooling flow be minimized?

- ANSWER: 1) Because the High Jacket Water and Lube oil Temperature and the Low Lube Oil Pressure engine trips are not available following an Autostart on undervoltage, no automatic trips will occur. Catastrophic engine failure will eventually occur (due to piston seizure due to loss of Jacket cooling or bearing failure due to loss of Lube Oil viscosity at high temperature).
 - EDG operation can be extended by minimizing the electrical load on the EDG (as indicated by continuous local monitoring of lube oil and jacket water temperatures).

TIME ALLOTTED: 10 minutes

KSA #: 064K1.03 3.1

REF: Logic diagrams 36-24B & D (Trip logic) EOP ECA-0.2 background document pg.3

COMMENTS:

RTL #A5.635.J

(t)

NUMBER	TITLE
2PL-506	Locally Start the No. 1 Emergency Diesel Generator
STEP ("C" denotes critical step)	STANDARD - (Indicate "S" for Sat. or "U" for Unsat.)
 Obtain a copy of OM-53A, Procedure ECA-0.0, Attachment A-1.5. 	<pre>Start time:</pre>
2. C Take local control of diesel generator No. 1	<pre>EXAMINER CUE: If asked, 2SWS*P21A is in AUTO. 2. Candidate inserts key into switch and selects the LOCAL position, at the local control panel. COMMENTS:</pre>

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1	NUMBER	TITLE
	2PL-506	Locally Start the No. 1 Emergency Diesel Generator
	STEP ("C" denotes critical step)	STANDARD - (Indicate "S" for Sat. or "U" for Unsat.)
	3. Verify that the ENGINE OVERSPEED and START FAILURE alarms are not activated on the local alarm panel.	3. Candidate locates local alarm panel and verifies no ENGINE OVERSPEED or START FAILURE alarm.
		EXAMINER CUE: No alarms are actuated.
		COMMENTS:
		EXAMINER NOTE: Either pushbutton should be capable of starting the DG independently.
10 Auto	4 C Depress the local start pushbutton until the engine { starts and is self- sustaining; then release the pushbutton.	4. Candidate simulates depressing the local start pushbutton.
$(c)_{\sim}$		COMMENTS:
		EXAMINER CUE: Diesel generator does not start.

NUMBER	TITLE
2PL-506	Locally Start the No. 1 Emergency Diesel Generator
STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
5.C Place key switch in AUTO and manually depress ES-1 or ES-2 emergency start relays.	<pre>EXAMINER NOTE: Provide key 138 to allow access to the Excitation Cabinet. 5.1.C Candidate places key switch to AUTO. 5.2.C Candidate simulates depressing the ES-1 or ES-2 Emergency Start Relay. EXAMINER CUE: Diesel Generator starts and is self-sustaining. COMMENTS:</pre>

-

NUMBER	TITLE
2PL-506	Locally Start the No. 1 Emergency Diesel Generator
STEP ("C" denotes critical step)	STANDARD - (Indicate "S" for Sat. or "U" for Unsat.)
6. Adjust diesel generator speed using the governor control to 515 rpm - 535 rpm.	<pre>6. Verifies DG engine speed is 515 rpm - 535 rpm. COMMENTS:</pre>
	EXAMINER CUE: Diesel Generator speed is 520 rpm.
7. Verify DG voltage greater than 4160 VAC.	7. Candidate locates DG voltmeter and verifies voltage. EXAMINER CUE: Voltmeter indicates 4160 VAC. EXAMINER NOTE: Candidate may use local voltage indication or call the control room. In all cases the indication should be given as 4160 volts. COMMENTS:

RTL #A5.635.J

NUMBER	TITLE
2PL-506	Locally Start the No. 1 Emergency Diesel Generator
STEP ("C" denotes critical step)	STANDARD - (Indicate "S" for Sat. or "U" for Unsat.)
8. Attempt to restore diesel control to the Control Room by placing the Local-Auto selector switch to AUTO.	8.1 Candidate locates the key switch and explains that it would be turned to the AUTO position.
	COMMENTS:
	EXAMINER CUE: Control of Diesel Generator is established from the control room.

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NUMBER	TITLE
2PL-506	Locally Start the No. 1 Emergency Diesel Generator
STEP ("C" denotes critical step)	STANDARD - (Indicate "S" for Sat. or "U" for Unsat.)
 Request Control Room operator verify open or open emergency bus tie breakers [2E7, 2F7] and [2A10, 2D10]. 	9. Candidate simulates a call to the Control Room to verify that the tie breakers are open.
	EXAMINER NOTE: Candidate may opt to verify breaker position locally at switchgear. If verified locally, inform candidate that all 4 breakers are open.
	EXAMINER CUE: The Control Room reports that the emergency bus tie breakers are open, the 2AE bus loads are stripped off and that they will close breaker 2E- 10.
	COMMENTS:
	Stop Time:

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* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

QUESTION: Given; an Emergency Diesel Generator has been restarted following a Station Blackout with very limited cooling water flow (estimated 50 gpm through temporary hoses).

1) Discuss the likely sequence of events if the EDG is fully loaded with insufficient cooling water flow.

2) How could the consequences of the limited cooling flow be minimized?

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

QUESTION:

- Given: the bus 2AE normal feeder breaker 2E07 has tripped open due to a ground fault (Type 51 inverse time relays on bus actuated).
 - Determine, using the applicable drawings, whether or not the Emergency Diesel Generator will automatically reenergize the bus.
 - -2) Determine, using the above drawings, whether the Emergency Diesel Generator output breaker could be manually closed.
 - 3) Discuss the possible consequences to the Emergency Diesel Generator if the output breaker were to close under the above conditions.

seen & say # 1) will must occur.

RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: Locally Start the No. 1 Emergency Diesel Generator

INITIAL CONDITIONS:	A station blackout has occurred. OM 53A
	Procedure ECA-0.0 "Loss of All AC Power"
	has led to step 16, which requires local
	actions to be taken to restore power.
	Service water pump 2SWS*P21A is in AUTO.

INITIATING	Your supervisor directs you to use Attachment A-
CUE:	1.5 of ECA-0.0 to start the No. 1 Diesel
	Generator. You have been given the keys for the No. 1 Diesel Generator.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance of the required task. Point to any indicator or component you verify or check and announce your observations.

After the task is complete, announce "I have completed the JPM", then hand this sheet back to the evaluator.

		LEY JOB PERFORM ALUATOR COVER S		a
JPM Number: 2CR-	New #9 Rev	<i>r</i> : 0	System #:015	-
JPM Title: Perform	a QPTR (Unsa	t)		1
K/A Reference:015/	4.02	Difficulty; 3.9/3.9	Task ID #: 0150	040201
JPM Application:	🗵 Requ	al 🗵 Initial Exam	Training	-
	•			
Evaluation Met	chod	LOCATION	TYPE	
🗙 Perfo	orm [] Plant Site	└ Training	
🗌 Simul	.ate 🖸	Simulator	🗌 Annual Requa	1. Exam
	C	Classroom	TLO 🔲	
		•	X Initial Oper	ator Exam
Administered H	Зу:		Other:	
BV-T	D	NRC DALL	N. 1 0	10.2
Other:		1 VLW	new grup r	U
Evaluation Results				
Performer: I	Name:		_ Employee No:	
Results	SA ⁻	Г	Time (minutes)	
		SAT [*] Allott	ed: <u>15</u> Actual:	
		Time	Critical: 🛛 Ye	s 🗵 No
		Administrativ	ve JPM 🛛 Fa	ulted
*Comments (Requir	ed for UNSAT			
· ·				
Evaluation Results		Check here if same a	s above	
Observer 1:				
Observer 2: Observer 3:				
Observer 4:			Employee No:	
		Time (minutes)	Resul	
	Question ID	Allotted	Actual SAT	UNSAT [*]
Question #1				
Employee No:				_
Question #2		<u> </u>		
Employee No: *Comments (Require		Evaluation):		
Comments (nequi	ed for UNSAT			
Evaluator (Print):_				
Evaluator Signatur	e		Date:	

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BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER:	2CR-New #9
JPM TITLE:	Perform a QPTR -
TASK STANDARD:	QPTR is identified as being > 1.02 (unsat)
RECOMMENDED STARTING LOCATION:	Simulator
DIRECTIONS:	You are to perform a manual Quadrant Power Tilt Ratio calculation.
INITIAL CONDITIONS:	A QPTR alarm has been received. The IPC is not available.
INITIATING CUE:	The ANSS directs you to perform 2OST-2.4A, beginning at step VII.B to determine if the alarm is valid.
REFERENCES:	20ST-2.4A
TOOLS:	Calculator
HANDOUT:	20ST-2.4A

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NUMBER; 2CR-New#9	TITLE: Perform a QPTR

	STANDARD
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)

EXAMINER NOTE: Provide candidate with Data Sheet 20ST-2.4A Page 8 with Normalization Factors inserted	Start Time: <u>EXAMINER NOTE</u> : Initialize simulator in Mode 1, 100%N. Place rods in MANUAL. Activate CLF NIS XMT 14, 2, 1, ramp 60 second. Adjust N44 channel gain to clear channel deviation alarms. Print out computer PCS group GP048 if available. Write snap.
 Records uncorrected detector current values. 	 Records eight power range detector currents. COMMENTS:
2. Multiplies each detector current by its normalization factor	2. Records eight corrected currents
	COMMENTS :

NUMBER; 2CR-New#9	TITLE: Perform a QPTR

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
3. Adds corrected currents.	3. Adds each set of four corrected currents. COMMENTS:
 Determines average corrected currents. 	4. Divides two current sums by four. COMMENTS:
5.C Checks results	<pre>5.C Determines that N44B exceeds 1.02. COMMENTS: EXAMINER CUE: Computer group GP048 is consistent with calculated results (if requested and QPTR was done properly) or provide printout. Examiner terminates JPM at this point. Stop Time;</pre>

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BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

QUESTION: What effect would a drop of control rod D4 have on the Quadrant Power Tilt at 100% power?

ANSWER: Power would be depressed on N43 and elevated on N44, (probably resulting in an Out-of-Specification QPTR).

Note; Requires use of figure 2OM 2-5 to determine location of excore detectors relative to dropped rod.

TIME ALLOTTED: 5 minutes

KSA #: 015K1.03 3.1/3.1 001K5.07 3.3/4.0 015A1.04 3.5/3.7

REFERENCE: 20M Figure 2-5

COMMENTS: _

a propped nod S. but looking for a propped nod S. but looking for apped on SPJR as opposide to Affect on SDM. Purboley O.K. SDM.

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

- QUESTION: Given that the upper and lower power range detector normalization factors have just been determined following a refueling outage to make the upper and lower Quadrant Power Tilt Ratios equal to 1.00, how would an actual quadrant power peak due to an incorrectly loaded fuel assembly be detected?
- ANSWER: By performance of a (full) incore flux map (that would detect an out-of specification Enthalpy Rise Hot Channel Factor, F_N^{AH}). (Completion may be prompted after the candidate mentions the flux map by having him refer to Technical Specifications to determine which power distribution limit would be exceeded.)

TIME ALLOTTED: 5 minutes

KSA #: 015K5.09 2.5/2.9 015K5.12 3.2/3.6

REF: T/S 4.2.3.1 and basis T/S 3.2.4 basis page B 3/4 2-8

COMMENTS: _____

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

QUESTION: Given that the upper and lower power range detector normalization factors have just been determined following a refueling outage to make the upper and lower Quadrant Power Tilt Ratios equal to 1.00, how would an actual quadrant power peak due to an incorrectly loaded fuel assembly be detected?

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

QUESTION: What effect would a drop of control rod D4 have on the Quadrant Power Tilt at 100% power?

BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: You are to simulate (perform) a manual Quadrant Power Tilt Ratio calculation.

INITIAL CONDITIONS:	A QPTR alarm has been received.	The IPC is not available.

INITIATING CUE:	The ANSS directs you to perform 2OST-2.4A, beginning at step V	/II.B to
	determine if the alarm is valid.	

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Perform the required task. Point to any indicator or component you verify or check and announce your observations.

After completing the task, announce "I have completed the JPM", then hand this sheet back to the evaluator.

	EAVER VALLEY JOB PERFOR EVALUATOR COVER	
JPM Number: 2PL- JPM Title: Align	019 Rev: 3 System Air Compressor for Operation	#: 078 on
K/A Reference:00	65AA1.04 3.5/3.4	Task ID #: 0000260401
JPM Designation JPM Application		SRO ial Exam Training
Evaluation Metho Perform X Simulat	N Plant Site	TYPE Training Annual Requal. Exam OJT NRC Initial
Operator Exam Administered By: BV-T Other:	X NRC	Other:
Evaluation Resul Performer:	Name:	Employee No:
Results *Comments (Requi		Time (minutes) otted: <u>15</u> Actual: <u></u> e Critical: 1 Yes X No Faulted: 1 on):
Comments (Requi	UNSAT All Tim red for UNSAT Evaluati	otted: <u>15</u> Actual: <u></u> ne Critical: Y es X No Faulted: D on):
Comments (Requi 	UNSAT All Tim	otted: <u>15</u> Actual: <u>No</u> Ne Critical: Yes X No Faulted: on): <u>Same as above</u> Employee No: <u>Employee No</u> : <u>Results</u>
Comments (Requi	UNSAT All Tim red for UNSAT Evaluati ts Check here if s ame: Time (minute estion ID Allotted	otted: <u>15</u> Actual: <u>No</u> Re Critical: Yes X No Faulted: on): <u>Same as above</u> Employee No: <u>Employee No:</u> Actual SAT UNSAT*
Comments (Requi	UNSAT All Tim red for UNSAT Evaluati ts Check here if s ame: Time (minute estion ID Allotted	otted:15 Actual: Me Critical: D Yes X No Faulted: D on): on): on): on): on): same as above Employee No: es) Results Actual SAT UNSAT*
Comments (Requi	UNSAT All Tim red for UNSAT Evaluati ts Check here if s ame: Time (minute estion ID Allotted	<pre>otted: 15 Actual: me Critical: Yes No Faulted: ON): on): same as above Employee No: es) Results Actual SAT UNSAT* O ON on):O</pre>

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RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE '

Read	:
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Task: Align Station Air Compressor for Operation

INITIAL CONDITIONS:	The Control	Room has been	evacuated due
	to fire.		

INITIATING The NSS hands you	copy of OM-2.56C.4, Procedure
CUE: E, Part 2 and te	you to perform Step 5.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate the task. Point to any indicator or component you verify or check and announce your observations.

After the task is completed, announce "I have completed the JPM", then hand this sheet back to the evaluator.

RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE EVALUATOR DIRECTION SHEET 2PL-019 JPM NUMBER: Align Station Air Compressor for Operation JPM TITLE: RECOMMENDED STARTING LOCATION: Turbine Building You are to simulate the task "Align Station DIRECTIONS: Air Compressor for Operation". The Control Room has been evacuated due to INITIAL fire. CONDITIONS: 2SAS-C21A is running on Domestic Water with TASK STANDARD: 2SAS-AOV105 closed. The NSS hands you a copy of OM-2.56C.4, INITIATING CUE: Procedure E, Part 2 and tells you to perform Step 5. OM-2.56C.4, Procedure E, Part 2, Issue 1, **REFERENCES:** Rev. 4 None TOOLS: 20M-56C.4.E, Part 2 HANDOUT:

OMCN 2-'92-262

RTL #A5.635.J

* * THIS SHEET TO BE GIVEN TO CANDIDATE *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

Briefly describe the impact of a loss of Station Instrument Air on the ability to complete valve positioning required by a Safety Injection or Containment Isolation signal.

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RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

Question; Briefly describe the impact of a loss of Station Instrument Air on the ability to complete valve positioning required by a Safety Injection or-Containment Isolation signal.

ANSWER: Instrument Air is not required because SI and CIA valves fail to their desired positions on a loss of air pressure (or control power). Valves that must change position following an SI are equipped with either motor or solenoid operators.

ALLOTTED: 4 minutes

KSA #: 078K3.02 3.4/3.6

REF: 20M-56C.4A INTENT AND METHODOLOGY item 3.F

COMMENTS:

RTL #A5.635.J

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

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ORAL QUESTION #2

Why does 20M 56C line up Domestic Water as the cooling medium to the 21A air compressor?

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

- Question; Why does 20M 56C line up Domestic Water as the cooling medium to the 21A air compressor?
- ANSWER: Domestic Water is utilized by OM2.56C because the normal supply, CCS, is unavailable. CCS is unavailable because procedure 56C deenergizes the BOP busses (to prevent undesired equipment operation). (Completion may be prompted, i.e. "Why will CCS be unavailable?".)

TIME 5 minutes ALLOTTED:

KSA #: 000067EK3.04 3.3/4.1

REF: 20M-28.1

COMMENTS:

R/TL #A5.635.J

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NUMBER	TITLE
2PL-019	Alternate Safe Shutdown - Turbine Building (N.O. #2)

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
("C" denotes critical step) 1.C Isolate all unnecessary loads on SAS.	

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R/TL #A5.635.J

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NUMBER	TITLE
2PL-019	Alternate Safe Shutdown - Turbine Building (N.O. #2)

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
2.C Align cooling water to the 2SAS-C21A air compressor from the Domestic Water supply.	<pre>2.1.C Candidate closes 2CCS- 78. EXAMINER CUE: 2CCS-78 is closed. 2.2.C Candidate closes 2CCS-83. EXAMINER CUE: 2CCS-83 is closed. 2.3.C Candidate opens 2CCS- AOV118. EXAMINER CUE: 2CCS-AOV118 is open. 2.4.C Candidate opens [2CCS*229]. EXAMINER CUE: 2CCS-229 is open. COMMENTS:</pre>

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R/TL #A5.635.J

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NUMBER	TITLE
2PL-019	Alternate Safe Shutdown - Turbine Building (N.O. #2)

STEP ("C" denotes critical step)	- STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
3.C Align compressor controls for 2SAS-C21A.	<pre>EXAMINER CUE: The VOLTAGE ON light and remote breaker lights are lit and no alarm status lights are lit. 3.1.C Candidate places LOCAL- REMOTE switch in the LOCAL position. 3.2.C Candidate depresses RESET/START pushbutton. EXAMINER CUE: The compressor is running with no problems. 3.3 Candidate notifies Supervisor of compressor status. COMMENTS:</pre>
EXAMINER CUES: Oil pressure is 30# aftercooler discharge is 110# intercooler inlet is 36# intake vacuum is 8" Cooling water outlet is 100°F aftercooler water outlet is 30°C aftercooler air outlet is 32°C	Stop Time:

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SCENARIO OVERVIEW

Facility: <u>Be</u>	aver Valley Pow	ver Station Unit 2	Scenario No.: _2_ Op-Test No.: <u>2LOT2B</u>
Examiners: Operators:			
Objectives: T	o evaluate the ann	licants ability to use	Normal, Abnormal, Emergency and Alarm Response
procedures to	respond to a charge	ging pump sheared	shaft, impulse pressure transmitter failure, 2RCS*PT444 failing V435 failing to close, ATWS, 2CHS*MOV350 fails to open,
	fails to auto start.		V435 failing to close, ATVVS, 2015 MOV350 fails to open,
			ate conditions. Rods are in Manual. 2CHS*P21B and Tornado Warning in effect. Tube leak on SG "B".
			ron 982 PPM. Rods in Auto with CBD at 190 steps.
2FWE-102 or	ben. 2RCS*PCV4	56 is isolated per	38 shut, 2FWE*P22 aligned to 'B' header 2FWE-36 shut; T.S. 3.4.11.b action. AOP 6.4 is complete to step 18 due to
20 gpd tube l 2FWS-P21A		mado watch in effec	t. AOP 75.1 complete through step 5. Lower power to remove
Event No.	Malf. No.	Event Type*	Event Description
N/A	N/A	R RO N PO/SRO	Lower power to remove 2FWS-P21A from service
1	PMP CHS1 4,0,D	C RO/SRO	Operating Charging Pump sheared shaft resulting in loss of all charging and seal injection flow
2	XMT MSS42 1,0,20,D	I PO/SRO	Impulse pressure transmitter 2MSS*PT446 fails low
3	XMT RCS30 1,2500,5,0,D	I RO/SRO	RCS pressure transmitter fails high causing spray valves and PORVs to open and heaters to turn off
4	VLV RCS32 4,75,0,C,RR CH455C.GT. 0.05	C RO/SRO	PZR PORV 2RCS*PCV455C fails to 75% open (Preload)
5	VLV RCS11 2,0,D	M ALL	PORV Block valve 2RCS*MOV535 fails to close causing RCS pressure to lower (Reactor trip and SI) (Preload)
6	MAL PPL1A & B ACT,2,0,D	M ALL	ATWS (Preload)
7	MAL PPL7A	C PO/SRO	2FWE*P23A fails to auto start, will manually start
	ACT,6,0,D		(Preload)
8	VLV BAT14 3,0,D	C RO/SRO	2CHS*MOV350 fails closed, must alternate emergency borate (Preload)
* (N)ormal,	(R)eactivity,	(I)nstrument,	(C)omponent, (M)ajor

BVPS 2LOT2B Rev. 0

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U2LOT-SIM-NRC EXAM-2LOT2B.2 (ic) REV 0

INITIAL CONDITIONS: Drill File 846 IC-47

Reactor power = 75%, BOL, RCS boron = 982 ppm, CBD = 190 steps

ADDITIONAL LINEUP CHANGES	STICKERS	VOND MARKINGS
Set CBD step counters at 190 steps	2RCS*MOV536 RED	2FWE*38 shut 24-3 (G-6) 2FWE*P22 aligned to 'B' header
Place BOL ΔI curve in RO operator aids	2CHS-P21B RED	2FWE*36 shut; 2FWE*102 open 24-3 (E-6)
2000 - 4000 MWD/MTU Reactivity Plan	2FWE*P23B RED	2MSS-16 shut 21-2 (C-1)
	2MSS*SOV120 YCT	2SVS*28 shut 21-2 (E-9)
	2MSS*SOV105C YCT	
	2SVS*PCV101B YCT	
	2SVS*HCV104 YCT	
EQUIPMENT STATUS	DATE/TIME OOS	TECHNICAL SPECIFICATION(S)
2RCS*PCV456	6 days ago/0759	3.4.11.b
2CHS*P21B	4 days ago/1610	3.1.2.4 & 3.5.2 (Info Only)
2FWE*P23B	6 hrs ago/1031	3.7.1.2.b

SHIFT TURNOVER INFORMATION

- 1. The plant is at 75% power, BOL. RCS boron 982 ppm. Rods in auto with CBD at 190 steps. Power was reduced 70 hours ago per System's request.
- 2. [2CHS-P21B] is removed from service for motor rewind. Motor is presently off site.
- 3. [2FWE*P23B] is OOS to replace the pump inboard bearing, return expected in 24 hours. Its discharge valve 2FWE*38 is shut.
- 4. 2FWE*P22 aligned to 'B' AFW header 2FWE-36 shut; 2FWE-102 open.
- 5. 2RCS*PCV456 OOS with block valve 2RCS*MOV536 closed with power removed.
- 6. <u>AOP 6.4 is complete to step 18</u>. <u>Approximately 44 hours ago a tube leak was detected in SG "B"</u>. <u>The leak rate is 20 gpd</u> based on the last HP and Chemistry estimate (Monitoring at 2 hour intervals IAW the AOP).</u>
- 7. 2MSS-16 shut, 2MSS-15 and 17 verified open.
- 8. 2SVS*28 shut.
- 9. 2MSS*PCV101B auto with its setpoint adjusted to 100%.
- 10.2MSS*SOV105C open.
- 11.2MSS*SOV120 open
- 12. Lower power at 10%/hour to remove 2FWS-P21A from service.

SCENARIO SUPPORT MATERIAL REQUIRED

1/2OM-48.1.C(ISS3) Figure 48.1.C-2 (ANSS Turnover Checklist) 2OM-54.2.S1 Log S1-2 (NSS Operating Report) 2OM-54.2.S1 Log S1-5 (NCO Report) 2OM-54.2.S1 Log S1-17 (ANSS Operating Report) 2OM-52.4.B (Load Following)

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Select DRILL 846, Initialize IC - 47, and establish initial plant conditions.	Reactor at approximately 75% power, BOL, steady state condition, RCS boron _982_ ppm, CBD _190_ steps. Ready to lower power to remove 2FWS-P21A from service.		
insert:			
VLV RCS32 4,75,0,C,RRCH455C.GT.0.05 VLV RCS11 2,0,D MAL PPL1A ACT,2,0,D MAL PPL1B ACT,2,0,D MAL PPL7A ACT 6,0,D VLV BAT14 3,0,D File STUFFON File LRTM5IC Assign shift positions.	PZR PORV, 2RCS*PCV455C fails to 75% open PORV Block 2RCS*MOV535 fails open ATWS 2FWE*P23A fails to auto start Emergency Borate Valve 2CHS*MOV350 fails closed		
NSS ANSS RO PO STA	<u>Simulator Frozen</u> until after shift turnover unless it needs to be run momentarily for an alignment change.		

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Conduct a shift turnover with oncoming operators.			Oncoming ANSS should complete the required checklist and carry out a formal shift turnover.
When the shift turnover is completed, place the simulator in RUN and commence the drill.	Simulator running/VCR recording		ANSS assumes control and directs operators to commence lowering
Depress VCR PLAY/RECORD			power IAW 2OM-52.4.B.
	Power lowering		RO develops reactivity plan, ANSS reviews and approves. Crew commences power reduction
EVENT #1			
After power is lowered ≥ 5% insert: PMP CHS1 4,0,D	2CHS*P21B shaft shears resulting in the loss of all normal charging and seal injection flow 2CHS*P21B running with lower than normal amps. Alarm A2-3E, CHARGING FLOW PATH TROUBLE lit A2-4D, RCP SEAL TROUBLE lit		RO notes that charging header flow and pressure are low, 2CHS*P21B amps are low, with PZR level lowering

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	Annunciator A2-3F, LETDOWN FLOW PATH TROUBLE will illuminate if letdown is not quickly isolated		ANSS refers to alarm response procedure, charging flow or pressure low section and directs RO to close 2CHS*FCV122, Charging pump flow control valve Crew may isolate letdown per ARP A2-3F
			Crew verifies that a common mode failure does not exist and starts the standby charging pump
After an appropriate delay, report as local operator that the speed changer for 2CHS*P21B is damaged and very noisy (if pump is running) If asked local discharge pressure is 33 psig	Normal charging and letdown established 2CHS*FCV122 in Auto		RO stabilizes PZR level, then places 2CHS*FCV122 in Auto
			Applicable T. S. 3.1.2.4 and 3.5.2
EVENT #2			
When PZR level stabilized, insert: XMT MSS42 1,0,20,D	Impulse pressure 2MSS*PT446 fails low Rods step in in Auto		

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	Annunciators SG LEVEL DEVIATION, STEAM FLOW > FEED FLOW, PZR PRESSURE LOW, TAVE DEVIATION, DELTA FLUX OUTSIDE TARGET BAND LIT Rod control in Manual Tave trending to Tref dl returning to Target Band		ANSS refers to AOP 2.1.3, RCCA Control Bank Inappropriate Continuous Movement PO determines that 2MSS*PT446 has failed low ANSS directs RO to place rods in Manual and to restore Tave
	All four channels of QPTR are operable		PO performs OST-2.4A, QPTR Manual Calculation T. S. 3.2.1, dI (less than 60 minutes outside target in last 24 hours) and 3.2.5, DNB (restore within two hours) impacted ANSS refers to 20M- 24.4.IF, Instrument Failure Procedure,
	SG levels lowering FRVs in Manual		Attachment 5 ANSS directs PO to place FRVs in Manual and adjust to stabilize SG levels NOTE: May not be necessary
	Main turbine first stage pressure sensor selected to PT447 on BB-C		ANSS directs PO to select PT447

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	FRVS in Auto		ANSS directs PO to place FRVs in Auto when SG levels returned to normal
	Steam Dumps RESET and in STM PRESS Mode		ANSS directs PO to place the Stm Dump Mode Selector Switch to RESET, then to STM PRESS Mode
			ANSS refers to ARP 20M-1.4.ACJ
	TL/2MSS446 is on Trip Switch TPS/2MSS446 in the Test (up) position Annunciator A12-1E is off AMSAC re-armed		ANSS contacts I & C and directs them to verify that Test Light TL/2MSS446 is off and to place Trip Switch TPS/2MSS446 in the Test (up) position
			ANSS refers to T.S. 3.3.1.1 Table 3.3- 1, item 23.e
	Annunciator A12-2H not lit (Both inputs must be < 10% to illuminate this window, the annunciator being dark implies the other input is operable per the T.S. action)		Crew determines that A12-2H is NOT lit

DUQUESNE LIGHT COMPANY Nuclear Power Division

Training Administrative Manual

U2DRILL846(6)REV0

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
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EVENTS #3, 4 & 5

XMT RCS30 1,2500,5,0,D

VLV RCS32 4,75,0,C,PRC:455C.GT.2250 (Preload) VLV RCS11 2,0,D (Preload) 2RCS*PT444 fails high causing PZR spray valves and PORV 2RCS*PCV455C to open

2RCS*PCV455C fails 75% open

2RCS*MOV535, PORV Block fails open

PZR CONTROL PRESSURE HIGH/LOW alarm, A4-1D

PZR CONTROL PRESSURE DEVIATION HIGH/LOW alarm. A4-1E, P0500D Various other PZR pressure and PRT alarms

Possible OTDT runback and rod stop. A4-4B, T0517D RO notes alarm, informs ANSS and crew refers to ARPs as necessary.

ANSS refers to ARP A4-1E, PRESSURIZER CONTROL PRESS DEVIATION HIGH/LOW

ANSS directs PORV 455C be closed and master pressure controller be placed in manual.

PO places master pressure controller in manual, closes spray valves, and manually controls heaters.

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U2DRILL846(7)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
NOTE: Crew may decide to manually trip reactor prior to auto trip setpoint.	RCS pressure continues to drop.		RO informs the ANSS that RCS pressure is still dropping with manual control of spray/heaters and that 2RCS*PCV455C indicates partially open.
EVENT #6 MAL ACT PPL1A 2,0,D MAL ACT PPL1B 2,0,D (Preload) CT #1 - Crew inserts negative reactivity into the core by inserting RCCAs before completing the immediate action steps of FR-S.1	ATWS Low PRZR pressure reactor trip annunciator actuates. First Out: A5-4H, P0488D. Reactor trip failure.		RO notes a reactor trip has not occurred and attempts to trip the reactor, informs ANSS of ATWS condition.
			Operators commence immediate actions for E-O and FR-S.1; ANSS refers to E-O and makes transition to FR-S.1.
	Rods inserting.		RO uses auto or manual rod control to insert rods.
			Crew sounds standby alarm and announces Unit 2 reactor trip failure.

U2DRILL846(8)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Two minutes after receiving direction to locally open reactor trip breakers, insert MAL PPL2A ACT,0,0,D MAL PPL2B ACT,0,0,D	Reactor tripped		Crew dispatches an operator to open the reactor trip breakers.
Then report RTBs manually opened.			NSS evaluates EPP, declares a Site Area Emergency due to ATWS/FR- S.1 entry (TAB 2.3) within 15 minutes of first out annunciator, informs crew, provides AA with notification form.
	Turbine manually tripped.		PO manually trips turbine
	Throttle, governor, reheat stop, and interceptor valves all closed.		PO verifies turbine trip.
	Steam dump bypass interlock selector switches in off.		PO places condenser steam dump Selector Switches in OFF
	MSR steam supply block valves closed. Reheat controller reset.		PO ensures reheat steam isolation and depresses reheat controller RESET pushbutton.
<u>EVENT #7</u> 2FWE*P23A fails to auto start MAL ACT PPL7A 6,0,D (Preload)	MD AFW pump running. (2FWE*P23A manually started). TD AFW pump running if required. 2FWE*HCV100A-F full open.		PO verifies AFW status, reports 2FWE*P23A auto start failure, manually starts pump.

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
<u>EVENT #8</u> VLV BAT14 3,0,D (Preload)	HHSI pumps running. 2CHS*MOV350 failed closed		Crew attempts to initiates emergency boration.
	2CHS*SOV206 open Makeup Mode Selector in BORATE 2CHS*FCV113A set to > 30 gpm Boric Acid Flow Totalizer set to > 1000 gpm Boric acid pump in Auto BA Makeup Blender Control in Start 2CHS-FR113 BA to Blender flow > 30 gpm 2CHS*FCV122 manually opened Charging flow > 40 gpm		Crew establishes alternate emergency boration
	PRZR pressure < 2335 psig.		RO checks PRZR pressure less than 2235 psig.
	SI Annunciator A5-4G, PZR LOW PRESSURE SAFETY INJECTION/REACTOR TRIP lit		Crew checks SI signal states, performs first fifteen steps of E-0 when time permits
	SG levels < 5% NR.		PO checks SG levels, verifies AFW flow is greater than 700 gpm. PO controls feed flow to maintain 5 - 50% SG narrow range level.

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	2CHS*FCV113B closed. 2CHS*FCV114A closed. 2CHS*FCV114B closed.		RO verifies dilution paths isolated.
	Uncontrolled cooldown not in progress.		RO monitors RCS for uncontrolled cooldown.
			ANSS goes to Step 16 of FR-S.1.
	PR NIs less than 5%. IR NIs negative SUR.		RO verifies reactor subcritical.
			ANSS makes transition from FR-S.1 back to E-0 and informs control room to perform E-0 immediate actions.
	Reactor locally tripped Rods bottom lights lit Flux decreasing		RO verifies reactor trip
			RO sounds standby alarm, and announces Unit 2 reactor trip.
			NSS informed to evaluates EPP
	Throttle or governor valves closed, reheat stops or interceptors closed.		PO verifies turbine trip.

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Instructional Goldelines	I LANI STATUS UK KESPUNSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	MSR steam supply block valves closed. Reheat controller reset pushbutton depressed.		PO ensures reheat steam isolation.
	Main generator output breakers open. Exciter circuit breaker open.		PO verifies generator trip.
	2AE and 2DF busses energized.		PO verifies power to AC emergency busses.
	SI annunciator A5-4G, PZR LOW PRESSURE SAFETY INJECTION/REACTOR TRIP lit SI actuation status light, A12-1D lit		Crew checks if SI is actuated/required.
Immediate actions complete.	Both trains of SI manually initiated EDGs running.		ANSS directs RO to manually initiate SI, both trains PO verifies EDGs running.
	2FWE*P23A running (2FWE*P23B OOS). 2MSS*SOV105A-F open. 2FWE*HCV100A-F open.		PO verifies AFW status.
	Two service water pumps running (one per train). Service water header pressure 60- 124 psig.		RO verifies service water system in service

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	2CHS*P21A and C running 2SIS*943 indicates 400 gpm of SI flow		RO verifies SI pump status
	SI valve alignment - all indicating lights with red SIS marks lit		RO/PO verify SI status
	CIA actuated, all indicating lights with orange CIA marks LIT.		RO/PO verify CIA
	All indicating lights with green marks lit.		RO/PO verify FWI
	MSLI NOT required		RO/PO check MSLI required.
	CIB and Containment Spray NOT required.		RO verifies CIB and containment spray status
	2CCS-AOV118 opened. One station air compressor running.		PO establishes filtered water cooling to station air compressors.
	Both CCP pumps running		RO/PO verify CCP in service.
	SR channels aligned properly.		RO verifies SR detector high voltage switches in NORMAL.
	Total AFW flow > 365 gpm.		PO verifies AFW flow greater than 365 gpm.

U2DRILL846(13)REV0

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	Plant cooling down due to hot leg break, RNO actions complete		RO verifies RCS Tavg stable at or trending to 547°F. RNO actions performed
	Recirc spray pumps secured.		ANSS directs performance of emergency safety function checklists when time permits RO checks recirc spray pump status.
	PORV 2RCS*PCV455C NOT closed and NOT isolated		RO checks PRZR isolated. (Transition required by RNO)
			ANSS makes transition to E-1, informs crew. Briefing held
	CREBAPS not required.		PO checks control room habitability.
	RCPs running. HHSI flow indicated, D/P and CCP flow satisfactory.		RO checks if RCPs should be stopped.
	Recirc spray pumps not running.		RO rechecks recirc spray pump status.
	CNMT sample amber lights lit.		RO verifies both H ₂ analyzers running.
	All SGs intact		PO checks if any SG is faulted.

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	SG level between 5% and 50%		PO maintains intact SG levels 5% to 50%.
	PORV 2RCS*PCV455C open PORV 2RCS*PCV455D in auto with block valve energized		RO checks PORVs and block valves.
	Subcooling > 41°F. Secondary heat sink satisfactory RCS pressure stable or rising PRZR level > 4%		RO/PO check if SI can be terminated.
			ANSS makes transition to ES-1.1, informs crew.
Collect and review logs after allowing operators to complete them.			Operator logs should be clear, accurate and concise.

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CHANGES TO THE DRILL OUTLINES

The only changes made to the drill outlines were to support the running of the drills. There were no content changes. Examples of the changes were changes to the initial equipment that was out of service, and reordering the sequence of the malfunctions.

SCENARIO OVERVIEW

Facility: Bea	Facility: <u>Beaver Valley Power Station Unit 2</u> Scenario No.: 1 Op-Test No.: <u>2LOT2B</u>					
Examiners:	Examiners: Operators:					
	,,,,,,,	······				
Response pro stuck rod, a pump trippin	Objectives: <u>To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm</u> <u>Response procedures to raise power and respond to a VCT problem, a steam flow problem, a</u> <u>stuck rod, a load rejection, a steam line break outside containment, coincident with one charging</u> <u>pump tripping and one charging pump failing to auto start.</u>					
Charging Pur	np and one Moto	r Driven AFW pu	eady state conditions. Rods are in auto. One mp are out of service. One PZR PORV is isolated. ue to tube leak on SG "B".			
steps. [2CH 2FWE-36 shu complete to s	Turnover: <u>The plant is at 75% power</u> . RCS boron 982 PPM. Rods in auto with CBD at 190 steps. [2CHS*P21B] and [2FWE*P23B] are OOS. 2FWE*38 shut, 2FWE*P22 aligned to 'B' header 2FWE-36 shut; 2FWE-102 open. 2RCS*PCV456 is isolated per T.S. 3.4.11.b action. AOP 6.4 is complete to step 18 due to 20 gpd tube leak on SG "B". Tornado watch in effect. AOP 75.1 complete through step 5.					
Event No.	Malf. No.	Event Type*	Event Description			
N/A	N/A	N RO/PO/ SRO	Raise power at 10%/hr			
1	XMT LDS3 1,100,120,0 ,D	I RO/SRO	VCT level transmitter 2CHS*115 fails high diverting letdown and loss of auto makeup			
2	MAL EHC1B ACT,0,30,0, D	R RO/SRO C PO	Load rejection, 15% (Governor valve #2 fails closed)			
3	MAL CRF8A ACT,B8,1,0, D	C RO N PO/SRO	Stuck rod, B8 (Preload)			
4	XMT 2MSS22 1,2.8,0,0,D	I PO/SRO	SG "B" steam flow transmitter 2MSS*FT485 fails as is			
5	MAL MSS2B ACT,1,5E ⁶ ,300,0,D	M RO/ PO/ SRO	Steam line break outside containment on SG "B"			
6	PMP CHS1 2,0,C,PPLSI A.EQ.1	C RO/SRO	2CHS*P21A trips on SI initiation (Preload)			
7	MAL PPL7B ACT,2,0,D	C RO/SRO	2CHS*P21C fails to auto start (Preload)			

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

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U2LOT-SIM-NRC EXAM-2LOT2B.1 (ic) REV 0

<u>INITIAL CONDITIONS</u>: Drill File 845 IC-47 Reactor power = 75%, BOL, RCS boron = 982 ppm, CBD = 190 steps

ADDITIONAL LINEUP CHANGES	STICKERS	VOND MARKINGS
Set CBD step counters at 190 steps Place BOL ∆I curve in RO operator aids 2000 - 4000 MWD/MTU Reactivity Plan	2RCS*MOV536 RED 2CHS-P21B RED 2FWE*P23B RED 2MSS*SOV120 YCT 2MSS*SOV105C YCT 2SVS*PCV101B YCT	2FWE*38 shut 24-3 (G-6) 2FWE*P22 aligned to 'B' header 2FWE*36 shut; 2FWE*102 open 24-3 (E-6) 2MSS-16 shut 21-2 (C-1) 2SVS*28 shut 21-2 (E-9)
EQUIPMENT STATUS 2RCS*PCV456 2CHS*P21B 2FWE*P23B	2SVS*HCV104 YCT <u>DATE/TIME OOS</u> 6 days ago/0759 4 days ago/1610 6 hrs ago/1031	<u>TECHNICAL SPECIFICATION(S)</u> 3.4.11.b 3.1.2.4 & 3.5.2 (Info Only) 3.7.1.2.b

SHIFT TURNOVER INFORMATION

- 1. <u>The plant is at 75% power, BOL. RCS boron 982 ppm. Rods in auto with CBD at 190 steps.</u> Power was reduced 70 hours ago per System's request.
- 2. [2CHS-P21B] is removed from service for motor rewind. Motor is presently off site.
- 3. [2FWE*P23B] is OOS to replace the pump inboard bearing, return expected in 24 hours. Its discharge valve 2FWE*38 is shut.
- 4. 2FWE*P22 aligned to 'B' AFW header 2FWE-36 shut; 2FWE-102 open.
- 5. 2RCS*PCV456 OOS with block valve 2RCS*MOV536 closed with power removed.
- 6. <u>AOP 6.4 is complete to step 18</u>. <u>Approximately 44 hours ago a tube leak was detected in SG "B"</u>. <u>The leak rate is 20 gpd on</u> the last HP and Chemistry estimate (Monitoring at 2 hour intervals IAW the AOP).</u>
- 7. 2MSS-16 shut, 2MSS-15 and 17 verified open.
- 8. 2SVS*28 shut.
- 9. 2MSS*PCV101B auto with setpoint adjusted to 100%.
- 10.2MSS*SOV105C open.
- 11.2MSS*SOV120 open.
- 12. Raise power at 10%/hour to 100%.

SCENARIO SUPPORT MATERIAL REQUIRED

1/20M-48.1.C(ISS3) Figure 48.1.C-2 (ANSS Turnover Checklist) 20M-54.2.S1 Log S1-2 (NSS Operating Report) 20M-54.2.S1 Log S1-5 (NCO Report) 20M-54.2.S1 Log S1-17 (ANSS Operating Report) 20M-52.4.B (Load Following)

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Select DRILL 845, Initialize IC - 47, and establish initial plant conditions.	Reactor at approximately 75% power, BOL, steady state condition. Ready to raise power to 100%. RCS boron _982_ ppm, CBD _190_ steps.		
Insert: PMP CHS1 2,0,C,PPLSIA.EQ.1 MAL PPL7B ACT,2,0,D MAL CRF8A ACT,B8,1,0,D	2CHS*P21A trips on SI initiation 2CHS*P21C fails to auto start Control rod B8 stuck.		
File STUFFON File LRTM5IC			
Assign shift positions.			
NSS ANSS RO PO STA	Simulator Frozen until after shift turnover unless it needs to be run momentarily for an alignment change.		
Conduct a shift turnover with oncoming operators.			Oncoming ANSS should complete the required checklist and carry out a formal shift turnover.
When the shift turnover is completed, place the simulator in RUN and commence the drill. Depress VCR PLAY/RECORD	Simulator running/VCR recording		ANSS assumes control and directs operators to commence raising power IAW 20M-52.4.B.

U2DRILL845(2)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE

EVENT #1

After power is raised \geq 5% insert: XMT LDS3 1,100,120,0,D VCT level transmitter 2CHS*LT115 fails high causing letdown to divert to the Waste Collection Tank and loss of Auto makeup VCT level lowers, alarm A2-2G, VCT TROUBLE comes in

RO compares 2CHS*LI115 with 2CHS*LI112 and determines that 2CHS*LT115 has failed high

ANSS refers to alarm response procedure, failed instrument section and directs RO to place 2CHS*LCV115A, VCT Level Control Switch in the V.C. TANK position

RO verifies 2CHS*LCV112 and 2CHS*LCV115A aligned to the VCT

Crew refers to 2OM-7.4.N, Blender Manual Makeup Operation

NOTE: Crew may initiate a Temporary Log to track VCT level

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
EVENTS #2, 3 & 4			
When ARP VCT trouble complete, insert:			
MONV FMS:484	Monitor 2MSS*FT484 (Ch. III).		
MAL EHC1B ACT,0,30,0,D	Governor Valve #2 fails closed resulting in a 15% load rejection and SGWLC upset		
XMT MSS22 1,2.8,0,0,D	B SG channel IV steam flow transmitter 2MSS*FT485 fails as is.		
NOTE: Event #2 starts	Rods stepping in (in Auto) due to load rejection. Various annunciators related to temperature, rod position, delta I, and PZR pressure in alarm A12-4A, > 15% LOAD REJECTION (C-7A), steam dumps armed		Crew determines load rejection in progress. ANSS refers to <u>AOP 2.35.2</u>
	GV #2 closed Turbine transfer from partial arc to full arc, power stable at approximately 60%		PO reports that GV #2 did not close in sequence and that it is full closed RO reviews alarms reports delta flux outside target band and DNB T.S. exceeded to ANSS T.S. 3.2.1 and 3.2.5

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
NOTE: Event #3 starts MAL CRF8A ACT,B8,1,0,D (Preload)	Load greater than 270 Mwe. Condenser vacuum greater than 26.5 inches Hg Rod B8 stuck		Crew checks plant status IAW AOP 2.35.2
	Annunciator A4-6D, DELTA FLUX OUT OF TARGET BAND lit Must borate approximately 120 gal. For 10% power change		RO develops reactivity plan based on power change and rod position change
	Rod B8 does not move		RO borates and withdraws rod to return dI to Target band
			ANSS refers to AOP 2.1.8
	Rods in manual		RO places rod control in Manual
			ANSS notifies I & C that rod B8 is not moving with rest of bank
NOTE: Event #4 starts	During the load rejection SG "B" FRV 2FWS*FCV488 modulates		PO acknowledges alarms, reviews indications, informs ANSS that
	open B SG feed flow and level rising. A6-10F SG "B" FEED FLOW > STEAM FLOW in alarm		ANSS refers to ARPs and 2OM- 24.4.IF, Instrument Failure Procedure, Attachment 3

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	Following the load rejection A6- 10H, SG 'B' STEAM FLOW > FEED FLOW and A6-10E SG "B" LEVEL DEVIATION are still in alarm		PO identifies 2MSS*FT485 as the failed instrument
	2FWS*FCV488 in Manual		ANSS directs PO to take manual control of MFRV 2FWS*FCV488 and restore SG level to normal.
	A6-10E clears as NR level returns to normal band		ANSS directs PO to select feedwater control channel III
	SG B SGWLC selected to channel		ANSS contacts I & C and directs that steam flow control be selected to Channel III
	2FWS*FCV488 in automatic.		ANSS directs PO to return MFRV 2FWS*FCV488 controller to automatic.
			SG "B" level channel 2FWS*LT486 declared inoperable, T.S. 3.3.1.1 Table 3.3-1, item 14 (trip within 6 hrs)
			ANSS contacts I & C and directs that 2LS/486A, SG "B" Lo-Lo level Rx trip, 2LS/486C, Hi-Hi level turbine trip and FW isolation bistables placed in trip

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INCODUCTIONAL CUIDELINES	DI ANT CTATUS OD DESDONOS		
INSTRUCTIONAL GUIDELINES		OBJECTIVE	EXPECTED STUDENT RESPONSE
To open cabinet door and trip bistables, insert; LOA PCS2 T,0,D BST PCS41 1,0,D BST PCS32 1,0,D LOA PCS2 F,0,D	2LS/486A, SG "B" Lo-Lo level Rx trip, 2LS/486C, Hi-Hi level turbine trip and FW isolation bistables tripped		RO/PO verifies I & C in correct rack, monitors bistable trip evolution, informs ANSS upon completion
Event #5			
When 2.24.IF complete, insert: MAL ACT MSS2B 1,5E ⁶ ,300,0,D	SG "B" Steam line break outside containment A10-4F MAIN STEAM VALVE AREA TEMPERATURE HIGH lit		
	Steam flow and reactor power increase Tave lowering		ANSS directs RO to manually trip reactor after diagnosing secondary break
	Reactor trip. First Out: Manual reactor trip A5- 5H, Y0004D.		RO manually trips reactor.
			ANSS refers to E-0 to verify immediate actions while RO and PO commence immediate actions.
			RO sounds standby alarm, and announces Unit 2 reactor trip.
			NSS informed to evaluate EPP

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	Throttle or governor valves closed, reheat stops or interceptors closed.		PO verifies turbine trip.
	MSR steam supply block valves closed. Reheat controller reset pushbutton depressed.		PO ensures reheat steam isolation.
	Main generator output breakers open. Exciter circuit breaker open.		PO verifies generator trip.
	2AE and 2DF busses energized.		PO verifies power to AC emergency busses.
	SI annunciator A5-4G lit SI actuation status light A12-1D lit		Crew checks if SI is actuated/required.
Immediate actions complete.	Both trains of SI manually initiated		ANSS directs RO to manually initiate SI, both trains
	EDGs running.		PO verifies EDGs running.
	2FWE*P23B running (2FWE*P23A OOS). 2MSS*SOV105A-F open. 2FWE*HCV100A-F open.		PO verifies AFW status.
	Two service water pumps running (one per train). Service water header pressure 60- 124 psig.		RO verifies service water system in service.

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
			RO verifies SI status.
<u>EVENT #6</u> PMP CHS1 2,0,C,PPLSIA.EQ.1 (Preload)	2CHS*P21A trips on SI initiation		
	2CHS*P21C HHSI pump fails to auto start		RO determines no HHSI pumps running, starts 2CHS*P21C and notifies ANSS
	No HHSI flow until 2CHS*P21C is manually started		
	CIA actuated, all indicating lights with orange CIA marks LIT.	· · ·	RO/PO verify CIA.
	All indicating lights with green marks lit.		RO/PO verify FWI.
	All indicating lights with yellow marks lit.		RO/PO check MSLI is required.
	CIB and containment spray NOT required.		RO verifies CIB and containment spray status
	2CCS-AOV118 opened. One station air compressor running.		PO establishes filtered water cooling to station air compressors.
	Both CCP pumps running		RO/PO verify CCP in service.

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	SR channels aligned properly.		RO verifies SR detector high voltage switches in normal.
	Total AFW flow > 365 gpm.		PO verifies AFW flow greater than 365 gpm.
	Plant cooling down due to unisolable steam line break, RNO actions complete		RO verifies RCS Tavg stable at or trending to 547°F. RNO actions performed
I	Recirc spray pumps secured.		RO checks recirc spray pump status.
	PORVs closed (not leaking). Spray valves closed. Safeties closed (PSMS data). PRT conditions normal.		RO checks PRZR isolated.
	RCPs running. CCP flow to RCPs.		RO checks if RCPs should be stopped.
:	SG "B" pressure dropping.		PO checks if any SGs are faulted.
			ANSS makes transition to E-2, and informs crew. Crew briefing held
;	Control room radiation not in high alarm, CIB has not occurred. CREBAPS not required.		PO checks control room habitability.
	All yellow SLI marks lit.		PO verifies steam line isolation.

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Note: A and C SG pressures may be dropping due to effects of SG "B" fault, but should not be diagnosed as faulted.	A and C SG pressure stable.		PO checks for any non-faulted SG.
	B SG pressure dropping uncontrollably.		PO identifies faulted SG.
CT #2 - Crew isolates faulted SG and directs operator to close isolation valve(s) from outside the control room prior to transition out of E-2. (E-2.A)			Crew isolates B SG. CT 1
	CNMT isolation valve 2FWS*HYV157B closed. MFRV 2FWS*FCV488 closed. BFRV 2FWS*FCV489 closed. AFW throttle valves 2FWE*HCV100C & D closed.		Crew verifies valves closed
	One MDAFW pump running. TD AFW pump running		
If directed to verify 2MSS*16 closed, check IDA Status for LOA AFW26 0,0,0,D	2MSS*16 previously closed.		
If directed to check 2SVS*28 closed, Check IDA Status for LOA MSS10 0,0,0,D	2SVS*28 previously closed.		

U2DRILL845(11)REV0			
INSTRUCTIONAL GUIDELINE	S PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Report when above actions completed.			
	Atmospheric dump valve 2SVS*PCV101B Closed with setpoint at 100%. RHR valve 2SVS*HCV104 closed. SG blowdown valve 2BDG*AOV100B1 closed. Blowdown sample valves 2SSR*AOV117A,B,C closed.		Crew verifies valves closed
	No SG levels rising uncontrollably.		Crew checks if SG tubes are intact. ANSS makes transition to E-1, informs crew. Crew briefing held
	CREBAPS not required.		PO rechecks control room habitability.
	RCPs running. HHSI flow indicated, D/P and CCP flow satisfactory.		RO checks if RCPs should be stopped.
	Recirc spray pumps not running.		RO rechecks recirc spray pump status.
	CNMT sample amber lights lit.		RO verifies both H ₂ analyzers running.
	B SG previously diagnosed as faulted and isolated (pending reports of local operator actions).		PO checks if any SG is faulted.

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	A and C SGs intact.		PO maintains intact SG levels 5% to 50%.
	PORVs shut in auto and block valves energized.		RO checks PORVs and block valves.
	Subcooling > 41°F. Secondary heat sink satisfactory. RCS pressure stable or rising. PRZR level > 4%.		RO/PO check if SI can be terminated.
			ANSS makes transition to ES-1.1, informs crew. Crew briefing held
	2CVS-P21A, B in PTL. 2DAS-P204A, B in STOP. 2DGS-P21A, B in PTL.		RO isolates CNMT vents and drains system.
	SI, CIA, (CIB) reset, A12-1C lit, A12-1D not lit.		RO resets SI, CIA, (CIB), SI Recirc (both trains).
	Domestic water previously aligned		PO verifies domestic water aligned to station air compressors
No local action required to align compressor drain valves.	2CCS-AOV118 opened (filtered water to station air compressors). Station air compressor running.		Checks station air compressor status.

SCENARIO OVERVIEW

Facility: Beaver Valley Power Station Unit 2 Scenario No.: 4 Op-Test No.: 2LOT2B

Examiners: Operators:

Objectives: To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm Response procedures to respond to a failure of the flow totalizer which does not terminate dilution flow at the setpoint, failure of controlling steam flow channel pressure compensation for SG "C". PZR pressure control problem, and a SGTR with loss of PZR pressure control

Initial Conditions: IC-50, BOL, 48% power, steady state conditions. Rods are in Manual. 2CHS*P21B and 2FWE*P23B are OOS. 2RCS*PCV456 is isolated. 2RCS*PCV455A OOS. Tornado Warning in effect. Tube leak on SG "B". Ready to raise power to 100%.

Turnover: The plant is at 48% power. RCS boron 1061 PPM. Rods in auto with CBD at 166 steps. [2CHS*P21B] and [2FWE*P23B] are OOS. 2FWE*38 shut, 2FWE*P22 aligned to 'B' header, 2FWE-36 shut; 2FWE-102 open, 2RCS*PCV455C is isolated per T.S. 3.4,11:b action. 2RCS*PCV455A OOS due to a ruptured diaphram. AOP 6.4 is complete to step 18 due to 10 gpd tube leak on SG "B". Tornado watch in effect. AOP 75.1 complete through step 5.

Event No.	Malf. No.	Event Type*	Event Description
N/A	N/A	R RO N PO/SRO	Raise power at 12%/hr
1	OVR BAT8A 2,0,D	I RO/SRO	Total makeup flow totalizer fails to terminate dilution at setpoint (Preload)
2	XMT MSS50 1,10,10,0,D	I PO/SRO	Steam flow pressure compensation failure 2MSS*PT486 fails low
3	MAL RCS4C ACT,600,60, 0,D	M ALL	Start as small leak that progressively worsens until SGTR SG "B" (600 GPM)
4	CNH PCS10 5,0,20,0,D VLV RCS33 3,0,C,PRC:44 4.LT.2230	C RO/SRO	PZR Master Pressure Controller fails and 2RCS*PCV455D sticks open
5	MAL RCP4C ACT,0,0,C,JP PLP4.EQ.1	C RO/SRO	RCP "C" trips when reactor tripped (Preload)
6	VLV RCS13 3,0,C,JPPLP 4.EQ.1	C RO/SRO	PORV Block valve 2RCS*MOV537 fails closed on reactor trip (Preload)
7	VLV RCS32 4,0,0,0,C, JPPLP4.EQ.1	C RO/SRO	PORV 2RCS*PCV455C fails closed (conditional on Rx trip) Preload
(NI)armal	(D) continuity	(I) notry mont	(C)emperent (M)eier

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

BVPS 2LOT2B Rev. 0

U2LOT-SIM-NRC EXAM-2LOT2B.4 (ic) REV 0

INITIAL CONDITIONS: Drill File 848 IC-??

Reactor power = 48%, BOL, RCS boron = 1061 ppm, CBD = 166 steps

ADDITIONAL LINEUP CHANGES	STICKERS	VOND MARKINGS
Set CBD step counters at 166 steps	2RCS*MOV536 RED	2FWE*38 shut 24-3 (G-6) 2FWE*P22 aligned to 'B' header
Place BOL AI curve in RO operator aids	2CHS-P21B RED	2FWE*36 shut; 2FWE*102 open 24-3 (E-6)
2,000 - 4,000 MWD/MTU Reactivity Plan	2FWE*P23B RED	2MSS-16 shut 21-2 (C-1)
Place rods in Manual	2MSS*SOV120 YCT	2SVS*28 shut 21-2 (E-9)
	2MSS*SOV105C YCT	
	2SVS*PCV101B YCT	
	2SVS*HCV104 YCT	
	2RCS*PCV455A RED	· ·
EQUIPMENT STATUS	DATE/TIME OOS	TECHNICAL SPECIFICATION(S)
2RCS*PCV456	6 days ago/0759	3.4.11.b
2CHS*P21B	4 days ago/1610	3.1.2.4 & 3.5.2 (Info Only)
2FWE*P23B	6 hrs ago/1031	3.7.1.2.b

SHIFT TURNOVER INFORMATION

- 1. <u>The plant is at 48% power, BOL. RCS boron 1061 ppm. Rods in manual with CBD at 166 steps.</u> Power has been at 48% for the past 4 days.
- 2. [2CHS-P21B] is removed from service for motor rewind. Motor is presently off site.
- 3. [2FWE*P23B] is OOS to replace the pump inboard bearing, return expected in 24 hours. Its discharge valve 2FWE*38 is shut.
- 4. 2FWE*P22 aligned to 'B' AFW header 2FWE-36 shut; 2FWE-102 open.
- 5. 2RCS*PCV456 OOS with block valve 2RCS*MOV536 closed with power removed.
- 6. 2RCS*PCV455A OOS due to a ruptured diaphram.
- 7. AOP 6.4 is complete to step 18. Approximately 44 hours ago a tube leak was detected in SG "B". The leak rate is 10 gpd and has remained there for the past 24 hours. (Monitoring at 2 hour intervals IAW the AOP).
- 8. 2MSS-16 shut, 2MSS-15 and 17 verified open.
- 9. 2SVS*28 shut.
- 10. 2MSS*PCV101B auto with setpoint adjusted to 100%.
- 11. 2MSS*SOV105C open.
- 12.2MSS*SOV120 open.
- 13. Raise power at 12%/hr to 100% IAW 20M-52.4.B, Load Following.

U2DRILL845(1)REV0

PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Reactor at approximately 48% power, BOL, steady state condition. Ready to raise power to 100%. RCS boron _1061_ ppm, CBD _166_ steps.		
2RCS*PCV455D fails open		
2RCS*PCV455C fails closed		
2RCS*MOV537 fails closed		
RCP 'C' trips after reactor trip		
Blender total makeup flow totalizer does not stop makeup at setpoint		
<u>Simulator Frozen</u> until after shift turnover unless it needs to be run momentarily for an alignment change.		
	Reactor at approximately 48% power, BOL, steady state condition. Ready to raise power to 100%. RCS boron _1061_ ppm, CBD _166_ steps. 2RCS*PCV455D fails open 2RCS*PCV455C fails closed 2RCS*MOV537 fails closed 2RCS*MOV537 fails closed RCP 'C' trips after reactor trip Blender total makeup flow totalizer does not stop makeup at setpoint	Reactor at approximately 48% power, BOL, steady state condition. Ready to raise power to 100%. RCS boron _1061_ ppm, CBD _166_ steps. 2RCS*PCV455D fails open 2RCS*PCV455C fails closed 2RCS*MOV537 fails closed RCP 'C' trips after reactor trip Blender total makeup flow totalizer does not stop makeup at setpoint

U2DRILL845(2)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Conduct a shift turnover with oncoming operators.			Oncoming ANSS should complete the required checklist and carry out a formal shift turnover.
When the shift turnover is completed, place the simulator in RUN and commence the drill.	Simulator running/VCR recording		ANSS assumes control and directs operators to commence raising power IAW 20M-52.4.B.
Depress VCR PLAY/RECORD			
EVENT #1			Crew develops reactivity plan and commences power escalation
OVR BAT8A 2,O,D	Blender makeup flow totalizer fails to stop flow at setpoint resulting in an over dilution (Preload)		Dilution started
	RCS temperature and pressure rising		Annunciator A4-3C, TAVE DEV FROM TREF (2RCS-TS408S High) Crew determines that an over dilution has occurred
			ANSS refers to ARP A4-3C
	Tave within 2°F of Tref		Crew reduces Tave by borating, inserting rods or raising turbine load

DUQUESNE LIGHT COMPANY Nuclear Power Division

Training Administrative Manual

U2DRILL845(3)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE

<u>EVENT #2</u>

XMT MSS50 1,10,10,0,D	Steam flow pressure compensation failure 2MSS*PT486 fails low causing SG "B" steam flow 2MSS*FI485 to indicate lower than actual SG "B" feed flow and level lowering Annunciators A6-10G, LOOP B STEAMLINE PRESSURE LOW; A6-10E, STM GEN 21B LEVEL DEVIATION FROM SETPOINT; A6-1-F, LOOP B FEED FLOW > STEAM FLOW lit	PO announces SG "B" alarms
		ANSS refers to ARPs
	SG "B" level returning to program	SG "B" MFRV 2FWS*FCV488 placed in manual and level controlled within <u>+</u> 5% of program
		ANSS refers to 2OM-24.4.IF, Attachment 4
		PO identifies 2MSS*PT486 as the failed instrument

U2DRILL845(4)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	A6-10E clears as NR level returns to normal band		ANSS directs PO to select feedwater control channel III (487)
To select steam flow channel III, clear OVR PCS9	SG B SGWLC selected to channel		ANSS contacts I & C and directs that steam flow control be selected to Channel III (484)
	2FWS*FCV488 in automatic		ANSS directs PO to return MFRV 2FWS*FCV488 controller to automatic
			SG "B" level channel 2FWS*LT486 declared inoperable
			ANSS contacts I & C and directs that 2LS/486A, SG "B" Lo-Lo level Rx trip, 2LS/486C, Hi-Hi level turbine trip and FW isolation bistables placed in trip
To trip bistables, insert; LOA PCS2 T,0,D BST PCS41 1,0,D BST PCS32 1,0,D LOA PCS2 F,0,D	2LS/486A, SG "B" Lo-Lo level Rx trip, 2LS/486C, Hi-Hi level turbine trip and FW isolation bistables tripped		RO/PO verifies I & C in correct rack, monitors bistable trip evolution, informs ANSS upon completion
EVENT #3			
MAL RCS4B ACT,0.05,120,0,D	SG "B" tube leak (0.05 gpm, 72 gpd)		

U2DRILL845(5)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
SG blowdown automatically isolates upon 2SSR-RQ100 high alarm actuation	Rad monitor alarms on condenser air ejector and SG blowdown. A4-5A, -5C.		
			Crew notes alarms and informs ANSS of indications of a SG tube leak, verifies alarms valid.
			Crew refers to ARPs as necessary.
			Crew monitors DRMS RM-11 console for affected radiation monitor channels.
			ANSS refers to AOP-2.6.4.
			Crew requests Chemistry support (leak rate and isotopic analysis).
20ST-6.2 is applicable at this leak rate.			Crew requests Health Physics support (leak rate).
	0.05 gpm leak < T.S. limit. Activity value pending Chemistry reports.		NSS verifies compliance with T.S. 3.4.6.2 and 3.7.1.4.
After a reasonable time has elapsed, report Air Ejector Charcoal Delay Beds in service			Operator dispatched to place the Air Ejector Charcoal Delay Beds in service

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U2DRILL845(6)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Note: Crew may wait for Rad Con or Chemistry verification of tube leak prior to isolating SG.	Steamline monitors in service (2MSS*SOV120 open).	· · · · · · · · · · · · · · · · · · ·	PO verifies main steamline radiation monitors available.
	2MSS*16 closed 2MSS*15, 17 open		Steam supply from "B" SG to 2FWE*P22 previously closed and other two steam supply valves verified open.
			2MSS*SOV105C previously hardened
	2SVS*PCV101B controller setpoint = 100%.		"B" SG atmospheric steam dump valve controller setpoint verified at 100%.
	2SVS*28 closed.		RHR valve from "B" SG previously closed.
Five minutes after being contacted as Rad Con, report "B" SG radiation is significantly higher than "A" and "C" SGs.			Crew requests Health Physics to perform water and air sampling and survey SG blowdown
AOP-2.6.4 complete.			Crew may transfer auxiliary steam to Unit 1 or aux. boilers.
After high rad monitor alarm comes in inform crew that SG "B" leak rate has risen to 800 gpd	High rad monitor alarm		

U2DRILL845(7)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE

EVENT #3A

After reporting leaking SG, insert;

MAL RCS4B ACT, 10, 180, 0, 0, D

"B" SG tube leak rises to 10 gpm over 3 minutes.

Charging flow rises to maintain PZR level

If required, contact crew as U2 Operations Manager and direct a plant shutdown commence at 1%/min.

Crew may have previously implemented AOP 2.51.1.

Two PORVs in Auto with block valves open

RO notes changing RCS parameters and informs ANSS.

Crew determines that leakage exceeds 150 gpd plant must be in Mode 3 within 5 hours. NSS/ANSS directs crew to commence a normal plant shutdown, refers to 20M-52.4.B Load Following.

NSS evaluates EPP

NSS either directs crew to raise rate of load reduction or implement Emergency Shutdown AOP 2.51.1.

RO sounds standby alarm and announces Unit 2 Emergency Shutdown

RO ensures one PORV in auto with its associated block valve open.



U2DRILL845(8)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
			PO sets turbine load setter as directed by ANSS
			RO utilizes Reactivity Plan for rapid power reduction activities
			RO commences boration
			RO ensures rods in Auto and verifies maintaining Tavg within 5°F of Tref.
			PO depresses Reference Control GO pushbutton
			System Operator notified of emergency load reduction and rate
EVENT #4			
3 minutes after load reduction commenced, insert; CNH PCS10 5,0,20,0,D VLV RCS33 3,0,C,PRC:444.LT.2230	PZR master pressure controller fails high PZR PORV 2RCS*PCV455D sticks open		
	Annunciator A4-1D, PRESSURIZER CONTROL PRESSURE HIGH/LOW lit		RO announces alarm and attempts to close PORV, then closes 2RCS*MOV537, informs ANSS
			RO verifies spray valves closed

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U2DRILL845(9)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	Pressurizer pressure and level stable		RO keeps crew informed of PRZR pressure and level.
EVENT #3B			
When pressurizer parameters stabilized, insert			
MAL RCS4B ACT,600,240,0,D	SGTR (600 gpm, ramped over 4 minutes)		
	PZR pressure and level lowering, charging flow rising		
			Crew determines that a manual reactor trip is required
<u>EVENT #5</u>	Reactor trip, turbine trip, RCS pressure drops. First Out: PRZR pressure low reactor trip. A5-4H, P0488D		RO informs ANSS of a reactor trip.
MAL RCP4C ACT,60,0,C,JPPLP4.EQ.1	RCP "C" trip one minute after reactor trip (Preload)		
Steps 1-7 of E-0 are immediate actions.			RO and PO commence immediate actions of E-0. ANSS references E-0 to verify immediate actions.
	Turbine trip due to reactor trip alarm A5-6D lit. Rod bottom lights lit. Neutron flux dropping.		RO verifies reactor trip.

U2DRILL845(10)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
			RO sounds standby alarm, announces Unit 2 reactor trip.
			NSS evaluates the EPP.
	Throttle or governor valves closed. Reheat stop or interceptor valves closed.		PO verifies turbine trip.
	MSR steam supply block valves closed. Reheat controller reset pushbutton depressed.		PO ensures reheat steam isolation.
	PCBs 352 and 362 open, ACB 41 open		PO verifies generator trip.
	2AE and 2DF energized by offsite power		PO verifies power to AC emergency busses.
	SI actuated/required		RO checks if SI is actuated. RO manually actuates both trains of Safety Injection
Immediate actions complete.	Both EDGs running.		PO verifies EDGs running.

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U2DRILL845(11)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	MDAFW pumps running. TDAFW pump steam supply valves open. AFW throttle valves full open.		PO verifies AFW status.
	Service water pumps running (one per train). Service water header pressure 60- 124 psig.		RO verifies service water system in service.
	Two HHSI pumps running. HHSI flow indicated. Both LHSI pumps running. All indicating lights with red SI marks lit.		RO/PO verifies SI status.
	All indicating lights with orange CIA marks lit.		RO/PO verifies CIA.
	All indicating lights with green FWI marks lit.		RO/PO verifies FWI.
	CNMT pressure < 3 psig. Steamline pressure > 500 psig. No steamline pressure high rate bistables lit.		RO/PO checks if main steamline isolation required.
	Annunciator A1-2H not lit. CNMT pressure < 8 psig.		RO checks CIB and CNMT spray status.

U2DRILL845(12)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	2CCS-AOV118 opened. One station air compressor running.		PO establishes filtered water cooling to station air compressors.
	Two CCP pumps running.		RO/PO verify CCP in service.
	SR channels in proper alignment.		RO verifies source range detector high voltage switches in normal.
	Total AFW flow > 365 gpm.		PO verifies total AFW flow > 365 gpm.
	Tavg dropping under the influence of AFW flow.		RO checks RCS Tavg stable at or trending to 547°F.
			PO stops dumping steam and reduces AFW flow.
			ANSS directs performance of ESF checklists.
	Recirc spray pumps secured.		RO checks recirc spray pump status.
	PORVs closed (not leaking). Spray valves closed. Safeties closed (PSMS data). PRT conditions normal.		RO checks PRZR isolated.
	2RCS*P21A&B running. CCP flow indicated.		RO checks if RCPs should be stopped.
	No SGs are faulted.		PO checks if any SGs are faulted.
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U2DRILL845(13)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	SG "B" level rising uncontrollably. Secondary radiation high. SGTR.		RO/PO check if SG tubes are intact.
			ANSS makes transition to E-3 and informs crew.
			NSS declares an Alert due to entry into E-3 required by EOPs (TAB 1.2.4), informs crew, provides AA with Initial Notification Form.
			STA begins monitoring status trees.
	CREBAPS not actuated. CR radiation not in high alarm. CIB has not occurred.		PO verifies control room habitability.
	2RCS*P21A&B running. CCP flows indicated.		RO checks RCPs should be stopped.
	2CVS-P21A,B PTL. 2DAS-P204A,B STOP. 2DGS-P21A,B PTL.		RO isolates CNMT vents and drains system.
	Auto SI blocked A12-1C lit. SI signal A12-1D not lit.		RO resets SI (both trains).
	Both trains of CIA reset.		RO resets CIA and CIB (both trains).

U2DRILL845(14)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	SG "B" ruptured. Unexpected rise in level. Rad Con survey results.		Crew identifies ruptured SG.
			ANSS directs Rad Con to initiate steamline surveys.
CT #1 - Crew isolates feed flow into and steam flow from the ruptured SG before a transition to ECA-3.1 occurs. (E-3.A) No action necessary to close TDAFW pump drains 2MSS*348	2SVS*PCV101B setpoint = 100% and closed. 2MSS*AOV101B, 102B closed. 2SVS*HCV104 closed. 2SVS*28 previously closed. 2MSS*16 previously closed. 2BDG*AOV100B1 closed. 2SDS*AOV111B1 closed.		Crew isolates flow from the ruptured SG. CT #1
and 2SDS-261.	2SDS*AOV129A closed. SG "B" level > 5%.		PO checks ruptured SG level.
	Main feedwater isolated. AFW throttle valves closed.		Crew isolates feed flow to SG "B".
	Power to MOV isolation valves available. PORVs closed (not leaking). At least one MOV open. Safeties closed (PSMS data). PRT conditions normal.		RO checks PORVs, block valves, and safeties.
	No SGs are faulted.		PO checks if any SGs are faulted.

U2DRILL845(15)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
			PO checks intact SG levels > 5%, maintains 5-50%.
	RCS pressure > 185 psig.		RO checks if LHSI pumps should be stopped, stops LHSI pumps places in auto.
	A SG pressure > 265 psig.		PO checks ruptured SG pressure > 265 psig.
CT #2 - Crew establishes/maintains an RCS temperature so that transition from E-3 does not occur because the RCS temperature is in either of the following conditions: Too high to maintain required subcooling for subsequent RCS depressurization -OR- Below the RCS temperature that causes a red or orange path challenge to subcriticality or integrity CSF. (E-3.B)			ANSS determines target cooldown temperature. CT #2
			STA trends cooldown rate.
			PO verifies condenser available and initiates cooldown at maximum rate.

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U2DRILL845(16)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
			RO blocks steamline SI when RCS pressure is below 1950 psig.
	LO-LO Tavg interlock defeated		PO places both Steam Dump Bypass Selector Switches to DEFEAT TAVG position
			PO recommences dumping steam
			PO stops cooldown at target temperature.
	SG "B" pressure stable.		PO checks ruptured SG pressure stable or rising.
	Subcooling > 61°F.		PO checks RCS subcooling greater than 61°F.
With RCPs "A" & "B" running, spray flow through 2RCS*PCV455B is unlikely	No spray valves available. RCP "C" tripped. 2RCS*PCV455A OOS		RO determines that no spray valves are available
EVENTS #6 & 7	No PZR PORVs are available		RO attempts to depressurize RCS
VLV RCS13 3,0,C,JPPLP4.EQ.1 (Preload)	2RCS*PCV456 turned over OOS 2RCS*PCV455D block, 2RCS*MOV537 failed closed 2RCS*PCV455C failed closed		using PZR PORV
VLV RCS32 4,0,0,0,C,JPPLP4.EQ.1 (Preload)			

U2DRILL845(17)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
			ANSS transitions to ECA-3.3, SGTR without Pressurizer Control
	SG "B" level < 75%		PO checks ruptured SG level
	All 4 kv busses energized by offsite power		PO verifies all 4 kv busses energized by offsite power
	2IAC-MOV 130 and 131 open CNMT instrument air header pressure > 85 psig		PO establishes instrument air to CNMT
	Normal spray and PZR PORV NOT available		Crew attempts to restore normal spray or PORV
	Intact SG levels between 5-50%		PO checks intact SG levels
	PZR level . 4%		RO checks PZR level
	Subcooling > 41°F AFW available > 365 gpm Intact SG levels > 5% RVLIS dynamic head > 43% Ruptured SG level onscale		Crew checks if SI flow can be terminated
	One HHSI pump stopped		RO stops one HHSI pump
	2CHS*MOV289 and 310 open 2CHS*FCV122 adjusted to maintain PZR level		RO establishes normal charging

U2DRILL845(18)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	2SIS*MOV867A, B, C, & D closed		RO closes high head SI cold leg injection valves
	Subcooling > 41°F RVLIS dynamic head > 43%		Crew verifies high head flow not required
. *	2CHS*MOV311 open 2CHS*MOV310 closed 2CHS*FCV122 throttled		RO establishes Aux spray
	PZR level stable or rising and > 4%		RO checks PZR level
			ANSS transitions to E-3, SGTR, step 16.b
	PRZR level > 76%, or RCS subcooling < Attachment A-5.1, or RCS pressure < A SG pressure and PRZR level > 4%.		RO stops depressurization by closing spray valve.
	RCS subcooling > 41°F. SG NR level(s) > 5% or > 365 gpm total feed flow available. RCS pressure stable or rising. PRZR level > 4%.		Crew checks if SI can be terminated.
Terminate scenario upon			

completion of RCS depressurization.

U2DRILL845(19)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE	

Collect and review logs after allowing crew time to complete them.

Crew logs should be accurate, clear, and concise.

SCENARIO OVERVIEW

Objectives: <u>To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm</u> <u>Response procedures to respond to a plugged boric acid filter, NI failure, MFW pump trip,</u> <u>LOOP, one EDG trips, one EDG breaker fails to close (loss of all AC power), TD AFW pump</u> <u>trips on overspeed (able to reset), RCP "C" #1 seal leak (50 gpm).</u>

Initial Conditions: <u>IC-49, 20% power, BOL, steady state conditions. Rods are in Manual.</u> <u>2CHS*P21B, 2FWE*P23B and 2FWS-P21A are OOS. 2RCS*PCV456 is isolated.</u> Tornado Warning in effect. Tube leak on SG "B". Shutdown in progress.

Turnover: <u>The plant is at 20% power. BOL, RCS boron 1333 PPM. Rods in Manual with CBD at 149 steps. [2CHS-P21B] and [2FWE*P23B] are OOS. 2FWE*38 shut, 2FWE*P22 aligned to 'B' header 2FWE-36 shut; 2FWE-102 open. 2FWS-P21A OOS to repair motor MB1 leads. 2RCS*PCV456 is isolated per T.S. 3.4.11.b action. AOP 6.4 is complete to step 18 due to 75 gpd tube leak on SG "B". Tornado watch in effect. AOP 75.1 complete through step 5. 2OM52.4.C complete to step 20. Continue shutdown.</u>

Event No.	Malf. No.	Event Type*	Event Description
N/A	N/A	N	Continue plant shutdown IAW 20M-52.4.C
1	MAL LDS3D ACT,95,0,0,D	C RO/SRO	F21, Boric Acid Filter to Blender plugs (Preload)
2	MAL NIS7A ACT,1,0,0,D	I PO/SRO	IR N35 blown instrument power fuse, must manually energize both source ranges when power drops to less than P-6
3	BST CFW24 1,0,D	I RO/SRO	2CNM-PS118B, MFW Pump suction pressure fails low causing trip of running MFW pump
	VLV CFW27 1,0,D		SU FW Pump recirc valve fails closed (Preload)
4	MAL SWD1 ACT,0,0,D	M ALL	LOOP
5	MAL DSG1A	C ALL	EDG 2-1 trips (Preload)
	ACT,0,0,D BKR HIV13		EDG 2-2 output breaker trips (Preload)
	2,0,D		Loss of ALL AC power
6	MAL AFW3A ACT,5440,0, D	C RO/PO/ SRO	TD AFW Pump trips (able to reset) (Preload)
7	MAL RCP1B ACT,50,300, 0,0,D	M ALL	RCP "C" #1 seal leak (50 gpm)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

BVPS 2LOT2B Rev. 0

U2LOT-SIM-NRC EXAM-2LOT2B.3 (ic) REV 0

INITIAL CONDITIONS: Drill File 847 IC-49

Reactor power = 20%, BOL, RCS boron = 1333 ppm, CBD = 149 steps

ADDITIONAL LINEUP CHANGES	STICKERS	VOND MARKINGS
Set CBD step counters at 149 steps	2RCS*MOV536 RED	2FWE*38 shut 24-3 (G-6) 2FWE*P22 aligned to 'B' header
Place BOL Δ I curve in RO operator aids	2CHS-P21B RED	2FWE*36 shut; 2FWE*102 open 24-3 (E-6)
0000 - 2000 MWD/MTU Reactivity Plan	2FWE*P23B RED	2MSS-16 shut 21-2 (C-1)
Ensure Rods in Manual	2FWS-P21A RED	2SVS*28 shut 21-2 (E-9)
	2FWS-MOV150A RED	2FWS-MOV150A shut 24-1 (B-8)
	2MSS*SOV120 YCT	2FWR-7 shut 24-1 (B-7)
	2MSS*SOV105C YCT	
	2SVS*PCV101B YCT	
	2SVS*HCV104 YCT	
EQUIPMENT STATUS	DATE/TIME OOS	TECHNICAL SPECIFICATION(S)
2RCS*PCV456	6 days ago/0759	3.4.11.b
2CHS*P21B	4 days ago/1610	3.1.2.4 & 3.5.2 (Info Only)
2FWE*P23B	6 hrs ago/1031	3.7.1.2.b

SHIFT TURNOVER INFORMATION

- 1. The plant is at 20% power, BOL. RCS boron 1333 ppm. Rods in manual with CBD at 149 steps.
- 2. [2CHS-P21B] is removed from service for motor rewind. Motor is presently off site.
- 3. [2FWE*P23B] is OOS to replace the pump inboard bearing, return expected in 24 hours. Its discharge valve 2FWE*38 is shut.
- 4. 2FWE*P22 aligned to 'B' AFW header 2FWE-36 shut; 2FWE-102 open.
- 5. 2RCS*PCV456 OOS with block valve 2RCS*MOV536 closed with power removed.
- 6. AOP 6.4 is complete to step 18. Approximately 44 hours ago a tube leak was detected in SG "B". The initial leak rate was 20 gpd. 6 hours ago the leak rose to 50 gpd and has slowly raised to its present value of 75 gpd. (Monitoring at 15 minute intervals IAW the AOP). The decision was made to shutdown and repair the leaking tube following the leak rate rise to 50 gpd. The shutdown was started three hours ago.
- 7. 2MSS-16 shut, 2MSS-15 and 17 verified open.
- 8. 2SVS*28 shut.
- 9. 2MSS*PCV101B auto with setpoint adjusted to 100%.
- 10.2MSS*SOV105C open.
- 11.2MSS*SOV120 open.

U2DRILL847(1)REV0

	DI ANT OTATIC OD DECDONOE		
INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
		02020112	

Select DRILL 847,
Initialize IC - 49, and establish
initial plant conditions.

Reactor at approximately 20% power, BOL. Shutting down to repair SGTL. RCS boron _1333_ ppm, CBD at _149_ steps.

Insert:

MAL DSG1A ACT,0,0,D BKR HIV13 2,0,D MAL AFW3A ACT,5440,0,0,0,D MAL LDS3D ACT,95,0,0,0,D VLV CFW27 1,0,D	Trip of EDG 2-1 Trip of EDG 2-2 Output Breaker Trip of TD AFW Pump (can reset) F21, Boric Acid Filter to Blender plugs SU FW pump recirc valve fails closed					
File STUFFON						
File LRTM5IC						
Assign shift positions.						
NSS	Simulator Frozen until after shift					
ANSS	turnover unless it needs to be run					
RO	_ momentarily for an alignment					
PO	change.					
STA	-					

Conduct a shift turnover with oncoming operators.

Oncoming ANSS should complete the required checklist and carry out a formal shift turnover.

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U2DRILL847(2)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
When the shift turnover is completed, place the simulator in RUN and commence the drill. Depress VCR PLAY/RECORD	Simulator running/VCR recording		ANSS assumes control and directs operators to continue the shutdown IAW 20M-52.4.C, step 20
	Turbine load and reactor power lowering		
EVENT #1			
After boration is started: MAL LDS3D ACT,95,0,0,0,D (Preload)	F21, Boric Acid Filter to Blender plugs		
	Boric acid flow to blender low A2-2E, BORIC ACID BLENDER INLET/OUTLET DEV FROM SP lit		RO announces alarm A23-2E ANSS refers to ARP
After an appropriate time delay report filter d/p is 24 psid	Filter d/p > 20 psid		Crew dispatches PAB operator to check Boric Acid Filter d/p
After an appropriate time delay Clear MAL LDS3D and report Filter Bypass Valve open	Filter Bypass Valve open		ANSS directs PAB operator to open BA Filter Bypass Valve
	Plant shutdown continues		ANSS directs crew to continue the shutdown

U2DRILL847(3)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE

EVENT #2

When power is 12-15%, insert; MAL NIS7A ACT,1,0,0,D

IR N35 blown instrument power fuse

Annunciator A4-4E, NIS DETECTOR/COMPENSATOR LOSS OF VOLTAGE lit

The following status lights are lit on the N35 drawer: LOSS OF COMP VOLTS BISTABLE TRIP SPARE LOSS OF DETECTOR VOLTS INSTRUMENT PWR ON status light is off

Power is greater than P10

RO announces alarm A4-4E

ANSS refers to ARP A4-4E and directs PO to check LOSS OF COMP VOLT status light on IR drawer ON

ANSS refers to AOP 2.2.1B, IR Channel Malfunction

Crew places both IR train A & B Block switches in INTERRANGE BLOCK position

ANSS directs crew to place a Caution Tag on SR N31 stating "Manually unblock Source Range on Shutdown"

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U2DRILL847(4)REV0

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	Status light "LEVEL TRIP BYPASS" lit Annunciator A4-5E, NIS SOURCE/INT RANGE HIGH FLUX TRIP BYPASS lit		Crew places "Level Trip Switch" to BYPASS on N35 drawer and to affix a Caution Tag to the switch
	Computer point N0096D tripped Level Trip Switch caution tagged		Computer point status verified using CRT Inter Range screen
EVENT #3 2FWS-P21B Suction Pressure Switch 2FWS-PSL118B fails			2FWS-P21B Trips MD AFW pump 2FWE*P23A Auto start
BST CFW24 1,0,D	2FWS-P21B trips (loss of all main feedwater)		
VLV CFW27 1,0,D	Fail 2FWR*FCV155, SU Feed Pump Recirc shut (Preload)		
	A6-10A, STM GEN FEEDPUMP 21A/B AUTO STOP lit A6-11A, AUX FW PUMP AUTO START/AUTO STOP		PO announces alarm A6-10A and 11A
	SG levels lowering		ANSS refers to ARP A6-10A
	Startup Feedwater Pump Recirc Valve does not fully open, unable to start the Startup Feedwater Pump		ANSS directs PO to start the Startup Feedwater Pump
	SG levels lowering		

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U2DRILL847(5)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
			ANSS refers to AOP 2.24.1, Loss of Main Feedwater
	Two Condensate pumps and heater drain pumps running		Crew checks condensate pump, heater drain pump and seperator drain pump status
			ANSS directs RO to manually trip the reactor and refers to E-O to verify immediate actions while operators perform immediate actions
	Turbine trip due to reactor trip alarm A5-6D lit. Rod bottom lights lit. Neutron flux dropping		RO verifies reactor trip.
			RO/PO sounds standby alarm, announces Unit 2 reactor trip NSS evaluates EPP, declares an Alert due to automatic reactor trip failure per TAB 2.3, informs crew, provides AA with notification form.
			PO verifies turbine trip
	MSR steam supply block valves closed. Reheater controller reset pushbutton depressed.		PO ensures reheat steam isolation

U2DRILL847(6)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	Main generator output breakers open. Exciter circuit breaker open.		PO verifies generator trip
2AE and 2DF busses energized.			PO verifies power to AC emergency busses
NOTE: If SIS occurs, ensure crew implements E-0 and ES-1.1 correctly (SI is not anticipated for this transient	No SI annunciator or SI actuation status light lit. CNMT pressure < 1.5 psig. PRZR pressure > 1855 psig. SG pressure > 500 psig.		RO checks if SI is actuated or required
SI is not required.			ANSS makes a transition to ES-0.1 and informs the control room
EVENT #4			STA monitors status trees
One minutes after completion of shift brief for ES-0.1 entry, Insert: MAL SWD1 ACT,0,0,D	LOOP		
EVENT #5			
MAL DSG1A ACT,0,0,D BKR HIV13 2,0,D	EDG 2-1 trips (Preload) EDG 2-2 output breaker trips (Preload)		PO announces loss of all power to AC emergency busses
Loss of all AC power EDG 2-1 tripped EDG 2-2 running, output breaker will not close. No cooling water			ANSS makes transition to ECA-0.0, directs RO and PO to perform appropriate immediate actions. S/U

U2DRILL847(7)REV0	-			
INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE	-
			STA monitors CSF status trees for information only.	S/U
-	Annunciator A5-6D lit. Jeutron flux dropping.		RO reverifies reactor trip.	S/U
			RO sounds standby alarm and announces Unit 2 loss of power.	S/U
·			 NSS reevaluates the EPP, declares the following EALs as applicable: Site Area Emergency due to loss of all feedwater/Heat Sink red path condition (TABs 1.1.1 and 1.2.1 Potential Losses). SAE due to loss of offsite and onsite power for > 15 mins. (TAB 3.1) 	f
	SLI manually actuated. /ISIVs and bypass valves closed.		PO ensures steamlines isolated.	
Exciter and output breakers open.			PO verifies generator trip.	
i	PRZR PORVs closed, orifice solation valves closed, Regen HX nlet valves closed.		RO checks if RCS is isolated	

U2DRILL847(8)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE

EVENTS #6 & 7

	MAL AFW3A ACT,5440,0,D (Preload)	TD AFW Pump trips No AFW flow (all AFW pumps stopped). 2MSS*SOV105A - F open.	PO reports no AFW flow
	Two minutes after ECA-0.0 entered, insert;		
1	MAL RCP1B ACT,50,300,0,0,D	RCP 'C' #1 seal leak (50 gpm)	
	CT #2 - Grew establishes the minimum required AFW flow to the SGs before SG dry out occurs.		Crew dispatches plant operator to South Safeguards to restore AFW flow using Attachments A-1.12 and A-1.11 CT 2
	Ten minutes after being directed to locally restore AFW flow, report that 2FWE*P22 has apparently tripped on overspeed, and can reset and open TTV. Insert:		
	MAL AFW3A CLR,0 LOA AFW22 0,0,D	Governor failure cleared. TTV reset, 2FWE*P22 starts. AFW flow available to SGs.	PO notes AFW flow to SGs, informs ANSS.
		SR channels aligned properly.	RO verifies source range detector high voltage switches in NORMAL, transfers NR45 to operable Source and Intermediate Range

U2DRILL847(9)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	IR 36 less than P6, 10 ⁻¹⁰ amps Both SR detectors energized		RO manually enrgizes both Source Range detectors
	2-2 EDG breaker will not manually close		PO tries to restore power to any AC emergency bus using diesel generator. EDG 2-2 stopped, personnel dispatched to investigate EDG 2-1 failure and EDG 2-2 breaker failure
	AC emergency busses deenergized.		ANSS goes to Step 11 after PO verifies emergency busses deenergized and reports same to ANSS.
As System Operator, report that several lightning strikes have deenergized offsite busses and transformers; investigation commencing immediately.			PO attempts to restore offsite power with Attachment A-1.4.
			Crew checks power restored to AC emergency bus (go to procedure step 34 when power is restored).
	2AE bus selected as cross-tie path.		Crew selected cross-tie path.
			Crew dispatches operator(s) to perform Attachment A-1.13AE.

U2DRILL847(10)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
			Crew notifies U1 NSS/ANSS that Attachment A-1.14 should be performed by BV-1 personnel.
	Service water pump 2SWS*P21B should remain in auto for possible automatic loading (EDG 2-2 cooling).		ANSS reviews SWS pump caution, informs crew.
			RO/PO place switches in pull-to-lock for equipment listed in Step 15.
Local reset and EDG control actions per Attachment A-1.5 are in progress.			Crew dispatches plant personnel to locally restore power using Attachment A-1.5. Emphasis is placed on local start of Emergency Generator 2-1.
After appropriate delay, use the following for local actions:			Crew requests Rad Con support to isolate RCP seals, dispatches plant operator to locally close valves.
LOA SEA1 0,0,0,D LOA SEA2 0,0,0,D LOA SEA3 0,0,0,D VLV SEA16 3,0,D VLV CCP58 3,0,D VLV CCP60 3,0,D	2CHS*178 closed. 2CHS*179 closed. 2CHS*180 closed. 2CHS*MOV381 closed. 2CCP*MOV156-1 closed. 2CCP*MOV157-1 closed.		
Report valves closed.			

U2DRILL847(11)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Ν	Blowdown isolation valves closed. Main and bypass feed regulating valves closed.		Crew checks SG isolation.
ŀ	All PORVs closed.		RO checks PRZR PORVs.
L	No SG pressure dropping in an uncontrolled manner or completely depressurized.		PO checks if any SGs are faulted.
	No SG levels rising in an uncontrolled manner.		Crew checks if SG tubes are intact, requests Rad Con surveys.
S	SG levels responding to AFW flow.		PO checks intact SG levels.
ŀ	Annunciator A6-4A not lit.		PO checks, PDWST level greater than 80 inches.
ŀ	Air temperature normal.		Crew checks control room ambient air less than 104°F.
ŀ	All PORVs closed.		RO checks PRZR PORVs.

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U2DRILL847(12)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
When the RCP seals are isolated, clear the LOOP and insert LOA SWD4 1,0,D LOA HIV1 1,0,D As System Operator report that power is available to Switchyard 138 kv bus 1	Power restored to 138 kv bus 1. 4 kv relays reset		ANSS directs plant operator to energize 2DF IAW Attachment A-1.4 PO closes breakers 2D10 and 2F7 to energize 2DF
			PO monitors 2DF bus, informs, ANSS that bus is energized.
Transition to Step 34 directed by continuous action Step 12.			ANSS proceeds to ECA-0.0 Step 34, informs crew.
Insert the following to energize the train "B" 480 volt busses LOA LOV1 1,0,D LOA LOV86-92 1,0,D	Train "B" 480 volt busses energized		
	SI annunciator status dependent on RCP "C" #1 seal leak		RO checks SI signal status, resets SI (if required).
Note: Alarm A1-1C actuated due to vital bus 1 and 3 powered from respective batteries.	480V emergency bus 2P energized. Battery charger 2-2 and inverter 2-4 energized.		Crew verifies equipment loaded on 2DF emergency bus.

U2DRILL847(13)REV0

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	2SWS*P21B running. Service water header pressure between 60 and 124 psig. EDG cooling valve 2SWS*MOV113D open.		RO verifies service water system in service.
			Crew dispatches operator(s) to restore Unit 2 station blackout equipment per Attachment A-1.16AE.
	RCS subcooling > Attachment A-5.1 value. PRZR level > 4%. SI valves not automatically aligned in SI mode.		ANSS selects recovery procedure based on operator reports.
Scenario assumes that SI is NOT required; if conditions warrant a transition to ECA-0.2, monitor crew actions.			ANSS makes transition to ECA-0.1, informs crew.
	No SI annunciator or SI actuation status light lit		RO checks SIS status
	CCP pumps stopped 2CCP*AOV107A, B & C closed HHSI pumps stopped RCP seals isolated		
	CIA and CIB reset		RO resets CIA and CIB

U2DRILL847(14)REV0

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	One Station Air Compressor running		PO checks Station Air Compressors PO dispatches operator to locally start one Station Air Compressor
	2AIC*MOV130 has no power, cannot be opened		PO cross connects station instrument air with CNMT instrument air
C	One CCP pump running		Crew starts one CCP pump
F	HHSI pumps all stopped		Crew checks HHSI pump status
fi V	2CHS*LCV115C & E open (suction from VCT) /CT makeup in Auto at > RCS C _B 2CHS*MOV289 and 310 closed		Crew verifies charging system alignment
Ν	Normal charging flow established		RO establishes normal charging flow
C	One CCP pump running CRDM shroud fans running CNMT recirc fans running		Crew starts One CCP pump, CRDM shroud fans, CNMT recirc fans
F	PDWST level greater than 80 inches		PO checks PDWST level
	SG narrow range level between 5% and 50%		PO checks SG narrow range level greater than 5% and controls AFW flow to maintain 5-50% level
	All train "B" CIA components correctly aligned		ANSS directs RO/PO to verify all indicating lights with orange CIA marks lit

U2DRILL847(15)REV0

INSTRUCTIONAL GUIDELINE	S PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	Annunciator A1-2H not lit CNMT pressure has remained less than 8 psig		RO checks CIB and spray status
	Quench and Recirc Spray Pumps in Auto Chemical Injection Pump in Auto		RO places Quench and Recirc Spray pumps in Auto
Insert;	CCP supply temperature is less than 105°		Crew establishes seal cooling IAW Attachment A-1.5
VLV CCP58 2,0,D VLV CCP60 2,0,D	2CCP*MOV156-1,157-1 are open		
	2CCP*107A, B & C are open		
	VCT temperature is less than 235°F 2CHS*178, 179, 180 checked closed		
To open 2CHS*178, 179, 180, Insert;	2CHS*MOV308A, B & C checked open		
LOA SEA1 0.1,0,0,D LOA SEA2 0.1,0,0,D	2CHS*HCV186 checked open 2CHS*178, 179, 180 opened until		
LOA SEA3 0.1,0,0,D	flow just indicated		
Collect and review logs after			Crew logs should be accurate, clear,

allowing crew time to complete.

Crew logs should be accurate, clear, and concise.

U2DRILL845(13)REV0

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INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	2IAC-MOV131, 130 opened (station to CNMT instrument air cross- connect). CNMT instrument air header pressure > 85 psig.		PO establishes instrument air to containment.
	Pressure stable or rising.		RO checks RCS pressure stable or rising.
	2CHS*FCV122 closed. 2CHS*MOV289, 310 opened. FCV adjusted to maintain PRZR level.		RO to establish normal charging flow.
	2SIS*MOV867A,B,C,D closed.		RO closes HHSI cold leg isolation valves.
			RO controls charging flow to maintain PRZR level.
	LHSI pumps stopped and in auto.		RO stops LHSI pumps and places in auto.
	RCS subcooling > 41°F. PRZR level > 4%.		RO verifies SI flow not required.
	No quench or recirc spray pumps running.		RO checks if CNMT spray should be stopped.

DUQUESNE LIGHT COMPANY Nuclear Power Division

Training Administrative Manual

U2DRILL845(14)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
PRZR level > 14%. One CCP pump running. 2CHS*FCV122 adjusted to establish 30 - 50 gpm charging flow. 2CHS*AOV204 opened. 2CHS*PCV145 in manual and 50% open. 2CHS*LCV460A, B opened. 2CHS*AOV200A, B, C opened as appropriate. 2CHS*PCV145 adjusted to 260 psig and placed in auto. CCP supply/return valves open 2CCP*175-1 & 2 2CCP*176-1 & 2 2CCP*177-1 & 2			RO checks if letdown can be established, then establishes letdown.
	Makeup control in Manual (due to 2CHS*LT115 failure) and set to greater than RCS boron concentration.		RO checks VCT makeup control system.
	2CHS*LCV115C, E opened. 2CHS*LCV115B, D closed.		RO aligns HHSI pump suction to VCT.
Terminate scenario at Step 18 of ES- 1.1. (align charging pumps suction to VCT).			

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U2DRILL845(15)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE			
 INSTRUCTIONAL CUIDELINES	I PLANT STATES OR RESPONSE	OBJECTIVE		
			EXPECTED STUDENT RESPONSE	

Collect and review logs after allowing operators to complete them.

Operator logs should be clear, accurate and concise.

	No rates
	(As submitted predminer)
1. The NCO is recovering a rod misaligne	d from its group in accordance with 20M-1.4.P
"RCCA or RCCA Group Misalignment".	Reactor Engineering has specified that the rod
should be withdrawn at no greater than	20 steps per hour. If the NCO were to withdraw
rods at a higher rate than specified which	ch of the following is a consequence of that
action?	
A. Low Xenon concentration cause	es neutron flux peaks in the affected quadrant.
B. Low Xenon concentration cause	es axial flux peaks in the bottom half of the core.
C. Intermediate Range Start Up Ra	ate will exceed 0.5 dpm in the affected quadrant.
D. Heat Up Rate will exceed 100	F per hour across the affected quadrant.
Answer: A	
K/A 00005 K1.03:	Importance:3.2
Cognitive Level: Knowledge	
Reference: Basis for Tech Specs 3/4.1.3, page	e B3/4 1-5, 2OM-52.2.A, Issue 4, Rev. 2, P&L 24
and 25.	
LP # : 2LP-SQS-1.3	Obj: 18
History: N/A	
Source: NEW	Type: CLOSED BOOK
JTA: 0000080401	

2. Unit 2 is operating at 100% power with all systems NSA. Reactor Coolant Pump 21C				
Upper Motor Bearing High Temperature computer alarm is received. The Alarm				
Response Procedure requires that the	RCP be tripped. Choose from the list below the			
correct sequence of actions and the rea				
	A. Trip the Reactor Coolant pump and allow Doppler Power Coefficient to lower reactor power before tripping the reactor.			
• • • •	violation of DNB parameters before tripping the			
reactor coolant pump.				
C. Trip the Reactor Coolant Pu region from a pump coast de	ump to minimize flow oscillations in the core			
	2/3 RCP bus Underfrequency Rx trip before			
tripping Reactor Coolant Pu				
ANSWER: B				
K/A: 000015/17 K3.03:	Importance:3.7			
Cognitive Level: Knowledge				
Reference: Tech Spec. Basis/ 3/4.1.1, 2 and 3 page 4-1 First sentence				
Lesson Plan #: 2LP-SQS-6.3 Obj. #: 10				
History: NEW				
Source:	Type: CLOSED BOOK			
JTA: 003AAA0401				

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3. A natura	A natural circulation cooldown has been in progress using ES-0.2 " Natural Circulation			
Cooldov	Cooldown". The RHS system is in service.			
Why mu	ust the entire RCS be brought to	less than 200 degrees pric	or to	
depress	surization?			
A. ⁻	To augment heat removal from t	he head structure.		
B. ⁻	To bypass the requirement for se	oaking the head for 29 hou	rs.	
C. ⁻	C. To maximize loop flow on continued natural circulation.			
D. ⁻	To prevent void formation in stag	gnant loops.		
		and the second		
ANSWER:D	ANSWER:D			
K/A: W/E09/E10 K2.2: Importance:3.6				
Cognitive Leve	Cognitive Level: Comprehension			
References: 20M-53B.4.ES-0.2 Background for Natural Circulation, Issue 1B, Rev. 4, Step 23				
	Lesson Plan #:2LP-SQS-53.3 Obj. #:3			
History: NEW				
Source:		Type: CLOSED BOOK		
JTA:				

Basic Rhysics - GFE lime.

4.	The unit is conducting a natural circulation cooldown in accordance with ES-0.2 "Natura		
	Circulation Cooldown". Cooldown rates are limited by procedure to less than 25°F per		
	hour for which of the following reaso	ons?	
	A. Limit steam generator press	ure drops to less than 25psig/min.	
	B. Limit subcooling rate of rise	to less than 25°F/hr.	
	C. Maintain RCS subcooling gr	eater than 200 degrees during reactor coolant	
	depressurization.		
	D. Maintain subcooled liquid in	the reactor vessel head region during reactor	
	coolant depressurization.		
ANS	WER:D		
K/A:\	W/E09/10 K3.1	Importance:3.3	
Cogr	nitive Level: Application		
Refe	rences: 2OM-53B.1.ES-0.2 Backgrour	nd for Natural Circulation Cooldown, Issue 1B, Rev	
	eps 6, 13 and 15		
	on Plan #:2LP-SQS-53.3	Obj. #:3	
Histo	ory: NEW		
Sour		Type: CLOSED BOOK	
JTA:3010010601			

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SA. The core age is MOL at 8000 MWD/MTU			
burnup. A malfuction requires turbine load to be runback at 5% per minute to 70%			
what is the total amount of boron injected into the			
e [2CHS*MOV350] and at what position should			
A. 443 gallons and Bank D at 151 steps.			
B. 294 gallons and Bank D at 170 steps.			
steps.			
D. 113 gallons and Bank D at 200 steps.			
Importance: 3.6			
Cognitive Level: Application			
ations Activities - Valid for burnups of 7000 - 9000			
MWD/MTU.			
Lesson Plan #: 2LP-SQS-7.1 Obj. #: 8			
History: NEW			
Type: OPEN BOOK			
Give copy of Reactivity Plan			

Direct look up

-	. Which of the following Primary Component Cooling system loads in the letdown path is isolated by automatic valve closure on a Low Level in Primary Component Cooling		
Surge Tanks [2CCP*TK21A, 21B]?			
A. Non Regenerative Heat			
B. Excess Letdown Heat Ex	changer [2CHS*E24]		
C. Degassifier Vent Chillers	[2BRS*E22A,22B]		
D. Seal Water Heat Exchan	ger[2CHS*E21]		
ANSWER: C			
K/A:000026 AK2.03 Importance:3.6			
Cognitive Level: Knowledge			
References 20M-15.5, Figure 15-1, 20M-15.3.B, Iss. 4, Rev. 10			
Lesson Plan #:: 2LP-SQS-15.1 Obj. #: 6			
History: NEW			
Source: Type: CLOSED BOOK			
JTA:: 0000060121			

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7.	 7. The unit is at 75% power and preparing to escalate power to 100%. The Pressurizer Pressure Control Station [2RCS*PK444A] is in Automatic and the output is at 50%. All systems are NSA with PZR Control Heater Control Group [2RCS*H2C] and [2RCS*H2D] selected to "ON". Which of the following is the expected status of PZR pressure control equipment at this point? 			
	A. Heater Groups B, D and	E ON,	Pressurizer Spray [2RCS*PCV455A] OPEN.	
	B. Heater Groups B, D and	E OFF	, Pressurizer Spray [2RCS*PCV455A] CLOSED.	
	C. Heater Groups C and D ON, Pressurizer Spray [2RCS*PCV455A] OPEN.			
	D. All Heater Groups OFF,	Pressu	rizer Spray [2RCS*PCV455A] OPEN.	
ANS	SWER: C			
К/А:	000027 A2.03		Importance:2.6	
Cog	nitive Level: Application	_		
Refe	erences: Curve Book CB-18, Rev. 0)		
	son Plan #: 2LP-SQS-6.4		Obj. #: 11	
Histo	ory: NEW	<u></u>		
Source:			Type: CLOSED BOOK	
JTA	: 0020090101			

8.	The crew is responding to a Secondary Side Steam Break Accident using ECA-			
	2.1,"Uncontrolled Depressurization of All Steam Generators." All steam generators are			
	depressurized to containment pressure and all steam generator levels are OFF-SCALE			
	low on the narrow range. The ANS	SS orders the NCO to throttle AFW flow to all three		
	steam generators to a minimum 50) gpm to each steam generator.		
	Maintaining a 50 gpm minimum AF	W flow is designed to acomplish which of the		
	following functions?			
	A. Provide minimum flow throu	ugh the operating Auxiliary Feedwater pumps.		
	B. Prevent exceeding pump ru	unout on the operating Auxiliary Feedwater pumps.		
	C. Provide thermal stress relie	of by maintaining wetted surfaces on the interior of the		
	steam generators.			
	D. Prevent overflow of the steam generators during restoration of narrow range			
	level.			
ANSV	VER: C			
K/A:0	00040 (W/E12) K3.2	Importance:3.3		
Coan	itive Level: Knowledge			
		3, Rev. 6, Background for CAUTION before step 6		
	on Plan #: 2LP-SQS-53.3	Obj. #: 3		
1922	11 FIGH #. 225-30.3			
•				
Histor	ry: NEW			
Sourc	ce:	Type: CLOSED BOOK		
JTA:	3010030601			

9.	Following an overcooling transient, the crew is responding to an Integrity Red Path			
	using FR-P.1," Response to Imminent Pressurized Thermal Shock Condition." The ${ m p}$			
	RCS is saturated at 400 psig.	SI can NOT	Γ be terminated.	
	Why should a Reactor Coolan	t Pump be s	started even if support conditions are missi	
	A. To establish Loop flow	 A. To establish Loop flow to stabilize Tavg and stop the cooldown. B. To mix heated loop water and SI flow to limit temperature stress on the vessel 		
	B. To mix heated loop wa			
	wall-			
 C. Use forced flow to collapse voids in the core outlet plenum and vessel hea D. To equalize RCS pressures, allowing uniform SI flow to the vessel. 		n the core outlet plenum and vessel head.		
		ing uniform SI flow to the vessel.		
	a and a second			
ANS	WER:B			
K/A:'	W/EO8 K3.2	Ir	mportance:3.6	
Cog	nitive Level: Knowledge			
Refe	erences: 20M-53B.4.FR-P.1, Bac	kground for	Step 6, Issue 1B, Rev. 1, page 21	
	on Plan #:2LP-SQS-53.3		Dbj. #: 3	
		R		
Histo	vrv: NFW	<u></u>		
	ory: NEW	 	VDE: CLOSED BOOK	
Sour		T	ype: CLOSED BOOK	

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10. The unit is operating at 100% power wi	The unit is operating at 100% power with all systems NSA when the Section A1 Main		
Condenser Water Box Outlet Valve [2C	Condenser Water Box Outlet Valve [2CWS*MOV100A] malfunctions and closes. Unit		
power remains constant.	power remains constant.		
As a result, the temperature of CWS to	As a result, the temperature of CWS to the cooling tower will(1) and condenser		
absolute pressure will(2)	absolute pressure will (2).		
A. (1) rise, (2) rise	A. (1) rise, (2) rise		
B. (1) fall, (2) fall	B. (1) fall, (2) fall		
C. (1) rise, (2) fall	C. (1) rise, (2) fall		
D. (1) fall, (2) rise	D. (1) fall, (2) rise		
ANSWER:A			
K/A:000051 K1.01	Importance:2.4		
Cognitive Level: Comprehension			
References: Component Fundamentals, Topic 1, Section B, Heat Exchangers and			
Condensers, Page 16 (See Westinghouse HTFF Book page 9-33 & 34			
Lesson Plan #: 2LP-SQS-26.2	Obj. #: 6		
History: NEW			
Source:	Type: CLOSED BOOK		
JTA: 0550110101			

11. The unit has tripped from 100%	. The unit has tripped from 100% power coincident with a complete loss of the		
switchyard.			
All RCP pumps are	All RCP pumps are off.		
• RVLIS is available.	RVLIS is available.		
RCS temperature a	RCS temperature and pressure are trending toward no-load values.		
 4Kv Emergency Bu 	 4Kv Emergency Bus 2AE and 2DF failed to load on the EDG's. 		
Based on these symptoms, which of the following procedures could be entered directly			
without entering E-0 "Reactor Trip and Safety Injection?"			
A. FR-C.1 "Response to Inadequate Core Cooling"			
B. ECA-0.1 "Loss of All AC Power Recovery Without SI Required"			
C. ES-0.2 "Natural Circulation Cooldown"			
D. ECA-0.0 "Loss of All AC Power"			
ANSWER:D	· ·		
K/A: 000055 G 2.4.1	Importance:4.3		
Cognitive Level: Comprehension			
References: 20M-53B.2 Section IV, Issue 1B, Rev 4, Page 13			
Lesson Plan #: 2LP-SQS-53.1 Obj. #: 1			
History: NEW			
Source:	Type: CLOSED BOOK		
JTA: 3010060601			

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12. Due to performing a maintainence work order, the 21B Steam Generator level cont	
inputs are selected as follows:	
S/G B Feedwater Fl	ow [2FWS-FI486] is on Channel IV
S/G B Steam Flow [2MSS-FI485] is on Channel IV
Turbine First Stage	Pressure is selected to Position PT446 (Channe
What will be the initial response	e of SG Main Feedwater Control Valve [2FWS*F
on Steam Generator 21B to the	e loss of 120 Vital Bus 3?
A. The valve opens as	S/G B Feedwater Flow 2FWS*FT486 fails low.
B. The valve closes as S/G B Steam Flow 2MSS*FT485 fails low.	
C. The valve closes as Turbine First Stage Pressure 2MSS*PT446 fail	
D. The valve opens as	S/G B Steam Flow 2MSS*PT485 fails low.
ANSWER:C	
K/A: 000057 A2.19	Importance:4.0/4.3
Cognitive Level: Application	
References: 20M-38.4.V, Issue 1, Rev	/. 6, 20M-24.4,IF, Issue 4,Rev. 5, USFSAR Fig.
Lesson Plan #: 2SQS-24.1	Obj. #: 5
History: NEW	
	Type: OPEN Book
Source:	

13. A fire has started in the Cable Spreading Room [CB-2]. The fire is now out and the fire brigade has not been able to enter the area. Smoke is entering room and the ANSS has implemented 20M-56C "Alternate Safe Shutdown Outside Control Room".	g the control	
room and the ANSS has implemented 20M-56C "Alternate Safe Shutdown Outside Control Boom".		
Outside Control Boom".	1 From	
Outside Control Room". T^{0}		
Which of the methods is to be used bring the unit to Cold Shutdown?		
A. Conduct a natural circulation cooldown using only the Train B (F	^{>} urple)	
equipment from the control room. B. Conduct a forced circulation cooldown using only Train A (Orange) Train		
		equipment from the Alternate Shutdown Panel.
C. Transfer all Train B (Purple) equipment to the Emergency Shutdown Pa and conduct a natural circulation cooldown.		
		D. Transfer all Train A (Orange) equipment to the Alternate Shutdo
and conduct a natural circulation cooldown.		
ANSWER: D		
K/A: 000067 K3.02 Importance: 2.5		
Cognitive Level: Knowledge		
References: 20M-53B.4. 20M-56C.4.B, Issue 1, Rev. 14		
Lesson Plan #: 2LP-SQS-56C.1 Obj. #: 2		
LESSUIT FIGH #. 2LF "SUB"SUU. I UUJ. #. 0	<u> </u>	
History: NEW		
History: NEW Source: Type: Closed Book		

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14.	The control room was evacuated due to a fire. Procedure 20M-56C.4.A" Alternate Safe		
	Shutdown from Outside the Control Room" is in progress. Control has been established		
	at the Alternate Shutdown Panel.		
	Which of the following steam release paths is available to cooldown the unit from the		
	ASP?		
	A. Atmospheric Dump Valve [2SVS*PCV101A] and Residual Heat Release		
	[2SVS*HCV104].		
	B. Atmospheric Dump Valve [2SVS*101B] and the Residual Heat Release valve		
	[2SVS*HC104].		
	C. Atmospheric Dump Valves [2SVS*PCV101A, 101C].		
	D. Atmospheric Dump Valves [2SVS*PCV101A, 101B].		
ANSW	/ER: D		
K/A: ,0	000068 K3.06	Importance: 3.9	
Cognitive Level: Knowledge			
References: 20M-56C.4.A, Issue 1, Rev. 8, Page A 3			
Lesson Plan #: 2LP-SQS-56C.1		Obj. #: 6	
History: NEW			
Source		Type: Closed Book	
JTA: 0	000020401		

15. Unit 2 Containment operates at sub-atmospheric pressure. Maintenance of sub-			
atmospheric pressure is required to me	et which one of the following criteria?		
A. Maintain minimum flow to C	A. Maintain minimum flow to Containment Radiation Monitors 2RQ-303A and		
303B for leakage detection.	303B for leakage detection.		
B. Ensure containment pressu	. Ensure containment pressure can be restored to sub-atmospheric pressure		
within 1 hour after a Design	within 1 hour after a Design Basis Accident.		
C. Maintain leakage for all at power operational modes up to Technical			
Specification limits.	Specification limits.		
D. Ensure containment temper	D. Ensure containment temperature can be maintained at a minimum of 85		
degrees in Modes 1 to 4.	degrees in Modes 1 to 4.		
ANSWER: B	********		
K/A: 000069 K1.01	Importance: 2.6		
Cognitive Level: Knowledge			
References: Basis for Tech Spec. 3/4.6.1.4 and 6.1.5 Page B 3/4 6-9, Amendment 80			
Lesson Plan #: 2LP-SQS-13.1	Obj. #: 1		
History: NEW			
Source:	Type: Closed Book.		
JTA: 0260060201			

Sistaction . To they go with question ?

ns NSA. Which of the following detectors will		
indicate a failed fuel pin leaking into into the RCS?		
A. Aerated Vent Transfer Line Monitor [2GWS-RQ103]		
2HVS-RQ109A, 109B]		
Low Range [2RMR-RQ201]		
Ionitor [2CHS-RQ101A,B]		
Importance:2.6		
Cognitive Level: Knowledge		
References: 20M-43.1.C, Issue 4, Rev. 3, Page 8		
Lesson Plan #: 2LP-SQS-43.1 Obj. #: 2		
History: NEW		
Type: CLOSED BOOK		

17.	The unit is operating at 100% Rated Thermal Power when control rods H2 and H4
	simultaneously drop into the core. In order to meet power distribution limits specified in
	the FSAR, which of the following actions is required from 2OM-53C.4.2.1.8 " Rod
	Inoperability?

A. Lower turbine load to less than 75% power at 5% per minute.

B. Trip the reactor and go to E-0 "Reactor Trip and Safety Injection" Step 1.

 $_{N} q \Rightarrow C$. Dilute until Control Bank D reads zero steps and Bank D rod bottom lights are lit.

D. Perform 20ST-49.1 "Shutdown Margin Calculation (Plant Critical) within 1 hour.

ANSWER:B			
K/A:000003 K3.04	Importance:3.8		
Cognitive Level: Memory			
References: 20M-53C.4.2.1.8, Issue 1A, Rev. 0			
Lesson Plan #: 2LP-SQS-53C.1	Obj. #: 1		
History: NEW			
Source:	Type Closed Book		
JTA: 0000070401			

18. The unit has tripped but a Safety Injection was NOT required. The crew has			
•••			
transitioned to ES-0.1" Reactor Trip Re	ponse." The following conditions exist:		
 All steam generators are bell 	ow the narrow range		
 All reactor coolant pumps ar 	All reactor coolant pumps are operating		
 Steam Dumps are open to the steam Dumps are o	Steam Dumps are open to the condenser and Tave is trending to 547°F		
Auxiliary Feedwater is 200 g	pm to each steam generator		
Is the requirement for a secondary heat	sink met?		
A. Yes, the steam dumps are open and the condenser is available.			
B. Yes, total auxiliary feedwate	r flow is greater than 365 gpm.		
C. No, all steam generator leve	Is are less than 5% in the narrow range.		
D. No, auxiliary feedwater must be greater than 365 gpm to each steam			
generator.			
ANSWER: B			
K/A: 000007 G.2.4.8	Importance: 3.0		
Cognitive Level: Comprehension			
References: 20M-53B.4.ES-0.1' Reactor Trip Response Background" Issue 1B, Rev. 5, Step			
12			
Lesson Plan #: 2LP-SQS-53.3	Obj. #: 3		
History: NEW			
Source:	Type: Closed Book		
JTA: 3010010601			

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19. The unit has tripped from 100% power due to a PZR Power Operated Relief Valve			
which has failed full open. What conditions will develop in the RCS if the Motor			
Оре	Operated Isolation Valve fails to close?		
	A. Breakflow will be within capacity of normal charging line flow, so RCS pressure		
	will stabilize at or near 2235 psig.		
B. HHSI flow will be initiated via the cold leg SI injection and RCS pressure will Whole shet of head? stabilize at or near 2235 psig.			
C. Breakflow will be within capacity of normal charging flow, so RCS pressure			
stabilizes at or near 1200 psig.			
D. HHSI flow will be initiated via the cold leg SI injection and RCS pressure			
stabilizes at or near 1200 psig.			
ANSWER: D			
K/A: 000008 AA2.25 Importance:2.8			
Cognitive Level: Comprehension			
References: 2OM-53B.4.FR-H1, Background, Issue 1B, Rev. 6, page 11 and 20			
		Obj. #: 5	
		H	
History: NEW			
Source:		Type: CLOSED BOOK	
JTA: 3110060601			

20.	A large LOCA has occurred on Unit 2.	Containment is at design maximum pressure.		
	The RCS is at saturation with system pressure matching containment pressure. All			
	equipment has responded as required by the SSPS. The RWST is 600 inches and			
	dropping.			
	What is the expected configuration for the Low Head Safety Injection Pumps			
	[2SIS*P21A, 21B] under these conditions?			
	A. Operating at maximum rated flow of both pumps.			
	B. Operating at shutoff head with recirculation flow to the RWST.			
	C. Shutdown on Refueling Water Storage Tank Low Low level.			
	D. Flow limited by the throttled settings for RCS Cold Leg SI Throttle valves.			
ANSWER: A				
K/A: 0	00011 K2.02	Importance: 2.6		
Cognitive Level: Comprehension				
References 20M-11.1.C, Issue 4, Rev. 0 page 3, 20M-11.1.D, Iss. 4, Rev. 0, page 3, 20M-				
11.2.B, Issue 4, Rev. 2 Page 3.				
Lesson Plan #: 2LP-SQS-11.1		Obj. #: 5		
History: NEW				
		Type: Closed Book		
Source		IN A STATE AND A STATE		
	8010020601	Type: Olosed Book		

01	Following a Safety Injection signal Lotd	own Orifice Isolation [2CHS-AOV200B] failed to		
	C. W 14 Have be	flu		
	close. If the letdown line were to break just outside of the containment penetration,			
	which of the following results can be expected?			
	A. Thermal shock to the charging line penetration.			
	B. Rapid core uncovery and fuel damage.			
	C. Loss of recirculation capability from the Containment Sump.			
D. Loss of injection flow to the RCS loop 21A.				
ANSWER: C				
K/A: W/E04 EK2.2		Importance: 3.8		
Cognitive Level: Knowledge				
References: 20M-7.5, Issue 4, Rev. 0, Figure 7-1A, Rev. 7				
Lesson Plan #: 2LP-SQS-7,1		Obj. #: 1		
History:	: NEW			
Source:		Type: Closed Book		
JTA: 0040150101				
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Have SI the get ID live head?				
ST. the ga				
	Have			

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22. The actions of E-1" Loss of Primary or	The actions of E-1" Loss of Primary or Secondary Coolant" are in progress.		
Annunciator A1-2E " RECIRCULATION MODE INITIATION is lit. All systems			
associated with this alarm perform as required.			
If the Containment Emergency Sump is empty, which of the following pump			
combinations may be damaged?			
A. Quench Spray Pumps [2QS	S*P21A, 21B]		
B. Low Head Safety Injection F	^p umps [2SIS*P21A, P21B]		
C. Residual Heat Removal Pur	nps [2RHR*P21A, 21B].		
D. High Head Safety Injection	Pumps [2CHS*P21A and B]		
ANSWER: D			
K/A: W/E11 K1.3	Importance: 3.6		
Cognitive Level: Knowledge	a state and a state of the stat		
References: 20M-11.1.D. Issue 4, Rev. 0, pag	<u>le 2</u>		
Lesson Plan #: 2LP-SQS-11.1	Obj. #: 5		
History: NEW			
Source:	Type: Closed Book		
JTA:0060160102			

23.	The unit operators are recovering from an Inadvertent SI. The following annunciators		
	are verified:		
	A12-1C, "AUTO SAFETY INJECTION BLOCKED" is lit		
	 A12-1D, "SAFETY INJECTION SIGNAL" is off. CIA and CIB (Both Trains) reset pushbuttons have been actuated. 		
	While attempting to restore charging flow, Charging Isolation Valve [2CHS*MOV310]		
	opens and remains open, Charging Isolation Valve [2CHS*MOV289] recloses when the		
	control switch is released.		
	Which operator action is required to open 2CHS*MOV289?		
	A. Open and verify P-4 signal from Reactor Trip Breaker A on PSMS, Data Page 1		
	B. Reset Train A CIA signal using "Containment Isolation Phase A Reset"		
	pushbutton on BB-A		
	C. Push and verify "Manual Action System Bypass Status Train A - HHSI" light lit on		
	panel 1069		
	D. Reset Train A SI slave relays using switch S821 at Safeguards Test Cabinet.		
ANSW	/ER: D		
	I/E02 K2.1 Importance: 3.4		
	ive Level: Application		
	nces: 2OM-53B.4.ES-1.1, Issue 1B Rev 6 Background for step 2 Note 1		
Lesso	n Plan #: 2LP-SQS-53.3 Obj. #: 6		
Histor	/: NEW		
Source	Type: OPEN BOOK		
	010010601 Copy of ES 1.1		
0 I A I V			

24.	Unit 2 is cooling down and has reached	Mode 4. RHS is valved in for service and 2A	
	RHS Pump [2RHS*P21A] is running.		
	RCS temperature is being maintained at 325°F		
	RCS pressure is at 335 psig	N	
	All RHS system components	s are NSA	
	B RHS train is available for s	service	
	According to the VOND, if RCS Pressu	re Transmitter [2RCS*PT440] fails high, which of	
	the following describes what will happe	n to the RHS system?	
	A. 2RHS*MOV701A and 2RHS	S*701B close and A RHS pump trips.	
	B. 2RHS*MOV701A and 2RHS	S*702A close and A RHS pump trips.	
	C. 2RHS*MOV701B and 2RHS	S*702B close and B RHS pump is inoperable.	
	D. 2RHS*MOV702A and 2RHS	S*702B close and B RHS pump is inoperable.	
ANSW	' <u>ER: A</u>		
K/A: 00	00025 K3.02	Importance: 3.3	
Cognit	tive Level: Application		
		10-1, 2OM-10.1.D, Issue 4, Rev. 0, page 3 to 6	
	n Plan #: 2LP-SQS-10.1	Obj. #: 9	
Histon	y: NEW		
Source		Type: OPEN BOOK	
	050080101	Open- Give figure 10-1	

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25.	The NCO manually actuates a reactor trip but the trip breakers fail to open. The plant		
	operator must manually trip the turbine because of the failure of which of the following		
	actuations?		
	A. Both First Stage Impulse Pre	ssure Transmitters [2MSS*PT446,	
	2MSS*PT447] still indicate gi	reater than 40% power.	
	B. Both P-4 signals are missing	due to both Reactor Trip Breakers [RTA and	
	RTB] being closed.		
	C. SSPS Train A and B signals	for Turbine Trip on Reactor Trip above P-9 were	
	not generated.		
	D. AMSAC Timer B-3 is blocked because both Main Feedwater Pumps are still		
	running.		
ANSW	/ER: B		
K/A: 00	00029 A2.09	Importance:4.4	
Cognit	Cognitive Level: Comprehension		
Refere	References: FSAR Figure 7.3-20		
Lessor	n Plan #: 2LP-SQS-26.3	Obj. #: 4	
History	y: NEW		
Source	ə:	Type: CLOSED BOOK	
JTA: 0	450070101		

26.	The unit is operating with a steam generator tube leak in Steam Generator 21C. Air		
	Ejector Discharge [2ARC-RQ100] radiation monitor is in "ALERT." Over the next 60		
	minutes 2ARC-RQ100 rises to "HIGH" alarm setpoint. What action should be taken?		
	A. Perform an emergency s	shutdown in accordance with AOP 2.51.1 and be	
	in MODE 3 as quickly as	possible.	
	B. Shutdown the plant and be in MODE 3 within 6 hours.		
	C. Trip the Reactor and Tur	bine go to E-0 "Reactor Trip and Safety	
	Injection [®] Step 1.		
	D. Continue to monitor the a	affected Steam Generator and prepare for a	
	normal plant shutdown.		
ANSW	/ER: A		
K/A: 0	00037 K3.02	Importance: 3.2	
Cognit	ive Level: Application		
Refere	ences: 20M-53C.4.2.6.4, Issue 1A, Rev.	9, Step 3	
Lesso	n Plan #: 2LP-SQS-53C.1	Obj. #: 8	
	· ·		
Histor	/: NEW		
Source	ə:	Type OPEN BOOK.	
<u>JTA: 0</u>	000110401	Give student AOP 4.6.4	

27.	A steam generator tube has r	uptured in the 21C Steam Generator. The crew is	
•	performing the actions require	erforming the actions required by E-3" Steam Generator Tube Rupture". The	
	cooldown of the RCS has bee	en completed and RCS pressure matches steam generat	
	pressure. Leakage into the at complete which of the following	ffected steam generator will continue until the operators ing task?	
	A. Isolate the 21C steam	generator and depressurize 21A and 21B steam	
	generators by at least	100 psig.	
	B. Isolate the 21C steam	generator and raise level in 21C steam generator to a	
	minimum of 5% level i	n the narrow range.	
	\mathcal{R} C. Spray the pressurizer	Spray the pressurizer as needed to minimize subcooling and hold the RCS pressure equals steam pressure in the affected steam generator.	
	pressure equals steam		
	D. Restore normal chargi	Restore normal charging and letdown and balance RCS pressure to match 21C	
	steam generator press	sure.	
ANSW	'ER: D		
K/A: 00	00038 K1.02	Importance: 3.2	
Cognit	ive Level: Knowledge		
	nces: 20M-53B.E-3 Backgrou	nd Issue 1B, Rev. 7, page	
	n Plan #: 2LP-SQS-53.3	Obj. #: 3	
200001			
History	/: NEW		
Source		Type: Closed Book	
	010040601		

28. Unit 2	Unit 2 has tripped from 100% power due to a small break LOCA. All RCP pump		
opera	operations were terminated when RCS pump trip criteria were met. With the 21C		
Stean	Steam Generator isolated and a natural circulation cooldown in progress, which of the		
follow	following responses may be expected from Loop 21C due to "loop stagnation"?		
A.	A. Tcold follows Loops 21A and 21B as steam pressure falls in Steam Generators		
	21A and 21B.		
B.	B. Tcold falls rapidly as SI flows fills the cold leg and RCP casing.		
C.	C. Tcold remains at or near saturation temperature for Steam Generator 21C steam		
	pressure.		
D.	Tcold rises as Loop 21C stagna	tes during cooldown of loops 21A and 21B	
ANSWER: B	مى يې مېرى يې م مېرى يې مېرى يې		
K/A: 000038	K1.01	Importance: 4.1	
Cognitive Level: Knowledge			
References: 2OM-53B.5.GI-12, Issue 1b, Rev. 1, Pages 1 and 4			
Lesson Plan #: 2LP-SQS-53.2 Obj. #: 9			
History: NEW	······································		
Source:		Type: CLOSED BOOK	
JTA: 301004	0601		

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9. Unit 2 is operating at 30% Rated Thermal Power with all systems NSA. Which one of			
the following will actuate the Motor Driven Auxiliary Feedwater Pump [2FWE*23A]?			
A. 4Kv Emergency Bus 2AE at 75% of rated voltage on 1 of 3 phases.			
B. 2RCS*SG21A Narrow Range L	B. 2RCS*SG21A Narrow Range Level Transmitter [2FWS*LT474] less than 5%.		
C. Low Pressurizer Pressure signal at 1845 psig on 2RCS*PT455 and 456.			
D. 2RCS*SG21A Feed Flow mism	atch on 2FWS*FT476 for 25 seconds.		
ANSWER: C			
K/A: 000054 A2.03	Importance: 4.1		
Cognitive Level: Knowledge			
References: 20M-24.1.D, Issue 4, Rev. 2 and 20M-24.1.E, Issue 4, Rev. 1			
Lesson Plan #: 2LP-SQS-24.1	Obj. #: 10		
History: NEW			
Source:	Type: CLOSED BOOK		
JTA:0130010101			

Stem Gocurs.

30.	With RCP's off and the unit on Natural Circulation, Main Stm Manifold Press Control
	[2MSS*PK464] is placed in STM PRESS mode. A large reduction in steam pressure
	would produce a Low Pressure Steam Line Safety Injection due to which of the following
	reasons?

A. Reactor Coolant Heat transfer rate to the steam generator is slowed.

B. Reactor Coolant Heat transfer rate to the steam generator is enhanced.

C. Steam generator feedwater flows rise at a higher rate.

D. Pressurizer pressures drop at a higher rate.

ANSWER: A		
K/A: W/E05 K1.2	Importance:3.9	
Cognitive Level: Knowledge		
References: 2OM-53B.4.FR-H.1, Issue 1B, Re	v 6, Step 5	
Lesson Plan #:2LP-SQS-53.3	Obj. #: 3	
History: NEW		
Source:	Type: CLOSED BOOK	
JTA: 3110060601		

Just putty in Ston Piece Mode would onot Just putty in Silly aske why a large atm do this. - Breakly in low press on Nat. Receic. domand would result in low press on Nat. Receic.

31. Steam Ge	31. Steam Generator Blowdown Test Tank [2SGC-TK23A] discharge is in progress when		
Liquid Waste Effluent Radiation Monitor [2SGC-RQI100] "Monitor Loss of Process			
Flow" alar	Flow" alarm annuciates on DRMS Console. The sample pump for 2SGC-RQI100 is		
NOT running. Which of the following actions should be taken?			
A. Ve	A. Verify Liquid Waste Eff High Rad Isol. Valve [2SGC-HCV100] has automatically		
clo	osed.		
B. Dis	spatch an operator to locally s	tart 2SGC-RQI100 sample pump at the monitor	
ski	id.		
C. Sta	C. Start 2SGC-RQI100 sample pump manually from the DRMS Console.		
D. Ma	D. Manually close Liquid Waste Eff High Rad Isol. Valve [2SGC-HCV100]		
ANSWER: D			
K/A: 00059 AK2.0	01	Importance: 2.7	
Cognitive Level: (
		14 CALITION before stop 12 g	
References: 201v	1-25.4.L, ISSUE 4, nev. 9, rayo	e 14, CAUTION before step 13.g	
Lesson Plan #: 21	LP-SQS-25.1	Obj. #: 5	
History: NEW			
Source:			
JTA: 072BBB0221 Copy of 2OM-25.L		Copy of 2OM-25.L	

00	A fuel ecomply had been in the en	ant fuel applifor a year. While being moved to a		
32.		A fuel assembly had been in the spent fuel pool for a year. While being moved to a ne		
	location, the assembly was snagge	d and damaged. Bubbles are observed rising fr		
	the fuel assembly. Which monitor w	vould warn the operators of the rising radiation I		
	due to the gas release in the spent	fuel pool?		
	A. Auxiliary Building - 755E	A. Auxiliary Building - 755B Airborne Monitor [2RMP-RQI312].		
	B. Fuel Handing Building V	B. Fuel Handing Building Vent Airborne Monitor [2RMF-RQI301B]		
	C. Elevated Release Detec	C. Elevated Release Detector Skid Monitor [2HVS-RQ109C].		
	D. Fuel Pit Bridge Area Radiation Monitor [2RMF-RQ202].			
		er men er		
ANS	WER: B			
K/A:	000061 AK1.01	Importance: 2.5		
	itive Level: Knowledge			
	rences: 2OM-43.1.C, Issue 4, Rev. 3,	page 22 and 23		
Rele	ences. 2014-43.1.C, 1550e 4, nev. 5,			
Less	on Plan #: 2LP-SQS-43.1	Obj. #: 1		
Histo	ry: NEW			
Sour	Ce:	Type: Closed Book		
	0700000000			
JIA:	072BBB0221			

33. A LOO	OCA has occurred that resulted in damage to fuel. Radiation levels in the		
conta	ontainment reached 200,000 Rem/hr and now , 24 hours later, are 5,000 Rem/hr.		
Conta	inment pressure peaked at 15 psi	g and now has returned to 0.5 psig.	
Which	n of the following describes the co	rrect use of "Adverse Containment" values.	
A.	Discontinue use of "adverse cor	tainment" values due to containment pressure	
	dropping below 5 psig.		
B.	Discontinue use of "adverse co	ntainment" values due to containment radiation	
	levels below 10 ⁵ Rads/hr.		
C.	C. Continue use of "adverse containment" values until integrated radiation dose is		
	confirmed to be below 10 ⁶ Rads.		
D.	D. Continue use of "adverse containment" values until containment pressure is		
	restored to subatmospheric pressure.		
ANSWER: C			
K/A: W/E16 A1.2		Importance: 2.9	
Cognitive Level: Application			
References: 20M53B.5.GI-2, Issue 1B, Revision 1, page 13			
Lesson Plan #: 2LP-SQS-53.3 Obj. #:6			
History: NEW			
Source:	Source: Type: CLOSED BOOK		
JTA: 301AAA	0601		

34. Pr	Pressurizer Level Control Selector Selector Switch is in Position I & II. Pressurizer		
Le	Level Transmitter [2RCS*LT461] fails high. Which of the following control actions		
sh	ould be confirmed as having occured	1?	
	A. PZR High Level RX Trip Channel III Bistable light lit.		
	B. Charging Flow Control Valve [2CHS*FCV122] closes to minimum flow		
	C. Pressurizer Back up Heater Groups A, B, D and E come on		
	D. Letdown Orifice Isolation Valves [2CHS*AOV200A, B, C] close.		
		array ¹¹	
ANSWER	: A		
K/A:: 0000	K/A:: 000028 G 2.4.4 Importance: 4.0		
Cognitive	Cognitive Level: Knowledge		
References: 2OM-6.4.IF, Issue 4, Revision 5, page 13			
Lesson Pl	Lesson Plan #: 2LP-SQS-6.4 Obj. #: 13		
History: NEW			
Source:		Type: CLOSED BOOK	
JTA:0110	030101		

35. Technical Specification 3.9.11 "Refueli	Technical Specification 3.9.11 "Refueling Operation - Storage Pool Water Level"		
requires a minimum of 23 feet of water	requires a minimum of 23 feet of water over irradiated fuel assemblies in the Spent Fuel		
Storage Pool? This level is required to	limit what hazard during fuel handling?		
A. Potential for criticality involving	two spent fuel assemblies.		
B. Exposure to lodine release fron	B. Exposure to lodine release from a damaged fuel assembly.		
C. Overheating damage to a fuel assembly from a loss of cooling.			
D. Damage to fuel handling equipr	nent from radiation exposure.		
ANSWER: B			
K/A: 00036 AK1.01 Importance: 3.5			
Cognitive Level: Knowledge			
References: Bases for Tech Spec. 3/4.9.11 page B 3/4 9-3			
Lesson Plan #: 2LP-SQS-20.1 Obj. #:10			
History: NEW			
Source:	Type: Closed Book		
JTA: 0330150101			

36.	The crew is performing step 25 of ECA-0.0 " Loss of All AC Power" and depressurizing		
	all three steam generators to 300 psig. The cooldown is stopped at 300 psig in order to		
	accomplish which one of the following	functions?	
	A. Block the Steam Line Isolat	tion signal and Low Steam Line Pressure SI.	
	B. Allow Auxiliary Feedwater Flow to fill all steam generators to above 5%		
	Narrow Range Level.		
	C. Maintain RCS subcooling g	reater than 50°F and PRZR level on scale.	
	D. Maximize injection of SI accumulator water and limit nitrogen injection into		
	RCS		
ANSW	/ER: D		
K/A: 0	K/A: 000056 K3.02 Importance: 4.4		
Cognitive Level: Knowledge			
References: 20M-53B.4.ECA-0.0 Issue 1B, Rev. 4, page 114			
	Lesson Plan #: 2LP-SQS-53.3 Obj. #: 3		
History: 2LOT 2A Question 17 NRC			
Source	Source: Modified from Q17 on 2LOT2A Type: CLOSED BOOK		
JTA: 3010060601			

37. The unit is at 100% power with all syster	The unit is at 100% power with all systems NSA. "A" Train SSPS testing is in progress.		
The "A" Train Reactor Trip Bypass break	The *A* Train Reactor Trip Bypass breaker[BYA] is racked in and closed. The Train *A*		
SSPS Input Error Inhibit Switch is in "INI	HIBIT". A 2 out 3 Reactor Trip signal is		
generated on low pressurizer pressure.	Which of the following actions will produce the		
acutal reactor trip?			
A. Train A Reactor Trip Breaker	[RTA] opens on loss of voltage to the UV coil.		
B. Train A Reactor Trip Bypass	Breaker [BYA] opens when the shunt trip coil		
energizes.			
C. Train B Reactor Trip Breaker	[RTB] opens on loss of voltage to the UV coil.		
D. Train B Reactor Trip Bypass	Breaker [BYB] opens when the shunt trip coil		
energizes.			
ANSWER: C			
K/A: 001 K1.05	Importance: 4.5		
Cognitive Level: Application			
References: 2OM-1.1.D, Issue 4, Rev. 0, page 5, page 8,			
Lesson Plan #: 2LP-SQS-1.2 Obj. #: 8			
History: NEW			
Source:	Type: CLOSED BOOK		
JTA: 0120080101			

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38. The unit	The unit is in Mode 5 in preparation for heating up. Annunciator A2-5D "NIS SOURCE		
RANGE	RANGE HIGH FLUX AT SHUTDOWN" comes into alarm. This is to alert the operator		
to perfor.	m which of the following actions	s?	
A	A. Block the source range high flux trips in preparation for reactor startup.		
E	Emergency borate the RCS	to restore core shutdown margin.	
c	. Turn off the source range hig	gh voltages for protection of the instrumentation.	
C). Verify all control rods fully in:	serted and the reactor trip breakers open.	
ANSWER: B			
K/A: 001 K6.08		Importance: 2.9	
Cognitive Level:	: Comprehension		
	M-2.4.AAQ, Issue 1, Rev. 4		
	Lesson Plan #:: 2LP-SQS-2.1 Obj. #: 10		
History: NEW	History: NEW		
Source:		Type: CLOSED BOOK	
JTA:015005010	1		

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39. The U	The Unit is critical and stabilized at 1E-8 amps in the Intermediate Range. The operator		
record	 records the following data in the Daily Journal: Control Bank C is at 100 steps Control Bank D is at 0 steps. Reactor Coolant system boron is 575 ppm Reactor Coolant system temperature is 547°F. 		
Exhib	iting a questioning attitude the Pla	ant Operator states that the rod configuration	
seem	s improper and consults Plant Cu	rve CB-15. Which of the following actions is	
requir	ed?		
A.	Manually trip the reactor and co	mmence emergency boration.	
B.	B. Insert Control Banks A, B, C and D and re-calculate the Estimated Critical		
	Position.		
C.	C. Request permission from General Manager Operations to enter Mode 1.		
D.	D. Request Nuclear Engineering validation of the current rod configuration.		
ANSWER: A			
K/A: 001 K5.0	K/A: 001 K5.04 K/A CHANGE Importance: 4.3		
Cognitive Level: Application			
References: CB-15 Issue 7, Rev. 0, 2OM-50.4.D, Issue 1, Rev. 31, Step 19			
Lesson Plan #: 2LP-SQS-50.1 Obj. #: 7			
History: NEW			
Source:	Source: Type: OPEN BOOK		
		Give CB-15	

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40.	At low RCS pressures, and with procecedural restrictions, the RCP Seal Water Bypass		
	Isolation Valve [2CHS*MOV307] may b	e opened. Opening this valve will produce which	
	of the following?		
	A. Number 2 Seal leakoff flow will rise above 1 gpm.		
	B. Number 1 Seal leakoff flow will	rise above 0.2 gpm.	
	C. Elevated cooling flow through R	CP Lower Radial Bearing.	
	D. Elevated cooling flow through R	CP Thermal Barrier.	
ANSV	WER: C		
K/A: (003 K1.03	Importance: 3.3	
Cogn	itive Level: Comprehension		
		age 4 and 5, 2OM-6.1.C,Issue 4, Rev.0, page 20	
	on Plan #: 2LP-SQS-6.3	Obj. #: 4.c	
Histo	ry: NEW		
Sourc		Type: Closed Book	
	0030020101		

41. The RCS is at 240 degrees and 325 psi	g. The operator is reviewing 20M-6.4.A,		
"Reactor Coolant Pump Startup", Section	"Reactor Coolant Pump Startup", Section IV, A in preparation for starting Reactor		
 Coolant Pump [2RCS*P21A]. Reactor Coolant Pump Number 1 Seal Leakoff indicates 0.15 gpm on [2CHS*FR154B], Reactor Coolant Pumps Seal Water Leak Off Flow Primary Coolant Water Temperature From RCP Thermal Barrier is 122°F on [2CCP-TI107A] Thermal Barrier Temperature. RCP Seal Injection Flow is 6 gpm on [2CHS-FI130A], Seal Injection Flow. Volume Control Tank is 19 psig on [2CHS-PI117], Volume Control Tank Pressure. 			
Which of the following must be completed prior to starting the Reactor Coolant Pump?			
A. Raise seal leakoff flow to greater than 0.2 gpm.			
B. Lower Primary Coolant Water Temperature to less than 105°F.			
C. Raise seal injection flow to greater than 6 gpm.			
D. Lower VCT pressure to less than 15 psig.			
ANSWER: A			
K/A: 003 K4.07	Importance: 3.2		
Cognitive Level: Application			
References: 20M-6.4.A, Issue 4, Rev. 6, page 3			
Lesson Plan #: 2LP-SQS-6.3 Obj. #: 12			
History: NEW			
Source:	Type: OPEN BOOK		
JTA: 0030010101	Provide section of 6.4.A for pump 21A		

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42.	The unit is at 100% power with all systems NSA only 15 days after completion of		
	refueling. Due to an erroneous chemistry sample, the mixed bed demineralizer DEMIN		
	21B is placed in service with a fresh res	sin charge. Which one of the following results	
	should be anticipated by the operator?		
	A. A significant rise in Tavg.		
	B. An insignificant rise in Tavg.		
	C. A significant drop in Tavg		
	D. A insignificant drop in Tavg		
ANSV	WER: A		
К/А: (004 A2.32	Importance: 3.4	
	Cognitive Level: Comprehension		
Refer	References: Generic Fundamentals: Reactor Theory Fundamentals, Topic 3: Control Reactivity		
Effects. A: Soluble Boron 192004, K1.11, page 9, 2OM-7.2.A, Issue 4, Rev. 7 page 2,			
precaution 6			
	Lesson Plan #: 2LP-SQS-7.1 Obj. #: 8		
History: NEW			
Source: Type		Type: CLOSED BOOK	
JTA:	JTA: 0040100101		

43.	The unit is in Mode 1 returning to	The unit is in Mode 1 returning to power after a reactor trip. The operator is borating to		
	counteract the burnout of xenon	and hold rods at current positions. 20M-7.2.A "		
	Chemical and Volumne Control	Chemical and Volumne Control System Precautions and Limitations require that the		
	boron concentration of the press	surizer must be maintained within 50 ppm of the RCS.		
	Which of the following is proced	urally allowed to accomplish this task?		
	A. Throttle open one pre	essurizer spray valve.		
	B. Energize pressurizer	heaters.		
	C. Cycle one pressurize	r PORV.		
	D. Align excess letdown to the VCT.			
	WER: B			
K/A:	004 A4.15 <i>K/A CHANGE</i>	Importance: 3.6		
Cogn	nitive Level: Application			
Refe	rences: 2OM-7.4.K, "Blender Borat	ion Operations", Issue 4, Rev. 1, Page 2, Step 9		
Less	on Plan #: 2LP-SQS-7.1	Obj. #: 8		
Histo	ry: NEW			
Sourc	ce:	Type: OPEN Book		

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44. The unit is operating in Mode 3 at norm	The unit is operating in Mode 3 at normal temperature and pressure with Charging Flow		
Control valve [2CHS*FCV122] controllir	Control valve [2CHS*FCV122] controlling at 60 gpm. Letdown Orifice 23 Isolation Valve		
[2CHS*AOV200B] is open and letdown	[2CHS*AOV200B] is open and letdown flow at 60 gpm. The ANSS wants to close		
Charging Flow Control Valve [2CHS*FC	CV122] for troubleshooting.		
Failure to close 2CHS*AOV200B before	e closing 2CHS*FCV122 will result in		
which of the following?			
A. Overcooling of the Regenera	ative Heat Exchanger [2CHS*E23].		
B. Thermal shock to the reacto	B. Thermal shock to the reactor vessel in loop 21A.		
C. Flashing of letdown flow dov	vnstream of the letdown orifice.		
D. Thermal shock to the Mixed	Bed Demineralizers.		
ANSWER: C			
K/A: 004 K5.09	Importance: 3.7		
Cognitive Level: Application.			
References: 20M-7.2A, Issue 4, Rev. 5, Page 2 of 7			
Lesson Plan #: 2LP-SQS-7.1 Obj. #: 3			
History: NEW			
Source:	Type: OPEN Book		
JTA: 0040150101			

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45.	120 VAC Vital AC Bus II [UPS*VITBS2-2] is completely lost and all attached AC panels				
	are deenergized. Which of the following describes how the "A" and "B" Train of SSPS				
	will react to a signal requiring Safety Injection to be actuated?				
	3 - A. A Train Equipment actuates; "B" Train slave relays are deenergized.				
	B. "A" and "B" Train require manual actuation, slave relays are deenergized.				
	C. "A" and "B" Train equipment will actuate as required.				
	 A and D Main equipment will dottate do required. D. "A" equipment actuates "B" Train slave relays remain energized. <i>Wain</i> 				
ANSV	ANSWER: A				
K/A: 0	K/A: 013 K2.01 Importance:3.6				
Cogni	Cognitive Level: Comprehension				
	References: 20M-1.5 Issue 4, Rev. 3, Figure 1-41				
	Lesson Plan #: 2LP-SQS-1.2 Obj. #: 7				
10350					
History: NEW					
	Source: Type: Closed Book				
	JTA: 0130010101				

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46. The unit has experien	. The unit has experienced a large LOCA. With regards to the CIB (Containment			
Isolation Phase B) sig	Isolation Phase B) signal which of the following must be true in order to reset the CIB			
signal?				
A. The SI (Sa	fety Injection) signal must be reset prior resetting the CIB.			
B. The React	or Trip Breakers (RTA and RTB) must be closed.			
C. The contai	nment pressure must be less than the HI-1 setpoint.			
D. The containment pressure must be less than HI-3 setpoint.				
ANSWER: D				
K/A: 013 A 3.02 Importance: 4.1				
Cognitive Level: Application	Cognitive Level: Application			
References: FSAR Figure 7.3	3-13,			
Lesson Plan #: 2LP-SQS-1.2	Obj. #: 10			
History: NEW				
Source:	Type OPEN BOOK			
JTA: 0130010101 Give FSAR Figure 7.3-13				

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47. The RCS pressure drops below 1800 ps	The RCS pressure drops below 1800 psig and a reactor trip and safety injection signal			
is generated. All ESF equipment respor	is generated. All ESF equipment responds as required. RCS pressure stabilizes at			
1500 psig with flow indicated on High Head Safety Injection Flow [2SIS*FI943].				
With the Safety Injection system in this condition, which of the following failures is most				
likely to result in fuel damage in this condition?				
	\mathcal{A} A. LHSI Pumps [2SIS*P21A, 21B] fail to start.			
B. HHIS Pumps [2CHS*P21A, 2	B. HHIS Pumps [2CHS*P21A, 21B] trip after starting.			
C. Motor Driven Auxiliary Feedw	vater Pumps [2FWE*21A, 21B] trip after starting.			
$\mathcal{A}_{.}$ D. Recirculation Spray Pumps [2	$\mathcal{A}_{.}$ D. Recirculation Spray Pumps [2RSS*P21C, 21D] fail to start.			
ANSWER: B				
K/A: 013 K3.01	Importance: 4.4			
Cognitive Level: Comprehension				
References: 2OM-53B.E-1, Issue 1B, Rev 6, pa	ages 1 to 25			
Lesson Plan #: 2LP-SQS-11.1	Obj. #: 2			
History: NEW				
Source:	Turney Classed Book			
JTA:3010020601	Type: Closed Book			
JTA:3010020601				

48.	The unit is in MODE 2 and is critical at 1%. The Plant Operator informs the Reactor		
	Operator that N-35 "LOSS OF COMP VOLT" light is lit on the NI cabinet. Which of the		
	following describes the impact of	f the loss of voltage?	
	A. N-35 will indicate hig	her amps then N-36.	
	B. N-36 will indicate hig	her amps then N-35.	
	C. P-10 would actuate at a higher indicated power level.		
	D. P-6 would actuate at	a lower indicated power level.	
ANS	WER: A		
K/A: (015 A 2.02	Importance: 3.1	
Cogn	itive Level: Comprehension		
	rences:		
		PENSATOR TROUBLE", Issue 1, Rev. 3 Page 3	
		e Channel Malfunction" Issue 1A, Rev. 1, Step 4	
		OBJ: 2	
LP#:	2LP-SQS-2.1	085. 2	
Histo	ry: NEW		
Sour	ce:	Type :CLOSED BOOK	
JTA:	0000100401		

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ce Range High Voltage [N31, N32] while
Importance: 3.1
age 13, 14, and 15
Obj. #: 6
Type: CLOSED BOOK
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50. The highest reading Core Exit Thermocouple tri-sector average temperature provides				
which one of the following temperature inputs?				
A. Rod Control Program Median Tavg Selector.				
B. OPPS Train "A "Arming circuit.				
C. A4-3C "Tavg DEVIATION FROM Tref" deviation alarm.				
D. Vertical board Subcooling Monitor [2RCS*YI001].				
ANSWER: D				
K/A: 017 K4.01 Importance: 3.4				
Cognitive Level: Knowledge				
References: 2OM-5D.1.C, Issue 4, Revision 0, page 18 and 19				
Lesson Plan #: 2LP-SQS-5.2 Obj. #: 4				
History: NEW				
Source: Type: Closed Book				
JTA: 0830040101				

51. Containment Recirculation Fan 2HVR*FN201C is aligned to 480V Emergency Bus 2-				
and running. Under this alignment which of the following signals will STOP the fa				
A. Safety Injection Signal.				
	B. Containment Isolation Signal (CIA).			
	C. Containment Spray Actuation Signal (CIB).			
	D. High Containment Pressure Reactor Trip.			
	ANSWER: A			
K/A: 022 A3.01 K/A CHANGE Importance: 4.1				
Cogn	itive Level: Knowledge			
Refe	ences: 20M-44C.1.D, Issue 4, Rev. 0, Pa	ages 2 and 3		
Less	on Plan #: 2LP-SQS-44C.1	Obj. #: 7		
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Histo	ry: NEW			
Sourc		Type: Closed Book		
JTA:	0880040101	· ·		

52. The 2 nd Point Heater [2FWS-H22A] must be removed from service. Which of the				
following actions is needed to maintain reactor power within limits?				
A. Reactor power must be re	A. Reactor power must be reduced to 95% prior to removal from service.			
B. Turbine load must be redu	B. Turbine load must be reduced to 40% load to remove the entire heater train			
from service.				
C. Turbine load must be redu	uced until Condensate Pump Discharge Pressure is			
greater than 650 psig.				
D. 2nd Point Heater [2FWS-H22B] must be removed from service to limit delta				
T across turbine to less th	an 50°F.			
ANSWER: B				
K/A:056 A2.12	Importance: 2.8			
Cognitive Level: Application				
References: 20M-23B.4.C, Issue 1, Rev. 6 pages 4 and 5, 20M-23A.2.A Issue 4, Rev. 1				
Lesson Plan #: 2LP-SQS-23.1 Obj. #: 13				
History: NEW				
Source:	Type: OPEN BOOK			
JTA: 06EEE0101				

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53. Total steam flow out of all steam gen	. Total steam flow out of all steam generators at current reactor power is 2 million			
	pounds-mass per hour. Which of the following is the minimum required main			
feed/condensate pump combination	feed/condensate pump combination required by 20M-24.2.A "Main Feedwater			
Precautions and Limitations" for main	ntaining steam generator levels on program?			
A. One Main Feedwater Pur	ap and One condensate Pump.			
B. One Main Feedwater Pun	np and Two Condensate Pumps.			
C. Two Main Feedwater Pun	nps and One Condensate Pump.			
D. Two Main Feedwater Pun	nps and Two Condensate Pumps.			
ANSWER: B				
K/A: 059 A1.03 Importance: 2.7				
Cognitive Level: Application				
References: 2OM-24.2.A, Issue 4, Rev. 4 Pr	ecautions 2, 10, 16 and 17			
Lesson Plan #: 2LP-SQS-SC Obj. #: 7				
History: NEW				
Source:	Type: OPEN BOOK			
JTA: 0590030101 Give 2OM-24.2.A				

54.	Unit 2 is escalating power after a 4 week Mode 5 outage. The unit is operating at 25%					
	power with all systems NSA for this power level. The operating Main Feedwater Pump					
	trips.					
	Which of the following would be the first automatic action?					
	A. All three auxiliary feedwater pumps start after 150 seconds on the AMSAC timer.					
	B. Both Motor Driven Auxiliary Feedwater Pumps [2FWE*P22A, 22B] start on low					
	S/G level.					
	C. Turbine Driven Auxiliary Feedwater Pump [2FWE*P23] starts on low S/G levels.					
	D. Both Motor Driven Auxiliary Feedwater Pumps [2FWE*P22A, 22B] start on trip of					
	the Main Feedwater Pump.					
ANSV	ANSWER: D					
K/A: 0	K/A: 059 K3.02 Importance: 3.6					
Cogni	tive Level: Knowledge					
Refer	ences: 20M-24.1.D, Issue 4, Rev. 2					
Lesso	n Plan #:: 2LP-SQS-24.1	Obj. #: 10				
Histor	y: NEW					
Sourc		Type: CLOSED BOOK				
	0610030101					

55.	The unit is holding at HOT SHUTD	OWN following a unit trip. Over the next hour, wh	
	of the following adjustments should the operator expect to make to maintain steam		
	generator levels at no load values?		
	A. Raise feedwater flow to	match decay heat load steam flow.	
	B. Drop feedwater flow to r	natch decay heat load steam flow.	
	C. Reset and restart one M	ain Feedwater pump to match steam flow.	
	D. Maintain 365 gpm minin	num feedwater flow to each steam generator.	
ANSV	VER: B		
K/A: (061 K1.01	Importance: 4.1	
Cogn	tive Level: Comprehension		
Refer	ences: 2OM-53B.5.GI-4, issue 1B, R	ev. 1, page 4 and 5	
Lesso	n Plan #:2LP-SQS-24.1	Obj. #:8	
Histor	y: NEW		
Sourc		Type: CLOSED BOOK	
	0610040101		
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56.	With both Motor Driven Auxiliary Feedwater Pumps [2FWE*P22A,22B] in service and					
	taking suction from the Primary Plant Demineralized Water Storage Tank					
	[2FWE*TK210].					
	Which of the following Motor Driven Auxiliary Feedwater Pump indications would alert					
			on to the operating pumps?			
	Pump Amps Discharge Pressure Flow					
	Α.	LOW	HIGH	LOW		
	В.	HIGH	LOW	HIGH		
	C.	ZERO	Equal to Suction	ZERO		
	D.	LOW	LOW	LOW		
ANSWER: D						
K/A: 061 A1.05						
Cognitive Level: Application						
Refere	References: Generic Fundamentals. Pump Performance with loss of suction					
Lesson Plan #: 2LP-SQS-24.1 Obj. #: 8						
History: NEW						
Source	Source: Type: Closed Book					
JTA:06	JTA:0610050101					

57. A change in setpoint for Process Effluent Radiation Monitor [2SGC-RQI100] is needed	
to release a Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B).	
This setpoint change can only be implemented under which of the following conditions?	
A. "Supervisor Mode" at the Health Physics RM-23A console.	
B. "Supervisor Mode" at the Control Room RM-23A console.	
C. At 2SGC-DAU100 (RM-80) on the monitor skid.	
D. At the RM-11 Local Panel console.	
ANSWER: B	
K/A: 068 2.3.11 <u>K/A CHANGE</u>	Importance: 2.7
Cognitive Level: Knowledge	
References: 20M-43.1.C, Issue 4, Rev. 3, page 2	
Lesson Plan #: 2LP-SQS-43.1	Obj. #: 7
History: NEW	
Source:	Type: Closed Book
JTA: 0720030101	

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58.	58. Annuciator A1-5A " GASEOUS WASTE SYSTEM TROUBLE" is in alarm. Computer			
	points 1/Y6557D and Y6558D * GWS OXY ANALYZER GWS-OA100A (B) WARI			
	in alarm. Failure to respond to this alarm could result in which of the following?			
	A. Increased corrosion to the inner surface of Waste Gas Tanks.			
	B. Loss of water seal to the operating Waste Gas Compressors.			
	C. Buildup to flammable concentrations of gasses in the Waste Gas Tanks.			
	D. Corrosion damage to the Waste Gas System Charcoal Delay Beds.			
ANSW	ANSWER: C			
K/A: 071 A4.29 Importance: 3.0		Importance: 3.0		
Cognit	Cognitive Level: Knowledge			
Refere	References: 20M-19.1.B, Issue 4, Rev 5, Page 2, 20M-19.2, Issue 4, Rev. 1, Precaution 9			
		Obj. #: 3		
History	History: NEW			
Source	9:	Type Closed Book		
JTA: 0	JTA: 0710070101			

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59. If Control Room Area Radition Monitor [2RMC*RQ201, 202] goes into ALERT what			
ure to gamma.			
a particulate release.			
particulate release.			
ure to neutrons.			
K/A: 072 K5.01 Importance: 2.7			
Cognitive Level: Knowledge			
ge 4			
Lesson Plan #: 2LP-SQS-43.1 Obj. #: 3			
Type: Closed Book			
JTA: 0720030101			

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60. The Unit is in MODE	5:	
RHS is in	 RHS is in service with the entire RCS at 130°F OPPS is NSA for MODE 5 and in service 	
OPPS is		
How many Reactor (Coolant Pumps may be started for heat up of the RCS under the	
condition?		
A. NONE		
B. ONE		
C. TWO		
D. THREE		
ANSWER: B		
K/A: 002 K1.13	Importance: 4.1	
Cognitive Level: Comprehen	ision	
References: 20M-6.4A."Rea	actor Coolant Pump Startup" Issue 4, Rev. 6, Page 1	
Lesson Plan #: 2LP-SQS-6.3	3 Obj. #: 12	
History: NEW		
Source:	Type: OPEN BOOK	
JTA: 003AAA0401	Copy of procedure	

61. A natural circulation cooldown is in progress in accordance with ES-0.2 *Natural			
Circulation Cooldown." The following in	Circulation Cooldown." The following information is available to the operator from		
PSMS.			
Core Exit Thermocouples (Ps	SMS)		
• Trisector 1= 495			
• Trisector 2 = 490			
• Trisector 3 = 488			
	ndicator [2RCS*PT440] = 1185 psig		
	ndicator [2RCS*PT441] = 1200 psig. ndicator [2RCS*PT442] = 1205 psig		
Using the listed information, which of the	e following would be the most conservative		
reading that should appear on the Subco	poling Monitor [2RCS*YI001] on VB-B		
subcooling?	nor clausable		
subcooling? A. 41 degrees Superheat			
B. Zero (0) degrees - saturated			
C. 41 degrees subcooled $72^{\circ}F$			
D. 92 degrees subcooled			
ANSWER: D			
K/A: 006 A1.16	Importance: 4.1		
Cognitive Level: Application			
References: Steam Tables 20M-53.3B ES-0.2, Foldout page.			
Lesson Plan #: 2LP-SQS-6.7 Obj. #: 7			
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History: NEW			
Source: Type: OPEN REFERNCE			
ITA: 3010060601 Give steam tables			

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	62. The unit is in mode 3 with the RCS at no load operating temperature and pressure.			
	Which of the following configurations would provide the operator with the most			
	pressurizer spray ?			
	A. Reactor Coolant Pump 2A [2RCS*P21A] ON and Pressurizer Spray Valves			
	[2RCS*PCV455A] OPEN, [2RCS*PCV455B] CLOSED. B. Reactor Coolant Pump 2C [2RCS*P21C] ON and Pressurizer Spray Valves [2RCS*PCV455B] OPEN, [2RCS*PCV455A] CLOSED.			
	C. Reactor Coolant Pump 2A [2RCS*P21A] ON and Pressurizer Spray Valves			
	[2RCS*PCV455B] OPEN, [2RCS*PCV455A] CLOSED.			
	D. Reactor Coolant Pump 2B [2RCS*P21B] ON and Pressurizer Spray Valves			
	[2RCS*PCV455A] OPEN, [2RCS*PCV455B] CLOSED.			
	K/A: 01	0 K1.03	Importance: 3.6	
	Cognitive Level: Comprehension			
	References: 20M-6.1.C, Issue 4, Rev. 0, Page 28			
	Lesson	Plan #: 2LP-SQS-6.4	Obj. #: 8	
	· · · · · · · · · · · · · · · · · · ·			
	History: NEW			
	Source:		Type: Closed Book	
	JTA: 0020090101			
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63. Pressuizer Control Level Switch is selected to position I & III. Which of the following			
instruments will turn off all the operating heater groups on low level?			
	A. 2RCS*LT459 OR 2RCS*LT461		
	B. 2RCS* LT460 OR 2RCS*LT462.		
	C. 2RCS*LT459 OR 2RCS*LT460		
D. 2RCS*LT461 OR 2RCS*LT462			
ANS	WER: A		
K/A: 011 K4.01 Importance: 3.3			
Cognitive Level: Knowledge			
Refer	References: 20M-6.4.IF, Issue 4, Revision 5, Page 13		
Lesso	Lesson Plan #: 2LP-SQS-6.4 Obj. #: 13		
Histor	y: NEW		
Source: Type: CLOSED BOOK			
JTA: 0020090101			

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64.	During a depressurization of the RCS, which of the following trips is designed		
	specifically to prevent DNBR from reaching the safety limit specified in Section 2 of		
	Technical Specifications?		
	A. Pressurizer High Pressure.		
	B. Power Range High Neutron Flu	IX.	
	C. Overtemperature Delta-Temper	rature.	
	D. Overpower Delta-T.		
ANSV	VER: C		
K/A: 012 K5.01		Importance: 3.3	
Cognitive Level: Knowledge			
References: 20M-1.1.B, Issue 4, Rev. 1 pages 5 and 6			
Lesson Plan #: 2LP-SQS-1.1		Obj. #: 5	
History: NEW			
Sourc	e:	Type: Closed Book	
JTA: 0120050101			

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65.	The annuciator A4-8G " ROD POSIT	ON DEVIATION ALARM" informs the operator of	
which of the following deviations in the Rod Position Indication System? A. At least one DRPI signal deviates 12 steps from the Group Demand for that			
			group.
	B. At least one Group Demand signal deviates 12 steps from the Bank Demand		
signal.			
	C. There is a one bit difference b	etween Data Cabinet A and Data Cabinet B.	
	D. Group demand signal is within	10 steps of the calculated Rod Insertion Limit.	
ANSV	VER: A		
K/A: 014 A1.02		Importance: 3.2	
Cogni	tive Level: Knowledge		
Refere	ences: 2OM-1.1.B, Issue 4, Rev. 1 page	e 20, 2OM-1.4.ACF, Issue 4, Rev. 1	
Lesson Plan #:2LP-SQS-1.1		Obj. #: 8	
Histor	y: NEW		
Source	e:	Type: Closed Book	
)140030101		

The unit is at 100% power with all systems NSA Main Condenser Vacuum (2CNM-			
The unit is at 100% power with all systems NSA. Main Condenser Vacuum [2CNM-			
CND21A] Section A Condenser Vacuum Transmitter [2CNM-PT103A] is damaged.			
ondenser Vacuum Transm	hitter [2CNM-PT103B] is intact. Annuciator A12-		
ENSER UNAVAILABLE (C-	-9) is lit.		
If the unit suffered a large load rejection at this point, which of the following steam			
ways would open first?			
A. 1 st and 2 nd Bank Steam Bypass Valves.			
B. 3 rd and 4 th Bank Steam Bypass Valves.			
C. Residual Heat Release Valve [2SVS*HCV104].			
spheric Steam Dumps [2S	SVS*AOV101A, 101B, 101C].		
ANSWER: D			
K/A: 016 K1.03 Importance: 3.2			
Cognitive Level: Comprehension			
References: 20M-22A.5, Issue 4, Rev. 0, Figure 22A-1, 20M-21.5, Issue 4, Rev. 2, Figure 21-			
9B (12241-LSK-11-14B)			
Lesson Plan #: 2LP-SQS-21.1 Obj. #: 3			
History: NEW			
	Type: CLOSED BOOK		
JTA: 0410030101			
	ection A Condenser Vacuu ondenser Vacuum Transm ENSER UNAVAILABLE (Configered a large load rejection ways would open first? and 2 nd Bank Steam Bypass and 4 th Bank Steam Bypass dual Heat Release Valve [2 <u>espheric Steam Dumps [25</u> <u>mprehension</u> 2A.5, Issue 4, Rev. 0, Figur 14B)		

67. Which of the following describ	bes the impact from a failure of Quench Spray Pumps		
[2QSS*P21A,21B] to start as	required by a CIB signal during a Design Basis LOCA?		
A. Implementation of EC	A-1.1 "Loss of Emergency Coolant Recirculation" will be		
entered due to the lac	entered due to the lack of sump level.		
	B. Recirculation Mode Initiation Signal is delayed by the slower RWST depletion		
rate.			
	would accord the about off head of Desire ulation Operation		
	C. Containment pressure would exceed the shutoff head of Recirculation Spray		
·	Pumps A and B [2RSS*P21A, 21B].		
D. Start up of Recirculation Spray Pumps C and D [2RSS*P21C, 21D] is delayed b			
slower RWST depletio	<u>n.</u>		
ANSWER: B			
K/A: 026 K3.02	Importance: 4.2		
Cognitive Level: Comprehension			
References: 20M-13.1.D, Issue 4, Re	ev. 0		
Lesson Plan #:: 2LP-SQS-13.1	Obj. #: 4		
	· · · · · · · · · · · · · · · · · · ·		
History: NEW	· · · · · · · · · · · · · · · · · · ·		
Source:	Type: Closed Book		
JTA:0060150101	By inspection. QSS flow is approx. 6000 gpn		
	less and will slow rate of depletion of RWST.		
	DBA so sump level will be present.		
	RSS pump capability is above design basis		

8. Unit 2 is at 100% power with all systems NSA. Which of the following is used to				
maintain the Containment at subatmospheric conditions?				
A. Containment Vacuum Air Ejecto	A. Containment Vacuum Air Ejector [2CVS-J22] in operation.			
B. Containment Vacuum Pumps [2	CVS-P21A,P21B] selected to AUTO.			
C. Containment Vacuum Pump [20	CVS-P21A,P21B] manually started as required.			
D. Containment Air Compressor [2	IAC-C21A,C21B] aligned to take suction on			
Containment.	·			
ANSWER: C				
K/A: 029 K. 4.02 Importance: 2.9				
Cognitive Level: Knowledge				
References: 20M-12.1.C, Issue 4, Rev. 0, 20M-12.4.E, Issue 4, Rev. 0				
Lesson Plan #: 2LP-SQS-12.1	Obj. #: 3			
History: NEW				
Source:	Type: CLOSED BOOK			
JTA: 0260060101				

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69.	New fuel with an enrichment of 4.2% is being placed in the spent fuel pool. Which of			
	the following complies with the Technical Specification Limiting Condition for Operation?			
	A. Storage is allowed in Region 2 of the Spent Fuel Pool with no restrictions.			
	B. Storage is allowed in Region 1 of the Spent Fuel Pool with no restrictions.			
	C. Fuel with this enrichment must be stored in a 3 out of 4 Checkerboard			
	pattern in Region 1.			
	D. Fuel with this enrichment may be stored in a 3 out of 4 Checkerboard patterr			
	in Region 2.			
ANSV	SWER: C			
K/A:	K/A: 033 G 2.2.30 Importance: 2.6			
Cogn	Cognitive Level: Application			
References: BVPS Technical Specifications 3/4.9.14				
Lesson Plan #: 2LP-SQS-20.1		bj. #: 10		
History: NEW				
Sourc	Source: Type: OPEN BOOK			
JTA: 033A0101 Tech Spec Reference for Student		ch Spec Reference for Student		

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70.	The unit is stable at 8% power with the	Main Turbine off-line. The Main Feedwater		
	Regulating Bypass Valves are in auton	natic and controlling at program level.		
	Inadvertently, loop 21A Main Steam At	mospheric Vent Valve [2SVS*PCV101A] fails full		
	open. Which of the following is the result of the valve opening? $\leftarrow \int $			
	Inadvertently, loop 21A Main Steam Atmospheric Vent Valve [2SVS*PCV101A] fails full would BC open. Which of the following is the result of the valve opening? Immud ov fr. time A. Intermediate Range High Reactor Power Trip is generated.			
	B. Reactor Trip due to Steam Generator 21A Low-Low level.			
	C. Steam Generator 21A level rises on increased steam demand.			
	D. Steam Generator 21 A level	rises to new program level.		
ANSW	/ER: C			
K/A: 0	35 K6.02	Importance: 3.1		
Cognit	tive Level: Comprehension			
Refere	ences: Generic Fundamentals, 2OM-21.1	I.D, Issue 4, Rev. 2, page 1		
Lesso	n Plan #: 2LP-SQS-24.1	Obj. #: 8		
History	/: NEW			
Source):	Type: Closed Book		
JTA: 0	350060101			

71.		down from extended full power operations. Stm Du
	Control Mode Selector is in STI	M PRESSURE mode. The operator adjusts the se
	on the Main Stm Manifold Pres	s Control [2MSS*PK422] from 8.8 turns to 8.5 turn
	operator observes Tavg	and Loop Delta T?
	A. Drop and drop.	and Loop Delta T?
	B. Drop and remain the	same.
	C. Rise and rise.	
	D. Rise and drop.	
ANSV	VER: B	
K/A: 0	39 A1.05	Importance: 3.2
Cogni	tive Level: Comprehension	
Refer	ences: See heat exchanger beha	vior GF. 20M-21.1.C
Lesso	n Plan #: 2LP-SQS-21	Obj. #: 3.
Histor	y: NEW	
Sourc	8:	Type: CLOSED BOOK

72. Annuciator A6-5G *CC	ONDENSER VACUUM LOW/LOW-LOW" alarm is lit. The		
operators are verifying	g criteria for proper operation of the Air Ejectors. Which of the		
following operating co	inditions could cause this alarm?		
A. Auxiliary Stear	m Supply to the Air Ejectors is 150 psig.		
B. Condensate Te	B. Condensate Temperatures leaving the air ejectors indicates 105 degrees.		
C. Intercondenser	r Loop Seals [2ASS-LG101A, B] indicate drained.		
. D. Mezzanine ver	nts 2ARC-357 and 2ARC-930 are open.		
ANSWER: C			
K/A: 055 K3.01	Importance: 2.5		
Cognitive Level: Comprehens	sion		
References: 20M-26.4.H, Issu	ue 1, Rev. 10, Attachment 1		
Lesson Plan #: 2LP-SQS-26.2	2 Obj. #: 7		
History: NEW			
Source:	Type: OPEN Book		

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73. The unit is in Mode 4 and heating up	b. All reactor coolant pumps are running. The 4KV		
Normal Electrical System is in NSA	for Mode 4. Which of the following is the source of		
power to Reactor Coolant Pump 21A [2RCS*P21A]?			
A. 138 kV Bus # 2 via System Station Service Transformer 2A.			
B. 138 kV Bus # 1 via System Station Service Transformer 2B.			
C. 345 kV Bus 3 via Unit Station Service Transformer 2C.			
D. Unit 1 4KV Bus 2A via Unit 1 to 2A Cross-Tie [ACB-2A2].			
ANSWER: A			
K/A:: 062 K2.01	Importance: 3.3		
Cognitive Level: Comprehension			
References: 2OM-36.1.B, Issue 4, Rev. 0, Page 1			
Lesson Plan #: 2LP-SQS-36.1 Obj. #: 4			
History: NEW			
Source:	Type: OPEN BOOK		
JTA: 0620040101	Give basic electrical print?		

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74.	Annuciator A8-10A "125 VDC BUS 2-1 GROUND" is lit. NO. 2-1 DC Bus Ground		
	Detector indicates a -75 VDC gro	ound. Under these conditions, which of the following is	
	a concern?		
	A. The 2-1 Battery may be inoperable due to low voltage.		
	B. The 2-1 Battery Charger	Output Breaker may trip on overcurrent.	
	C. A 125 VDC Bus 2-1 load	could actuate inadvertently if a positive ground occurs	
<u></u>	D. 125 VDC Bus 2-1 Distribu	ution Switchboard may trip on voltage differential.	
ANSW	ER: C		
K/A: 06	63 A2.01	Importance: 2.5	
Cogniti	ve Level: Comprehension		
		0, 20M-39.4.F. Issue 4. Rev. 1 Section II. (This	
Refere	nces: 2OM39.1.C, Issue 4, Rev.	0, 20M-39.4.F, Issue 4, Rev. 1 Section II. (This	
Referei referen	nces: 2OM39.1.C, Issue 4, Rev.	IN OM actually says device will actuate.)	
Referei referen	nces: 2OM39.1.C, Issue 4, Rev. ce is real shaky here. NOTHING		
Referen referen Lesson	nces: 2OM39.1.C, Issue 4, Rev. ce is real shaky here. NOTHING Plan #: 2LP-SQS-39.1	IN OM actually says device will actuate.)	
Referei referen	nces: 2OM39.1.C, Issue 4, Rev. ce is real shaky here. NOTHING Plan #: 2LP-SQS-39.1	IN OM actually says device will actuate.)	

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75. Unit 2 is at 100% power with all system	ns NSA. 2OST-36.1 "Emergency Diesel			
Generator [2EGS*EG2-1] Monthly Tes	Generator [2EGS*EG2-1] Monthly Test* is in progress with the diesel paralleled to 2AE			
and at 4450 KW for the last 30 minutes	and at 4450 KW for the last 30 minutes. Without warning the unit trips and a Safety			
injection signal is actuated. A "Fast Transfer" from USST to SSST occurs with no				
problems. What is the status of Emergency Diesel Generator [2EGS*EG2-1] at the				
completion of the transfer?				
A. Paralleled with Emergency Bus 2AE with Emergency Diesel Generator Breaker				
[ACB2E10] closed.				
B. At rated speed and voltage with	Emergency Diesel Generator Breaker			
[ACB2E10] open.				
C. In "Cooldown" cycle with Emerg	gency Diesel Generator Breaker [ACB2E10]			
open.				
D. Tripped with Emergency Diesel	Generator Breaker [ACB2E10] locked out.			
ANSWER: B				
K/A: 064 A2.16	Importance: 3.3			
Cognitive Level: Comprehension				
References: 2OST-36.1, Issue 4, Rev. 24 page 7, 2OM-36.1.D, Issue 4, Rev. 3, page 31				
Lesson Plan #: 2LP-SQS-36.2 Obj. #: 5				
History: NEW	· · · · · · · · · · · · · · · · · · ·			
Source:	Type: Closed Book			
JTA: 0640040101				

76. The Unit is in MODE 5, Containment F	Purge to the Auxiliary Bulding Ventilation Vent is		
in progress when Containment Purge Monitor [2HVR*RQ104A, 104B] HIGH Alarm is			
activated. Which of the following fans when tripped will close the Containment Isolation			
Valves [2HVR-MOD23A,23B,25A,25B]?			
A. Containment Air Recirculation Fan [2HVR-FN201B].			
B. Containment lodine Filtration Fan [2HVR-FN203B].			
C. Leak Collection Filter Exhaust Fan [2HVS-FN204B].			
D. Leak Collection Normal Exhaust Fan [2HVS-FN263B].			
ANSWER: D			
K/A: 073 K4.01 Importance: 4.0			
Cognitive Level: Comprehension			
References: 20M-43.1.C, Issue 4, Rev. 3, page 43			
Lesson Plan #: 2LP-SQS-43.1 Obj. #: 7			
History: NEW			
Source:	Type: CLOSED BOOK		
JTA: 072BBB0221			

77. T	ne Unit is at 100% power. If	e operator is preparing to start Service Water pump	
•	2SWS-P21A]. Which of the for ontrol board?	lowing parameters will prevent a pump start from the Conditions	
	A. Service Water Pum	(2SWS-P21B) in AFTER START.	
i	B. Standby Service Water Pump [2SWE-P21A] in AFTER START.		
	C. Secondary Component Cooling Water Heat Exchanger Service Water		
	Supply Isolation Valve [2SWS*MOV107A] OPEN.		
	D. Service Water Pum	Discharge Valve [2SWS*MOV102A] OPEN.	
ANSWEI	R: D		
ANSWEI K/A: 076		Importance:2.9	
K/A: 076		Importance:2.9	
K/A: 076 Cognitive	A4.02		
K/A: 076 Cognitive Referenc	A4.02 e Level: Knowledge		
K/A: 076 Cognitive Referenc	A4.02 e Level: Knowledge ces: 2OM-30.1.D, Issue 4, Re	. 4, pages 4,5 and 14	
K/A: 076 Cognitive Referenc	A4.02 e Level: Knowledge ces: 2OM-30.1.D, Issue 4, Re Plan #: 2LP-SQS-30.1	. 4, pages 4,5 and 14	
K/A: 076 Cognitive Reference Lesson F	A4.02 e Level: Knowledge ces: 2OM-30.1.D, Issue 4, Re Plan #: 2LP-SQS-30.1	. 4, pages 4,5 and 14	

78.	Containment Instrument Air Compress	ors [2IAC-C21A, 21B] are out of service. Station		
	Air Compressor [2SAS-C21A] is supplying containment instrument air with Containme			
	Instrument Air Isolation Valve [2IAC-MOV130] and Containment Instrument Air Backu			
	Supply Valve open [2IAC*MOV131]. A CIA signal was actuated. Which of the followin			
	configurations is expected?			
	A. 2IAC-MOV130 open, 2IACMOV131 open.			
	B. 2IAC-MOV130 closed 2IACMOV131 open.			
	C. 2IAC-MOV130 closed, 2IACMOV131 closed.			
	D. 2IAC-MOV130 open, 2IACMOV131 closed.			
ANSV	VER: B			
K/A: 0	K/A: 079 K4.01 Importance: 2.9			
Cognitive Level: Knowledge				
References: 20M-34.1.D, Issue 4, Rev. 1, page 6				
Lesso	Lesson Plan #: 2LP-SQS-34.1 Obj. #: 5.a			
Histor	y: NEW			
Sourc	e:	Type: OPEN BOOK		
JTA	0784440101	Figure 34-1		

79 A CO_2 discharge is imminent in a protected zone. Which of the following actions are available to alert personnel in the protected zone?

- A. Predischarge warning horn sounds inside the protected zone.
- B. Blue rotating lights are initiated in all occupied areas for the protected zone.
- C. A Wintergreen oderizer is released in the zone prior to discharge.
- D. All key card controlled entrance doors are locked closed for the affected zone.

ANSWER: A			
K/A: 086 A4.04	Importance: 3.1		
Cognitive Level: Knowledge			
Ref.: 20M-33.1.D "Fire Protection Systems Instrumentation and Control", Issue 4, Rev. 2,			
Page 4 of 11			
LP#: 2LP-SQS-33	OBJ: 4		
History: 2LOT2, 11/7/97, (Fire Protection, Alt. Safe Shutdown, Type: CLOSED BOOK Injury and Casualty Control), Used on 2LOT2A Exam question 78			
Source: Based on SQS 1132,			
JTA: 0860070101			

80. The unit is in MODE 5 with the RCS or	The unit is in MODE 5 with the RCS operating at Reduced Inventory. Procedure 20M-		
10.4.D RHS Operation With RCS At Re	educed Inventory/Midloop Condition" is in		
progress. The RCS is drained to 3 fee	t below the flange. Which of the following is an		
acceptable flow configuration for the RHR pumps?			
A. RHR Pumps [2RHR*P21A,	and 21B] running with total system flow limited to		
3000 gpm including letdown	flow and recirculation for the pumps.		
B. RHR Pumps [2RHR*P21A] OR [RHR*P21B] operating at less than 3000			
gpm.			
C. RHR Pumps [2RHR*P21A]	OR [2RHR*P21B] operating at less than 4000		
gpm.			
D. RHR Pumps [2RHR*P21A, a	and 21B] running with total system flow limited to		
4350 gpm including letdown flow and recirculation for the pumps.			
ANSWER: C			
K/A: 005 K3.01	Importance: 3.9		
Cognitive Level: Comprehension			
References: 20M-10.2.A, Issue 4, Rev. 6, Page 2			
Lesson Plan #: 2LP-SQS-10.1	Obj. #: 10.a		
History: NEW			
Source:	Type: OPEN BOOK		
JTA: 005AAA0101	Limits and precautions in reference		

and it B'C not C

81.	The plant is in Mode 4 on RHR with a cooldown to Mode 5 in progress. The "A" Train of
	RHS is in service. During the construction of scaffolding on the RHR platform, the
	instrument air line to [2RHS*HCV758A] is broken, resulting in the loss of air to the valve.
	Which of the following describes the impact on RHS Heat Exchanger Outlet Flow
	Control Valve 2RHS*HCV758A and RHS system flow?

- A. The valve fails open. [2RHS*FCV605A] automatically closes to control flow.
- B. The valve fails open. The RHR pump will run out at maximum system flow.
- C. The valve fails closed. [2RHS*FCV605A] automatically opens to maintain flow.
- D. The valve fails closed. [2RHS*FCV605A] must be manually opened to maintain flow.

ANSWER: A		
K/A: 005A2.04	Importance: 2.9/2.9	
Cognitive Level: Comprehension		
Ref.: 20M10.5"Residual Heat Removal Systems Figures and Tables" Figure10.1		
_P#: 2LP-SQS-10.1 OBJ: 8		
History NEW		
Source:		
JTA: 0050080101 Type: CLOSED BOOK		

82. Which of the following describes the function of the sparger installed in the Press Relief Tank [2RCS*TK22]?			
		A. Allows drainage of the P Pumps [2DGS*P21A, 2	Pressurizer Relief Tank via Primary Drains Transfer 1B].
 B. Reduces pressure by spray from Pressurizer Relief Tank Spray Valve [2 MOV516]. C. Directs steam discharge from Pressurizer PORV's [2RCS*455C,D, 2RC to bottom of tank. D. Mixes nitrogen cover gas into tank volume via Nitrogen Supply Valve [2RCS*AOV101]. 			
		ANSWER: C	
		K/A: 007 K4.01 <u>K/A CHANGE</u>	Importance: 2.6
Cognitive Level: Knowledge			
References: 20M-6.1.C, Issue 4, Rev.	0, page 33		
Lesson Plan #: 2LP-SQS-6.4 Obj. #: 7			
History: NEW			
Source:	Type: CLOSED BOOK		
Ource.			

83. Th	The Containment Iodine Filtration Charcoal adsorbers [2HVR-FLTA211A(B)] are			
designed for iodine removal from containment during which of the following scenerios?				
	Α.	Normal subatmospheric and	shutdown plant operations for normal	
		containment access.		
	В.	Post Design Basis LOCA atmospheric clean up of containment prior to any		
		release to the Uncontrolled Area.		
	C.	C. Scrubbing of Containment Purge Exhaust during Containment RWDA-G		
		releases.		
	D.	. Filtering exhaust during the initial lift of the vessel head prior to refueling		
	canal flooding.			
ANSWER:	A			
K/A: 027 K5.01 Importance: 3.1		Importance: 3.1		
Cognitive Level: Knowledge				
References: 2OM-44C.1.B				
Lesson Pla	Lesson Plan #: 2LP-SQS-44C.1 Obj. #: 1			
History: NEW				
Source:	Source: Type: CLOSED BOOK			
JTA: 02700	JTA: 0270010101			

84.	Step 29 of E-1 " Loss of Reactor or Secondary Coolant" checks H2 concentration in		
	preparation for startup of the Hydrogen Recombiners. If H2 concentration is 4.5%, why		
	must the TSC be consulted prior to star	tup of the Hydrogen Recombiners?	
	A. The hydrogen recombiner could	ignite a hydrogen burn during on line	
	operations.		
	B. Hydrogen concentration is above	e the design capacity of the recombiner.	
	C. Core damage is indicated and d	ose rates will be higher than projected while	
	aligning containment penetrations.		
	D. Containment depressurization to subatmospheric conditions must be completed		
prior to recombiner startup.			
ANSWE	ER: A		
K/A: 028 A2.02		Importance: 3.5	
Cognitive Level: Knowledge			
References: 20M-53B.4.E-1 Background, Issue 1B, Rev. 6, step 29			
Lesson	Plan #: 2LP-SQS-53.3	Obj. #: 3	
	<u></u>		
History: NEW			
Source:		Type: Closed Book	
JTA: 3010020601			

85.	Unit 2 is at 100% with all systems NSA and control rods in MANUAL. Without warning		
	large load rejection occurs and	A4-8A '	" ROD CONTROL SYSTEM URGENT ALARM"
	annunciates. Which of the follow	wing ac	ctions occur or must be completed due to this
	alarm?		
	A. Rods step in at the fixed	speed	rate of 48 steps per minute.
B. Control Rod Bank Selector Switch must be placed in AUTO to allow rods to st			tch must be placed in AUTO to allow rods to step
	in.		
C. Operator must insert rods in MANUAL to clear Tavg-Tref mismatch.			NUAL to clear Tavg-Tref mismatch.
	D. Steam Dumps are forced	d to con	ntrol a higher Tave-Tref mismatch.
ANSV	VER:D		
K/A: 041 K6.03			Importance: 2.7
Cogn	itive Level: Comprehension		
Refer	ences: 20M-1.1.C, Issue 4, Rev. (0	
Lesson Plan #: 2LP-SQS-21.1			Obj. #: 5.c
	•		
Histor	y: NEW		
Sourc	e:		Type: Closed Book
JTA: (0410030101		

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86. The Unit is at 100 % with all systems N	The Unit is at 100 % with all systems NSA. The unit experiences an Overtemperature		
Delta T runback. The runback signal c	Delta T runback. The runback signal clears. Which one of the following indicates the		
expected response of the main turbine	?		
A. Main Turbine Governor valves v	vill hold at the runback position.		
B. Main Turbine Governor valves v	vill return to original load position.		
C. Turbine Load Control drops out	C. Turbine Load Control drops output to minimum load at the selected loading rate.		
D. Main Turbine Governor valves o	control turbine speed to 1800 rpm at minimum		
load.			
ANSWER: A			
K/A: 045 K4.12 Importance: 3.3			
Cognitive Level: Knowledge			
References: 2OM-26.1.D, Issue 4, Rev. 2, page 31 and 32			
Lesson Plan #: 2LP-SQS-26.3 Obj. #: 4			
History: NEW			
Source: Type: Closed Book			
ITA: 0450070101			

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87. The Unit is at 100% power with all sy	The Unit is at 100% power with all systems NSA. Service Water is 75°F. Containment		
temperature is 90°F. Which of the fo	temperature is 90°F. Which of the following is the Maximum Allowable Primary		
Containment Air Pressure?			
A. Less than or equal to 9.0 psia			
B. Greater than 9.0 psia and less	s than 9.65 psia.		
C. Greater than 9.65 psia and les	ss than 10.5 psia.		
D. Greater than 10.5 psia.			
ANSWER: B			
K/A: 103 A1.01	Importance: 3.7		
Cognitive Level: Application			
References 20M-12.5 Figure 12-1, Technical Specification 3.6.1.4			
Lesson Plan #: 2LP-SQS-12.1 Obj. #: 9.d			
History: NEW			
Source: Type: OPEN BOOK			
JTA: 103DDD0101 Figure 12.1			

opinatione but Viery easy. A + D Not planable.

88. Unit 2 is in Mode 1 with all systems NS	A. You are assigned as the on duty NCO.		
Which of the following Control Room an	Which of the following Control Room areas are within the assigned "At Controls" area?		
A. Unit 1/Unit 2 Control Room	separation doors.		
B. Inside the Unit 2 Nuclear Shift Supervisor's Office.			
C. Unit 2 Digital Radiation Monitor Console.			
D. Inside the Unit 2 Vertical Bo	ard [VB-A].		
ANSWER: C			
K/A: 2.1.1 Importance: 3.7			
Cognitive Level: Knowledge			
References: 1/2OM-48.1.A, Issue 3, Rev. 15, page 5 and 8			
Lesson Plan #: 1/2LP-SQS-48.1 Obj. #: 4			
History: NEW			
Source: Type: CLOSED BOOK			
JTA:119CCC0301			

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89.	89. The unit has operated at 100% power for 100 days and all systems are NSA. The		
power range Nuclear Instruments read as follows • N-41 - 99% • N-42 - 99.7% • N-43 - 99.6% • N-44 - 98.8%			
	At the completion of 2OM-54.4.C1 * Da	aily Heat Balance" calculated Net Reactor Power	
	is 2644 MWT. Which of the power ran	ge nuclear instrument gains must be adjusted?	
	A. N-41 and N-44		
	B. N-42 and N-43		
	C. N-41, N-43 and N-44		
D. N-41, N-42, N-43 and N-44			
ANSWER: C			
K/A: 2	2.1.7	Importance: 3.7	
Cognitive Level: Application			
References: 20M-54.4.C1, Issue 1, Revision 11, page 2			
Lesso	Lesson Plan #:2LP-SQS-RI Obj. #: 5		
History: NEW			
Sourc	e:	Type: OPEN BOOK	
JTA: C	150050201	Give procedure to candidates.	

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90.	The Unit is at 1% power with all systems NSA for the current power level. The 21A		
	Steam Generator is overfed and Tavg drops from 548°F to 543°F. What action is an, authorized reponse for this situation? A. Lower feedwater flow and restore Tavg 548°F. B. Trip the reactor and go to E-0 "Reactor Trip or Safety Injection", Step 1.		
	C. Raise control rods in 5 step increme	ents or less.	
	D. Place the unit in HOT STANDBY w	th all rods inserted within 15 minutes.	
ANSV	VER: A		
K/A: 2.1.11		Importance: 3.0	
Cognitive Level: Knowledge			
References: Ops Standards Page 3			
Lesson Plan #: 2LP-SQS-50.1 Obj. #: 9		Obj. #: 9	
History: NEW			
Sourc	e:	Type: CLOSED BOOK	
JTA:			

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The unit is at 100% power with all ever	ma NOA At 0100 CL Appumlator 01A	
The unit is at 100% power with all systems NSA. At 0100, SI Accumlator 21A		
[2SIS*TK21A] low pressure alarm annunciated. Pressure continues to decline.		
Technical Specification 3.5.1 contains the following action statement: With one accumulator inoperable, except as a result of a closed isolation valve, restore the inoperable accumulator to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.		
Which of the following will meet the Teo	chnical Specification Definitions of HOT	
STANDBY and HOT SHUTDOWN to co	omplete the mode changes required by the listed	
action statement?		
A. At 0800 reactor power must be less	than 5% Rated Thermal Power and at 1400	
Tavg must be less than 350°F.		
B. At 0800 reactor power must be 0% Rated Thermal Power and at 1400 Tavg must be		
less than 350°F.		
C. At 0800 Keff must be less than 0.99	and at 1400 Tavg must be less than 200°F.	
D. At 0800 Keff must be less than or equal to 0.95 and at 1400 Tavg must be less than		
<u>350°F.</u>		
/ER: B	N	
.1.22	Importance: 2.8	
tive Level: Comprehension		
	able 1.1, page 1-8 and 3.5.1	
Lesson Plan #: 2LP-SQS-TS Obj. #: 2		
y: NEW		
e:	Type: OPEN BOOK	
	Give a copy of Table 1-1	
	Technical Specification 3.5.1 contains t With one accumulator inoperable, isolation valve, restore the inoper status within 1 hour or be in at lea hours and in HOT SHUTDOWN wi Which of the following will meet the Tec STANDBY and HOT SHUTDOWN to co action statement? A. At 0800 reactor power must be less Tavg must be less than 350°F. B. At 0800 reactor power must be 0% less than 350°F. C. At 0800 Keff must be less than 0.99 D. At 0800 Keff must be less than or e 350°F. //ER: B 1.22 ive Level: Comprehension ences: Unit 2 Technical Specifications, T in Plan #: 2LP-SQS-TS	

92.	A RWDA-G is in progress from Unit 2 Gaseous Waste Tanks in accordance with			
	1/2OM-19.4A.B "Unit 2 GW Storage Tk Disch to Unit 1 Atmos. Vent". Two hours after			
	the release has begun, the operator has verified the release rate boing 3 SCFM. Which			
	of the following actions must be comple	eted?		
	A. Contact the shift chemist and verify tritium samples are complete for each tank			
	contained in the RWDA-G.			
	B. Notify Health Physics to reset the HI and HI-HI alarm setpoints in accordance			
	with the Radiation Control Manual.			
	C. Notify the ANSS to review the RWDA-G and confirm data entered is complete			
	and all steps taken in procedure	e are correct.		
	D. Hand carry the procedure to Un	it 1 and have Unit 1 NCO close Decay Tank		
	Bleed Control Valve [FCV-1GW	·-105].		
ANSW	ER: D			
K/A: 2.	2.4	Importance: 2.8		
Cogniti	Cognitive Level: Knowledge			
References: 1/2OM-19.4A.A, Issue 3, Rev. 3, page 1 and page B.7.a and 8.				
	Lesson Plan #: 2LP-SQS-19.1 Obj. #: 9 h			
History: NEW				
Source	Source: Type: OPEN BOOK			
		Give copy of procedure		

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pump, which of the following is required? A. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be declutched and closed manually. B. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be closed first to prevent pressure buildup in the suction line. C. Low Head SI Pump Discharge Valve [2SIS*3] must be closed prior to seating to suction valve. D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application References: NPDAP 3.4, Revision 10, page 22				
 Low Head SI Pump Suction Valve [2SIS*MOV8809A] Low Head SI Discharge Valve [2SIS*3] In accordance with NPDAP 3.4 "Clearance/Tagout Procedure" practices for clearing a pump, which of the following is required? A. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be declutched and closed manually. B. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be closed first to prevent pressure buildup in the suction line. C. Low Head SI Pump Discharge Valve [2SIS*3] must be closed prior to seating to suction valve. D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application References: NPDAP 3.4, Revision 10, page 22 	93. The Low Head SI Pump [2SIS*P21A] must be put on clearance to repair the pur			
 Low Head SI Discharge Valve [2SIS*3] In accordance with NPDAP 3.4 "Clearance/Tagout Procedure" practices for clearing a pump, which of the following is required? A. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be declutched and closed manually. B. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be closed first to prevent pressure buildup in the suction line. C. Low Head SI Pump Discharge Valve [2SIS*3] must be closed prior to seating to suction valve. D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application 		casing vent [2SIS-899]. Two of the clearance points are:		
In accordance with NPDAP 3.4 "Clearance/Tagout Procedure" practices for clearing a pump, which of the following is required? A. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be declutched and closed manually. B. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be closed first to prevent pressure buildup in the suction line. C. Low Head SI Pump Discharge Valve [2SIS*3] must be closed prior to seating t suction valve. D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application 		 Low Head SI Pump Suction Valve [2SIS*MOV8809A] 		
pump, which of the following is required? A. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be declutched and closed manually. B. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be closed first to prevent pressure buildup in the suction line. C. Low Head SI Pump Discharge Valve [2SIS*3] must be closed prior to seating to suction valve. D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application		Low Head SI Discharge Va	Low Head SI Discharge Valve [2SIS*3]	
 A. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be declutched and closed manually. B. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be closed first to prevent pressure buildup in the suction line. C. Low Head SI Pump Discharge Valve [2SIS*3] must be closed prior to seating to suction valve. D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application 	In accordance with NPDAP 3.4 "Clearance/Tagout Procedure" practices for clearing a			
 closed manually. B. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be closed first to prevent pressure buildup in the suction line. C. Low Head SI Pump Discharge Valve [2SIS*3] must be closed prior to seating to suction valve. D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application	pump, which of the following is required?			
 B. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be closed first to prevent pressure buildup in the suction line. C. Low Head SI Pump Discharge Valve [2SIS*3] must be closed prior to seating to suction valve. D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application References: NPDAP 3.4, Revision 10, page 22	A. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be declutched and			
prevent pressure buildup in the suction line. C. Low Head SI Pump Discharge Valve [2SIS*3] must be closed prior to seating to suction valve. D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application References: NPDAP 3.4, Revision 10, page 22	closed manually.			
C. Low Head SI Pump Discharge Valve [2SIS*3] must be closed prior to seating to suction valve. D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application References: NPDAP 3.4, Revision 10, page 22	B. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be closed first to			
suction valve. D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application References: NPDAP 3.4, Revision 10, page 22	prevent pressure buildup in the suction line.			
D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application References: NPDAP 3.4, Revision 10, page 22	C. Low Head SI Pump Discharge Valve [2SIS*3] must be closed prior to seating the			
pressure buildup in the suction line. ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application References: NPDAP 3.4, Revision 10, page 22	suction valve.			
ANSWER: C K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application References: NPDAP 3.4, Revision 10, page 22	D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent			
K/A: 2.2.13 Importance: 3.6 Cognitive Level: Application References: NPDAP 3.4, Revision 10, page 22	pressure buildup in the suction line.			
Cognitive Level: Application References: NPDAP 3.4, Revision 10, page 22	ANSWER: C			
References: NPDAP 3.4, Revision 10, page 22	<u>K/A: 2</u>	2.2.13	Importance: 3.6	
	Cognitive Level: Application			
	References: NPDAP 3.4, Revision 10, page 22			
Lesson Plan #: 1/2LP-SQS-AP.2 Obj. #: 6.	Lessc	on Plan #: 1/2LP-SQS-AP.2	Obj. #: 6.	
History: NEW				
Source: Type: OPEN BOOK			Type: OPEN BOOK	
JTA: 119A0301 Give NPDAP 3.4				

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94.	Reactor Coolant System pressure falls with the Unit at 100% Rated Thermal Power and								
	all systems NSA. Based on the	Safety Limits contained in Technical Specification 2.1.1							
	Safety Limts-Reactor Core, whic	Safety Limts-Reactor Core, which of the following is occuring?							
	A. Margin to DNB is risir	ng as Critical Heat Flux rises.							
	B. Margin to DNB is falli	ng as Critical Heat Flux falls.							
	C. Margin to DNB is risir	ng as Actual Heat Flux rises.							
	D. Margin to DNB is falli	ng as Actual Heat Flux falls.							
ANSV	WER: B								
K/A:2.	.2.22	Importance: 3.4							
Cogni	itive Level: Comprehension								
Refer	rences: Basis for Technical Specific	cation 2.1.1,							
Lesso	on Plan #: 2LP-SQS-1.1	Obj. #: 7							
	· · · · · · · · · · · · · · · · · · ·								
Histor	ry: NEW								
Source	xe:	Type: CLOSED BOOK							
JTA: (0020090101	· ·							

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1											
95.	A meter qualified operator is to enter a	High Radiation Area that is 250 mrem/hr general									
	area to perform a short task. Which of	the following is NOT required for the operator to									
	enter the area?										
A. Heath Physic coverage at the job location.											
	B. High Radiation briefing from Health Physics.										
	C. Alarming Radiation Dosimeter.										
	D. Thermoluminescent Dosimeter.										
ANSV	ANSWER: A										
K/A:2	.3.1	Importance: 2.6									
Cogni	tive Level: Knowledge										
	ences: GERT Student Handout, Rev. 19,	May 1998, page 7-3 to 7-5									
	n Plan #: LP-RC-02	Obj. #:7-2									
Histor	y: NEW										
Sourc		Type: Closed Book									
	410040302										

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96.	Unit	2 is in Mode 3 with the fo	blowing conditions:				
	Tavg is at 450°F and stable						
		RCS Pressure is at 15					
			ssures are at 430 psig and stable				
	Pres		and A are ON. The operator places the Pressuri				
			AL. As RCS pressure rises, which of the following				
		ations should occur first?	•				
	A.		l on low steam line pressure.				
	B.		1 on low RCS pressure.				
	C. AMSAC actuation on low steam generator pressure.						
	D.		nerated on High RCS pressure.				
ANSV	/ER: A		· · · · · · · · · · · · · · · · · · ·				
K/A: 2	2.4.2 k	(/A CHANGE	Importance: 3.9				
Cogni	tive Le	vel: A: Comprehension					
			Setpoints", Issue 4, Rev. 3, pages 4 and 5				
LP#:		SQS-1.1	OBJ: 5. b				
<u> </u>							
Histor		1997 Modulo IV Miritton	exam, Modified from Question 49, 2LOT 2A				
			exam, mouned none Question 49, 2LOT 2A				
Source							
JTA: 0			CLOSED BOOK				

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97. The ur	nit is critical at 5E-8 amps. Interr	nediate Range Channel N-35 high voltage is lost.							
Which	of the following is an appropriate	eresponse?							
A.	Restore the channel prior to rais	sing thermal power above P-6.							
B.	B. Restore the channel prior to raising thermal power above 5%.								
C.	Place the unit in Mode 3 with the	e Reactor Trip Breaker Open until the channel is							
	restored.								
D.	Place the unit in Mode 1 with re	actor power greater than P-10 then restore the							
	inoperable channel.								
ANSWER: B	· · · · · · · · · · · · · · · · · · ·								
K/A: 2.4.4	· ·	Importance: 4.0							
Cognitive Leve	el: Application								
References: 2	OM-53C.4.2.2.1B, Issue 1A, Rev	. 1							
Lesson Plan #	: 2LP-SQS-2.1	Obj. #: 16							
		· · · · · · · · · · · · · · · · · · ·							
History: NEW									
Source:		Type: OPEN BOOK							
JTA: 00001004	401	Give AOP Z, Z, IB							

Northy P6 Kinooledge

98. The u	unit has undergone a Loss of Cool	ant Accident. Both trains of Safety Injection are									
in se	rvice and High Head SI Flow [2SIS	S*FI943] indicates 500 gpm. Coolant system									
press	pressure is only 50 psig above highest steam generator pressure.										
Tripp	Tripping the Reactor Coolant Pumps is required at this time to accomplish which of the										
follow	following strategies?										
A	. Prevent damage to Reactor Cod	plant Pumps operating in a highly voided system.									
В	. Prevent Reactor Coolant Pump	overspeed and generation of missile fragments.									
с	C. Limit heat input to the RCS during an inadequate core-cooling situation.										
D	Limit the loss of reactor coolant	after system drainage to the break location.									
ANSWER: D											
K/A: 2.4.6		Importance: 3.1									
Cognitive Lev	vel: Knowledge										
References:	2OM-53B.5.GI-6, Issue 1B, Rev. 1	, page 9									
Lesson Plan	#:2LP-SQS-53.2	Obj. #: 11									
History: NEW	1										
Source:		Type: Closed Book									
JTA:301AAA	0601										
	· · · · · · · · · · · · · · · · · · ·										

99. The Unit is in Mode 4 at 325	psig and 322 degrees. All systems are NSA for the current											
plant condition. Pressurizer	level suddenly drops rapidly and subcooling in the RCS											
falls to 0 degrees. The opera	ator has entered AOP 2.6.5 "Shutdown LOCA". Under											
these conditions, which of the	these conditions, which of the following mitigation strategies is designed to restore											
subcooling but limit overpres	subcooling but limit overpressure conditions in the RCS?											
A. Manually initiate both	A. Manually initiate both trains of High Head Safety Injection.											
B. Stop all but one opera	B. Stop all but one operating Reactor Coolant Pump.											
C. Isolate all letdown pat	hways and open Charging Flow Control Valve											
[2CHS*FCV122].												
D. Depressurize the RCS	S to refill the Pressurizer.											
ANSWER: C												
K/A: 2.4.9	Importance: 3.3											
Cognitive Level: Knowledge												
References: 20M-53C.4.2.6.5, Issue	1A, Rev. 9, Caution before step 1, Steps 2 and 3											
Lesson Plan #:2LP-SQS-53C.1	Obj. #:4											
History: NEW												
Source:	Type: Closed Book											
JTA: 0000560401												

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100.	A fire i	s in progress in the 480 V Substa	tion 2-4 Bus 2G. The MCC is energized and the							
	MCC fire is spreading rapidly. Water is the only fire fighting medium available. Which									
	of the following is the minimum safe recommended fire fighting configuration for using									
	water on the energized MCC?									
	A. High velocity fog at least 15 feet from the MCC.									
	B. High velocity fog at least 30 feet from the MCC.									
	C. High pressure stream at least 45 feet from MCC.									
	D. High pressure stream at least 60 feet from MCC.									
ANSV	ANSWER: A									
K/A:2	.4.25		Importance: 2.9							
	Cognitive Level: Knowledge									
		2OM53.4.B, Issue 1, Rev. 10, pag	e 7							
Lesso	on Plan	#: Fire Brigade Training	Obj. #:							
Objec	ctive:									
Histo	History: NEW									
Sourc			Type: Closed Book							
	0860040	0101	Knowledge for Brigade Captain's							

12/27/98

NOTE TO:	NRC Document Control Desk Mail Stop 0-5-D-24
FROM:	$\frac{V_{IRGII}}{Operating Licensing Branch, R_{II}}$, Licensing Assistant
SUBJECT:	OPERATOR LICENSING EXAMINATION ADMINISTERED ON Marder, 23-25 99. AT Brown Velley (1917 2 DOCKET #50-412

 $On \underbrace{\sum 23 - 25}{495} Operator Licensing Examinations were administered at the referenced facility. Attached, you will find the following information for processing through NUDOCS and distribution to the NRC staff, including the NRC PDR:$

- Facility submitted outline and initial exam submittal. designated for distribution under RIDS Code A070. (Grapes a) As given operating examination, designated for distribution under RIDS Code A070. Item #1 - (a)
 - b)

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Item #2 -Examination Report with the as given written examination attached, designated for distribution under RIDS Code IE42.

To:	John Caruso- USNRC
From:	Rich Brooks, Duquesne Light Co.
Date:	February 5, 1999
Subject:	Beaver Valley Power Station, Unit 2 - Initial Exam Materials

The following materials are being submitted to you for review, comment, and approval for the BVPS Unit 2 NRC Initial License Examination scheduled for the week of March 22, 1999.

This submittal is in accordance with the instructions in Rev 8 of NUREG-1021, "Operator Licensing Examiner Standards."

1. Operating Test Drills (4)

1

- 2. Operating Test JPMs (14 JPMs & 1 set of Admin questions.)
- 3. Exam Materials History (page 2 of this memo)

The QA checklists will be submitted after the exam materials have been validated by the operating crew and specific scenarios, with candidate rotations, decided.

We request that these materials be withheld from public disclosure until after the completion of the examination.

If you have any questions or require further information, please contact me at (412) 393-5755.

Answer Distribution - Written Exam 2LOT 2B Beaver Valley RO Exam

Α	В	С	D
26	27	24	23

Classification for Level

Knowledge	Comprehension	Application			
45	32	23			

Complies with minimum Higher Level for NUREG 1021

New Questions - 97

Number requiring supply of reference:

24

The following is a list of changes and the reasons for the changes to Written Exam Outline:

Page 5 - Tier 2 Group 1

Original K/A 001 - 2.12 contained a concept of multiple rod drop on start up that is NOT allowed configuration at Beaver Valley.

Original K/A 004 K6.01 did not fit concept changed on review by IDT

Original K/A 022 2.01 Power supplies to CAR fan concept did not reflect reference material available.

Original K/A 068 6.10 original question concept did not match as built condition of plant on further review

Page 6 - Tier 2 Group 2

Original K/A 075 A2.01 is typo error system should be 076 Original question Topic altered due to overlap with JPM.

Original K/A 086 K1.01 The equipment addressed in original concept no longer operational at Beaver Valley Unit 2. Retired in place

Page 7 Tier 2 Group 3

K/A 005 A2.04 added to replace K/A 034 K1.04

Original K/A 007 A1.02 did not fit concept on review by IDT

Original K/A 034 K1.04 is not within scope of RO job at Beaver Valley.

Page 8 - Tier 3

Original K/A 2.1.11 original concept was not testable under current Ops Standards for operator performance. OPS Standards would produce reactor trip

Original K/A 2.4.1 did not fit concept on review by exam author.

PWR RO Examination Outline

(Follows Form ES-401-4)

Facility: BVPS Unit 2			Date of Exam: Exam Lev									/el: RO	
			K/A Category Points										
Tier	Group	K	K	K	K	K	K	A	A	A	A	G	Point
		1	2	3	4	5	6	1	2	3	4		Total
1.	1	4	3	6				0	2			1	16
Emergency	2	5	4	3				1	3			1	17
& Abnormal	3	1	0	1				0	0			1	3
Plant Evolutions	Tier Totals	10	7	10				1	5			3	36
2.	1	3	1	3	3	3	1	2	3	1	2	1	23
Plant	2	3	1	2	4	1	1	3	3	0	1	1	20
Systems	3	0	0	1	1	1	1	1	2	0	1	0	8
	Tier Totals	6	2	6	8	5	3	6	8	1	4	2	51
3. Ge	neric Knowled	lge an	d		Ca	t 1	Cat 2 Cat		t 3 Cat 4		at 4	13	
	Abilities				4 3		1		5				
 Note: - Attempt to distribute topics among all K/A categories; select at least one topic from every K/A category within each tier. - Actual point totals must match those specified in the table. - Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities. - Systems/evolutions within each group are identified on the associated outline. - The shaded areas are not applicable to the category tier. 													

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		PWR	RO Ex	aminati	ion Out	line	(Follows Form	ES-401-4)	
Emerg	ency a	nd Abn	ormal F	Plant Ev	olution	s - Tier	1 /Group 1	,	
E/APE # / Name / Safety Function	К 1	К 2	К 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / I	1.03						Operational implications of Xenon Transient	3.2	1
000015/17 RCP Malfunction / IV			3.03		1	· · · · - ·	Sequence of events for tripping Rx and RCPs	3.7	
W/E09 & E10 Natural Circ. / IV		2.2	1	<u> </u>	1	<u> </u>	Relationship between heat removal systems	3.6	
W/E09 & E10 Natural Circ. / IV			3.1				Operating Characteristics during transient conditions	3.3	$\frac{1}{1}$
000024 Emergency Boration / I	1.02	1		<u> </u>	+		Relationship between boron addition and Rx power	3.6	
000026 Loss of Component Cooling Water / VIII	X	X		<u> </u>	2.03		Determine lineup to restore CCW	2.6	$\frac{1}{1}$
000027 Pressurizer Pressure Control System Malfunction / III		2.03		 		<u> </u>	Relation of pressure control failure and controllers	2.6	1
000040 (W/E12) Steam Line Rupture - Excessive Heat Transfer / IV			3.2				EOPs associated with uncontrolled depressurization of all SGs	3.3	1
W/E08 RCS Overcooling - PTS / IV			3.2				Reasons for EOP responses to PTS •	3.6	1
000051 Loss of Condenser Vacuum / IV	1.01	X	1				Relation of Condenser Vacuum to CW flow (LER)	2.4	1
000055 Station Blackout / VI						2.4.1	Knowledge of EOP entry conditions	4.3	1
000057 Loss of Vital AC Elec. Inst. / VI				-	2.19		Impact of loss of Vital AC bus on SG level control	4.0	1
000067 Plant Fire On-site / IX		X	3.02				Steps called out in site Fire Plans, etc.	2.5	1
000068 Control Room Evacuation. / VIII		-	3.06			<u> </u>	Local operation of dumps to control Tave	3.9	1
000069 (W/E14) Loss of CTMT Integrity / V	1.01						Effect of containment pressure on leak rate	2.6	1
000076 High Reactor Coolant Activity / IX		2.01			1		Relation of RCS activity to radiation monitors	2.6	1
									<u> </u>
K/A Category Totals:	4	3	6	0	2	1	Group Point Total:		16

		PWF	R RO E	xamina	ation O	utline	(Follows Form	ES-401-4)	
Emer	gency	and Ab	normal	Plant I	Evolutio	ons - Tie	r 1 /Group 2		
E/APE # / Name / Safety Function	K 1	К 2	К 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
000003 Dropped Control Rod / I	1	1	3.04		1		Reasons for actions in the AOP	3.8	1
000007 Reactor Trip Stabilization Recovery / I					1	2.4.8	How event-based EOPs are used	3.0	1
000008 Pressurizer Vapor Space Accident / III					2.25		Expected leak rate for open PORV or Code Safety	2.8	1
000011 Large Break LOCA / III		2.02					Relation of pumps and a Large Break LOCA	2.6	1
W/E04 LOCA Outside Containment / III		2.2					Interrelation between LOCA ORC and Heat Removal	3.8	1
W/E11 Loss of Emergency Coolant Recirc. / IV	1.3				1		Indications of a Loss of Recirculation	3.6	1
W/E02 SI Termination / III		2.1					Interlocks and auto features associated with SI Termination	3.4	1
000025 Loss of RHR System / IV			3.02				Isolation of RHR due to pressure increase	3.3	1
000029 Anticipated Transient w/o Scram / I				ł	2.09		Interpret Main Turbine Trip as related to ATWS	4.4	1
000037 Steam Generator Tube Leak / III		X	3.02				Check of Condenser Air Ejector exhaust monitor	3.2	1
000038 Steam Generator Tube Rupture / III	1.02						Leak rate vs. Pressure change	3.2	1
000038 Steam Generator Tube Rupture / III	1.01						Consequences of PTS	4.1	1
000054 Loss of Main Feedwater / IV					2.03		Reasons and conditions for AFW pump startup	4.1	1
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / IV	1.2						EOPs associated with Loss of Heat Sink	3.9	1
000059 Accidental Liquid Rad Waste Rel. / IX		2.01					Relationship of Accidental release and liquid radiation monitor	2.7	1
000061 ARM System Alarms / VII	1.01						Detector Limitations	2.5	1
W/E16 High Containment Radiation / IX				1.2			Ability to monitor operating characteristics of the facility	2.9	1
K/A Category Totals:	5	4	3	1	3	1	Group Point Total:		17

		WR R	(Follows Fo	orm ES-401	-4)				
	rgency and	Abnor	mal Pla	<u>nt Evol</u> ı	tions -	Tier 1 /G	roup 3		,
E/APE # / Name / Safety Function	К 1	К 2	К 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / II					1	2.4.4	Ability to recognize AOP entry conditions	4.0	1
000036 Fuel Handling Accident / VIII	1.01						Radiation exposure hazards	3.5	1
000056 Loss of Offsite Power / VI			3.02			1	Actions in EOP for loss of Offsite Power	4.4	1
								_	1
									1
									1
K/A Category Totals:	1		1			1	Group Point Total:		3

					kamina							(Follows Form ES-40)1-4)	
			_		<u>ıs - Tie</u>	e <u>r 2 /G</u> r	oup 1							
System # / Name 001 Control Rod Drive	<u>K1</u>	<u>K2</u>	<u>K3</u>	K4	K5	<u>K6</u>	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Point
	1.05											Relation between CRD & RPS	4.5	1
001 Control Rod Drive						6.08					1	Purpose of High Flux at Shutdown alarm	2.9	1
001 Control Rod Drive					<u>5.04</u>							Knowledge of rod insertion limits	4.3	1
003 Reactor Coolant Pump	1.03											Relationship of Seal Bypass	3.3	1
003 Reactor Coolant Pump				4.07			<u> </u>		1		<u>+</u>	Minimizing mechanical seal leakage	3.2	1
004 Chemical and Volume Control				1			-	2.32				Predict impact of valving in an unborated bed	3.4	1
004 Chemical and Volume Control										<u>4.15</u>	1	Use of heater for uniform	<u>3.6</u>	1
004 Chemical and Volume Control					5.09				†		†	boron concentration Operational implications of thermal shock	3.7	1
013 Engineered Safety Features Actuation		2.01						<u> </u>				Power supplies to ESF equipment control	3.6	1
013 Engineered Safety Features Act.					†			1	3.02	<u> </u>	<u>+</u>	Monitor auto operation	4.1	1
013 Engineered Safety Features Actuation		1	3.01									Effect on fuel of a loss of	4.1	1
015 Nuclear Instrumentation				<u> </u>				2.02			<u> </u>	ESFAS Erratic IR compensation		
015 Nuclear Instrumentation				4.01									3.1	1
017 In-core Temperature Monitor				4.01							ļ	Design Feature; SR shutoff	3.1	1
022 Containment Cooling			2.01									ITM input to subcooling	3.4	1
056 Condensate	_	ļ	<u>3.01</u>			<u>X</u>						Signals to stop CAR fans	<u>4.1</u>	1
	_				Χ	Χ	Χ	2.12				Impact of bypassing LP heaters	2.8	1
059 Main Feedwater		X			X	X	1.03					Power level restrictions	2.7	
059 Main Feedwater		X	3.02		X	X						Effect of loss of MFW on AFW	3.6	1
061 Auxiliary/Emergency Feedwater	1.01	1										Relation of AFW to SG	4.1	
061 Auxiliary/Emergency Feedwater	1	<u> </u>	1				1.05	<u> </u>				Changes in Flow/motor amps		-
068 Liquid Radwaste	+	x	X				X				2.3.11		3.6	1
071 Waste Gas Disposal		<u>↑</u> X	_≏			x	<u> </u>			4.29	<u> </u>	Control of release setpoints	<u>2.7</u>	1
072 Area Radiation Monitoring		X			5.01	$\frac{X}{X}$				4.29		O ₂ limits in waste gas tank	3.0	1
K/A Category Point Totals:	3			<u> </u>						-		ARM sources		1
	5	1	3	3	3	1	2	3	1	2	1	Group Point Total:		23

				PWR	RO E	xaminat	ion Out	line				(Follows Form ES-401-	4)	
				Plant	Syster	ns - Tie	<u>r 2 /Gro</u>	up 2						
System #/Name	К 1	К 2	К 3	K 4	К 5	К 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp	Poin
002 Reactor Coolant	1.13					1		1				Relationship of RCS and RCPs	4.1	1
006 Emergency Core Cooling			<u></u>			1	1.16	1				Determine subcooling	4.1	1
010 Pressurizer Pressure Control	1.03					1	1					Impact of RCP loss on Spray Valve Ops	3.6	1
011 Pressurizer Level Control		<u> </u>		4.01			1					Operation of PZR heater cutout	3.3	1
012 Reactor Protection					5.01		-					Operational implications of DNB	3.3	1
014 Rod Position Indication		1					1.02		X			Impact of DRPI switches on indication	3.2	1
016 Non-Nuclear Instrumentation	1.03						X	1				Effect of NNIS on SDS	3.2	1
026 Containment Spray			3.02									Effect of loss of CCS on RSS	4.2	1
029 Containment Purge				4.02	X							Design features for negative pressure	2.9	1
033 Spent Fuel Pool Cooling		X			X	X			[X	2.2.30	New fuel movement	2.6	1
035 Steam Generator						6.02				1		Effect of PORV failure	3.1	1
039 Main and Reheat Steam			·····	ļ	†		1.05			1		Effect of MS controls on RCS Tave	3.2	1
055 Condenser Air Removal		x	3.01									Effect of a loss of CARS on the Main Condenser	2.5	1
062 AC Electrical Distribution		2.01										Bus power supplies to major loads	3.3	1
063 DC Electrical Distribution			1		X			2.01			1	Impact of grounds	2.5	1
064 Emergency Diesel Generator								2.16			1	Impact of loss of offsite power in TEST	3.3	1
073 Process Radiation Monitoring		X	1	4.01		X			X			Termination of release on high activity	4.0	1
076Circulating Water					1	X	X	2.01	X			Service Water Start-UP	<u>2.9</u>	1
079 Station Air		X	X	4.01	X	X	X		X			Cross-connect with instrument air	2.9	1
086 Fire Protection										<u>4.04</u>		CO2 Discharge Warning	<u>3.1</u>	1
K/A Category Point Totals:	3	1	2	4			3	3	0	 	1	Group Point Total:		2

				Examina								(Follows Form ES-401	-4)	
		Plar	nt Syste	ms - Ti	er 2 /G	roup 3								
System #/Name	К 1	К 2	К 3	K 4	К 5	К 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp	Points
005 Residual Heat Removal			3.01					<u> </u>	X			Flow limits at reduced inventory	3.9	1
005 Residual Heat Removal								<u>2.04</u>				Effects of a loss of RHR on the RCS	<u>2.9</u>	1
007 Pressurizer Relief/Quench Tank		X				X				<u>4.01</u>		Maintaining PRT pressure	2.6	1
027 Containment Iodine Removal			X	X	5.01	X	X		X			Purpose of charcoal filters	3.1	1
028 Hydrogen Recombiner and Purge Control				X				2.02	X		<u> </u>	LOCA hydrogen concerns	3.5	1
034 Fuel Handling Equipment	1.04	X	X		X						<u> </u>	Relation with NIS	2.6	±
041 Steam Dump/Turbine Bypass Control						6.03						How Loss of CRDS affects SDS	2.7	1
045 Main Turbine Generator		X		4.12								Auto turbine runback	3.3	1
103 Containment		X					1.01					Changes in containment pressure	3.7	1
					_									
									[
K/A Category Point Totals:	0	0	1	1	1	1	1	2	0	1	0	Group Point Totals:		10

ES-401 Generic Knowledge and Abilities Outline (Tier 3) Form ES-401-5

Facility:		Date of Exam:	Exam Le	vel:
Category	K/A	Торіс	Imp.	Points
	2.1.1	Conduct of operations requirements	3.7	1
	2.1.7	Evaluate plant performance	3.7	1
Conduct of	<u>2.1.2</u>	Operator Responsibilities during all modes of plant operation	3.0	1
Operations	2.1.22	Determine mode of operation	2.8	1
	Total			
	2.2.4	Explain variations in systems between units	T	4
	2.2.13	Tagging and Clearance Procedures	2.8	1
Equipment	2.2.22	LCOs and Safety Limits	3.6	1
Control			3.4	
	Total			3
	2.3.1	10 CFR 20 and facility Radiological Control Requirements	2.6	1
Radiation				<u> </u>
Control	· ·		,	
	Total		······································	
				1
	2.4.2	EOP entry requirements and immediate actions	<u>3.9</u>	1
-	2.4.4	Ability to recognize AOP entry requirements	4.0	1
Emergency	2.4.6	Symptom based EOP mitigation strategy Low power/shutdown mitigation strategy	3.1	1
rocedures	2.4.9	3.3	1	
nd Plan	2.4.25	Knowledge of Fire Protection Procedures	2.9	1
	Total			5
ier 3 Target Point	Total (RO)			13

Follows NUREG -1021, Rev. 8, January 1997BVPS 2LOT 2B Rev. 08 of 8

ES-301

Individual Walk-Through Test Outline Form ES-301-2

Facility: <u>BVPS2</u>

Date of Examination: _3/22/99_

Exam Level (circle one): <u>**RO**</u> / SRO(I) / SRO(U) Operating Test No.: _____

	<u>r</u>	
System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description
1. 001/ Recover Dropped RCCA/ D,S	1.	 a. 003AK1.07 - 3.1- affect of dropped rod on Shutdown Margin
		 b. 003AK1.03 - 3.5 - How reactor power responds after rod drop
 002/ Respond to Shutdown LOCA/ D,S,A,L 	2.	 a. 009EK3.04 - 4.1 - Determine High Head Safety Injection Requirements
	-	 b. 009EA1.01 - 4.4 - Determine Cold Overpressure Protection Setpoint
 006/ Makeup to the Refueling Water Storage Tank (RWST)/ N,S 	3.	a. 033K1.05 - 2.7 - Alternate source of Makeup to the RWST
		 b. 011EK3.12 - 4.4 - Strategy of ECA-1.1 (cooldown and depressurize)
4. 061/Reset Terry Turbine Trip and Throttle Valve/ D,P,R	(4,)	 a. 061K4.02 - 4.5 - Turbine driven AFW pump autostart signals
		 b. 061K4.01 - 3.9- Alternate Source of water to AFW (Service Water)
 003/ Restore Reactor Coolant Pump (RCP) Seal Cooling / N,S 	(4)	 a. 003K1.12 - 3.0 - Effects of RCS leakage through the Thermal Barrier Heat Exchanger
		 b. 003A2.01 - 3.5 - Effect of sudden Seal Injection on an overheated RCP seal
6. 076/ Startup Standby Service Water System (SWS) / D,S	4.	 a. 076K4.02 - 2.9 - Automatic actions on low SWS header pressure
		 b. 076K1.16 - 3.6 - Effect of Containment Isolation Signal on the SWS

System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description				
 103/ Perform Containment Isolation Phase A (CIA) checklist / D,S 	5.	a. 013K1.01 - 4.2 - Identify signals which cause a CIA				
		b. 103K4.06 - 3.1 - How to override CIA to obtain Samples				
8. 064 / Start #1 Diesel Generator (DG) using local relays / D,P,M	6.	 a. 064K1.01 - 4.1 - Is ground fault protection available while running in Emergency Mode? 				
		 b. 064A4.01 - 4.0 - Requirements for local manual start of DG 				
 015 / Perform a Quadrant Power Tilt Factor (QPTR) (unsatisfactory result) / N,S 	7.	 a. 001K5.07 - 3.3 - Effect of control rod drop on QPTR 				
		 b. 015K5.12 - 3.2 - Implication of excessive QPTR on power peaking 				
 078 / Start an Instrument Air (IA) Compressor / D,P 	. 8.	a. 078K3.02 - 3.4 - Is IA required for a safe shutdown?				
`		 b. 067AK3.04 - 3.3 - Use of Filtered Water (as backup compressor cooling) 				
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)Iternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (P)Iant, (R)CA						

		2/3/99
ES-30	1	Administrative Topics Outline Form ES-301-1
	ty: <u>BVPS2</u>	Date of Examination: <u>3/22/99</u>
		one): <u>RO</u> / SRO Operating Test Number:
1	Administrative Topic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	2.1.20, Ability to execute procedure steps	1. New JPM, fill out an operating Manual Change Notice.
	2.1.21, Ability to Obtain a controlled copy and make a working copy of a procedure	1. New JPM Obtain controlled copy and make a working copy of a procedure. T.S. M cut Splie instrument
A.2	2.2.22, Knowledge of LCOs and Safety Limits	 Determine pressures and temperatures at which safety limit curve would be violated. Guitances JPM Actions required if safety limit curve is violated.
A.3	2.3.9, Knowledge of process for performing a Containment Purge	1. New JPM, Perform a Containment Purge. Value lineur Map meter gualified both at that ask question About Stry fine
A.4	2.4.6, Symptom based EOP mitigation strategies.	 New JPM, determine highest priority critical safety function from simulator control board indications.

SCENARIO OVERVIEW

Engility D											
	eaver valley Po	wer Station Uni	t <u>2</u> Scenario No.: _1_ Op-Test No.: <u>2LOT2B</u>								
Examiners			_ Operators:								
	·	· · · · · · · · · · · · · · · · · · ·									
Objectives:	To evaluate the	applicante ability	to use Nervel Al								
Response p	rocedures to rais	e nower and resp	to use Normal, Abnormal, Emergency and Alarm bond to a VCT problem, a steam flow problem, a								
stuck rod,	a load rejection, a	steam line break	coutside containment, coincident with one charging								
pump trippi	ng and one charg	ing pump failing	to auto start.								
Initial Cond	itions: <u>IC-47, 759</u>	<u>% power, BOL, st</u>	eady state conditions. Rods are in auto. One								
<u>Charging Fu</u>	inp and one wot	or Uriven AFW n	UMD are out of service. One PZP POPV is included								
Tomado wa	Tornado watch in effect. AOP 6.4 in effect due to tube leak on SG "B".										
Turnover: <u>T</u>	he plant is at 75°	<u>% power</u> . RCS h	oron 982 PPM. Bods in auto with CBD at 100								
<u>steps.</u> [20]	Turnover: The plant is at 75% power. RCS boron 982 PPM. Rods in auto with CBD at 190 steps. [2CHS*P21B] and [2FWE*P23B] are OOS. 2FWE*38 shut, 2FWE*P22 aligned to 'B' header 2FW/E-36 shut: 2FW/E 103 apar. AOD 3 to 100 states to 100 states and 100 states and 100 states are stated at 100										
21 112-00 31	<u>iui, zrv</u> ve-iuz op	en. AUP 6.4 is co	Omplete to step 18 due to 20 and tube leak as 00 "p"								
Tornado wa	tch in effect. AOP	75.1 complete th	rough step 5.								
— <u> </u>											
Event No.	Malf. No.	Event Type*	Event Description								
1	N/A	N RO/PO/	Raise power at 10%/hr								
		SRO									
2	XMT LDS3	I RO/SRO	VCT level transmitter 2CHS*115 fails high								
	1,100,120,0		diverting letdown and loss of auto makeup								
	,D										
3	XMT	I PO/SRO	SG "B" steam flow transmitter 2MSS*FT485								
	2MSS22		fails as is								
	1,2.8,0,0,D MAL ACT	P P0/020									
4	EHC1B	R RO/SRO C PO	Load rejection, 15% (Governor valve #2 fails								
	0,30,0,D	C PO	closed)								
5	MAL ACT	C RO									
5	CRF8A	N PO/SRO	Stuck rod, H2 (Preload)								
	H2,1,0,D	11 10/0h0									
6	MAL ACT	M RO/									
Ŭ	MSS2B	PO/	Steam line break outside containment on SG "B"								
i	1,5E ⁶	SRO	U U								
	,300,0,D										
7	PMP CHS1	C RO/SRO									
-	2,0,C,PPLSI		2CHS*P21A trips on SI initiation (Preload)								
	Α										
8	MAL PPL7B	C RO/SRO	20HS*P210 foile to pute at 10 h h								
	2,0,D 2CHS*P21C fails to auto start (Preload)										
(N)ormal,											

Scenario #1 Summary Description.

Unit 2 is at 75% power. System has requested that power be raised to 100% at 10%/hour. During the power escalation VCT level transmitter 2CHS*LT115 fails high causing letdown to divert to liquid waste and loss of VCT auto makeup. Manual makeup and dilution are available. SG "B" steam flow transmitter 2MSS*FT485 fails as is causing a level error following the upcoming load rejection. Turbine Governor Valve #2 fails closed resulting in a 15% load rejection. Rod H2 remains at its original position as rods step in due to RCS temperature rising. After AOP 2.1.8 complete and Technical Specification 3.1.3.1.c.3 actions are addressed a steam break from SG "B" outside containment occurs. Pre-loaded is a trip of HHSI Pump "A" on SI actuation and HHSI Pump "C" fails to auto start. After the faulted SG is isolated, transition is made to E-1. The scenario is terminated when normal charging and letdown are established in accordance with ES-1.1.

SCENARIO OVERVIEW

Facility: <u>B</u>	eaver Valley Po	wer Station Unit	<u>2</u> Scenario No.: _2_ Op-Test No.: <u>2LOT2B</u>							
Examiners	S:		Operators:							
	<u> </u>									
high, 2RCS* 2FWE*P23A	Objectives: <u>To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm Response</u> procedures to respond to a charging pump sheared shaft, impulse pressure transmitter failure, 2RCS*PT444 failing high, 2RCS*PCV455C sticking open with 2RCS*MOV435 failing to close, ATWS, 2CHS*MOV350 fails to open, 2FWE*P23A fails to auto start.									
2FWE*P23B	are OOS. 2RCS*	ower, BOL, steady s PCV456 is isolated.	state conditions. Rods are in Manual. 2CHS*P21B and Tornado Warning in effect. Tube leak on SG "B".							
Turnover: <u>Th</u> [2CHS*P21B 2FWE-102 o AOP 75.1 co	e plant is at 75% p and [2FWE*P23E pen. AOP 6.4 is complete through ste	ower. BOL, RCS b 3] are OOS. 2FWE complete to step 18 c p 5. Lower power to	oron 982 PPM. Rods in Auto with CBD at 190 steps. *38 shut, 2FWE*P22 aligned to 'B' header 2FWE-36 shut; fue to 20 gpd tube leak on SG "B". Tornado watch in effect. o remove 2FWS-P21B from service.							
Event No.	Malf. No.	Event Type*	Event Description							
1	N/A	R RO N PO/SRO	Lower power to remove 2FWS-P21A from service							
2	PMP CHS1 4,0,D	C RO/SRO	Operating Charging Pump sheared shaft resulting in loss of all charging and seal injection flow							
3	XMT MSS42 1,0,20,D	I PO/SRO	Impulse pressure transmitter 2MSS*PT446 fails low							
4	XMT RCS30 1,2500,5,0,D	I RO/SRO	RCS pressure transmitter fails high causing spray valves and PORVs to open and heaters to turn off							
5	VLV RCS32 4,75,0,C,RR CH455C.GT. 0.05	C RO/SRO	PZR PORV 2RCS*PCV455C fails to 75% open (Preload)							
6	VLV RCS11 2,0,D	M ALL	PORV Block valve 2RCS*MOV535 fails to close causing RCS pressure to lower (Reactor trip and SI) (Preload)							
7	MAL PPL1A & B 2,0,D	M ALL	ATWS (Preload)							
8	MAL PPL7A 6,0,D	C PO/SRO	2FWE*P23A fails to auto start, will manually start (Preload)							
9	VLV BAT14 3,0,D	C RO/SRO	2CHS*MOV350 fails closed, must alternate emergency borate (Preload)							
(N)ormal,	(R)eactivity,	(I)nstrument, (C)omponent, (M)ajor							

Scenario #2 Summary Description.

Unit 2 is at 75% power with a planned power reduction to 65% to remove 2FWS-P21B from service using Normal Operating Procedures. After power has been reduced > 5% the operating charging pump shaft shears causing a loss of charging and seal injection flow. After the standby charging pump is started and normal letdown established/stabilized, turbine impulse pressure transmitter fails low. When steam dumps in Pressure Mode and AMSAC is re-armed the controlling RCS pressure transmitter fails high causing PZR spray valves and PORVs to open and heaters to turn off. PZR PORV 2RCS*PCV455C sticks at 75% open and its block valve fails to close resulting in a reduction of RCS pressure. An ATWS occurs. Pre-loaded are an auto start failure of AFW Pump "A", the Emergency Borate valve is failed closed (must alternate emergency borate per FR-S.1. EOP progression is E-0, FR-S.1, E-0, E-1. Terminate scenario upon transition from E-1 or E-1, step 18 complete.

SCENARIO OVERVIEW

Objectives: <u>To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm</u> <u>Response procedures to respond to a plugged boric acid filter, MFW pump trip, LOOP, one</u> <u>EDG trips, one EDG breaker fails to close (loss of all AC power), TD AFW pump trips on</u> <u>overspeed (able to reset), RCP "C" #1 seal leak (50 gpm).</u>

Initial Conditions: <u>IC-49, 20% power, BOL, steady state conditions</u>. Rods are in Manual. <u>2CHS*P21B and 2FWE*P23B are OOS</u>. <u>2RCS*PCV456 is isolated</u>. <u>Tornado Warning in effect</u>. <u>Tube leak on SG "B"</u>. <u>Shutdown in progress</u>.

Turnover: <u>The plant is at 20% power</u>. <u>BOL</u>, <u>RCS boron 1333 PPM</u>. <u>Rods in Manual with CBD</u> at 149 steps. [2CHS-P21B] and [2FWE*P23B] are OOS. 2FWE*38 shut, 2FWE*P22 aligned to 'B' header 2FWE-36 shut; 2FWE-102 open. AOP 6.4 is complete to step 18 due to 75 gpd tube leak on SG "B". Tornado watch in effect. AOP 75.1 complete through step 5. 2OM52.4.C complete to step 20. Continue shutdown.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N	Continue plant shutdown IAW 20M-52.4.C
2	MAL LDS30 95,0,D	C RO/SRO	F21, Boric Acid Filter to Blender plugs
3	BST CFW24 1,0,D	I PO/SRO	2CNM-PS118B, MFW Pump suction pressure fails low causing trip of running MFW pump
4	MAL NIS4A 0.51,0,D	I RO/SRO	IR N35 loss of compensating voltage, must manually energize both source ranges when power drops to less than P-6
5	MAL SWD1 0,D	M ALL	LOOP
6	MAL DSG1A 0,D BKR HIV13 2,D	C ALL	EDG 2-1 trips (Preload) EDG 2-2 output breaker trips (Preload) Loss of ALL AC power
7	MAL AFW3A 5440,0,D	C RO/PO/ SRO	TD AFW Pump trips (able to reset) (Preload)
8	MAL RCP1B 50,300,30,D	M ALL	RCP "C" #1 seal leak (50 gpm)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario #3 Summary Description.

Unit 2 is at 20% power with a unit shutdown in progress in accordance with normal operating procedures. After a 5% power reduction the boric acid filter to blender plugs stopping normal boration until the filter is locally bypassed. MFW Pump "B" trips due to a failure of its suction pressure transmitter. After the Start-up Feed Pump is started and SG levels stabilized, Intermediate range N35 will lose compensating voltage this will require AOP entry. This loss will require the operators to manually energize the source ranges after the reactor trips. A loss of offsite power (LOOP) occurs. EDG 2-1 trips and EDG 2-2 output breaker fails to close resulting in a loss of all AC power and ECA-0.0 entry. Pre-loaded are a trip of the TD AFW Pump (FR-H.1 <u>NOT</u> entered due to ECA-0.0 being in effect). Five minutes after the LOOP a 50 gpm leak develops in RCP "C" #1 seal causing transition to ECA-0.2 when AC power is restored. After an appropriate delay power is restored to 4 kv emergency bus DF by placing EDG's 2-1 output breaker in the EDG 2-2 breaker cubicle. The scenario is terminated when RCP seal cooling has been established.

SCENARIO OVERVIEW

Facility: _	Facility: <u>Beaver Valley Power Station Unit 2</u> Scenario No.: _4_ Op-Test No.: <u>2LOT2B</u>					
Examiners	Examiners: Operators:					
Objectives: <u>To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm</u> <u>Response procedures to respond to a failure of the controlling steam flow channel pressure</u> <u>compensation for SG "C", the flow totalizer does not terminate dilution flow at the setpoint, PZR</u> <u>pressure control problem, and a SGTR with loss of PZR pressure control</u> Initial Conditions: <u>IC-50, EOL, 48% power, steady state conditions. Rods are in auto.</u> <u>2CHS*P21B and 2FWE*P23B are OOS. 2RCS*PCV456 is isolated. Tornado Warning in effect.</u> <u>Tube leak on SG "B". Ready to raise power to 100%.</u> Turnover: <u>The plant is at 48% power. RCS boron 318 PPM. Rods in auto with CBD at 171</u> <u>steps. [2CHS*P21B] and [2FWE*P23B] are OOS. 2FWS-MOV152 de-energized shut.</u> <u>2FWE*38 shut, 2FWE*P22 aligned to 'B' header, 2FWE-36 shut; 2FWE-102 open. AOP 6.4 is</u> <u>complete to step 18 due to 10 gpd tube leak on SG "B". Tornado watch in effect. AOP 75.1</u> <u>complete through step 5.</u>						
	Event No. Malf. No. Event Type* Event Description					
Event No.		Event Type*	Event Description			
Event No. 1	N/A	Event Type* R RO N PO/SRO	Event Description Raise power at 10%/hr			
l		R RO	' 			
1	N/A XMT MSS47	R RO N PO/SRO	Raise power at 10%/hr Steam flow pressure compensation failure			
1	N/A XMT MSS47 1,10,10,0,D OVR BAT8A	R RO N PO/SRO I PO/SRO	Raise power at 10%/hr Steam flow pressure compensation failure 2MSS*PT486 fails low Total makeup flow totalizer fails to terminate			
1 2 3	N/A XMT MSS47 1,10,10,0,D OVR BAT8A 2,0,D MAL RCS4C	R RO N PO/SRO I PO/SRO I RO/SRO	Raise power at 10%/hr Steam flow pressure compensation failure 2MSS*PT486 fails low Total makeup flow totalizer fails to terminate dilution at setpoint (Preload) Start as small leak that progressively worsens until			
1 2 3 4	N/A XMT MSS47 1,10,10,0,D OVR BAT8A 2,0,D MAL RCS4C 600,60,0,D CNH PCS10	R RO N PO/SRO I PO/SRO I RO/SRO M ALL	Raise power at 10%/hrSteam flow pressure compensation failure 2MSS*PT486 fails lowTotal makeup flow totalizer fails to terminate dilution at setpoint (Preload)Start as small leak that progressively worsens until SGTR SG "B" (600 GPM)			
1 2 3 4 5	N/A XMT MSS47 1,10,10,0,D OVR BAT8A 2,0,D MAL RCS4C 600,60,0,D CNH PCS10 5,0,20,0,D VLV RCS11	R RO N PO/SRO I PO/SRO I RO/SRO M ALL C RO/SRO	Raise power at 10%/hr Steam flow pressure compensation failure 2MSS*PT486 fails low Total makeup flow totalizer fails to terminate dilution at setpoint (Preload) Start as small leak that progressively worsens until SGTR SG "B" (600 GPM) PZR Master Pressure Controller fails high PORV Block valve 2RCS*MOV535 fails closed			
1 2 3 4 5 6	N/A XMT MSS47 1,10,10,0,D OVR BAT8A 2,0,D MAL RCS4C 600,60,0,D CNH PCS10 5,0,20,0,D VLV RCS11 3,0,C VLV RCS13	R RO N PO/SRO I PO/SRO I RO/SRO M ALL C RO/SRO C RO/SRO	Raise power at 10%/hr Steam flow pressure compensation failure 2MSS*PT486 fails low Total makeup flow totalizer fails to terminate dilution at setpoint (Preload) Start as small leak that progressively worsens until SGTR SG "B" (600 GPM) PZR Master Pressure Controller fails high PORV Block valve 2RCS*MOV535 fails closed after manual close PORV Block valve 2RCS*MOV537 breaker trips			

Scenario #4 Summary Description.

Unit 2 is at 48% power, steady state conditions. While power is being raised >5% the makeup totalizer fails to stop at its setpoint requiring dilution to be manually terminated. SG "C" steam flow channel IV pressure compensation fails requiring manual feed control until an alternate channel is selected. The corresponding SG level channel must also be declared inoperable and its bistables tripped. A small S/G tube leak occurs requiring AOP entry for S/G tube leak. Leak will get progressively worse requiring crew to initiate AOP for emergency shutdown. During emergency shutdown, PZR Master controller fails resulting in an RCS pressure transient. The transient results in the loss of several pressure control components. S/G leakage escalates to SGTR. "C" RCP trips when the reactor trips, this removes the last remaining component that can be used in E-3 to depressurize the RCS. The loss of PZR pressure control results in ECA-3.3 entry. The crew must use auxiliary spray to depressurize the RCS. The scenario is terminated when E-3, is re-entered from ECA-3.3 and step 16 b is complete.

Chepare fear of Sheets In all JPM's & questions JUST INITIAL Conditions of Cues No other infor.

ES-301		Administrative Topics Outline Form ES-301	-1
Facilit	y: <u>BVPS2</u>	Date of Examination: <u>3/22/99</u>	
Exam	ination Level (circle	one): <u>RO</u> / SRO Operating Test Number:	
	Administrative Topic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions	
	2.1.20, Ability to execute procedure steps	1. New JPM, determine highest priority critical safety function from list of parameters.	
A.1			
	2.1.12, Ability to apply TS for a system	1. New JPM, Determine Tech Spec requirements for a failed PZR pressure transmitter. UKCY	
A.2	2.2.22, Knowledge of LCOs and Safety Limits	1. New JPM, determine if safety limit was exceeded during event based on chart recorder traces	
A.3	2.3.10, Ability to perform procedures to reduce excessive levels of radiation	1. New JPM, Determine maximum stay time in high radiation area becf up or reploce CET livel	
A.4	2.4.29, Knowledge of the Emergency Plan	1. New Question Which emergency facility should you report to for an Alert	
		2. New Question Which emergency facility should you report to prior to entry into PAB when being dispatched from OSC.	isec]

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	Number:) Fitle: De	ADM-IF T etermine	S (2LOT2 TS Requ	B NRC) Rev:0 irements for 1	Sy Faile	/stem #:2 1 PZR Pro	2.1 essure Xm	nitter
K/A H	Reference	∋: 2.1.	12 [2.9]	Task ID #	: 119	0150301		
	Applicat	_		🛛 Initi			🗖 Tra	ining
Evalu	uation Me	ethod		LOCATION		TYPE		
	X Per	form		Plant Site		Trainin	g	
	🗖 Sim	ulate		Simulator		Annual	Requal.	Exam
			X	Classroom		OJT		
					X	Initial	Operato:	r Exam
Admin	istered	By:					•	
D B	BV-T							
× N	IRC							
Ο ο	ther:	<u> </u>						
			-					
Evalu	ation Re	sults						
	Performe	er: Name	e:			Employee	≥ No:	
	Results		SAT			Time (m:	inutes)	
			UNSAT*	Allo	tted:	20	Actual:	
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-				Administrati] _{Yes} Faulte	
					ve JP	MX	Faulte	d
Comme	ents (Red	quired f	or UNSAT	Administrati	ve JP	MX	Faulte	d
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Evalua	ation Res Observer	sults 1: Nam	Chee	Evaluation):	ve JP	M X above	Faulte	d
Evalua	ation Res Observer Observer	sults 1: Nam 2: Nam	D Chea me:	Evaluation): ck here if sar	ve JP	M X above Employee Employee	No:	d
Evalua	ation Res Observer	sults 1: Nam 2: Nam 3: Nam	Cheo ne: ne	Evaluation):	ve JP	M X above Employee Employee Employee	Faulte	d
Evalua	ation Res Observer Observer Observer	Sults 1: Nar 2: Nar 3: Nar 4: Nar	Cheo ne: ne ne ne	Evaluation): ck here if sar Cime (minutes)	ve JP ne as 	M X above Employee Employee Employee Employee	Faulte No: No: No: No: Results	d
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RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task:

Determine TS Requirements for Failed PZR Pressure Transmitter

INITIAL	The plant is operating at 100% power all systems in
CONDITIONS	NSA. Pressurizer pressure transmitter 2RCS*PT455 fails low. All other PZR pressure transmitters are operable.

Your supervisor directs you to identify all required Tech Spec actions for this failure. Include any applicable time limits.
applicable cline clinics.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been met, announce "I have completed the JPM". Then hand back this sheet to the evaluator.

RIL #A5.635.J BEA	VER VALLEY JOB PERFORMANCE MEASURE
	EVALUATOR DIRECTION SHEET
JPM NUMBER:	ADM-IF TS (2LOT2B NRC)
JPM TITLE:	Determine TS Requirements for Failed PZR Pressure Transmitter.
TASK STAN:	Identify All TS Requirements for Failed PZR Pressure Transmitter, including time limits.
RECOMMENDED STARTING LOCATION:	Control Room/Simulator
DIRECTIONS :	Determine TS Requirements for Failed PZR Pressure Transmitter
INIT. CONDITIONS:	The plant is operating at 100% power all systems in NSA. Pressurizer pressure transmitter 2RCS*PT455 fails low. All other PZR
INIT. CUE:	pressure transmitters are operable. Your supervisor directs you to identify all required Tech Spec actions for this failure. Include any applicable time limits.
REFERENCES :	Tech Specs
TOOLS:	None

HANDOUT :

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RTL #A5.635.J

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arigide National

NUMBER	TITLE
ADM-IF TS (2LOT2B	Determine TS Requirements for Failed PZR
NRC)	Pressure Transmitter.

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	START TIME:
(Init the repair we	may begin the JPM by referring to various references to make an evaluation of the functions served by the failed transmitter. The specific reference used is not important, rather that the correct functions are identified. The JPM is written using the figure on page 22 of 20M-6.4.IF
1. Locates reference.	1. Candidate locates page 22 of 20M-6.4.IF
2. Identify functions fed from transmitter	 Identifies transmitter feeds:
	Rx Trips OTDT PZR Press Low PZR Press High ESF ACT
	PZR Press Low(SI) P-11 AND
	SDP indication
	Comments:

RTL #A5.635.J

NUMBER	TITLE
ADM-IF TS (2LOT2B	Determine TS Requirements for Failed PZR
NRC)	Pressure Transmitter.

STEP	STANDARD (Indicate "S" for Sat. or "U"
("C" denotes critical step)	for Unsat.)
 Checks Tech Specs for applicability 	3.1 Candidate reviews TS 3.3.1.1 table 3.3-1 and determines the following items are applicable:
	Item 7 OTDT Item 9 PZR Press low Item 10 PZR Press High
	Comments:
	3.2 Candidate reviews TS 3.3.2.1 table 3.3-3 and determines the following items are applicable: Item 1.d PZR Press Low(SI)
	Comments:
	EVALUATOR NOTE: P-11 is NOT applicable since the minimum channels operable is still met.
	3.3 Candidate reviews TS 3.3.3.5 table 3.3-9 and determines the following items are applicable:
	Item 7 PZR Press
	Comments:

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NUMBER	TITLE	
ADM-IF TS (2LOT2B	Determine TS Requirem ents for Failed PZR	
NRC)	Pressure Transmitter .	

STEP • ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)			
4.C Determine Tech Spec requirements.	<pre>4.1.C Identifies that bistables for the failed channel must be placed in the tripped condition within 6 hours for: Rx Trips OTDT PZR Press Low PZR Press High ESF ACT PZR Press Low(SI)</pre>			
	Comments:			
	EVALUATOR NOTE: SDP action is NOT applicable since the minimum channels operable is still met.			
	Comments:			
	STOP TIME			

BEAVER VALLEY JOB PERFORMANCE EVALUATOR COVER SHE	CE MEASURE ET
JPM Number: ADM-S TREES (2LOT2B NRC)Rev:0 JPM Title: Determine FRPs to Enter and Prior.	System #:2.1 ity
K/A Reference: 2.1.20 [4.3] Task ID #: 3	301AAA0601
JPM Application: Requal 🛛 Initial	Exam Training
Evaluation Method LOCATION	TYPE
🗙 Perform 🗖 Plant Site	T raining
Simulate Simulator	Annual Regual. Exam
X Classroom	JOJT
	X Initial Operator Exam
	Other:
	- Ocher :
× NRC	
U Other:	
Evaluation Results	
Performer: Name:	
	Employee No:
	Time (minutes)
	ed: 20 Actual:
	ritical: 🛛 Yes 🗵 No
	JPM 🛛 Faulted
*Comments (Possired for INICAM Declaration)	
*Comments (Required for UNSAT Evaluation):	
Evaluation Results Check here if same	as above
Observer 1: Name:	Employee No:
Observer 2: Name Observer 3: Name	Employee No:
Observer 3: Name Observer 4: Name	Employee No: Employee No:
Time (minutes)	Results
	ctual SAT UNSAT*
Question #1 N/A	
Employee No:	
Question #1 N/A	
Employee No:	
*Comments (Required for UNSAT Evaluation):	
Evaluator (Print):	Organization:
Evaluator Signature	Date:

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Rev. 0

BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: Determine FRPs to Enter and Priority

INITIAL The plant was operating at 100% power all systems in NSA. A large break LOCA occurred, the EOPs have been CONDITIONS: entered, Procedure E-1 "Loss of Reactor or Secondary Coolant" is being implemented. The following plant conditions exist: CNMT pressure 16.5 PSIG All core exit T/Cs 752 F All RCPs are OFF RVLIS Full range 46% ALL Power Range NIS 0% IRs Startup rate is minus .3 DPM SRs NIS are deenergized ALL RCS cold leg temps 573 F RCS pressure 0 PSIG All S/Gs NR levels 18% Total AFW flow to S/Gs 300 GPM PZR level 0%

INIT. CUE:	Your supervisor informs you that the STA has been injured, and requests you to perform EOP Status Tree monitoring. Complete the review of the Status Trees and report back the procedures that should be entered and their order of entry.
	and their order of entry.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been completed, announce "I have completed the JPM". Then hand back this sheet to the evaluator.

·	RIL #A5.635.J BEA	AVER VALLEY JOB PERFORMANCE MEASURE				
		EVALUATOR DIRECTION SHEET				
	JPM NUMBER:	ADM-S TREES (2LOT2B NRC)				
	JPM TITLE:	Determine FRPs to Enter and Priority				
	TASK STAN:	All FRPs identified and properly prioritized.				
	RECOMMENDED STARTING LOCATION:	Control Room/Simulator				
	DIRECTIONS:	Determine FRPs to Enter and Priority				
	INIT. CONDITIONS:	The plant was operating at 100% power all systems in NSA. A large break LOCA occurred, the EOPs have been entered, Procedure E-1 "Loss of Reactor or Secondary Coolant" is being implemented. The following plant conditions exist: CNMT pressure 16.5 PSIG All core exit T/Cs 752 F All RCPs are OFF RVLIS Full range 46% ALL Power Range NIS 0% IRs Startup rate is minus .3 DPM SRs NIS are deenergized ALL RCS cold leg temps 573 F RCS pressure 0 PSIG All S/Gs NR levels 18% Total AFW flow to S/Gs 300 GPM PZR level 0%				
	INIT. CUE:	Your supervisor informs you that the STA has been injured, and requests you to perform EOP Status Tree monitoring. Complete the review of the Status Trees and report back the procedures that should be entered and their order of entry.				
	REFERENCES:	Status trees				
	TOOLS:	None				
	HANDOUT :					

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NUMBER	TITLE	
ADM-S TREES (2LOT2B NRC)	Determine FRPs to Enter and Priority	

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)		
	START TIME:		
1. Locates Status Trees.	1. Candidate locates Status Trees		
2. Checks Subcriticality	2. Candidate determines Subcriticality tree is GREEN/SATISFIED		
	Comments:		
3. Checks Core Cooling	3.1 Candidate determines Core Cooling tree is ORANGE with FR-C.2 indicated		
	Comments:		
4. Checks Heat Sink	4.1 Candidate determines Heat Sink tree is RED with FR- H.1 indicated		
	Comments:		

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NUMBER	TITLE	
ADM-S TREES (2LOT2B NRC)	Determine FRPs to Enter and Priority	

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)		
5. Checks Integrity	5.1 Candidate determines Integrity tree is GREEN/SATISFIED		
	Comments:		
6. Checks Containment	4.1 Candidate determines Containment tree is ORANGE with FR-Z.1 indicated		
	Comments:		
7. Checks Heat Sink	7.1 Candidate determines Inventory tree is YELLOW with FR-I.2 indicated		
	Comments:		
	EVALUATOR NOTE: The identification of FR-I.2 in the		
	next step is NOT critical since yellow path procedures are only optionally entered at the discretion of the NSS/ANSS.		

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NUMBER	TITLE
ADM-S TREES (2LOT2B NRC)	Determine FRPs to Enter and Priority

STEP . ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)		
8.C Prioritizes Procedures to be entered.	<pre>8.1.C Candidate reviews status tree results and determines order of procedure entry to be: 1. FR-H.1 2. FR-C.2 3. FR-Z.1 4. FR-I.2</pre>		
	Comments:		
9. Report results	9. Candidate reports results to supervisor.		
	Comments:		
	STOP TIME		

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BEAVER VALLEY JOB PERFORMANCE MEASURE EVALUATOR COVER SHEET

JPM Number: ADM-Sa JPM Title: Determi K/A Reference: 2	ne li Tech S	pec Safety I	Limit has	been Viol	em #:2.2 ated.
JPM Application:	Requal	🛛 Initi	al Exam		Training
Evaluation Method Perform Simulate Administered By: BV-T NRC	□ P] □ Si ⊠ C1	OCATION ant Site mulator assroom	□ Ann □ OJT ⊠ Ini	uining ual Requa tial Opera	
Comments (Required	ame: SAT UNSAT [*]	Allo Time Administrati	Tim tted: Critical ve JPM	e (minutes 20 Actu .: D Ye S Faulted	al:s 🔀 No
Observer 2: Observer 3: Observer 4: Ques Question #1	Name: Name Name Name Tir		_ Emp _ Emp _ Emp	ve loyee No: _ loyee No: _ loyee No: _ Resul SAT □	
Question #1 Employee No:		N/A			
*Comments (Required 			Orga	nization:	

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RTL	#A5.6	35.0	J	BEAVER	VALLEY	JOB	PERFORMANCE	MEASURE
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CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task:

____ Determine If Tech Spec Safety Limit has been Violated.

INITIAL	The plant had been operating at 100% power all systems
CONDITIONS:	in NSA. A loss of feedwater induced ATWS occurred.

INIT. CUE: Using these control room strip charts for wide range RCS pressure and wide range Tc and Th, determine if a Tech Spec safety limit has been violated, including any applicable actions and time limits. Assume that Rx power was 40% during the period of the strip chart recordings.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been completed, announce "I have completed the JPM". Then hand back this sheet to the evaluator.

RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE					
EVALUATOR DIRECTION SHEET					
JPM NUMBER:	ADM-Safety Limit (2LOT2B NRC)				
JPM TITLE:	Determine If Tech Spec Safety Limit has been Violated.				
TASK STAN:	Identify TS for Safety Limit was violated, including actions and time limits.				
RECOMMENDED STARTING LOCATION:	Control Room/Simulator				
DIRECTIONS:	Determine If Tech Spec Safety Limit has been Violated.				
INIT. CONDITIONS:	The plant had been operating at 100% power all systems in NSA. A loss of feedwater induced ATWS occurred.				
INIT. CUE:	Using these control room strip charts for wide range RCS pressure and wide range Tc and Th, determine if a Tech Spec safety limit has been violated, including any applicable actions and time limits. Assume that Rx power was 40% during the period of the strip chart recordings.				
REFERENCES:	Tech Specs				
TOOLS:	None				

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HANDOUT:

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NUMBER	TITLE			
ADM-Safety Limit	Determine If Tech Spec Safety Limit has been			
(2LOT2B NRC)	Violated.			

• • •	STEP C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)	
		START TIME:	
		EVALUATOR NOTE: Candidate may check steps 1- and in any order.	
1.	Locates reference.	 Candidate locates Tech Spec 2.1 and figure 2.1-1 	
2.	Calculate hottest loop Tavg	2. Using the numbers taken from the strip charts, candidate calculates hottest loop Tavg to be <u>+</u> F	
		Comments:	
3.C	Checks Reactor Core Safety limit Tech Spec for applicability	3.1.C Candidate reviews TS 2.1.1 and determines that the Reactor Core Safety Limit Tech Spec has been violated.	
		Comments:	
		3.2.C Candidate determines that the action required is to be in HOT STANDBY within 1 hour	
		Comments:	

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NUMBER	TITLE			
ADM-Safety Limit	Determine If Tech Spec Safety Limit has been			
(2LOT2B NRC)	Violated.			

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
3.C Checks Reactor Coolant System Pressure Safety limit Tech Spec for applicability	3.1.C Candidate reviews TS 2.1.2 and determines that the Reactor Coolant System Pressure Safety limit Tech Spec has NOT been violated. Comments:

BE	AVER VALLEY JOB EVALUATOR	PERFORMANCE COVER SHEET	MEASURE			
JPM Number: ADM-RAD JPM Title: Determin	(2LOT2B NRC) Res	7 · 0 5 ·	stem #:2.3			
K/A Reference: 2.3	K/A Reference: 2.3.10 [2.9] Task ID #: 301AAA0601 2.1.25 [2.8]					
JPM Application:	Requal 🗙	Initial Example	am 🗖	Training		
Evaluation Method	LOCATIO		TYPE			
Perform Simulate	Plant :		Training			
Simulate	Simulat Classro	or 🖬	Annual Requa	al. Exam		
Administered By:			Initial Oper Other:			
BV-T		_				
X NRC						
• Other:						
Results		Allotted:_ Time Criti istrative JPN	1 🗵 Faul	s) Jal: es 🗵 No lted		
Evaluation Results	Check here	if same as	above			
Observer 1: N Observer 2: N	ame:ame		Employee No:			
Observer 3: N	ame		Employee No: Employee No:			
Observer 4: N	ame Time (m	I	Employee No: Resu			
Quest Question #1	ion ID Allott	ed Actua		UNSAT*		
Employee Not	N/P	<u> </u>	🖸			
Ouestion #1	N/A		-	-		
Employee No:				L		
*Comments (Required :	for UNSAT Evalua	tion):	-			
Evaluator (Print): Evaluator Signature		C)rganization: Date:			

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RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: Determine Stay Time in High Rad Area

INITIAL CONDITIONS: The plant is operating at 100% power all systems in NSA. It is necessary close valve A-1 on Training pump A-1 located in training pump A-1 cubicle on the 755' level of the PAB. Your annual year to date radiation exposure is 3.25 REM TEDE. Your RADOS limit is 750 mR. You are meter qualified to perform your own monitoring.

INIT. CUE:	As part of your pre-job brief, your supervisor directs you to use the posted map of the area (given) to
	determine your maximum allowable stay time, at the valve.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been completed, announce "I have completed the JPM". Then hand back this sheet to the evaluator.

	VER VALLEY JOB PERFORMANCE MEASURE
	EVALUATOR DIRECTION SHEET
JPM NUMBER:	ADM-RAD (2LOT2B NRC)
JPM TITLE:	Determine Stay Time in High Rad Area
TASK STAN:	BVPS Dose guide limits not exceeded.
RECOMMENDED STARTING LOCATION:	Control Room/Simulator
DIRECTIONS:	Determine Maximum stay time in high radiatic area.
INIT. CONDITIONS:	The plant is operating at 100% power all systems in NSA. It is necessary close val A-1 on Training pump A-1 located in train pump A-1 cubicle on the 755' level of the PAB. Your annual year to date radiation exposure is 3.25 REM TEDE. Your RADOS lim is 750 mR. You are meter qualified to per your own monitoring.
INIT. CUE:	As part of your pre-job brief, your supervis directs you to use the posted map of the are (given) to determine your maximum allowable stay time, at the valve.
	Map of area
REFERENCES :	

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NUMBER	TITLE
ADM-RAD (2LOT2B NRC)	Determine Stay Time in High Rad Area

r	
STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	START TIME:
	EVALUATOR NOTE: It may be necessary to help orient the student to the location of valve A-1 on the map.
 Determine dose rate at the valve. 	 Candidate reviews map and determines that the dose rate at the valve is 1250 mR/hr.
	Comments:
2.C Calculate maximum stay time.	2.C Candidate determines maximum stay time :
	750mR = 1250mR/60min X (x) 750 = 20.83 X (x) 750/20.83 = x
	36 min. = ×
	Comments:
	STOP TIME

RTL #A5.640E

DUQUESNE LIGHT COMPANY Nuclear Power Division Training Administrative Manual

OJT CHECKLIST/JPM COVER PAGE

PROGRAM TITLE: Licensed Operator Training

SUBDIVISION: On-the-Job Training

OJT CHECKLIST/JPM TITLE: Determine TS Requirements for Failed PZR

Pressure Transmitter

JPM NO.: ADM-IF TS (2LOT2B NRC)

COMPUTER CODE: N/A

Revision No.	Date

Revision No.	Date

PREPARED BY: R. J. Brooks DATE:

APPROVED FOR IMPLEMENTATION:

jan-s Ne

Director, Operations Training, or Designee

____ DATE : ____

RTL #A5.640E

DUQUESNE LIGHT COMPANY Nuclear Power Division Training Administrative Manual

LESSON PLAN AND OJT REVISION APPROVAL SHEET

DOCUMENT TITLE: Determine TS Requirements for Failed PZR Pressure Transmitter

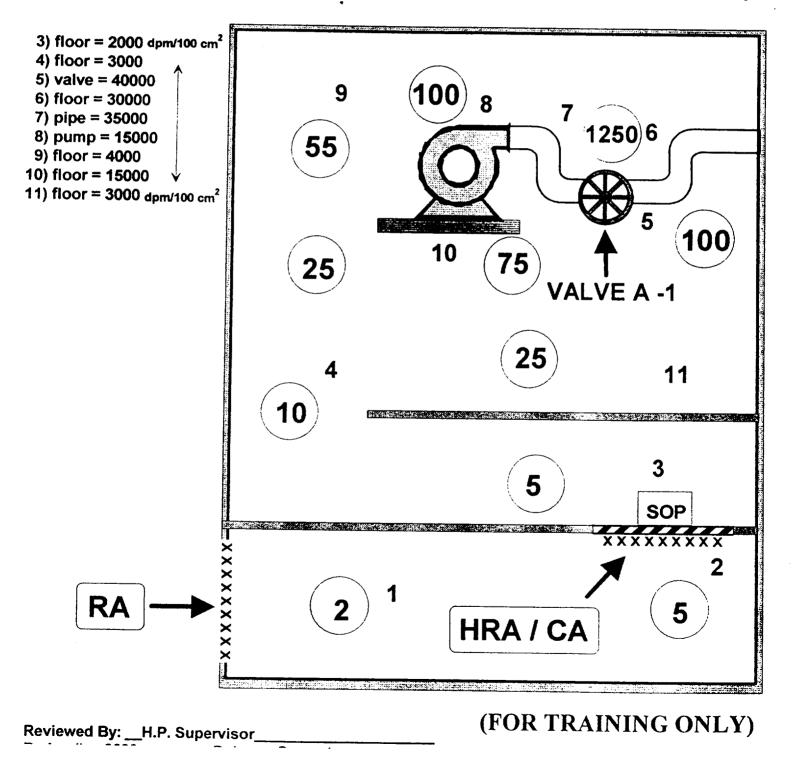
Revision			Approval	-
No.	Brief Description	Revised by:	Signature Date	-

REACTOR POWER10	0%
SURVEY DATE _Current_	TIME 0800
SURVEYED BYRandy F	Radtech
BADGE #7777	
RWP #399-8000	
INST. TYPE _RO2	SR # 1234
INST. TYPE _RM-14	SR #_ 5678

- * ALL AREAS ARE POSTED RCA UNLESS OTHERWISE NOTED.
- · CIRCLED NUMBERS ARE RADIATION LEVELS IN mR/hr.
- * NUMBERS ARE SMEAR LOCATIONS.
- * ALL SMEARS ARE LESS THAN 1000dpm/100cm² EXCEPT:

TRNG. A - 1 PUMP CUBICLE 755'

RCA =Radiologically Controlled Area RA = Radiation Area Boundry CA = Contaminated Area Boundry HRA = High Radiation Area X X X X X X X = Boundry



* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

The Emergency Plan has been implemented in response to a Large break LOCA. As an extra NCO for the shift, you had been assigned the PAB tour. The standby alarm is sounded, and an announcement made that an "ALERT has been declared, all onsite emergency response personnel and facilities should begin to activate". To which emergency response facility should you report?

ORAL QUESTION #1

The Emergency Plan has been implemented in response to a Large break LOCA. As an extra NCO for the shift, you had been assigned the PAB tour. The standby alarm is sounded, and an announcement made that an "ALERT has been declared, all onsite emergency response personnel and facilities should begin to activate". To which emergency response facility should you report? Operations Support Center (OSC located below the ANSWER: Unit 1 CR in the process instrument room).)

TIME ALLOTTED: 3 minutes

KSA #: 2.4.39 3.3/3.1 2.4.43 2.8/3.5

REF:

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EPP Vol 1 section 7 page 7-2 item 7.1.2 rev. 11

COMMENTS:

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

The Emergency Plan has been implemented in response to a Large break LOCA. As a member of the Operations Support Center, you are being dispatched to the PAB to realign the valves in the HHSI system. Which emergency response facility should you report to when leaving the OSC?.

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RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

The Emergency Plan has been implemented in response to a Large break LOCA. As a member of the Operations Support Center, you are being dispatched to the PAB to realign the valves in the HHSI system. Which emergency response facility should you report to when leaving the OSC?. ANSWER:

Radiological Operations Center (ROC)

TIME 3 minutes ALLOTTED: KSA #: 2.4.34 3.8/3.6 EPP Vol 1 section 2 page 5-9 item 5.2.7.3 rev. REF: 11 COMMENTS:

Facility: <u>BVPS2</u>		Date of Examination: <u>3/22/99</u>	
Exam Level (circle one): RO / SRO	(I) / SRO(U)		
System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description	
1. 001/ Recover Dropped RCCA/ D,S J/M CK G	1.	a. 003AK1.07 - 3.1 - Explain affect of dropped rod on Shutdown Margin	
N OK MY		b. 003AK1.02 - 3.1 - Explain Affect of turbine/reactor power mismatch on rod control	
2. 002/ Respond to Shutdown LOCA/ D,S(A,L	2.	a. 009EK3.04 - 4.1 - Determine High Head Safety Injection Requirements	
LOCA D,S,A,L Air forth		b. 009EA1.01 - 4.4 - Determine Cold Overpressure Protection Setpoint	
3. 006/ Makeup to the Refueling Water Storage Tank (RWST)/ N,S	3.	a. 033K1.05 - 2.7 - Find flowpath for Alternate source of Makeup to the RWST (Spent Fuel Pool)	
(ika y		b. 011EA1.11, 4.2 - Priority of keeping	
1. 061/Reset Terry Turbine Trip and Throttle Valve/ D, P,R	4.	core covered during LOCA Dec.	
FC-1		b. 061K4.01 - 3.9- Find flowpath for Alternate Source of water to AFW (Service Water)	
5. 003/ Restore Reactor Coolant Pump (RCP) Seal Cooling / N,S	4.	a. 003K1.12 - 3.0 - Analyze Effects of RCS leakage through the Thermal Barrier Heat Exchanger	
$)^{0}$		b. 003A2.01 - 3.5 - Predictened of sudden Seal Injection on an overheated RCP seal	
5. 076/ Startup Standby Service Water System (SWS) / D,S	4.	a. 062AA1.02 - Contrast SWS heat load at BOL with that at EOL	
And En y		 b. 076K1.16 - 3.6 - Deduce affect of Containment Isolation Signal on the SWS and Liquid Discharge 	

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System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description	
 103/ Perform Containment Isolation Phase A (CIA) checklist / D,S 	5.	a. 103A2.03 - 3.5 - Predict results of failure to isolate Containment after fuel damaging accident	
•		b. 103K4.06 - 3.1 - Determine how to override CIA to obtain Samples	
 064 / Start #1 Diesel Generator (DG) using local relays / D,P,M, 	6. notifiel	a. 062A2.12 - 3.2 - Predict impact of reenergizing a faulted bus	
ru-t		b. 064K1.02 - 3.1 - Develop plan to mitigate reduction of cooling water	
9. 015 / Perform a Quadrant Power Tilt Factor (QPTP) (unsatisfactory result) (N,S	7.	 a. 001K5.07 - 3.3 - Evaluate effect of control rod drop on QPTR 	
		b. 015K5.12 - 8.2 - Relate excessive power peaking to power distribution Technical Specifications	betel
10. 078 / Start an Instrument Air (IA) Compressor / D,P)	8.	a. 078K3.02 - 3.4 -Predict affect of loss of IA on Safe Shutdown capability.	Delet
		 b. 067AK3.04 - 3.3 - Determine why Domestic water is needed as backup air compressor cooling. 	
* Type Codes: (D)irect from bank, (N room, (S)imulator, (L)ow-Power, (l)odified from P)lant, (R)CA	i bañk, (N)ew, (A)lternate path, (C)ontrol	

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Explanation of changes to JPM Followup Questions

JPM #1 Question b.	The former question "b" was determined to be too closely related to question "a", <u>if</u> question "a" was answered using a reactivity balance including negative reactivity from the dropped rod. The new question "b" explores a different aspect of the rod control circuit (development of the temperature error signal).
JPM #3, Question b	The former question "b" was determined to be potentially low cognitive level (if candidate knew the high level actions in ECA 1.1 from memory); also, the question did not elicit the particular major actions required by the key.
	The replacement question is a higher cognitive level because it requires application of a general principle ("keep the core covered") to make a choice which is not explicitly set out in the procedure.
JPM #4 Question a	The former question "a" was chosen for its high importance rating in the K/A catalogue, but was too low in cognitive level ("list autostart signals for the Terry Turbine").
	The replacement question is a higher cognitive level because it requires combining information from two references (the P&ID/VOND and the Operating Manual) to determine which steam supply valve is upstream and that the upstream valve must be closed first.
JPM #6 Question a	The previous question "a" was determined to be too low in cognitive level (essentially "knowledge of automatic actions on low discharge pressure). This knowledge was also found to be measured by the written portion of the exam.
	The replacement question is at a higher cognitive level in that it requires integrating the affect of power history on RCS decay heat rate and the dependence of Spent Fuel Pool heat load on time after refueling. (This knowledge would be operationally significant during the mitigation of a Loss of Service Water event.)

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JPM #7 Question a	The former question "a" was determined to be of a low a cognitive level ("know which signals cause a phase A Containment Isolation").
	The replacement questions requires applying knowledge of the effects of fuel damage (increased RCS activity levels) and extrapolating normal radiation levels to identify hazards to chemists during sampling. Recent plant concerns with awareness of radiological conditions during transit to work locations are also tested.
JPM #8 Question a	The original question "a" required combining the knowledge that the ground sensing transformer is disconnected on an emergency start with the fact that this removes ground protection from the Diesel Generator.
	To increase the cognitive level, the replacement drawing requires the use of two circuit schematics (or two logic drawings) to determine the effect of an overcurrent condition on the 4160V Emergency Bus and the DG output breaker. It also tests awareness of the consequences of reenergizing a fault while DG electrical protection is minimized due to operation in the Emergency Mode.
JPM #8 Question b	The original question "b" was also determined to be a combination of two knowledges (panel is normally in REMOTE control and the pushbuttons only start the DG in LOCAL).
	The replacement question is much higher in cognitive level because it requires use of knowledge of the removal of engine trips in Emergency Mode to extrapolate the results of DG operation without sufficient cooling. It also requires the formulation of an original plan to minimize DG overheating, which is not explicitly directed by the procedure.

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RTL #A5.640U <u>BEAVER VALLEY JOB PERFORMANCE MEASURE</u> EVALUATOR COVER SHEET
JPM Number: 2CR-090 Rev:3 System #:003 JPM Title: Recover a Dropped RCCA
K/A Reference:003 AA1.02 3.6/3.4 Task ID #: 0000070401
JPM Application: 🛛 Requal 🖾 Initial Exam 🗌 Training
Evaluation Method LOCATION TYPE Image: Second structure Plant Site Training Image: Simulate Simulator Annual Requal. Exam Image: Classroom OJT Administered By: Other:
BV-T X NRC Other:
Performer: Name: Employee No: Results SAT Time (minutes) UNSAT* Allotted: 15_Actual: Time Critical: Yes X No Administrative JPM Faulted *Comments (Required for UNSAT Evaluation):
Evaluation Results Check here if same as above Observer 1: Name: Employee No: Observer 2: Name Employee No: Observer 3: Name Employee No: Observer 4: Name Employee No: Time (minutes) Results Question ID Allotted Actual
Question #1
Evaluator (Print): Organization: Evaluator Signature Date:

RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER: 2CR-090

JPM TITLE: Recover a Dropped RCCA

TASK STANDARD: 1. Control Rod P-8 has been recovered and restored to alignment with Control Bank D. 2. All control rods are left operable. 3. The RIL alarm is left operable.

STARTING LOCATION: Simulator

DIRECTIONS: You are to perform the task: Recover a dropped RCCA

INITIATING A plant startup was in progress. Control CONDITIONS: Bank D rods were at 131 steps when rod P-8 dropped to the bottom of the core. The actions of AOP 2.1.8 have been completed and the crew has transitioned to 20M-1.4.P. The cause for the dropped rod has been identified and corrected. The GMNPO has directed withdrawing the dropped rod.

INITIATING CUE: The ANSS directs you, as RO, to recover control rod P-8 and align the rod with the other rods in Control Bank D using procedure 20M-1.4.P, section IV.D. You are to perform steps D.1 through D.11.

REFERENCES: 20M-1.4.P, "RCCA or RCCA Group Misalignment", Issue 4, Revision 2

TOOLS:

None

HANDOUT: 20M-1.4.P " RCCA or RCCA Group Misalignment", Issue 4, Revision 2

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

- Question; The plant is at 100% power steady state operation, with rod control in manual. A control rod drops; the reactor does <u>not</u> trip. Assume no operator action. Briefly, describe the effect of the dropped control rod on shutdown margin.
- ANSWER: The Shutdown Margin will not change. The negative reactivity added by the dropped control rod will be equalized by positive reactivity from a decrease in Tavg. (Tavg no longer on program.) Therefore, upon a reactor trip, less positive reactivity will be added by a decrease in Tavg to 547°F. This decrease in the affect of the cooldown will cancel out the reduced trip reactivity worth of the rods.

(Alternate reasoning; since SDM is defined as the amount the Reactor <u>would</u> be shutdown with all rods inserted, the actual insertion of a rod does not change SDM.)

In KC

TIME ALLOTTED: 3 Minutes

KSA #: 003 AK1.07 3.1/3.2

REF: 20ST-49.1

COMMENTS:

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

QUESTION: The plant is at 100% power with rod control in automatic. Bank D is at 215 steps.

Briefly, explain the effect of a dropped rod in the vicinity of Power Range Channel N44 on automatic rod control (assume that the reactor does not trip).

ANSWER: The dropped rod will appear to N44 as a decrease in Reactor Power. The power mismatch circuit of the Automatic Rod Control Unit will sense Reactor Power less than Turbine Power and will withdraw the Bank D rods. (NOTE: Bank D rods will only withdraw to the C-11 permissive setpoint) (The Tavg decrease will also cause rods to withdraw, but this will not occur until after the power mismatch has anticipated the cooldown.)

ALLOTTED:	4 Minutes		Ú	Gu and Lot
KSA #:	003 AK 1.02	3.1/3.4	(and the second	ľ

REF: 20M-1.1

COMMENTS:

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

The plant is at 100% power with rod control in automatic. Bank D is at 215 steps.

Briefly, explain the effect of a dropped rod in the vicinity of Power Range Channel N44 on automatic rod control (assume that the reactor does not trip).

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

The plant is at 100% power steady state operation, with rod control in manual. A control rod drops; the reactor does <u>not</u> trip. Assume no operator action. Briefly, describe the effect of the dropped control rod on shutdown margin.

RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: Recover a dropped rod and restore the rod to proper alignment with it's bank.

INITIAL CONDITIONS:	A plant startup was in progress. Control Bank D rods were at 131 steps when rod
	P-8 dropped to the bottom of the core. The actions of AOP 2.1.8 have been completed and the crew has transitioned to 20M-1.4.P.
	The cause for the dropped rod has been identified and corrected. The GMNPO has directed withdrawing the dropped rod.

The ANSS directs you, as RO, to recover control INITIATING rod P-8 and align the rod with the other rods in CUE: Control Bank D using procedure 20M-1.4.P, section IV.D. You are to perform steps D.1 through D.11.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been met, announce "I have completed the JPM". Then hand back this sheet to the evaluator.

NUMBER	TITLE	•
2CR-090	Recover a Dropped RCCA	
STEP ("C" denotes critica	l step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
EXAMINER NOTE: Candidate should perform Section D of 20M-1.4.P.		EXAMINER NOTE: Simulator IC- 24 (25% power rods at 131 steps). Activate Malf CRF 3A P8, 1,0 0,D, Act. Then clear malfunction. (OR,for exam, IC 69) Start time:
1.C Place Rod Control Selector Switch to bank which has dropped rod.		1.C Candidate places the switch to the Control Bank "D" position. COMMENTS:
2.C Align Discor Switches for Recovery		2.C Candidate places all disconnect switches for Bank D to the Rod Disconnected Position except for rod P-8 which is left in CONNECT. COMMENTS:

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NUMBER	TITLE	
2CR-090	Recover a D	ropped RCCA
STEP		STANDARD
("C" denotor aritigal star)		(Indicate "S" for Sat. or "U"
("C" denotes critical step)		for Unsat.)
3. Record Step Position for dropped Rod Group Step Counter.		3. Candidate Records:
		3.1 Bank with dropped RCCA (D).
		3.2 Group with dropped rod (Group 1).
		3.3 Position of rods in group with dropped rod (131 steps).
		3.4 Dropped rod designation (P-8).
		3.5 Dropped rod position (0 steps).
		COMMENTS:
4. Reset Dropped F Counter to zero		4. Candidate resets the Step Counter by:
		4.1 Opening glass cover on dropped rod Group Step Counter.
		4.2 Reset counter to zero.
		4.3 Close glass cover.
		COMMENTS:

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NUMBER	TITLE	
2CR-090	Recover a D	ropped RCCA
STEP ("C" denotes critica	l step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
5. Contact GMNO a Engineering to rate of rod wi	determine	5. Candidate ask for rate of rod withdrawal as determined by GMNO and Reactor Engineering. EXAMINER CUE: Acting as GMNO and Reactor Engineering inform candidate that there is no limitation on the rate of rod withdrawal. COMMENTS:
6.C Move Rod Motic the OUT positio		 6.1.C Candidate places the Rod Motion lever in the OUT position. 6.2 The moving control rod is stepped out at 5 step increments or less. 6.3 Candidate verifies that Tavg remains equal to Tref. EXAMINER NOTE: When candidate demonstrates compliance with 5 step increments in two or three rod pulls, cue the candidate that they may pull continuously to 120 steps as a time compression tactic. At 120 steps, stop and finish alignment in 5 step increments. COMMENTS:

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NUMBER	TITLE	
2CR-090	Recover a Di	ropped RCCA
STEP ("C" denotes critica 7. Verify Annuncia "ROD CONTROL ST	tor A4-8A	STANDARD (Indicate "S" for Sat. or "U" for Unsat.) 7. Candidate indicates that alarm A4-8A is
ALARM" is lit.		expected when rod movement starts COMMENTS:
8. Monitor DRPI to dropped rod is withdrawn.		8. Candidate monitors DRPI and verifies rod P-8 is being withdrawn. EXAMINER CUE: DRPI lights for Rod P-8 indicate the rod is being withdrawn from the core. COMMENT:

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NUMBER	TITLE
2CR-090	Recover a Dropped RCCA

STEP	STANDARD
	(Indicate "S" for Sat. or "U" for Unsat.)

9.C	Continue to move dropped rod until Group Step Counter indicates previous position recorded in procedure Step D.3.	9.C Candidate withdraws the rod until the Group Step Counter indicates 131 steps.
		EXAMINER CUE: Group Step Counter for CBD both indicate 131 steps.
		COMMENTS:
10.	Verify dropped rod is now at the same position as other rods in bank by observing DRPI.	 Candidate verifies Rod P-8 indicates same as other rods in CBD on DRPI.
		EXAMINER CUE: DRPI indicates all rods in CBD at 131 steps.
		COMMENTS:

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NUMBER			·	
TOPIBER		TITLE		
2CR-090		Recover a Dr	copped RC	CA
L	·····	<u> </u>		
STEP	otos suitios]		e "S" for Sat. or "U"
	otes critica	i step)	for Unsa	(t.)
11.C	Replace all switches to position.	disconnect ROD CONNECT	11.C	Candidate places all switches for CBD to ROD CONNECT position.
			COMMENT	S:
12.C	Clear urgen alarms on po cabinet.		12.1.C	Candidate clears urgent alarm using reset P/B on BB-B.
			12.2	Candidate verifies Ann. A4-8A clears.
			COMMENT	S :

NUMBER	TITLE	
2CR-090	Recover a l	Dropped RCCA
STEP ("C" denotes critica		STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
13.C Resets P/A Cor	lverter	13.C Directs local operator to reset P/A converter for Bank D to 131 steps To reset the P/A converter. LOA CRF 2 1,0,D LOA CRF 3 131,0,D LOA CRF 2 0,0,D (OR, set MCRFPA(4)=131) To reset the plant computer: (X= rod that is dropped) CIH MCRFGNSC(X)=MCRFPA(4) CIH MCRFB1PC(X)=MCRFPA(4) Comments;
14. Verifies Core P distribution no		<pre>14.1 Performs NIS Channel Check 14.2 Verifies ΔI in band 14.3 Checks rods > RIL 14.4 Checks Incore Thermocouples (PSMS) 14.5 Verifies Tavg deviation <u>Annunciator clear.</u> Comments;</pre>

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NUMBER	TITLE
2CR-090	Recover a Dropped RCCA
STEP	STANDARD

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
15. Restores Rod Control Selector Switch	<pre>15. Candidate places the Rod Control Selector switch in MANUAL. EXAMINER CUE: Inform candidate that the JPM is complete. If asked, direct candidate to place rod control in MANUAL. Comments;</pre>

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Page 8 of 8

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* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

The plant is at 100% power with rod control in automatic. Bank D is at 215 steps.

Briefly, explain the effect of a dropped rod in the vicinity of Power Range Channel N44 on automatic rod control (assume that the reactor does not trip).

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

The plant is at 100% power steady state operation, with rod control in manual. A control rod drops; the reactor does <u>not</u> trip. Assume no operator action. Briefly, describe the effect of the dropped control rod on shutdown margin.

RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE

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Read:

Task: Recover a dropped rod and restore the rod to proper alignment with it's bank.

A plant startup was in progress. Control Bank D rods were at 131 steps when rod
P-8 dropped to the bottom of the core.
The actions of AOP 2.1.8 have been
completed and the crew has transitioned
to 20M-1.4.P.
The cause for the dropped rod has been
identified and corrected. The GMNPO has
directed withdrawing the dropped rod.

INITIATING CUE:	The ANSS directs you, as RO, to recover control rod P-8 and align the rod with the other rods in Control Bank D using procedure 20M-1.4.P, section
	IV.D. You are to perform steps D.1 through D.11.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been met, announce "I have completed the JPM". Then hand back this sheet to the evaluator.

RTL #A5.640U	U <u>BEAVER VALLEY JOB PERFORMANCE MEASURE</u> EVALUATOR COVER SHEET	
JPM Number: 3 JPM Title: R	2CR-620 Rev:4 System #: 006 Respond to a Shutdown LOCA	
K/A Reference JPM Applicat:	ce: 009EA1.13 4.4/4.4 Task ID #:000056 tion: I Requal Initial Exam Training	0401
Evaluation Me		
X Perf	form 🛛 Plant Site 🗍 Training	
🗌 Simu	ulate 🛛 Simulator 🗌 Annual Requal.	Exam
	🗖 Classroom 🔲 OJT	
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RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER:	2CR-620
JPM TITLE:	Respond to a Shutdown LOCA
TASK STANDARD:	 RCS isolated and HHSI flow established.

RECOMMENDED

STARTING LOCATION: Simulator

DIRECTIONS: You are to perform the task "Respond to a Shutdown LOCA".

INITIAL The plant was in Hot Shutdown, Mode 4, on CONDITIONS: RHS, with the normal charging pathway being the declared Boration Flowpath. PZR level rapidly dropped from 25% to 0% and PRT alarms were received. The NSS has decided to enter AOP 2.6.5 "Shutdown LOCA" to stabilize plant conditions.

INITIATING CUE: The NSS/ANSS directs you to perform the first six steps of AOP 2.6.5 "Shutdown LOCA" to establish HHSI flow.

REFERENCES: 20M-53C.4.2.6.5 (ISSUE 1A Rev 8) "Shutdown LOCA"

TOOLS: None

HANDOUT: AOP 2.6.5

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NUMBER	TITLE Respond to a Shutdown LOCA-			
2CR-620	Faulted			
STEP				
("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)			
EXAMINER NOTE: Candidate may secure the RCP during this JPM due to seal leakoff, Vibration, ect., but this is not required by the AOP.	Start time: EXAMINER NOTE: Initialize simulator in Mode 4, Hot Shutdown, with RHS in service (IC-4). De-energize 2SIS*MOV867A, B, C, D using LOAs LOV100, LOV109, LOV114, and LOV117. Remove RHR yellow tags on board, energize RHS recorders. Place PCV145 in MANUAL at 50% open. Activate Malf RHR1A=100% and CLF RHR VLV13=2 (RHS suction relief open & MOV 750A open) Have Shorting Bar available. Write snap. OR IC-66 for exam.			
1.Candidate locates procedure.	1.1 Candidate locates AOP 2.6.5 "Shutdown LOCA". COMMENTS:			

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NUMBER	TITLE
2CR-620	Respond to a Shutdown LOCA- Faulted

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
2. Check Safety Injection; not actuated.	<pre>2.1 Candidate verifies annunicator A12-1D off 2.2 Candidate checks other Safety Injection Annunciators not lit COMMENTS:</pre>
	Injection Signal exists. No Annunciators are lit (repeat cue as asked throughout this JPM).
3.C Isolate RCS Letdown.	 3.1 Candidate verifies closed Letdown Orifice Isolation Valves 2CHS*AOV200A, B, C. 3.2 Candidate verifies closed Regen Heat Exchanger Letdown Inlet vlvs. [2CHS*LCV460A, B]. 3.3.Candidate attempts to close RHS Train A, B Cross connect Isol Vlv 2RHS*MOV750A 3.4.C Candidate closes HCV 142. COMMENTS:

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2CR-620	-				
	TITLE Respond to a Shutdown LOCA- Faulted				
STEP	STANDARD				
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)				
 Check if charging flow is adequate. 	4.1 Candidate adjusts 2CHS*FCV122 as necessary to maintain PZR Level				
	4.2 Candidate checks if PRZR level greater than 4%.				
	4.3 Candidate checks if PRZR level stable or rising.				
	4.4 Candidate verifies PRZR <u>level <4% and dropping.</u> COMMENTS:				
	EXAMINER CUE: PRZR level is offscale low.				
5. Alert Plant Personnel of the Shutdown LOCA.	5.1 Candidate sounds standby alarm.				
	5.2 Candidate announces Unit 2 Shutdown LOCA.				
	5.3 Evacuates nonessential personnel from containment.				
	5.4 Candidate notifies NSS/ANSS to evaluate for EPP initiation. COMMENTS:				
	EXAMINER CUE: NSS will evaluate for EPP, no				

personnel are in CNTMT.

RTL #A5.635.J

NUMBER	TITLE
2CR-620	Respond to a Shutdown LOCA- Faulted

STEP		
STEP		STANDARD (Indicate "S" for Sat. or "U"
("C"	denotes critical step)	for Unsat.)
6.	Check SI equipment status.	6.1 Candidate verifies two Charging/HHSI pumps available. COMMENTS:
		EXAMINER CUE: "A" HHSI pump is "available" but in PTL
7.	Check [2SIS*MOV867A-D] High Head SI Cold Leg Isol Vlvs - None energized.	7.1 Candidate verifies NO High Head SI Cold Leg isolation valves are energized.
		COMMENTS :
8.C	Establish alternate SI flowpath.	8.1 Candidate verifies only one Charging/HHSI pump running.
		8.2 Candidate opens/verifies [2CHS*LCV115B and/or D].
		8.3 Candidate closes/verifies [2CHS*LCV115C and/or E].
		8.4 Candidate locates shorting bar and inserts it into receptacle on 'VB' A for [2SIS*MOV836].

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NUMBER	TITLE
2CR-620	Respond to a Shutdown LOCA- Faulted

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
· ·	<pre>8.5.C Candidate opens [2SIS*MOV836]. EXAMINER NOTE: Use of valves 868A & 840 is acceptable in 8.5 8.6.C Candidate closes [2CHS*MOV289]. 8.7 Candidate dispatches operators to re-<u>energize [2SIS*MOV867A-D]. COMMENTS:</u></pre>
	EXAMINER CUE: Other operators will reenergize the valves EXAMINER NOTE: Terminate the JPM at this point.

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

Assume that you have progressed in AOP 2.6.5, "Shutdown LOCA" to Step 11. The following conditions exist following a LOCA in MODE 4:

Containment radiation level is 100R/hr Containment pressure is 2 psig Pressurizer level = 22% RCS Pressure = 285 psig RCS Temperature (based on Core Exit T/Cs) = 380°F Subcooling by the PSMS is 40°F

Determine if the second charging pump should be started, and explain your answer.

ANSWER: The containment conditions are adverse. The PZR level is less than that required for adverse conditions. Therefore, the second charging pump should be started.

TIME

ALLOTTED: 5 minutes

KSA #: 009 EK3.04 4.1/4.3

REF: AOP 2.6.5 Attachment 3

COMMENTS:

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

Question;

Assume you are at Step 26 of AOP 2.6.5, "Shutdown LOCA. The following conditions exist:

OPPS is armed.

All RCS Cold leg Temperatures are = 320°F

All RCS Hot leg Temperatures are = 320° F

All RCS Wide Range Pressures are = 375 psig

Determine if the Cold Overpressure Protection System lift setpoint for either OPPS PORV is exceeded. Explain how you reached your conclusion.

ANSWER: No. By applying the graph for the existing conditions,

(2RCS*PCV455C = 475 psig)

(2RCS*PCV456 = 555 psig)

ALLOTTED: 5 minutes

KSA #: 009 EA1.01 4.4/4.3

REF: AOP 2.6.5 Attachment 1

COMMENTS:

TIME

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

Assume you are at Step 26 of AOP 2.6.5, "Shutdown LOCA. The following conditions exist:

OPPS is armed.

All RCS Cold leg Temperatures are = $320^{\circ}F$

All RCS Hot leg Temperatures are = $320^{\circ}F$

All RCS Wide Range Pressures are = 375 psig

Determine if the Cold Overpressure Protection System lift setpoint for either OPPS PORV is exceeded. Explain how you reached your conclusion.

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

Assume that you have progressed in AOP 2.6.5, "Shutdown LOCA" to Step 11. The following conditions exist following a LOCA in MODE 4:

Containment radiation level is 100R/hr Containment pressure is 2 psig Pressurizer level = 22% RCS Pressure = 285 psig RCS Temperature (based on Core Exit T/Cs) = 380°F Subcooling by the PSMS is 40°F

Determine if the second charging pump should be started, and explain your answer.

RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

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Task: Respond to a Shutdown LOCA.

INITIAL CONDITIONS:	The plant was in Hot Shutdown, Mode 4, on RHS, with the normal charging pathway
· ·	kHS, with the normal charging pathway being the declared Boration Flowpath. PZR level rapidly dropped from 25% to 0% and PRT alarms were received. The NSS has decided to enter AOP 2.6.5 "Shutdown LOCA" to stabilize plant conditions.

INITIATING. The NSS/ANSS directs you to perform the first s CUE: HHSI flow.	ix
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At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance or perform as directed the required task. Point to any indicator or component you verify or check and announce your observations.

After determining that the Task has been completed, announce "I have completed the JPM", then hand this sheet back to the evaluator.

	<u>BEAVER V</u>	ALLEY JOB EVALUATOR	PERFOR	MANCE ME SHEET	EASURE	
JPM Number: 2CF			Rev:0		n #: 006	
JPM Title: Makeup	to the RWST			-,		
K/A Reference: 00	6A2.02	Difficulty:	3.9/4.3	Task	ID #:0060100	101
JPM Application:] Initial E			
					Tanany	-
Evaluation Me	orm late	LOCAT Plant Simula Class: NRC	Site	Tr An J J J J J J J J O J		ator Exam
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Question #1						
Employee No: Question #2 Employee No:					_ □	
*Comments (Requir	ed for UNSAT	Evaluation):				
Evaluator (Print):					anization:	
Evaluator Signature		<u> </u>		-	_ Date:	

BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER:	2CR-New#3
JPM TITLE:	Makeup to the RWST
TASK STANDARD.:	Blended makeup is established to the RWST at between 2000 and 2100 ppm Boron
RECOMMENDED STARTING LOCATION:	Simulator
DIRECTIONS:	You are to makeup to the RWST using blended flow
INITIAL CONDITIONS:	Following a Large Break LOCA while at 100% power, Recirculation from the Containment sump has been lost. ECA 1.1 has been performed up to step 5.
INITIATING CUE:	The ANSS directs you, as an extra licensed operator, to make up to the RWST at 120 GPM per 20M-7.4.0.
REFERENCES:	ECA 1.1 20M-7.4.0
TOOLS:	NA
HANDOUT:	ECA 1.1 pgs. 1 through 5, 2OM 7.4.0

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

QUESTION; If blended flow is unavailable for RWST makeup in ECA 1.1, what is the alternate source of makeup? Trace the alternate flowpath on the VOND and discuss the driving head used.

ANSWER: Transfer (of borated water) from the Spent Fuel Pool Purification Pumps to the RWST. The flowpath is shown on VONDS 20-1 and 13-2. (The path is from the Spent Fuel Pool, through valve #2 to either Purification Pump, then through filter 21A or 21B and valve 35 or 36 to valve 47 and the RWST.)

TIME ALLOTTED: 10 minutes

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KSA #:033K1.05-2.7, 006A1.15-3.3

REF: ECA 1.1, 20M-7.4.0

COMMENTS: _____

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

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During the performance of ECA 1.1, all sources of borated makeup water, including the RWST, have been exhausted. Should makeup continue with unborated (primary grade) water, or should makeup flow be secured until borated water is again available? Explain the basis for your choice.

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

Trace the alternate flowpath for makeup to the RWST in ECA 1.1 on the VOND and discuss the driving head used.

BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

*THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task: Makeup to the RWST

INITIAL CONDITIONS:	Following a Large Break LOCA while at 100% power, Recirculation from the Containment sump has been lost. ECA 1.1 has been performed up to step 5.
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INITIATING CUE: The ANSS directs you, as an extra licensed operator, to make up to the RWST at 120 gpm per 20M-7.4.0.	
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At this time, ask the evaluator any questions you have about this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".



Perform the required task. Point to any indicator or component you verify or check and announce your observations.

After completing the task, announce "I have completed the JPM", then hand this sheet back to the evaluator.

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

· · ·

STEP	STANDARD -	
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)	
	<pre>Start time:</pre>	
<pre>1.C Directs local valve lineup. EXAMINERS CUE: Aux. Bldg operator reports; 2FNC-35,-36,&-38 verified closed 2FNC-47 has been opened</pre>	1.C Directs local opening of 2FNC-47. COMMENTS:	
2.Stops the Makeup System	2. Places Makeup Control Switch in STOP COMMENTS:	
	EXAMINER CUE: If requested, inform candidate that the accident occurred in Mode 1 (dilution valves are unlocked).	

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

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STEP	STANDARD
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)
3.C Selects Manual mode of makeup	3.1C Places Makeup Mode Selector switch in MANUAL.
	COMMENTS:
4.C Aligns Makeup valves.	 Puts the following control switches to CLOSE;
	4.1C 2CHS FCV113B, BA blender disch to Chg Pumps
	4.2C 2CHS FCV114B, Blender outlet to VCT
	4.3 2CHS SOV206, Alt. Emergency Boration Vlv
	4.4 2CHS MOV350 Emergency Boration Isolation Vlv
EXAMINER NOTE: Emergency valves are not critical because they are initially closed and will not receive an open signal	COMMENTS:

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

STEP	STANDARD
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)
5.C Adjusts Boric Acid flow to the blender.	<pre>EXAMINER CUE: ANSS desires 120gpm flow at 2050 ppm. BAT "A" is in service at 7480 ppm. 5.1 Calculates ~ 33 gpm desired (32.08 to 33.69 gpm). 5.2C Sets 2CHCS FCV 113A between 8.02 and 8.42 COMMENTS:</pre>
	<pre>EXAMINER NOTE: If the flow is initially mis-set, but corrected in step 17 of the procedure, that constitutes satisfactory completion of this step. Allowable settings are based on a concentration of 2000 to 2100 ppm if total flow is exactly 120 gpm.</pre>

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

STEP		STANDAF	
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	otes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)	
6.C	Adjusts total makeup flow.	6.1C	Sets 2CHS FCV168 to ~ 7.5 (7.32 to 7.68)
		6.2C	Sets 2CHS FCV114A pot. to ~ 7.5 (7.32 to 7.68)
		COMMENT	rs :
		initi corre const	<u>ER NOTE</u> : If the flow is ally mis-set, but cted in step 17, that itutes satisfactory etion of this step.
		based 2000	table settings are on a concentration of to 2100 ppm with ly 32.89gpm boric acid
		satis: makeu	5 and 6 are both factory as long as p concentration is en 2000 and 2100 ppm.

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

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STEP	STANDARD _	
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)	
7.C Sets Boric acid totalizer	7.C Sets Boric acid totalizer <u>to at least 267 gallons.</u> COMMENTS:	
	EXAMINER CUE: ANSS directs an initial addition of 1,000 gallons.	
	EXAMINER NOTE: Totalizer may be set much higher due to anticipated continuous addition. Critical element is not to interrupt addition during the course of the JPM.	
8.C Sets Total Makeup totalizer	<pre>EXAMINER CUE: ANSS directs an initial addition of 1,000 gallons. 8.C Sets Total Makeup flow totalizer to at least 1000 gallons. COMMENTS:</pre>	
	EXAMINER NOTE: Totalizer may be set much higher due to anticipated continuous addition. Critical element is to not interrupt addition during the course of the JPM.	

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

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STEP	STANDARD	
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)	
9. Records Total Makeup Flow reading	9. Records Total flow <u>reading.</u> COMMENTS:	
	EXAMINER NOTE: This step may not be performed due to urgency of EOP initial conditions	
10.C Directs operator at blender room to lineup to the RWST	<pre>10.1C Directs opening 2CHS 87, Blender to Refueling Cavity Isolation 10.2C Directs opening 2CHS 89, Blender to RWST Isolation EXAMINER CUE: In Expert Mode, type Set RCHV87 = 2 COMMENTS:</pre>	

NUMBER	TITLE
2CR-New#3	Makeup to the RWST

STEP	STANDARD	
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)	
11.C Initiates makeup	11.C Places the Makeup Control Switch to START COMMENTS:	
12. Verifies expected flows	12. Checks red and green pens on 2CHS-FR113. COMMENTS:	

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	Reset the '		Trip and Throttle Valu	
K/A Referen JPM Applica			Task ID #: 061 ial Exam 🗍 Training	10090101
	form [ulate [LOCATION Plant Site Simulator Classroom	Annual Requal. OJT	
Administered BV-T Other:	-	NRC	Initial Operato	
*00000000000000000000000000000000000000		Tin Administ	rative JPM Fault	No ed
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RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE		
	EVALUATOR DIRECTION SHEET	
JPM NUMBER:	2PL-004	
JPM TITLE:	Reset the Terry Turbine Trip and Throttle Valve	
TASK STANDARD:	2FWE*P22 trip and throttle valve is reset.	
RECOMMENDED STARTING LOCATION:	In Plant	
DIRECTIONS:	You are to simulate the task "Reset the Terry Turbine Trip and Throttle Valve".	
INITIAL CONDITIONS:	The plant is in Mode 1 at 50% power. The turbine driven auxiliary feedwater pump has tripped due to an overspeed condition. The problem has been corrected. A plant operator has verified that the trip and throttle valve is closed. No start signal exists for [2FWE*P22] and the pump is stopped. The pump is not required to feed the steam generators.	
INITIATING CUE:	Your supervisor directs you to reset the trip and throttle valve for [2FWE*P22].	
REFERENCES:	20M-24.4R Issue 1 Revision 13	
TOOLS:	None	
HANDOUT:	20M-24.4R	

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NUMBER	TITLE
2PL-004	Reset Terry Turbine Trip
I	Throttle Valve

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
3.C To open the trip and throttle valve, turn the handwheel in the clockwise direction until it is fully down (CLOSED).	3.C Simulates turning handwheel in the clockwise direction to raise the latch to engage the valve.
	COMMENTS:
	EXAMINER CUE: Latch (crossbar) rises to the full up position (oil trip latch is engaged)

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NUMBER	TITLE
2PL-004	Reset Terry Turbine Trip Throttle Valve

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
4.C Reset overspeed trip device.	4. Candidate simulates resetting overspeed trip device by:
	4.1.C Pulling overspeed trip connecting rod to the left.
	4.2 Ensuring overspeed tappet washer flat side lines up with the overspeed trip lever (scribe mark on washer is aligned with punch mark on tappet housing)
	EXAMINER CUE: The washer is aligned with the linkage.
	4.3.C Release connecting rod, allowing spring tension to maintain reset condition.
	4.4 Ensuring washer flat edge is flush against vertical side of overspeed trip lever.
	COMMENTS :

NUMBER	TITLE
2PL-004	Reset Terry Turbine Trip Throttle Valve

STEP ("C" denotes	critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
by obset	the valve is latched rving the latch on ht side of the	<pre>5. Candidate: 5.1 Verifies that it has engaged the latch hook. 5.2 Calls ANSS to tell him that this requires an independent verification. EXAMINER CUE: The ANSS will assign another operator to perform independent verification. COMMENTS: EXAMINER CUE: The Terry</pre>
		Turbine did trip due to an overspeed condition. There is NO auto start signal present.

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NUMBER	TITLE
2PL-004	Reset Terry Turbine Trip Throttle Valve

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
6.C Reopen the trip throttle valve by turning the handwheel counter clockwise.	<pre>6.Candidate 6.1 Simulates turning it counter clockwise 6.2.C Continues turning until the valve stops in the full open position. 6.3 Inform ANSS of need for independent verification. EXAMINER CUE: The ANSS will assign another operator to perform independent verification. COMMENTS:</pre>

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NUMBER	TITLE
2PL-004	Reset Terry Turbine Trip Throttle Valve

STEP ("C"	denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
7.C	To prevent thermal binding of Trip Throttle valve, crack valve off its back seat by 1/4 turn.	7.C Candidate Simulates turning handwheel 1/4 turn clockwise to prevent thermal binding
		COMMENTS :

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NUMBER	TITLE
2PL-004	Reset Terry Turbine Trip Throttle Valve

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
8.C Push both pushbuttons to dump oil from the governor to preclude overspeed of the Terry Turbine on a restart. Observe governor linkage until movement ceases or hold for 15 seconds.	<pre>8. Candidate: 8.1.C Simulates depressing both pushbuttons simultaneously. 8.2 Holds pushbuttons until linkage movement ceases or 15 seconds has elapsed. COMMENTS: EXAMINER CUE: All governor linkage movement has stopped. (15 seconds has elapsed, if asked). EXAMINER CUE: 2FWE*P22 is not needed to control steam gen. level. Stop Time:</pre>

ORAL QUESTION #1

- Ouestion: The plant is in Mode 3 with all conditions stable. The Terry Turbine has been started by manually opening 2MSS*SOV105A and D to feed the steam generators. Explain the correct sequence by which the steam supplies should be closed in order to secure the Terry Turbine and the reason for this sequence.
- ANSWER: First close 2MSS*SOV105A, then 2MSS*SOV105D. The SOV closest to the Main Steam header must be closed before the downstream SOV, in order to avoid steam binding of the downstream SOV pilot valve, which could cause the downstream SOV to be incapable of reopening. The VOND must be consulted to determine that SOV105A is the upstream valve, then the caution in the OM applied.

TIME

- ALLOTTED 5 minutes
- KSA #: 061 K1.03 3.5/3.9
- REF: Caution in 20M-24.4K for securing an AFW pump. VOND 21-2

COMMENTS:

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

Question:

If demineralized water was not available to supply auxiliary feed, show on the applicable VONDs how another source of water can be aligned to the auxiliary feedwater pump suction. .

ANSWER: The service water system is aligned as follows: from the "B" SWS header through valves 103B,98, and valve 90, 91, or 92.

Kay challens tog TIME ALLOTTED: 5 minutes KSA #: 061K4.01 3.9/4.2 REF: 20M-24.1 VOND 24-3 VOND 30-3 VOND 30-1 COMMENTS:

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

If demineralized water was not available to supply auxiliary feed, show on the applicable VONDs how another source of water can be aligned to the auxiliary feedwater pump suction.

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

The plant is in Mode 3 with all conditions stable. The Terry Turbine has been started by manually opening 2MSS*SOV105A and D to feed the steam generators. Explain the correct sequence by which the steam supplies should be closed in order to secure the Terry Turbine and the reason for this sequence.

RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE

Read:

Task:

Reset the Terry Turbine Trip and Throttle Valve

INITIAL CONDITIONS:	The plant is in Mode 1 at 50% power. The
	turbine driven auxiliary feedwater pump
· · ·	has tripped due to an overspeed
	condition. The problem has been
	corrected. A plant operator has verified
	that the trip and throttle valve is
	closed. No start signal exists for
	2FWE*P22, and the pump is stopped. The
	pump is not required to feed the steam
	generators.

INITIATING CUE:

Your supervisor requests that you reset the trip and throttle valve for 2FWE*P22.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate the required task. Point to any indicator or component you verify or check and announce your observations. Do not operate any equipment.

After completing the task, announce "I have completed the JPM", then hand this sheet back to the evaluator.

Replacement JPM

RTL #A5.640E

DUQUESNE LIGHT COMPANY Nuclear Power Division Training Administrative Manual

OJT CHECKLIST/JPM COVER PAGE

<u>PROGRAM TITLE</u>: Licensed Operator Training (Retraining)

SUBDIVISION: On-the-Job Training

OJT CHECKLIST/JPM TITLE: Respond to RCP Oil Leak

<u>JPM NO.</u>: New #5

COMPUTER CODE: N/A

Revision No.	Date
0	2/15/99

Revision No.	Date

PREPARED	<u>BY</u> :	
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_____ <u>DATE:</u>____

W. Brickenstein

APPROVED FOR IMPLEMENTATION:

____ <u>DATE</u>: _____

Director, Operations Training, or Designee

NRC # 5

RTL #A5.640E

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DUQUESNE LIGHT COMPANY Nuclear Power Division Training Administrative Manual

LESSON PLAN AND OJT REVISION APPROVAL SHEET

DOCUMENT TITLE: New JPM #5, Respond to RCP Oil Leak

Revision			Approval	
<u>No.</u>	Brief Description	Revised by:	Signature	Date
0	Developed for initial exam use; exercises more references and "gray areas"/higher cognitive levels than 2CR-513.	Brickenstein		

RTL #A5.640U	BEAVER	R VALLEY C	<u>'OB PERFOF</u> 'OR COVER	MANCE MEAS	URE
JPM Number: Ne	ew #5	201120111		System #	. 003
JPM Title: Resp	oond to RC	CP Oil Leak	•	• • • • • • • • • • • • • • • • • • • •	
K/A Reference:	003 A3	3.04 3.6/3	.6	Task ID	#:0030010101
JPM Application:	. [X Requal	🗵 In	itial Exam	Training
Evaluation Me			ATION	TYPE	
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		UNSAT*	Time Administrativ	ted:10_	Actual:
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		UNSAT*	Time Administrativ	ted: <u>10</u> Critical: Yes	Actual:s
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	red for UNS	UNSAT*	Time Administrativ n): ere if same as	ed:10 Critical:□ Yes ve JPM	Actual:s INO
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RTL#45635J	BEAVER VALLEY JOB PERFORMANCE MEASURE
	EVALUATOR DIRECTION SHEET
JPM NUMBER:	New # 5
JPM TITLE:	Respond to RCP Oil Leak
TASK STANDARD:	The "A" Reactor Coolant Pump is stopped before Thrust Bearing temperature reaches 300°F.
RECOMMENDED STARTING LOCATIC	DN: Simulator
DIRECTIONS:	You are to start the "A" Reactor Coolant Pump.
INITIAL CONDITIONS	The plant is in Mode 3. Plant startup procedures have led you to 2OM 6 Procedure A, Reactor Coolant Pump Startup, Steps IV.A.12.c through 22. Assume all steps and conditions to this point are satisfied.
INITIATING CUE:	Your supervisor directs you to perform Step IV.A.12.c of Procedure 20M-6.4.A for 2RCS*P21A.
REFERENCES:	20M-6.4.A Issue 4, Rev. 7 20M-6.4.AAC, Issue 4, Rev. 1
TOOLS:	Plant Computer, Stopwatch
HANDOUT:	20M-6.4.A and 20M-6.4.AAC

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NUMBER

New # 5

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TITLE: Respond to RCP Oil Leak

\langle	STEP //C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	BOOTH NOTE; monitor variables (MONV) TRCPUTB(1), XA40018R, JRCXRCS8, and JRCP417H.	Start time:
	 Candidate obtains a copy of OM-6, Procedure A, "Reactor Coolant System Startup". . 	<pre>1. Candidate locates OM- 6, Procedure A. (Allow time to review the procedure.) COMMENTS:</pre>
	2. Place the 21A reactor coolant pump control switch to START (BB-A) (c	2. Takes switch to the START position. COMMENTS:

:

NUMBER	TITLE: Respond to RCP Oil Leak
New # 5	

STEP ("C" denot	es critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
3.	Verify the oil lift pump running light (red) energizes. (BB-A)	 Candidate verifies the red light is LIT.
		EXAMINER CUE: Oil lift pump running light (red) is energized.
		COMMENTS:
		EXAMINER CUE: If asked, notify the candidate that the No. 1 seal leakoff flow is about 1 gpm before and 3 gpm after the lift pump start and the differential pressure is greater than 212 psid. The lift oil pump is still running.

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NUMBER	TITLE: Respond to RCP Oil Leak
New # 5	

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
4. Verify that the 2RCS*P21A running light (red) illuminates approximately 2 minutes after placing the control switch to start. (BB-A)	4. Candidate verifies that the red light is energized. EXAMINER CUE: After a 2 min. time delay the red light is energized. BOOTH CUE: Check Malf. RCP8A has actuated. COMMENTS:
	TRCPUTB(1),300,500,0 after the Low Bearing Oil reservoir alarm is received.

RTL	#A5.	635.J
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NUMBER	TITLE: Respond to RCP Oil Leak
New # 5	

STEP ("C" denot	es critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)	
5.	Verify that the RCP amps drop off 10 to 30 seconds after the RCP breaker closes. (VB-A)	 5.1 Candidate locates the pump current (amps) (2RCS*II21A). 5.2 Candidate checks that the RCP amps drop off within 30 seconds. EXAMINER CUE: Inform the candidate that RCP amps return within 30 seconds. Also annunciator A2-5C is in alarm. Shaft vibration is at 30 mils, frame vibration is at 5 mils. 	what is this
6.	Obtain a copy of ARP A2-4F.	6. Candidate locates a copy of A2-4F. COMMENTS: EXAMINER CUE: The computer alarm for the first A2-4F. alarm is "RCP OIL COLL TK 23A LVL LS103A HIGH". The annunciator reflashed on "RCP 21A BRG LO LVL 71- RCAAX LOW".	

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NUMBER	TITLE: Respond to RCP Oil Leak
New # 5	

STEP	STANDARD
("C" denotes critical step)	(Indicate "S" for Sat. or "U" for Unsat.)
7. Verify that RCP bearing temperatures are increasing.	 7.1 Candidate monitors RCP "A" bearing temperatures using the recorder and/or the Plant Computer (PCS). 7.2 Verifies that upper thrust bearing temperature is increasing. COMMENTS: COMMENTS: EXAMINER NOTE: The candidate may deduce that he has an "actual" low reservoir level and trip the RCP at this point. (However, spurious level alarms sometimes occur on RCP start, so he may investigate further.) EXAMINER CUE: "A" upper thrust bearing temperature is rising from ~ 75°F at 30°F/min. "B" and "C" upper thrust bearings are stable at about 150°F.

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NUMBER	TITLE: Respond to RCP Oil Leak
New # 5	

STEP ("C" denotes	s critical step)	STANDARE (Indicate "S) " for Sat. or "U" for Unsat.)
8.C	Operator stops RCP due to oil leak/high bearing temperature.	8.1	Candidate determines, from recorder or PCS, that bearing temperature is above 200°F.
		8.2.C	Places control switch to STOP.
		8.3	Verifies white light is lit.
		for Hig receive tempera increas White 1	<u>R CUE</u> : Computer alarm h Temperature is d at 195°F; "A" bearing ture is continuing to e. RCP control switch ight illuminates when stopped.
			<u>R CUE</u> : Examiner tes JPM at this point
		Stop Tir	me:

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* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

One of the Initial conditions prior to starting the **first** reactor coolant pump is to establish a bubble in the pressurizer. What is the reason for establishing a bubble prior to starting a RCP? (Include a discussion of the sequence of events that would occur in the RCS if a RCP were started in a solid RCS with SG secondary side temperature more than 40°F above the lowest RCS cold leg temperature.)

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

QUESTION: One of the Initial conditions prior to starting the first reactor coolant pump is to establish a bubble in the pressurizer. What is the reason for establishing a bubble prior to starting a RCP? (Include a discussion of the sequence of events that would occur in the RCS if a RCP were started in a solid RCS with SG secondary side temperature more than 40°F above the lowest RCS cold leg temperature.)

ANSWER: There is the potential to over-pressurize the reactor coolant system when the pump is started (which could actuate the OPPS).

The sequence of events would begin with the cold water being pumped (through the Reactor Vessel) to the primary side of the SG. The cold water in the RCS would pick up heat from the relatively warmer water in the SG and expand. The expansion of the water in the solid RCS would cause a large, rapid pressure increase (up to 100 psig for each degree the RCS heated up).

TIME ALLOTTED: 5 minutes

KSA #: 003 K1.10 3.0/3.2

REF: 20M-6.4.A precaution II.B,K, 20M-6.2 precaution 17

COMMENTS: _____

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

QUESTION: Discuss the affects of a gradually worsening leak in the Thermal Barrier Heat Exchanger with the plant in Mode 1 NSA. Include the expected alarms and any automatic actuations that might occur.

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

QUESTION: Discuss the affects of a gradually worsening leak in the Thermal Barrier Heat Exchanger with the plant in Mode 1 NSA. Include the expected alarms and any automatic actuations that might occur.

- ANSWER: 1) CCP surge tank level will increase (prior to 2CCP AOV107 actuation)
 - 2) CCP radiation monitor alarms
 - 3) CCP value in the discharge from the Thermal Barrier Heat Exchanger will close (on high flow at 58 gpm or high pressure at 122 psig)
 - 4) (Pressurizer level drops slightly until charging flow increases)

(The fourth item is not required for credit. Completion may be prompted, i.e. "Will there be any other effects or actuations?")

(If candidate assumes that 2CCP AOV107 closes immediately, prompt "what indications would occur if the leak were too small to cause automatic isolation?")

TIME ALLOTTED: 5 minutes

KSA #: 003K1.12, 3.0/3.3

REF: 20M-15.1.d pg. 14 of 26

COMMENTS: _____

BEAVER VALLEY JOB PERFORMANCE MEASURE

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

Read:

Task:

You are to start the "A" Reactor Coolant Pump

INIT. CUE:	Your supervisor directs you to perform Steps IV.A.12.c through 22 of Procedure 2OM-6.4.A for 2RCS*P21A.

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".



Perform the required task. Point to any indicator or component you verify or check and announce your observations.

After determining the Task has been completed, announce "I have completed the JPM", then hand this sheet back to the evaluator.

BEAVER VALLEY JOB PERFORM EVALUATOR COVER S	
JPM Number: 2CR (New #5) Rev: 0	System #: 003
JPM Title: Restore RCP Seal Cooling	
K/A Reference: 003A3.01 Difficulty;3.3/3.2	Task ID #: 3010060601 0830010101
JPM Application: I Requal I Initial Ex	
Evaluation Method LOCATION	
Perform L Plant Site X Simulate X Simulator	Annual Requal. Exam
$\Box \rightarrow 0 \land V'$	
L Classroph	Initial Operator Exam
Administered By:	Other:
□ Other:	
Evaluation Results	
Performer: Name:	Employee No:
Results SAT	Time (minutes)
	d:15Actual:
Time	Zritical:□Yes ⊠No
Administrativ	e JPM Faulted JPM
*Comments (Required for UNSAT Evaluation):	
/	
Evaluation Results Check here if same as	
Observer 1: Name: Observer 2: Name	
Observer 3: Name	
Observer 4: Name/ Time (minutes)	_ Employee No: Results
Question ID Allotted	Actual SAT UNSAT
Question #1 Employee No:	
Question #2	
Employee No:	
*Comments (Required for UNSAT Evaluation):	
Evaluator (Print):	Organization:
Evaluator (Print):	- 0
Evaluator Signature	Date

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#### BEAVER VALLEY JOB PERFORMANCE MEASURE

#### **EVALUATOR DIRECTION SHEET**

| JPM NUMBER:                       | 2CR-New#5                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JPM TITLE:                        | Restore RCP Seal Cooling -                                                                                                                                                                                                                                                                                                                                 |
| TASK STANDARD:                    | CCP and Seal Injection are restored, in the correct order                                                                                                                                                                                                                                                                                                  |
| RECOMMENDED<br>STARTING LOCATION: | Simulator                                                                                                                                                                                                                                                                                                                                                  |
| DIRECTIONS:                       | You are to perform the task "Restore RCP Seal Cooling"                                                                                                                                                                                                                                                                                                     |
| INITIAL CONDITIONS:               | RCP Seal Cooling was lost due to a Station Blackout. ECA-0.0<br>was performed through step 18 to isolate Seal Injection and<br>CCP flow to the Thermal Barrier Heat Exchanger. Bus 2AE<br>has been reenergized from offsite power (control power is not<br>available to the CCP return AOVs from "B" and "C" RCPs.<br>ECA-0.1/is complete through step 12. |
| INITIATING CUE:                   | The ANSS directs you to perform attachment A-1.2,<br>Establishing RCP CCP Cooling and Seal Injection, for the "A"<br>RCP only.                                                                                                                                                                                                                             |
| REFERENCES:                       | EOP Attachment A-1.2                                                                                                                                                                                                                                                                                                                                       |
| TOOLS:                            | Plant Computer                                                                                                                                                                                                                                                                                                                                             |
| HANDOUT:                          | EOP Attachment A-1.2                                                                                                                                                                                                                                                                                                                                       |
|                                   |                                                                                                                                                                                                                                                                                                                                                            |

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| NUMBER     | TITLE                    |
|------------|--------------------------|
| 2CR-New #5 | Restore RCP Seal Cooling |

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| STEP                                                 | STANDARD                                                                                                                                                                                              |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ("C" denotes critical step)                          | (Indicate "S" for Sat. or "U" for Unsat.)                                                                                                                                                             |
| 2.C Opens CCP Pump Return<br>Header Isolation        | <pre>2.1 Opens 2CCP MOV 157-1.<br/>2.2C Directs local opening of<br/>2CCP MOV 156-1<br/>COMMENTS:</pre>                                                                                               |
| 3.C Opens Thermal Barrier<br>Outlet Isolation Valves | 3.1C Opens 2CCP AOV107A. 3.2 Monitors lower bearing temperatures on the <u>plant computer</u> . COMMENTS: EXAMINERS CUE: AOV 107A indicates open. AOVs 107B&C will be opened when power is available. |

| NUMBER     | TITLE                    |
|------------|--------------------------|
| 2CR-New #5 | Restore RCP Seal Cooling |

| STEP                            | STANDARD                                                                       |  |
|---------------------------------|--------------------------------------------------------------------------------|--|
| ("C" denotes critical step)     | (Indicate "S" for Sat. or "U" for Unsat.)                                      |  |
|                                 |                                                                                |  |
| 4.Checks Seal Injection Lineup. | 4.1 Verifies VCT temperature<br>indicator 2CHS-TI116 is<br>less than 235°F.    |  |
|                                 | EXAMINER CUE: TI 116 reads<br>95°F.                                            |  |
|                                 | 4.2 Directs local operator to<br>check 2CHS 178, 179, &<br>180 closed.         |  |
|                                 | EXAMINER CUE: Seal Injection<br>throttle valves are closed                     |  |
|                                 | 4.3 Checks Seal Injection<br>isolation valves 2CHS-<br>MOV 308A,B,&C are open. |  |
|                                 | 4.4 Checks Seal Injection<br>controller 2CHS HCV186<br>set to 0% (open).       |  |
|                                 |                                                                                |  |
|                                 |                                                                                |  |
|                                 | COMMENTS:                                                                      |  |

| NUMBER     | ΤΙΤLΕ                    |
|------------|--------------------------|
| 2CR-New #5 | Restore RCP Seal Cooling |

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| STEP                                                     | STANDARD                                                                                                                    |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| ("C" denotes critical step)                              | (Indicate "S" for Sat. or "U" for Unsat.)                                                                                   |
| 5.C Directs Opening of Seal<br>Injection throttle valves | 5.1C Directs opening of A RCP<br>seal injection valve<br>2CHS 179                                                           |
|                                                          | EXAMINER CUE: Increase LOA<br>SEA 2 in small increments<br>(~0.01 in LOA magnitude =<br>"one turn on valve") as<br>directed |
|                                                          | 5.2 Monitors seal injection<br>flow on 2CHS-FI130A.                                                                         |
|                                                          | 5.3 Monitors lower bearing<br>temperature on the plant<br>computer.                                                         |
|                                                          |                                                                                                                             |
| EXAMINER NOTE: Examiner<br>stops JPM at this point.      | COMMENTS:                                                                                                                   |
|                                                          | Stop time:                                                                                                                  |

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#### **BVPS JOB PERFORMANCE MEASURE**

#### **ORAL QUESTION #1**

QUESTION: Discuss the affects of a leak in the Thermal Barrier Heat Exchanger. Include the expected alarms and any automatic actuations that might occur.

ANSWER: 1) CCP surge tank level will increase

- 2) CCP radiation monitor alarms
- 3) CCP valve in the discharge from the Thermal Barrier Heat Exchanger will close (on high flow at 58 gpm or high pressure at 122 psig)
- 4) (Pressurizer level drops slightly until charging flow increases)

(The fourth item is not required for credit. Completion may be prompted, i.e. "Will there be any other effects or actuations?")

TIME ALLOTTED: 5 minutes

KSA #: 003K1.12, 3.0/3.3

REF: 20M-15.1.d pg. 14 of 26

COMMENTS:

#### BVPS JOB PERFORMANCE MEASURE

#### **ORAL QUESTION #2**

QUESTION: What would be the effects of suddenly restoring seal injection to a seal which had lost seal cooling for an extended period?

ANSWER: RCP damage would result (due to failure of the #1 seal from thermal shock or bending of the RCP shaft due to uneven temperature distribution).

TIME ALLOTTED: 5 minutes

KSA #: 003A2.01, 3.5/3.9

REF: 20M-53B.5.GI-6 pg. 46

COMMENTS: \_\_\_\_\_

\* \* THIS SHEET TO BE GIVEN TO CANDIDATE \* \*

# **BVPS JOB PERFORMANCE MEASURE**

#### **ORAL QUESTION #2**

QUESTION; What would be the effects of suddenly restoring seal injection to a RCP seal which had lost seal cooling for an extended period?

\* \* THIS SHEET TO BE GIVEN TO CANDIDATE \* \*

#### BVPS JOB PERFORMANCE MEASURE

#### **ORAL QUESTION #1**

QUESTION: Discuss the affects of a leak in the Thermal Barrier Heat Exchanger. Include the expected alarms and any automatic actuations that might occur.

# BEAVER VALLEY JOB PERFORMANCE MEASURE

# CANDIDATE DIRECTION SHEET

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

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|---|---|-----|--|
|   |   | - 1 |  |
|   |   | - 1 |  |
| - | _ | _   |  |

Read:

| Task: | Restore | RCP | Seal | Cooling |
|-------|---------|-----|------|---------|
|-------|---------|-----|------|---------|

| INITIAL CONDITIONS: | RCP Seal Cooling was lost due to a Station Blackout. ECA-0.0<br>was performed through step 18 to isolate Seal Injection and CCP                                                                                 |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | flow to the Thermal Barrier Heat Exchanger. Bus 2AE has been reenergized from offsite power (control power is not available to the CCP return AOVs from "B" and "C" RCPs). ECA-0.1 is complete through step 12. |

| INITIATING CUE | The ANSS directs you to perform attachment A-1.2, Establishing RCP  |
|----------------|---------------------------------------------------------------------|
| Line out       | The Artos directs you to perform attachment A-1.2, Establishing RCP |
|                | CCP Cooling and Seal Injection, for the "A" RCP only.               |
|                |                                                                     |

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Perform the required task. Point to any indicator or component you verify or check and announce your observations.

After completing the task, announce "I have completed the JPM", then hand this sheet back to the evaluator.

| BEAVER VALLEY JOB PERFORMA<br>EVALUATOR COVER SH |                                         |
|--------------------------------------------------|-----------------------------------------|
| JPM Number: 2CR-126 Rev: 3 System #:             |                                         |
| JPM Title: Startup the Standby Service W         |                                         |
| K/A Reference: 076000A2.02 2.7/3.1               | Tack ID #.0763330121                    |
| JPM Designation: NO X RO                         |                                         |
| JPM Application: X NRC X Initial                 |                                         |
|                                                  | Exam 🔀 Training                         |
| Evaluation Method LOCATION                       | ТҮРЕ                                    |
|                                                  | ] Training                              |
| 🗌 Simulate 🛛 Simulator                           | Annual Requal. Exam                     |
| 🗆 Classroom [                                    | ] ОЈТ                                   |
| -                                                | X Initial Operator Exam                 |
|                                                  | Other:                                  |
| U BV-T X NRC                                     |                                         |
| □ Other:                                         |                                         |
| Evaluation Results                               |                                         |
| Performer: Name:                                 | Employee No:c                           |
| Results 🗌 SAT                                    | Time (minutes)                          |
| UNSAT* Allott                                    | ed: <u>15</u> Actual:                   |
|                                                  | ritical: 🗌 Yes 🗵 No                     |
| *Comments (Required for UNSAT Evaluation)        | :                                       |
|                                                  |                                         |
| Evaluation Results  Check here if sam            |                                         |
| Observer 1: Name:                                | Employee No:                            |
| Observer 2: Name<br>Observer 3: Name             | Employee No:                            |
| Observer 4: Name                                 | Employee No:                            |
| Time (minutes)<br>Question ID Allotted A         | Results<br>ctual SAT UNSAT <sup>*</sup> |
| Question #1                                      |                                         |
| Employee No:Question #2                          |                                         |
|                                                  |                                         |
|                                                  |                                         |
| *Comments (Required for UNSAT Evaluation)        |                                         |
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RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER: 2CR-126 JPM TITLE: Startup the Standby Service Water System RECOMMENDED STARTING LOCATION: Simulator DIRECTIONS: You are to perform the task "Startup the Standby Service Water System". INITIAL The plant is at 100% power. The "A" Train CONDITIONS: Service Water Pump [2SWS\*P21A] has just tripped. TASK STANDARD: Train "A" standby service water is in service and pressurizing the SWS system. INITIATING CUE: Your Supervisor directs you to QUICKLY supply water to the SWS header from the SWE system, using the normal operating procedure, 20M-30.4G. Assume all Initial Conditions are SAT. **REFERENCES:** 20M-30.4.G Issue 4 Rev. 2 TOOLS: None

HANDOUT: 20M-30.4.G

| NUMBER                                                                                        | TITLE                                                                                                                                                                     |  |
|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 2CR-126                                                                                       | Startup the Standby Service<br>Water System                                                                                                                               |  |
|                                                                                               |                                                                                                                                                                           |  |
| STEP<br>("C" denotes critical step)                                                           | STANDARD<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                                  |  |
| <ol> <li>Locate the procedure to<br/>startup the standby<br/>service water system.</li> </ol> | <pre>Start time:</pre>                                                                                                                                                    |  |
| 2. Place discharge valve on<br>SWE pump to CLOSE.                                             | <pre>2.1 Places control switch for<br/>2SWE*MOV116A to CLOSE.<br/>2.2 Verifies green light<br/>illuminates.<br/>COMMENTS:<br/>EXAMINER CUE: Green light is<br/>lit.</pre> |  |

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| NUMBER                                                                                                                                  | TITLE                                                                                  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|--|
| 2CR-126                                                                                                                                 | Startup the Standby Service<br>Water System                                            |  |
|                                                                                                                                         |                                                                                        |  |
| STEP<br>("C" denotes critical step)                                                                                                     | STANDARD<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                               |  |
| 3.C Place Standby Service<br>Water Pump [2SWE*P21A]<br>control switch to START.                                                         | 3.1.C Places control switch to START.                                                  |  |
|                                                                                                                                         | 3.2 Verifies red light illuminates.                                                    |  |
|                                                                                                                                         | COMMENTS :                                                                             |  |
|                                                                                                                                         | EXAMINER CUE: Red light is lit.                                                        |  |
| 4.C Check that Standby<br>Service Water Pressure<br>[2SWE-PI114] is not less<br>than 5 psig below Service                               | 4.1 Compares the two pressure indications.                                             |  |
| Water System pressure<br>[2SWS-PI113A]. Then<br>place discharge valve<br>[2SWE*MOV116A] in AUTO,<br>and verify that the valve<br>opens. | 4.2 Determines that<br>pressure requirement<br>is satisfied.                           |  |
|                                                                                                                                         |                                                                                        |  |
|                                                                                                                                         | EXAMINER CUE: [2SWE-PI114]<br>indicates 140 psig. [2SWS-<br>PI113A] indicates 50 psig. |  |

| NUMBER                              | TITLE                                                          |  |
|-------------------------------------|----------------------------------------------------------------|--|
| 2CR-126                             | Startup the Standby Service<br>Water System                    |  |
|                                     |                                                                |  |
| STEP<br>("C" denotes critical step) | STANDARD<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)       |  |
|                                     | 4.3 Locates control switch<br>for [2SWE*MOV116A].              |  |
| . <u>.</u>                          | 4.4.C Takes control switch<br>to the AUTO or OPEN<br>position. |  |
|                                     | 4.5 Verifies red light illuminates.                            |  |
|                                     | 4.6 Notifies NSS of T.S.<br>3.7.4.1.                           |  |
|                                     | COMMENTS :                                                     |  |
|                                     |                                                                |  |
|                                     | EXAMINER CUE: Act as NSS.<br>Acknowledge Tech Spec<br>report.  |  |

| NUMBER                                                                                       | TITLE                                                                                                                                                        |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2CR-126                                                                                      | Startup the Standby Service<br>Water System                                                                                                                  |
| STEP<br>("C" denotes critical step)                                                          | STANDARD<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                     |
| 5. Check 2SWE-II21A pump Amps<br>are Normal, between 115<br>and 135 amps.                    | <pre>5.2 Verifies meter indicates    between 115 and 135. COMMENTS:  EXAMINER CUE: Pump current    is currently 90 amps.  EXAMINER CUE: Red light lit.</pre> |
| 6. If A1-4G "Service Water<br>Header Pressure Low" is<br>on, then refer to 20M-<br>30.4.AAB. | 6. Verifies alarm window not<br>illuminated. COMMENTS:           EXAMINER CUE:         A1-4G did not<br>alarm.                                               |

| NUMBER                                                                                                    | TITLE                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2CR-126                                                                                                   | Startup the Standby Service<br>Water System                                                                                                                                                                                    |
|                                                                                                           |                                                                                                                                                                                                                                |
| STEP<br>("C" denotes critical step)                                                                       | STANDARD<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                                                                                       |
| 7. Verify SWE System is<br>operating properly in<br>accordance with 1/2 OM-<br>54.3A "Outside Plant Log". | 7. Candidate dispatches another<br>operator to perform 1/2 OM-<br>54.3A.           COMMENTS:           COMMENTS:             EXAMINER CUE: The outside<br>operator will perform 1/2<br>OM-54.3A   EXAMINER NOTE: The following |
|                                                                                                           | steps may be omitted.                                                                                                                                                                                                          |
| <ol> <li>Verify [2SWS*MOV107A,C]<br/>are open.</li> </ol>                                                 | 8. Verifies valve open (Red)<br>lights are lit.                                                                                                                                                                                |
|                                                                                                           | COMMENTS:                                                                                                                                                                                                                      |
|                                                                                                           | EXAMINER CUE: Red lights are<br>lit for both valves. It is<br>desired to place 2SWS*P21A<br>in pull-to-lock.                                                                                                                   |

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| AIL #A5.035.J                                                                                         |                                                                  |  |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--|
| NUMBER                                                                                                | TITLE                                                            |  |
| 2CR-126                                                                                               | Startup the Standby Service<br>Water System                      |  |
| STEP                                                                                                  | STANDARD                                                         |  |
| ("C" denotes critical step)                                                                           | (Indicate "S" for Sat. or "U"<br>for Unsat.)                     |  |
| 9. Place the SWS A Header<br>Pump [2SWS*P21A] to STOP<br>then PULL-TO-LOCK.                           | 9.1 Places control switch for<br>P21A to STOP.                   |  |
|                                                                                                       | 9.2 Places control switch to PULL-TO-LOCK.                       |  |
|                                                                                                       | COMMENTS:                                                        |  |
|                                                                                                       |                                                                  |  |
| <ol> <li>Verify 2SWS*MOV102A is<br/>closed and log time SWS<br/>pump removed from service.</li> </ol> | 10.1 Verifies closed (Green)<br>light is lit for MOV102A.        |  |
|                                                                                                       | 10.2 Logs time pump removed from service.                        |  |
|                                                                                                       | COMMENTS:                                                        |  |
|                                                                                                       |                                                                  |  |
|                                                                                                       |                                                                  |  |
|                                                                                                       |                                                                  |  |
|                                                                                                       | EXAMINER CUE: Valve<br>2SWS*MOV102A is shut, green<br>light lit. |  |
|                                                                                                       |                                                                  |  |

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| RTL i | #A5 | .6 | 3 | 5 | .J |  |
|-------|-----|----|---|---|----|--|
|-------|-----|----|---|---|----|--|

| NUMBER                                                                                       | TITLE                                                                                                                                                          |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2CR-126                                                                                      | Startup the Standby Service<br>Water System                                                                                                                    |
|                                                                                              |                                                                                                                                                                |
| STEP<br>("C" denotes critical step)                                                          | STANDARD<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                       |
| 11. Verify SWE operating<br>properly in accordance<br>with Outside Plant Log<br>1/2 OM-54.3A | <pre>11. Candidate requests     status of log 1/2 OM-     54.3A.  EXAMINER CUE: All Standby Service Water parameters     are SAT.  COMMENTS:  Stop Time:</pre> |

#### ORAL OUESTION #1

- QUESTION: Compare the severity of a total loss of Normal and Standby service water (both trains) at the Beginning of Life (fist day at full power) compared to the End of Life (16 months at full power). Include a discussion of which heat loads would be higher after shutdown in each case.
- ANSWER : The loss would be more severe at EOL due to the higher decay heat load from the core on the RHS and CCW systems. While the heat load on the Spent Fuel Heat Exchangers would be higher at BOL, this heat load (from the 1/3 of the core offloaded) is smaller than the equilibrium decay heat for the whole core.

TIME

ALLOTTED: 5 minutes

062AA1.02 3.2/3.3 KSA #:

REF: AOP 2.30.1

COMMENTS:

BVPS JOB PERFORMANCE MEASURE

## ORAL QUESTION #2

- QUESTION: The plant is at 100% power. An inadvertent Train "A" CIA signal has been generated. How would this signal affect a Liquid Waste discharge, if one were in progress and the signal could not be reset? What action M May Shall & Johan?
- ANSWER: Since Secondary Component Cooling Water (CCS) is isolated by the Phase "A" signal, less water will be returning to the Cooling Tower. This decrease in water flow to the tower in turn reduces cooling tower blowdown, which is the dilution flow for the Radwaste Discharge. The discharge should be manually terminated until the Discharge Permit can be recalculated for the lower dilution flow.

TIME

- ALLOTTED: 5 minutes
- KSA #: 076K1.16 3.6/3.8

REF: 20M-30.1.0

COMMENTS:

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\* \* THIS SHEET TO BE GIVEN TO CANDIDATE \* \*

# BVPS JOB PERFORMANCE MEASURE

#### ORAL QUESTION #2

The plant is at 100% power. An inadvertent Train "A" CIA signal has been generated. How would this signal affect a Liquid Waste discharge, if one were in progress and the signal could not be reset

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# \* THIS SHEET TO BE GIVEN TO CANDIDATE \*

# BVPS JOB PERFORMANCE MEASURE

#### ORAL QUESTION #1

Compare the severity of a total loss of Normal <u>and</u> Standby service water (both trains) at the Beginning of Life (fist day at full power) compared to the End of Life (16 months at full power). Include a discussion of which heat loads would be higher after shutdown in each case.

# RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

## CANDIDATE DIRECTION SHEET

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

Read:

Task:

: Startup the Standby Service Water System

| INITIAL CONDITIONS: | The plant is at 100% power. The "A"<br>Train Service Water Pump [2SWS*P21A] has<br>just tripped. |
|---------------------|--------------------------------------------------------------------------------------------------|
|                     |                                                                                                  |

| INITIATING<br>CUE: | Your Supervisor directs you to QUICKLY supply<br>water to the SWS header from the SWE system, using<br>the normal operating procedure, 20M-30.4G. Assume<br>all Initial Conditions are SAT. |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Perform the required task. Point to any indicator or component you verify or check and announce your observations.

After completing the task, announce "I have completed the JPM", then hand this sheet back to the evaluator.

| BEAVER VALLEY JOB PERFORMANC<br>EVALUATOR COVER SHEE  | <u>E MEASURE</u>             |
|-------------------------------------------------------|------------------------------|
| JPM Number: 2CR-046 Rev: 04 System #: 0               |                              |
| JPM Title: Perform ESF Checklist - CIA                | (                            |
| K/A Reference: 013A4.01 4.5/4.8 Ta                    | sk ID #: 0130010101          |
| 103K1.08 3.6/3.8 103K1.08 3.6/                        | 3.8 3010010601               |
| JPM Designation: 🗌 NO 🗵 RO 🗵                          | SRO Faulted:                 |
| JPM Application: 🗵 NRC 🗵 Initial                      | Exam 🔲 Training              |
|                                                       |                              |
| Evaluation Method LOCATION                            | ТҮРЕ                         |
|                                                       | Training                     |
|                                                       | Annual Requal. Exam          |
|                                                       | OJT                          |
| X                                                     | Initial Operator Exam        |
| Administered By:                                      |                              |
| BV-T NRC                                              |                              |
| • Other:                                              |                              |
|                                                       |                              |
| Evaluation Results                                    |                              |
| Performer: Name:                                      | Employee No:                 |
| Results SAT                                           | Time (minutes)               |
|                                                       | d: <u>15</u> Actual:         |
| Time Cr<br>*Comments (Required for UNSAT Evaluation): | itical: 🗋 Yes 🖾 No           |
|                                                       |                              |
|                                                       |                              |
| Evaluation Results  Check here if same                | as above                     |
| Observer 1: Name:<br>Observer 2: Name                 | Employee No:<br>Employee No: |
| Observer 3: Name                                      | Employee No:                 |
| Observer 4: Name<br>Time (minutes)                    | Employee No:<br>Results      |
| Question ID Allotted Ac                               |                              |
| Question #1                                           |                              |
| Employee No:<br>Question #2                           |                              |
| Employee No:                                          |                              |
| *Comments (Required for UNSAT Evaluation):            |                              |
|                                                       |                              |
| Evaluator (Print):                                    | Organization:                |
| Evaluator Signature                                   | Date:                        |

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RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER: 2CR-046

JPM TITLE: Perform ESF Checklist - CIA

RECOMMENDED

STARTING LOCATION: Simulator

- **DIRECTIONS:** You are to perform the task "Perform ESF Checklist CIA".
- INITIATING The plant has had a reactor trip and a CONDITIONS: The plant has had a reactor trip and a safety injection. Operators have proceeded to Step 21 in OM-53A, Procedure E-O, 'Reactor Trip and Safety Injection." The plant computer is not available. Another operator has verified and signed for all valves except for the ones on Pages 6 and 7.
- **TASK STANDARD:** Seal Return containment penetration is isolated.
- INITIATING CUE: Your supervisor directs you to review the instructions for and then perform Attachment A-0.2, "Containment Isolation Phase A Checklist" starting at Page 6 and report back on the status of Containment Isolation Phase A.

REFERENCES: OM-2.53A.1, E-0, Issue 1B, Revision 3.

TOOLS: None

HANDOUT: 0M-2.53A.1, Attachment A-0.2, Issue 1B, Revision 1, signed off through page 5.

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| NUMBER  | TITLE                       |
|---------|-----------------------------|
| 2CR-046 | Perform ESF Checklist - CIA |

| STEP<br>("C" denotes critical step)                      | STANDARD               |
|----------------------------------------------------------|------------------------|
| <ol> <li>Obtain copy of Attachment<br/>A-0.2.</li> </ol> | <pre>Start time:</pre> |

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| NUMBER  | TITLE                       |
|---------|-----------------------------|
| 2CR-046 | Perform ESF Checklist - CIA |

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| STEP<br>("C" denotes critical step)                                                  | STANDARD<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.C. Locate each component's<br>indicated and check status<br>vs required condition. | <pre>EXAMINER CUE: Prove<br/>indications for each<br/>component to support<br/>required position. All<br/>components are required in<br/>position, except<br/>"2CHS*MOV378 RCP Seal Water<br/>Cnmt Return Isol Vlv" which<br/>has neither green nor red<br/>light illuminated and 2CHS-<br/>MOV381 which has its red<br/>light lit.</pre> 2.1 Candidate checks each<br>valve on Attachment A-0.2<br>in the required condition. 2.2 Candidate initials each<br>component on checklist. COMMENTS: |

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| NUMBER  | TITLE                       |
|---------|-----------------------------|
| 2CR-046 | Perform ESF Checklist - CIA |
|         |                             |

| STEP<br>("C" denotes critical step) | STANDARD -<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                                                                     |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | (Cont. from Previous Page)<br>EXAMINER NOTE: Candidate<br>may initiate routine<br>diagnostics such as change<br>indicating lamps, have<br>local operator cycle MCC<br>Breaker, reset thermal<br>overload, etc. |
|                                     | EXAMINER CUE: If candidate<br>asks you as local operator<br>to check MCC Breaker, tell<br>him it will take at least<br>10 minutes.                                                                             |
|                                     | 2.3 Candidate places<br>control switch for<br>2CHS*MOV378 to the<br>CLOSED position.                                                                                                                           |
|                                     | 2.4.C Candidate places<br>control switch for<br>2CHS*MOV381, to the<br>CLOSED position.                                                                                                                        |
|                                     | COMMENTS :                                                                                                                                                                                                     |

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| NUMBER  | TITLE                       |
|---------|-----------------------------|
| 2CR-046 | Perform ESF Checklist - CIA |

| <ul> <li>3. Reports Status of the CIA system to supervisor.</li> <li>3. Candidate reports all Components in the required position, except "[2CHS*MOV378] RCP Seal Water Return Cnmt Isol Valve" which has neither green nor red lights illuminated and 2CHS*MOV381 which needed to be closed manually.</li> <li>COMMENTS:</li> </ul> | STEP<br>("C" denotes critical step) | STANDARD -<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 500p Time:                                                                                                                                                                                                                                                                                                                           |                                     | Components in the required<br>position, except<br>"[2CHS*MOV378] RCP Seal<br>Water Return Cnmt Isol<br>Valve" which has neither<br>green nor red lights<br>illuminated and<br>2CHS*MOV381 which needed<br>to be closed manually.<br>COMMENTS: |

Revision: 4

#### ORAL QUESTION #1

Question: Given; A Main Steamline Break inside containment has occurred inside containment. A failure of one control rod to insert has resulted in the bursting of many fuel rods in the vicinity of the stuck rod.

> Discuss the consequences of a failure of the Containment Isolation Phase A signal to isolate the RCS sample lines under these conditions.

ANSWER: The bursting of the fuel rods would greatly increase the activity in the Reactor Coolant System.

The failure to isolate the sampling lines could result in substantial overexposures of the primary chemist and increased general area radiation levels in the auxiliary building near the sampling lines. (Completion may be prompted, i.e. "how would your ability to transit the auxiliary building be affected?".)

TIME ALLOTTED: 5 minutes

KSA #: 103A2.03 3.5/3.8

REF: 20M-53A.1.ECA-1.2

COMMENTS:

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE **ORAL QUESTION #2** Question:  $\mathcal A$  How can the primary coolant hot leg sample line. containment isolation valve [2SSR\*SOV128A1] - be opened with a CIA signal present? Explain using the applicable drawing. ANSWER: & The valve can be opened if the CIA signal is present and the valve has reset (by taking the control switch to the CLOSED position and then to the OPEN position) after a time delay. 4 minutes that TIME ALLOTTED; 111 world igned te NU 103K4.06 (3.1/3.7) KSA #: 013K4.02 (3.9/4.2) 110 REF: 20M-14A.1.D (I&C) page 9 Logic drawing 12241-LSK-14-15F Electrical Schematic COMMENTS:

\* \* THIS SHEET TO BE GIVEN TO CANDIDATE \* \*

### BVPS JOB PERFORMANCE MEASURE

## ORAL QUESTION #2

How can the primary coolant hot leg sample line containment isolation valve [2SSR\*SOV128A1] can be opened with a CIA signal present? Explain using the applicable drawing.

## ORAL QUESTION #1

Given; A Main Steamline Break inside containment has occurred inside containment. A failure of one control rod to insert has resulted in the bursting of many fuel rods in the vicinity of the stuck rod.

Discuss the consequences of a failure of the Containment. Isolation Phase A signal to isolate the RCS sample lines under these conditions.

# RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

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# CANDIDATE DIRECTION SHEET

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

Read:

Task:

Perform ESF Checklist - CIA

| INITIAL CONDITIONS: | The plant has had a reactor trip and a    |
|---------------------|-------------------------------------------|
|                     | safety injection. Operators have          |
|                     | proceeded to Step 21 in OM-53A, Procedure |
|                     | E-0, "Reactor Trip and Safety Injection." |
|                     | The plant computer is not available.      |
|                     | Another operator has verified and signed  |
|                     | for all valves except for the ones on     |
|                     | Pages 6 and 7.                            |

| starting at Page 6 and report back on the status<br>of Containment Isolation Phase A. | INITIATING<br>CUE: | Your supervisor directs you to review the<br>instructions for and then perform Attachment A-<br>0.2, "Containment Isolation Phase A Checklist"<br>starting at Page 6 and report back on the status<br>of Containment Isolation Phase A. |
|---------------------------------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|---------------------------------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Perform the required task. Point to any indicator or component you verify or check and announce your observations.

After completing the task, announce "I have completed the JPM", then hand this sheet back to the evaluator.

| RTL #A5.640U BEAVER VALLEY JOB PERFORMANCE MEASURE<br>EVALUATOR COVER SHEET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| JPM Number: 2PL-506 Rev: 3 System: 064                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |
| JPM Title: Locally Start the No. 1 Emergency Diesel Generator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |
| K/A Reference: 055 EA1.02 4.3/4.4 Rev. 1 Task ID #: 064002010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4          |
| 000055EA1.02 4.3/4.4 000055G06 3.8/4.1 -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |
| JPM Application: 🛛 Requal 🖾 Initial Exam 🗖 Training                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |
| Evaluation Method LOCATION TYPE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |
| 🗋 Perform 🖾 Plant Site 🗍 Training                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |
| 🔀 Simulate 🔲 Simulator 🗌 Annual Requal. Exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |
| Classroom DOJT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |
| 🗵 Initial Operator Exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |
| Administered By:  Other:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |
| BV-T NRC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |
| Other:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |
| Evaluation Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |
| Performer: Name: Employee No:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |
| Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |
| UNSAT* Allotted: <u>20</u> Actual:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |
| Time Critical: Ves X No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | >          |
| Time Critical: Yes X No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ,<br>]     |
| Time Critical: Yes X No<br>Administrative JPM Faulted X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ,<br>]     |
| Time Critical: Yes X No<br>Administrative JPM Faulted X<br>*Comments (Required for UNSAT Evaluation):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ,<br>]     |
| Time Critical: Yes X No<br>Administrative JPM Faulted X  *Comments (Required for UNSAT Evaluation):  Evaluation Results Check here if same as above Observer 1: Name: Employee No:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ,<br>]<br> |
| Time Critical:       Yes       X         Administrative JPM       Faulted       X         *Comments (Required for UNSAT Evaluation):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | )<br>]<br> |
| Time Critical:       Yes       X         Administrative JPM       Faulted       X         *Comments (Required for UNSAT Evaluation):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | )<br>]<br> |
| Time Critical:       Yes       X         Administrative JPM       Faulted       X         *Comments (Required for UNSAT Evaluation):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | )<br>]<br> |
| Time Critical:       Yes       Yes | )<br>]<br> |
| Time Critical:       Yes       Yes       Yes         Administrative JPM       Faulted       Yes       Yes         *Comments (Required for UNSAT Evaluation):       Faulted       Yes         Evaluation Results       Check here if same as above       Employee No:       Yes         Observer 1:       Name:       Employee No:       Yes       Yes         Observer 2:       Name       Employee No:       Yes       Yes         Observer 3:       Name       Employee No:       Yes       Yes         Observer 4:       Name       Employee No:       Yes       Yes         Observer 4:       Name       Employee No:       Yes       Yes         Ouestion ID       Allotted       Actual       SAT       UNSAT*         Question #1       Image:       Image:       Image:       Image:                                                                                                                                                                                                                                                                                                             | )<br>]<br> |
| Time Critical:       Yes       X         Administrative JPM       Faulted       X         *Comments (Required for UNSAT Evaluation):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | )<br>]<br> |
| Time Critical:       Yes       X       No         Administrative JPM       Faulted       X         *Comments (Required for UNSAT Evaluation):       *       *         Evaluation Results       Check here if same as above       *         Observer 1:       Name:       Employee No:       *         Observer 2:       Name       Employee No:       *         Observer 3:       Name       Employee No:       *         Observer 4:       Name       Employee No:       *         Question ID       Allotted       Actual       SAT       UNSAT*         Question #1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |
| Time Critical:       Yes       X       No         Administrative JPM       Faulted       X         *Comments (Required for UNSAT Evaluation):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |
| Time Critical:       Yes       X       No         Administrative JPM       Faulted       X         *Comments (Required for UNSAT Evaluation):       *       *         Evaluation Results       Check here if same as above       *         Observer 1:       Name:       Employee No:       *         Observer 2:       Name       Employee No:       *         Observer 3:       Name       Employee No:       *         Observer 4:       Name       Employee No:       *         Question ID       Allotted       Actual       SAT       UNSAT*         Question #1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |
| Time Critical:       Yes       X       No         Administrative JPM       Faulted       X         *Comments (Required for UNSAT Evaluation):       *       *         Evaluation Results       Check here if same as above       *         Observer 1:       Name:       Employee No:       *         Observer 2:       Name       Employee No:       *         Observer 3:       Name       Employee No:       *         Observer 4:       Name       Employee No:       *         Question ID       Allotted       Actual       SAT       UNSAT*         Question #1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |

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RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR DIRECTION SHEET

JPM NUMBER: 2PL-506

JPM TITLE: Locally Start the No. 1 Emergency Diesel Generator

- TASK STANDARD: The No. 1 Diesel Generator is started and ready to energize the 2AE Emergency Bus.
- RECOMMENDED STARTING LOCATION: Plant
- DIRECTIONS: You are to simulate the task "Locally Start the No. 1 Emergency Diesel Generator"

INITIAL A station blackout has occurred. OM 53A CONDITIONS: Procedure ECA-0.0 "Loss of All AC Power" has led to step 16, which requires local actions to be taken to restore power. Service water pump 2SWS\*P21A is in AUTO.

INITIATING CUE: Your supervisor directs you to use Attachment A-1.5 of ECA-0.0 to start the No. 1 Diesel Generator. You have been given the keys for the No. 1 Diesel Generator.

REFERENCES: OM 2.53A ECA-0.0 Attachment A-1.5 Issue 1B Revision 2

TOOLS: Plant Page, Flashlight, Key 138 for Excitation Cabinet

HANDOUT: OM 2.53A ECA-0.0 Attachment A-1.5

#### BVPS JOB PERFORMANCE MEASURE

#### **ORAL QUESTION #2**

| QUESTION: | Given; an Emergency Diesel Generator has been    |
|-----------|--------------------------------------------------|
|           | restarted following a Station Blackout with very |
|           | limited cooling water flow (estimated 50 gpm     |
|           | through temporary hoses).                        |

1) Discuss the likely sequence of events if the EDG is fully loaded with insufficient cooling water flow.

2) How could the consequences of the limited cooling flow be minimized?

- ANSWER:
  - 1) Because the High Jacket Water and Lube oil Temperature and the Low Lube Oil Pressure engine trips are not available following an Autostart on undervoltage, no automatic trips will occur. Catastrophic engine failure will eventually occur (due to piston seizure due to loss of Jacket cooling or bearing failure due to loss of Lube Oil viscosity at high temperature).
    - 2) EDG operation can be extended by minimizing the electrical load on the EDG (as indicated by continuous local monitoring of lube oil and jacket water temperatures).

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TIME

ALLOTTED: 10 minutes

KSA #: 064K1.03 3.1

REF: Logic diagrams 36-24B & D (Trip logic) EOP ECA-0.2 background document pg.3

COMMENTS:

| NUMBER                                                                                    | TITLE                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2PL-506                                                                                   | Locally Start the No. 1<br>Emergency Diesel Generator                                                                                                                                           |
| STEP<br>("C" denotes critical step)                                                       | STANDARD -<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                                                      |
| <ol> <li>Obtain a copy of OM-53A,<br/>Procedure ECA-0.0,<br/>Attachment A-1.5.</li> </ol> | <pre>Start time:</pre>                                                                                                                                                                          |
| 2. C Take local control of<br>diesel generator No. 1                                      | <pre>EXAMINER CUE: If asked,<br/>2SWS*P21A is in AUTO.<br/>2. Candidate inserts key<br/>into switch and<br/>selects the LOCAL<br/>position, at the local<br/>control panel.<br/>COMMENTS:</pre> |

| NUM           | BER                                                                                                                          | TITLE                                                                                                                                                                                   |
|---------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2PL-          | -506                                                                                                                         | Locally Start the No. 1<br>Emergency Diesel Generator                                                                                                                                   |
| STE :<br>("C" | denotes critical step)                                                                                                       | STANDARD<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                                                |
| 3.            | Verify that the ENGINE<br>OVERSPEED and START FAILURE<br>alarms are not activated on<br>the local alarm panel.               | 3. Candidate locates local<br>alarm panel and verifies<br>no ENGINE OVERSPEED or<br>START FAILURE alarm.           EXAMINER CUE:         No alarms are<br>actuated.           COMMENTS: |
| 4.C.          | Depress the local start<br>pushbutton until the engine<br>starts and is self-<br>sustaining; then release<br>the pushbutton. | <pre>EXAMINER NOTE: Either   pushbutton should be   capable of starting the DG   independently. 4. Candidate simulates   depressing the local start   pushbutton. COMMENTS:</pre>       |
|               |                                                                                                                              | EXAMINER CUE: Diesel<br>generator does not start.                                                                                                                                       |

RTL #A5.635.J

| NUMBER                                                                                          |                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                 | TITLE                                                                                                                                                                                                                                                                                                                                |
| 2PL-506                                                                                         | Locally Start the No. 1<br>Emergency Diesel Generator                                                                                                                                                                                                                                                                                |
|                                                                                                 |                                                                                                                                                                                                                                                                                                                                      |
| STEP                                                                                            | STANDARD<br>(Indicate "S" for Sat. or "U"                                                                                                                                                                                                                                                                                            |
| ("C" denotes critical step)                                                                     | for Unsat.)                                                                                                                                                                                                                                                                                                                          |
| 5.C Place key switch in<br>AUTO and manually<br>depress ES-1 or ES-2<br>emergency start relays. | <pre>EXAMINER NOTE: Provide key<br/>138 to allow access to the<br/>Excitation Cabinet.<br/>5.1.C Candidate places key<br/>switch to AUTO.<br/>5.2.C Candidate simulates<br/>depressing the ES-1 or<br/>ES-2 Emergency Start<br/>Relay.<br/>EXAMINER CUE: Diesel<br/>Generator starts and is<br/>self-sustaining.<br/>COMMENTS:</pre> |
|                                                                                                 |                                                                                                                                                                                                                                                                                                                                      |

RTL #A5.635.J

| NUMBER                                                                                     | TITLE                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2PL-506                                                                                    | Locally Start the No. 1<br>Emergency Diesel Generator                                                                                                                                                                                                                                                         |
| STEP<br>("C" denotes critical step)                                                        | STANDARD -<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                                                                                                                                                                    |
| 6. Adjust diesel generator<br>speed using the governor<br>control to 515 rpm - 535<br>rpm. | <pre>6. Verifies DG engine speed<br/>is 515 rpm - 535 rpm.<br/>COMMENTS:</pre>                                                                                                                                                                                                                                |
|                                                                                            | <u>EXAMINER CUE</u> : Diesel<br>Generator speed is 520 rpm.                                                                                                                                                                                                                                                   |
| 7. Verify DG voltage greater<br>than 4160 VAC.                                             | 7. Candidate locates DG<br>voltmeter and verifies<br>voltage.          EXAMINER CUE: Voltmeter<br>indicates 4160 VAC.         EXAMINER NOTE: Candidate<br>may use local voltage<br>indication or call the<br>control room. In all cases<br>the indication should be<br>given as 4160 volts.         COMMENTS: |

| Ally Start the No. 1<br>Togency Diesel Generator<br>DARD<br>icate "S" for Sat. or "U"<br>Unsat.)<br>Candidate locates the key<br>switch and explains that<br>it would be turned to the<br>AUTO position.<br>MENTS: |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DARD<br>Candidate locates the key<br>switch and explains that<br>it would be turned to the<br>AUTO position.                                                                                                       |
| icate "S" for Sat. or "U"<br>Unsat.)<br>Candidate locates the key<br>switch and explains that<br>it would be turned to the<br>AUTO position.                                                                       |
| icate "S" for Sat. or "U"<br>Unsat.)<br>Candidate locates the key<br>switch and explains that<br>it would be turned to the<br>AUTO position.                                                                       |
| switch and explains that<br>it would be turned to the<br>AUTO position.                                                                                                                                            |
| MENTS:                                                                                                                                                                                                             |
| MINER CUE: Control of<br>esel Generator is<br>stablished from the<br>ontrol room.                                                                                                                                  |
|                                                                                                                                                                                                                    |

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| NUMBER                                                                                                                   | TITLE                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2PL-506                                                                                                                  | Locally Start the No. 1<br>Emergency Diesel Generator                                                                                                                              |
| STEP<br>("C" denotes critical step)                                                                                      | STANDARD -<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                                         |
| 9. Request Control Room<br>operator verify open or<br>open emergency bus tie<br>breakers [2E7, 2F7] and<br>[2A10, 2D10]. | 9. Candidate simulates a call<br>to the Control Room to<br>verify that the tie<br>breakers are open.                                                                               |
|                                                                                                                          | EXAMINER NOTE: Candidate<br>may opt to verify breaker<br>position locally at<br>switchgear. If verified<br>locally, inform candidate<br>that all 4 breakers are<br>open.           |
|                                                                                                                          | EXAMINER CUE: The Control<br>Room reports that the<br>emergency bus tie breakers<br>are open, the 2AE bus loads<br>are stripped off and that<br>they will close breaker 2E-<br>10. |
|                                                                                                                          | COMMENTS:                                                                                                                                                                          |
|                                                                                                                          | Stop Time:                                                                                                                                                                         |

\* \* THIS SHEET TO BE GIVEN TO CANDIDATE \* \*

## BVPS JOB PERFORMANCE MEASURE

#### ORAL QUESTION #2

QUESTION: Given; an Emergency Diesel Generator has been restarted following a Station Blackout with very limited cooling water flow (estimated 50 gpm through temporary hoses).

1) Discuss the likely sequence of events if the EDG is fully loaded with insufficient cooling water flow.

2) How could the consequences of the limited cooling flow be minimized?

\* THIS SHEET TO BE GIVEN TO CANDIDATE \* \*

BVPS JOB PERFORMANCE MEASURE

#### ORAL QUESTION #1

QUESTION:

Given: the bus 2AE normal feeder breaker 2E07 has tripped open due to a ground fault (Type 51 inverse time relays on bus actuated).

 Determine, using the applicable drawings, whether or not the Emergency Diesel Generator will automatically reenergize the bus.

-2) Determine, using the above drawings, whether the Emergency Diesel Generator output breaker could be manually closed.

3) Discuss the possible consequences to the Emergency Diesel Generator if the output breaker were to close under the above conditions.

seen & say \$1) will met occur.

RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

#### CANDIDATE DIRECTION SHEET

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

R

Read:

Task: Locally Start the No. 1 Emergency Diesel Generator

| INITIAL CONDITIONS: | A station blackout has occurred. OM 53A  |  |  |
|---------------------|------------------------------------------|--|--|
|                     | Procedure ECA-0.0 "Loss of All AC Power" |  |  |
|                     | has led to step 16, which requires local |  |  |
|                     | actions to be taken to restore power.    |  |  |
|                     | Service water pump 2SWS*P21A is in AUTO. |  |  |

| INITIATING | Your supervisor directs you to use Attachment A-<br>1.5 of ECA-0.0 to start the No. 1 Diesel<br>Generator. You have been given the keys for the |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
|            | Generator. You have been given the keys for the                                                                                                 |
|            | No. 1 Diesel Generator.                                                                                                                         |

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate performance of the required task. Point to any indicator or component you verify or check and announce your observations.

After the task is complete, announce "I have completed the JPM", then hand this sheet back to the evaluator.

| BEAVER VALLEY JOB PERFORMANCE MEASURE<br>EVALUATOR COVER SHEET |             |                    |                                              |            |                                       |                                        |
|----------------------------------------------------------------|-------------|--------------------|----------------------------------------------|------------|---------------------------------------|----------------------------------------|
| JPM Number: 2CR                                                | New #9      | Rev: 0             |                                              | Syst       | em #:015                              |                                        |
| JPM Title: Perform                                             | a QPTR (Ur  | nsat)              |                                              |            |                                       | ,                                      |
| K/A Reference:015                                              | A4.02       | Diffic             | ulty; 3.9/3.9                                |            | Task ID #: 015                        | 0040201                                |
| JPM Application:                                               | X Re        | equal 🗵            | Initial Exam                                 | 🛛 Tra      | aining                                | -                                      |
| Evaluation Me                                                  | thod        | LO                 | CATION                                       | 1          | TYPE                                  |                                        |
| 🔀 Perfo                                                        | orm         | 🛛 Pl               | ant Site                                     | <b>–</b> 1 | Fraining                              |                                        |
| 🛛 Simu                                                         | late        | 🗵 Si               | mulator                                      |            | Annual Requ                           | al. Exam                               |
|                                                                |             | 🛛 с1               | assroom                                      |            | TLC                                   |                                        |
|                                                                |             |                    | •                                            | X          | Initial Ope                           | rator Exam                             |
| Administered                                                   | By:         |                    |                                              |            | Other:                                |                                        |
| D BV-T                                                         |             | X NR               | C Davi                                       | N          | 0                                     | Nr.2                                   |
| Other:                                                         |             |                    | 1 Ver                                        | 1 VI W     | gens                                  |                                        |
|                                                                |             |                    |                                              |            |                                       |                                        |
| Evaluation Results                                             |             |                    |                                              |            |                                       |                                        |
| Performer:                                                     |             |                    | ,                                            | _ 8        | Employee No: _                        |                                        |
| Results                                                        |             | SAT                |                                              |            | Fime (minutes)                        |                                        |
|                                                                | Ο ι         | JNSAT <sup>*</sup> | Allotte                                      | ed:        | <u>15</u> Actua                       |                                        |
|                                                                |             |                    | Time                                         | Critical:  | ΠY                                    | es 🗵 No                                |
| <b>*</b> -                                                     |             |                    | Administrativ                                | e JPM      | E F                                   | aulted                                 |
| Comments (Requir                                               | ed for UNSA | T Evalua           | tion):                                       |            |                                       |                                        |
| ······                                                         |             |                    | <u>.                                    </u> |            |                                       | ······································ |
| Evaluation Results                                             |             | Chook              | here if same as                              | abouo      |                                       |                                        |
| Observer 1:                                                    | Name:       |                    |                                              |            | Employee No: _                        |                                        |
| Observer 2:                                                    | Name        |                    |                                              | E          | Employee No: _                        |                                        |
| Observer 3:<br>Observer 4:                                     |             |                    |                                              | _ E        | Employee No: _<br>Employee No: _      | <u>-</u>                               |
| Observer 4.                                                    | Name.       | Tin                | ne (minutes)                                 | _ 1        | _mployee No<br>Resu                   |                                        |
|                                                                | Question ID |                    | llotted                                      | Actual     | SAT                                   | UNSAT <sup>*</sup>                     |
| Question #1                                                    |             |                    |                                              |            |                                       |                                        |
| Employee No:                                                   |             |                    |                                              | <u></u>    |                                       | _                                      |
| Question #2                                                    |             |                    |                                              |            |                                       |                                        |
| Employee No:                                                   |             | _<br>T C           | ti − ).                                      |            |                                       |                                        |
| *Comments (Requir                                              | ed for UNSA |                    | lion):                                       |            |                                       |                                        |
|                                                                |             |                    |                                              |            | · · · · · · · · · · · · · · · · · · · |                                        |
| Evaluator (Print):                                             |             |                    |                                              |            | Organization:                         |                                        |
| Evaluator (Frint).                                             |             |                    |                                              |            | -                                     |                                        |
|                                                                | ·           |                    |                                              |            |                                       |                                        |

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# BEAVER VALLEY JOB PERFORMANCE MEASURE

### EVALUATOR DIRECTION SHEET

| JPM NUMBER:                       | 2CR-New #9                                                                                             |
|-----------------------------------|--------------------------------------------------------------------------------------------------------|
| JPM TITLE:                        | Perform a QPTR -                                                                                       |
| TASK STANDARD:                    | QPTR is identified as being > 1.02 (unsat)                                                             |
| RECOMMENDED<br>STARTING LOCATION: | Simulator                                                                                              |
| DIRECTIONS:                       | You are to perform a manual Quadrant Power Tilt Ratio calculation.                                     |
| INITIAL CONDITIONS:               | A QPTR alarm has been received. The IPC is not available.                                              |
| INITIATING CUE:                   | The ANSS directs you to perform 2OST-2.4A, beginning at step VII.B to determine if the alarm is valid. |
| REFERENCES:                       | 20ST-2.4A                                                                                              |
| TOOLS:                            | Calculator                                                                                             |
| HANDOUT:                          | 20ST-2.4A                                                                                              |

| NUMBER; 2CR-New#9 | TITLE: Perform a QPTR |
|-------------------|-----------------------|
|                   |                       |

| STEP                                                                                                              | STANDARD<br>(Indicate "S" for Sat. or "U" for Unsat.)                                                                                                                                                                                                                                                |  |
|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| ("C" denotes critical step)                                                                                       |                                                                                                                                                                                                                                                                                                      |  |
|                                                                                                                   |                                                                                                                                                                                                                                                                                                      |  |
| EXAMINER NOTE: Provide<br>candidate with Data<br>Sheet 20ST-2.4A Page 8<br>with Normalization<br>Factors inserted | Start Time:<br><u>EXAMINER NOTE</u> : Initialize<br>simulator in Mode 1, 100%N.<br>Place rods in MANUAL.<br>Activate CLF NIS XMT 14, 2,<br>1, ramp 60 second. Adjust<br>N44 channel gain to clear<br>channel deviation alarms.<br>Print out computer PCS<br>group GP048 if available.<br>Write snap. |  |
| <ol> <li>Records uncorrected<br/>detector current values.</li> </ol>                                              | <ol> <li>Records eight power range<br/>detector currents.</li> <li>COMMENTS:</li> </ol>                                                                                                                                                                                                              |  |
| 2. Multiplies each detector<br>current by its<br>normalization factor                                             | 2. Records eight corrected currents COMMENTS:                                                                                                                                                                                                                                                        |  |

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| NUMBER; 2CR-New#9 | TITLE: Perform a QPTR |  |
|-------------------|-----------------------|--|
|                   |                       |  |

| ("C" denotes critical step) | (Indicate "S" for Sat. or "U" for Unsat.) |
|-----------------------------|-------------------------------------------|

| 3. Adds corrected currents.                  | 3. Adds each set of four<br>corrected currents.<br>COMMENTS:                                                                                                                                                                                                       |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4. Determines average<br>corrected currents. | <pre>4. Divides two current sums     by four COMMENTS:</pre>                                                                                                                                                                                                       |
| 5.C Checks results                           | <pre>5.C Determines that N44B     exceeds 1.02. COMMENTS:  EXAMINER CUE: Computer group GP048 is consistent with calculated results (if   requested and QPTR was done   properly) or provide   printout. Examiner terminates JPM at   this point. Stop Time;</pre> |

#### **BVPS JOB PERFORMANCE MEASURE**

#### **ORAL QUESTION #1**

QUESTION: What effect would a drop of control rod D4 have on the Quadrant Power Tilt at 100% power?

ANSWER: Power would be depressed on N43 and elevated on N44, (probably resulting in an Out-of-Specification QPTR).

Note; Requires use of figure 2OM 2-5 to determine location of excore detectors relative to dropped rod.

TIME ALLOTTED: 5 minutes

KSA #: 015K1.03 3.1/3.1 001K5.07 3.3/4.0 015A1.04 3.5/3.7

**REFERENCE: 20M Figure 2-5** 

COMMENTS: \_

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#### BVPS JOB PERFORMANCE MEASURE

## ORAL QUESTION #2

- QUESTION: Given that the upper and lower power range detector normalization factors have just been determined following a refueling outage to make the upper and lower Quadrant Power Tilt Ratios equal to 1.00, how would an actual quadrant power peak due to an incorrectly loaded fuel assembly be detected?
- ANSWER: By performance of a (full) incore flux map (that would detect an out-of specification Enthalpy Rise Hot Channel Factor,  $F_N^{aH}$ ). (Completion may be prompted after the candidate mentions the flux map by having him refer to Technical Specifications to determine which power distribution limit would be exceeded.)

TIME ALLOTTED: 5 minutes

- KSA #: 015K5.09 2.5/2.9 015K5.12 3.2/3.6
- REF: T/S 4.2.3.1 and basis T/S 3.2.4 basis page B 3/4 2-8

COMMENTS: \_

# \* \* THIS SHEET TO BE GIVEN TO CANDIDATE \* \*

## **BVPS JOB PERFORMANCE MEASURE**

### **ORAL QUESTION #2**

QUESTION: Given that the upper and lower power range detector normalization factors have just been determined following a refueling outage to make the upper and lower Quadrant Power Tilt Ratios equal to 1.00, how would an actual quadrant power peak due to an incorrectly loaded fuel assembly be detected?

# \* \* THIS SHEET TO BE GIVEN TO CANDIDATE \* \*

# BVPS JOB PERFORMANCE MEASURE

#### **ORAL QUESTION #1**

QUESTION: What effect would a drop of control rod D4 have on the Quadrant Power Tilt at 100% power?

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#### BEAVER VALLEY JOB PERFORMANCE MEASURE

#### CANDIDATE DIRECTION SHEET

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

Read:

Task: You are to simulate (perform) a manual Quadrant Power Tilt Ratio calculation.

| INITIAL CONDITIONS: | A QPTR alarm has been received. | The IPC is not available. |
|---------------------|---------------------------------|---------------------------|
|                     | · ·                             |                           |

| INITIATING CUE: | The ANSS directs you to perform 2OST-2.4A, beginning at step VII.B to determine if the alarm is valid. |
|-----------------|--------------------------------------------------------------------------------------------------------|
|                 |                                                                                                        |

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".



Perform the required task. Point to any indicator or component you verify or check and announce your observations.

After completing the task, announce "I have completed the JPM", then hand this sheet back to the evaluator.

|                                                     | LLEY JOB PERFORMANCE<br>VALUATOR COVER SHEE                                        |                                                               |
|-----------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------|
| JPM Number: 2PL-019 Re<br>JPM Title: Align Air Comp | ev: 3 System #: (<br>ressor for Operation                                          | 078                                                           |
| K/A Reference:065AA1.04                             | 3.5/3.4                                                                            | <b>Task ID #:</b> 0000260401                                  |
|                                                     | NO X RO X<br>NRC X Initial F                                                       | SRO<br>Exam Training                                          |
| Evaluation Method<br>Perform<br>X Simulate          | LOCATION       X     Plant Site       Simulator     Image: Classroom       X     X | TYPE<br>Training<br>Annual Requal. Exam<br>OJT<br>NRC Initial |
| Operator Exam                                       | -                                                                                  |                                                               |
| Administered By:<br>BV-T<br>Other:                  | × NRC hed                                                                          | Other:                                                        |
|                                                     |                                                                                    |                                                               |
| <u>Evaluation Results</u><br>Performer: Name:       |                                                                                    | Employee No:                                                  |
| Results 🗌 SA                                        | T                                                                                  | Time (minutes)                                                |
| UN                                                  |                                                                                    | 1: <u>15</u> Actual:                                          |
|                                                     | Time Cri                                                                           | itical: 🚺 Yes 🗶 No<br>Faulted: 🗌                              |
| *Comments (Required for                             | UNSAT Evaluation):                                                                 |                                                               |
|                                                     |                                                                                    |                                                               |
| Evaluation Results Observer: Name:                  | Check here if same                                                                 | as above<br>Employee No:                                      |
| Question 2                                          | Time (minutes)<br>ID Allotted Act                                                  | Results<br>cual SAT UNSAT <sup>*</sup>                        |
| Question #1                                         |                                                                                    |                                                               |
| Question #2                                         |                                                                                    |                                                               |
| *Comments (Required for                             | UNSAT Evaluation):                                                                 |                                                               |
|                                                     |                                                                                    |                                                               |
| Evaluator (Print):                                  |                                                                                    | Organization:                                                 |
| Evaluator Signature:                                |                                                                                    | Date:                                                         |

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RTL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE

#### CANDIDATE DIRECTION SHEET

\* THIS SHEET TO BE GIVEN TO CANDIDATE \*

Read:

Task:

Align Station Air Compressor for Operation

| INITIAL CONDITIONS: | The Control | Room has been | evacuated due |
|---------------------|-------------|---------------|---------------|
|                     | to fire.    | · ·           |               |

| INITIATING | The NSS hands you a copy of OM-2.56C.4, | Procedure |
|------------|-----------------------------------------|-----------|
| CUE:       | E, Part 2 and tells you to perform Step | 5.        |
|            |                                         |           |

At this time, ask the evaluator any questions you have on this JPM.

When satisfied that you understand the assigned task, announce "I am now beginning the JPM".

Simulate the task. Point to any indicator or component you verify or check and announce your observations.

After the task is completed, announce "I have completed the JPM", then hand this sheet back to the evaluator.

RIL #A5.635.J BEAVER VALLEY JOB PERFORMANCE MEASURE EVALUATOR DIRECTION SHEET 2PL-019 JPM NUMBER: Align Station Air Compressor for Operation JPM TITLE: RECOMMENDED STARTING LOCATION: Turbine Building You are to simulate the task "Align Station DIRECTIONS: Air Compressor for Operation". The Control Room has been evacuated due to INITIAL fire. CONDITIONS: 2SAS-C21A is running on Domestic Water with TASK STANDARD: 2SAS-AOV105 closed. The NSS hands you a copy of OM-2.56C.4, INITIATING CUE: Procedure E, Part 2 and tells you to perform Step 5. OM-2.56C.4, Procedure E, Part 2, Issue 1, REFERENCES: Rev. 4 None TOOLS: 20M-56C.4.E, Part 2 HANDOUT: OMCN 2-'92-262

RTL #A5.635.J

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\* \* THIS SHEET TO BE GIVEN TO CANDIDATE \*

#### BVPS JOB PERFORMANCE MEASURE

# ORAL QUESTION #1

Briefly describe the impact of a loss of Station Instrument Air on the ability to complete valve positioning required by a Safety Injection or Containment Isolation signal.

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RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

#### ORAL QUESTION #1

- Briefly describe the impact of a loss of Station Instrument Air on the ability to complete valve Ouestion; positioning required by a Safety Injection or-Containment Isolation signal.
- Instrument Air is not required because SI and CIA valves fail to their desired positions on a ANSWER: loss of air préssure (or control power). Valves that must change position following an SI are equipped with either motor or solenoid operators.

TIME ALLOTTED: 4 minutes

KSA #: 078K3.02 3.4/3.6

20M-56C.4A INTENT AND METHODOLOGY item 3.F REF:

COMMENTS:

RTL #A5.635.J

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\* \* THIS SHEET TO BE GIVEN TO CANDIDATE \* \*

### BVPS JOB PERFORMANCE MEASURE

#### ORAL QUESTION #2

Why does 20M 56C line up Domestic Water as the cooling medium to the 21A air compressor?

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#### ORAL QUESTION #2

- Question; Why does 20M 56C line up Domestic Water as the cooling medium to the 21A air compressor?
- ANSWER: Domestic Water is utilized by OM2.56C because the normal supply, CCS, is unavailable. CCS is unavailable because procedure 56C deenergizes the BOP busses (to prevent undesired equipment operation). (Completion may be prompted, i.e. "Why will CCS be unavailable?".)

TIME 5 minutes ALLOTTED:

KSA #: 000067EK3.04 3.3/4.1

REF: 20M-28.1

COMMENTS:

R/TL #A5.635.J

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| NUMBER  | TITLE                                                   |
|---------|---------------------------------------------------------|
| 2PL-019 | Alternate Safe Shutdown - Turbine Building<br>(N.O. #2) |
|         |                                                         |

| STEP<br>("C" denotes critical step)          | STANDARD<br>(Indicate "S" for Sat. or "U"<br>for Unsat.) |
|----------------------------------------------|----------------------------------------------------------|
| 1.C Isolate all unnecessary<br>loads on SAS. | <pre>Start time:</pre>                                   |

| R/TL | #A5. | .635.J |
|------|------|--------|
|------|------|--------|

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| NUMBER  | TITLE                                                   |
|---------|---------------------------------------------------------|
| 2PL-019 | Alternate Safe Shutdown - Turbine Building<br>(N.O. #2) |
|         |                                                         |

| STEP<br>("C" denotes critical step)                                                              | STANDARD<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.C Align cooling water to the<br>2SAS-C21A air compressor<br>from the Domestic Water<br>supply. | <pre>2.1.C Candidate closes 2CCS-<br/>78.<br/>EXAMINER CUE: 2CCS-78 is<br/>closed.<br/>2.2.C Candidate closes<br/>2CCS-83.<br/>EXAMINER CUE: 2CCS-83 is<br/>closed.<br/>2.3.C Candidate opens 2CCS-<br/>AOV118.<br/>EXAMINER CUE: 2CCS-AOV118<br/>is open.<br/>2.4.C Candidate opens<br/>[2CCS*229].<br/>EXAMINER CUE: 2CCS-229 is<br/>open.<br/>COMMENTS:</pre> |

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R/TL #A5.635.J

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| NUMBER  | TITLE                                                   |
|---------|---------------------------------------------------------|
| 2PL-019 | Alternate Safe Shutdown - Turbine Building<br>(N.O. #2) |

| STEP<br>("C" denotes critical step)                                                                                                                                                                                                    | STANDARD<br>(Indicate "S" for Sat. or "U"<br>for Unsat.)                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.C Align compressor controls<br>for 2SAS-C21A.                                                                                                                                                                                        | EXAMINER CUE: The VOLTAGE<br>ON light and remote breaker<br>lights are lit and no alarm<br>status lights are lit.<br>3.1.C Candidate places LOCAL-<br>REMOTE switch in the                       |
|                                                                                                                                                                                                                                        | LOCAL position.<br>3.2.C Candidate depresses<br>RESET/START pushbutton.<br>EXAMINER CUE: The<br>compressor is running with<br>no problems.<br>3.3 Candidate notifies<br>Supervisor of compressor |
|                                                                                                                                                                                                                                        | Status<br>COMMENTS:                                                                                                                                                                              |
| EXAMINER CUES:<br>Oil pressure is 30#<br>aftercooler discharge is 110#<br>intercooler inlet is 36#<br>intake vacuum is 8"<br>Cooling water outlet is 100°F<br>aftercooler water outlet is<br>30°C<br>aftercooler air outlet is<br>32°C |                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                        | Stop Time:                                                                                                                                                                                       |

Revision: 3

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#### SCENARIO OVERVIEW

| Facility: Beaver Valley Power Station Unit 2 Scenario No.: _2_ Op-Test No.: 2LOT2B |                                                                                          |                                             |                                                                                                                           |  |  |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|--|--|
|                                                                                    | Tacinty. <u>Deaver Valley Fower Station Shitz</u> Section No2_ Op Foether. <u>220120</u> |                                             |                                                                                                                           |  |  |
| Examiners:                                                                         |                                                                                          |                                             | Operators:                                                                                                                |  |  |
|                                                                                    |                                                                                          |                                             |                                                                                                                           |  |  |
| Objectives, T                                                                      | e eveluete the enel                                                                      | icente chility to use                       | Normal Abnormal Emorgancy and Alarm Personse                                                                              |  |  |
| procedures to                                                                      | respond to a charge                                                                      | ing pump sheared s                          | Normal, Abnormal, Emergency and Alarm Response<br>shaft, impulse pressure transmitter failure, 2RCS*PT444 failing         |  |  |
|                                                                                    | CV455C sticking of<br>fails to auto start.                                               | pen with 2RCS*MO                            | V435 failing to close, ATWS, 2CHS*MOV350 fails to open,                                                                   |  |  |
|                                                                                    |                                                                                          |                                             | As conditions. Dode one is Manual, 2019;12:021P and                                                                       |  |  |
| Initial Condition                                                                  | ons: <u>1C-47, 75% pot</u><br>are OOS. 2RCS*P                                            | CV456 is isolated.                          | ate conditions. Rods are in Manual. 2CHS*P21B and<br>Tomado Warning in effect. Tube leak on SG "B".                       |  |  |
| Tumover: Th                                                                        | e plant is at 75% po                                                                     | wer BOI RCS bo                              | ron 982 PPM, Rods in Auto with CBD at 190 steps.                                                                          |  |  |
| [2CHS*P21B]                                                                        | and [2FWE*P23B]                                                                          | are OOS. 2FWE*3                             | 38 shut, 2FWE*P22 aligned to 'B' header 2FWE-36 shut;                                                                     |  |  |
| 2FWE-102 or<br>20 and tube l                                                       | en. 2RCS*PCV45<br>eak on SG *B". Tor                                                     | 56 is isolated per 1<br>nado watch in effec | F.S. 3.4.11.b action. AOP 6.4 is complete to step 18 due to<br>t. AOP 75.1 complete through step 5. Lower power to remove |  |  |
| 2FWS-P21A                                                                          |                                                                                          |                                             |                                                                                                                           |  |  |
|                                                                                    | r                                                                                        | T                                           | E rest Deservation                                                                                                        |  |  |
| Event No.                                                                          | Malf. No.                                                                                | Event Type*                                 | Event Description                                                                                                         |  |  |
| N/A                                                                                | N/A                                                                                      | R RO<br>N PO/SRO                            | Lower power to remove 2FWS-P21A from service                                                                              |  |  |
| 1                                                                                  | PMP CHS1<br>4,0,D                                                                        | C RO/SRO                                    | Operating Charging Pump sheared shaft resulting<br>in loss of all charging and seal injection flow                        |  |  |
| 2                                                                                  | XMT MSS42<br>1,0,20,D                                                                    | I PO/SRO                                    | Impulse pressure transmitter 2MSS*PT446 fails low                                                                         |  |  |
| 3                                                                                  | XMT RCS30<br>1,2500,5,0,D                                                                | I RO/SRO                                    | RCS pressure transmitter fails high causing spray valves and PORVs to open and heaters to turn off                        |  |  |
| 4                                                                                  | VLV RCS32<br>4,75,0,C,RR<br>CH455C.GT.<br>0.05                                           | C RO/SRO                                    | PZR PORV 2RCS*PCV455C fails to 75% open<br>(Preload)                                                                      |  |  |
| 5                                                                                  | VLV RCS11<br>2,0,D                                                                       | M ALL                                       | PORV Block valve 2RCS*MOV535 fails to close causing RCS pressure to lower (Reactor trip and SI) (Preload)                 |  |  |
| 6                                                                                  | MAL PPL1A<br>& B<br>ACT,2,0,D                                                            | M ALL                                       | ATWS (Preload)                                                                                                            |  |  |
| 7                                                                                  | MAL PPL7A                                                                                | C PO/SRO                                    | 2FWE*P23A fails to auto start, will manually start                                                                        |  |  |
| ACT,6,0,D (Preload)                                                                |                                                                                          |                                             |                                                                                                                           |  |  |
| 8                                                                                  | 8 VLV BAT14 C RO/SRO 2CHS*MOV350 fails closed, must alternate emergency borate (Preload) |                                             |                                                                                                                           |  |  |
| * (N)ormal,                                                                        | (R)eactivity,                                                                            | (I)nstrument,                               | (C)omponent, (M)ajor                                                                                                      |  |  |

BVPS 2LOT2B Rev. 0

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### U2LOT-SIM-NRC EXAM-2LOT2B.2 (ic) REV 0

### INITIAL CONDITIONS: Drill File 846 IC-47

Reactor power = 75%, BOL, RCS boron = 982 ppm, CBD = 190 steps

| ADDITIONAL LINEUP CHANGES                                                                                           | STICKERS                                                              | VOND MARKINGS                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Set CBD step counters at 190 steps<br>Place BOL ∆I curve in RO operator aids<br>2000 - 4000 MWD/MTU Reactivity Plan | 2RCS*MOV536 RED<br>2CHS-P21B RED<br>2FWE*P23B RED<br>2MSS*SOV120 YCT  | 2FWE*38 shut 24-3 (G-6) 2FWE*P22 aligned to 'B' header<br>2FWE*36 shut; 2FWE*102 open 24-3 (E-6)<br>2MSS-16 shut 21-2 (C-1)<br>2SVS*28 shut 21-2 (E-9) |
|                                                                                                                     | 2MSS*SOV105C YCT<br>2SVS*PCV101B YCT<br>2SVS*HCV104 YCT               | TECHNICAL SPECIEICATION(S)                                                                                                                             |
| EQUIPMENT STATUS<br>2RCS*PCV456<br>2CHS*P21B<br>2FWE*P23B                                                           | DATE/TIME OOS<br>6 days ago/0759<br>4 days ago/1610<br>6 hrs ago/1031 | TECHNICAL SPECIFICATION(S)<br>3.4.11.b<br>3.1.2.4 & 3.5.2 (Info Only)<br>3.7.1.2.b                                                                     |

### SHIFT TURNOVER INFORMATION

- 1. The plant is at 75% power, BOL. RCS boron 982 ppm. Rods in auto with CBD at 190 steps. Power was reduced 70 hours ago per System's request.
- 2. [2CHS-P21B] is removed from service for motor rewind. Motor is presently off site.
- 3. [2FWE\*P23B] is OOS to replace the pump inboard bearing, return expected in 24 hours. Its discharge valve 2FWE\*38 is shut.
- 4. 2FWE\*P22 aligned to 'B' AFW header 2FWE-36 shut; 2FWE-102 open.
- 5. 2RCS\*PCV456 OOS with block valve 2RCS\*MOV536 closed with power removed.
- 6. AOP 6.4 is complete to step 18. Approximately 44 hours ago a tube leak was detected in SG "B". The leak rate is 20 gpd based on the last HP and Chemistry estimate (Monitoring at 2 hour intervals IAW the AOP).
- 7. 2MSS-16 shut, 2MSS-15 and 17 verified open.
- 8. 2SVS\*28 shut.
- 9. 2MSS\*PCV101B auto with its setpoint adjusted to 100%.
- 10. 2MSS\*SOV105C open.
- 11.2MSS\*SOV120 open
- 12. Lower power at 10%/hour to remove 2FWS-P21A from service.

### SCENARIO SUPPORT MATERIAL REQUIRED

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1/20M-48.1.C(ISS3) Figure 48.1.C-2 (ANSS Turnover Checklist) 20M-54.2.S1 Log S1-2 (NSS Operating Report) 20M-54.2.S1 Log S1-5 (NCO Report) 20M-54.2.S1 Log S1-17 (ANSS Operating Report) 20M-52.4.B (Load Following)

# U2DRILL846(1)REV0

| INSTRUCTIONAL GUIDELINES          | PLANT STATUS OR RESPONSE           | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|-----------------------------------|------------------------------------|-----------|---------------------------|
|                                   |                                    |           |                           |
| Select DRILL 846,                 | Reactor at approximately 75%       |           |                           |
| Initialize IC - 47, and establish | power, BOL, steady state           |           |                           |
| initial plant conditions.         | condition, RCS boron _982_ ppm,    |           |                           |
|                                   | CBD _190_ steps. Ready to lower    |           |                           |
|                                   | power to remove 2FWS-P21A from     |           |                           |
|                                   | service.                           |           |                           |
| Insert:                           |                                    |           |                           |
|                                   |                                    |           |                           |
| VLV RCS32                         | PZR PORV, 2RCS*PCV455C fails       |           |                           |
| 4,75,0,C,RRCH455C.GT.0.05         | to 75% open                        |           |                           |
| VLV RCS11 2,0,D                   | PORV Block 2RCS*MOV535 fails       |           |                           |
| MAL PPL1A ACT,2,0,D               | open<br>ATWS                       |           |                           |
| MAL PPL1B ACT,2,0,D               | /////0                             |           |                           |
| MAL PPL7A ACT 6,0,D               | 2FWE*P23A fails to auto start      |           | · · · ·                   |
| VLV BAT14 3,0,D                   | Emergency Borate Valve             |           |                           |
|                                   | 2CHS*MOV350 fails closed           |           |                           |
| File STUFFON                      |                                    |           |                           |
| File LRTM5IC                      |                                    |           |                           |
| Assign shift positions.           |                                    |           |                           |
| NSS                               | Simulator Frozen until after shift |           |                           |
| ANSS                              | turnover unless it needs to be run |           |                           |
| R0                                | momentarily for an alignment       |           |                           |
| PO                                | change.                            |           |                           |
| STA                               |                                    |           |                           |
|                                   |                                    |           |                           |

# U2DRILL846(2)REV0

| INSTRUCTIONAL GUIDELINES                                                                 | PLANT STATUS OR RESPONSE                                                                                                                                                                                                                | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                      |
|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------|
| Conduct a shift turnover with oncoming operators.                                        |                                                                                                                                                                                                                                         |           | Oncoming ANSS should complete the required checklist and carry out a formal shift turnover.                    |
| When the shift turnover is completed, place the simulator in RUN and commence the drill. | Simulator running/VCR recording                                                                                                                                                                                                         |           | ANSS assumes control and directs operators to commence lowering power IAW 20M-52.4.B.                          |
| Depress VCR PLAY/RECORD                                                                  |                                                                                                                                                                                                                                         |           | •                                                                                                              |
|                                                                                          | Power lowering                                                                                                                                                                                                                          |           | RO develops reactivity plan, ANSS reviews and approves. Crew commences power reduction                         |
| EVENT_#1                                                                                 |                                                                                                                                                                                                                                         |           |                                                                                                                |
| After power is lowered <u>&gt;</u> 5% insert:<br>PMP CHS1 4,0,D                          | 2CHS*P21B shaft shears resulting<br>in the loss of all normal charging<br>and seal injection flow<br>2CHS*P21B running with lower<br>than normal amps. Alarm A2-3E,<br>CHARGING FLOW PATH<br>TROUBLE lit<br>A2-4D, RCP SEAL TROUBLE lit |           | RO notes that charging header flow<br>and pressure are low, 2CHS*P21B<br>amps are low, with PZR level lowering |

| INSTRUCTIONAL GUIDELINES                                                                                                                                                                                | PLANT STATUS OR RESPONSE                                                                                 | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                         | Annunciator A2-3F, LETDOWN<br>FLOW PATH TROUBLE will<br>illuminate if letdown is not quickly<br>isolated |           | ANSS refers to alarm response<br>procedure, charging flow or pressure<br>low section and directs RO to close<br>2CHS*FCV122, Charging pump flow<br>control valve<br>Crew may isolate letdown per ARP<br>A2-3F |
|                                                                                                                                                                                                         |                                                                                                          |           | Crew verifies that a common mode<br>failure does not exist and starts the<br>standby charging pump                                                                                                            |
| After an appropriate delay, report<br>as local operator that the speed<br>changer for 2CHS*P21B is<br>damaged and very noisy (if pump is<br>running)<br>If asked local discharge pressure is<br>33 psig | Normal charging and letdown<br>established<br>2CHS*FCV122 in Auto                                        |           | RO stabilizes PZR level, then places 2CHS*FCV122 in Auto                                                                                                                                                      |
|                                                                                                                                                                                                         |                                                                                                          |           | Applicable T. S. 3.1.2.4 and 3.5.2                                                                                                                                                                            |

### <u>EVENT #2</u>

U2DRILL846(3)REV0

When PZR level stabilized, insert: XMT MSS42 1,0,20,D

Impulse pressure 2MSS\*PT446 fails low Rods step in in Auto

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U2DRILL846(4)REV0

|                          | - <b>T</b> ***********************************                                                                                                                                                                                |           |                                                                                                                                                                                                          |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                                                                                                                                                                      | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                                                                                                                |
|                          | Annunciators SG LEVEL<br>DEVIATION, STEAM FLOW ><br>FEED FLOW, PZR PRESSURE<br>LOW, TAVE DEVIATION, DELTA<br>FLUX OUTSIDE TARGET BAND<br>LIT<br>Rod control in Manual<br>Tave trending to Tref<br>dl returning to Target Band |           | ANSS refers to AOP 2.1.3, RCCA<br>Control Bank Inappropriate<br>Continuous Movement<br>PO determines that 2MSS*PT446 has<br>failed low<br>ANSS directs RO to place rods in<br>Manual and to restore Tave |
|                          | All four channels of QPTR are operable                                                                                                                                                                                        |           | PO performs OST-2.4A, QPTR<br>Manual Calculation                                                                                                                                                         |
|                          |                                                                                                                                                                                                                               |           | T. S. 3.2.1, dI (less than 60 minutes<br>outside target in last 24 hours) and<br>3.2.5, DNB (restore within two hours)<br>impacted                                                                       |
|                          |                                                                                                                                                                                                                               |           | ANSS refers to 20M- 24.4.IF,<br>Instrument Failure Procedure,<br>Attachment 5                                                                                                                            |
|                          | SG levels lowering<br>FRVs in Manual                                                                                                                                                                                          |           | ANSS directs PO to place FRVs in<br>Manual and adjust to stabilize SG<br>levels<br>NOTE: May not be necessary                                                                                            |
|                          | Main turbine first stage pressure sensor selected to PT447 on BB-C                                                                                                                                                            |           | ANSS directs PO to select PT447                                                                                                                                                                          |

# U2DRILL846(5)REV0

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PLANT STATUS OR RESPONSE                                                                                                                                                            | OBJECTIVE                                                                                                                                                                               | EXPECTED STUDENT RESPONSE                                                                                                                                                                                                                                                                                                                                         |
| FRVS in Auto                                                                                                                                                                        |                                                                                                                                                                                         | ANSS directs PO to place FRVs in<br>Auto when SG levels returned to<br>normal                                                                                                                                                                                                                                                                                     |
| Steam Dumps RESET and in STM PRESS Mode                                                                                                                                             |                                                                                                                                                                                         | ANSS directs PO to place the Stm<br>Dump Mode Selector Switch to<br>RESET, then to STM PRESS Mode                                                                                                                                                                                                                                                                 |
|                                                                                                                                                                                     |                                                                                                                                                                                         | ANSS refers to ARP 20M-1.4.ACJ                                                                                                                                                                                                                                                                                                                                    |
| TL/2MSS446 is on<br>Trip Switch TPS/2MSS446 in the<br>Test (up) position<br>Annunciator A12-1E is off<br>AMSAC re-armed                                                             |                                                                                                                                                                                         | ANSS contacts I & C and directs them<br>to verify that Test Light TL/2MSS446<br>is off and to place Trip Switch<br>TPS/2MSS446 in the Test (up)<br>position                                                                                                                                                                                                       |
|                                                                                                                                                                                     |                                                                                                                                                                                         | ANSS refers to T.S. 3.3.1.1 Table 3.3-<br>1, item 23.e                                                                                                                                                                                                                                                                                                            |
| Annunciator A12-2H not lit<br>(Both inputs must be < 10% to<br>illuminate this window, the<br>annunciator being dark implies the<br>other input is operable per the T.S.<br>action) |                                                                                                                                                                                         | Crew determines that A12-2H is NOT lit                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                     | Steam Dumps RESET and in STM<br>PRESS Mode<br>TL/2MSS446 is on<br>Trip Switch TPS/2MSS446 in the<br>Test (up) position<br>Annunciator A12-1E is off<br>AMSAC re-armed<br>AnsAC re-armed | FRVS in Auto<br>Steam Dumps RESET and in STM<br>PRESS Mode<br>TL/2MSS446 is on<br>Trip Switch TPS/2MSS446 in the<br>Test (up) position<br>Annunciator A12-1E is off<br>AMSAC re-armed<br>Annunciator A12-2H not lit<br>(Both inputs must be < 10% to<br>illuminate this window, the<br>annunciator being dark implies the<br>other input is operable per the T.S. |

## DUQUESNE LIGHT COMPANY

Nuclear Power Division

Training Administrative Manual

#### U2DRILL846(6)REV0

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| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|--------------------------|--------------------------|-----------|---------------------------|
|                          |                          |           |                           |

## EVENTS #3, 4 & 5

XMT RCS30 1,2500,5,0,D

VLV RCS32 4,75,0,C,PRC:455C.GT.2250 (Preload) VLV RCS11 2,0,D (Preload) 2RCS\*PT444 fails high causing PZR spray valves and PORV 2RCS\*PCV455C to open

2RCS\*PCV455C fails 75% open

2RCS\*MOV535, PORV Block fails open

PZR CONTROL PRESSURE HIGH/LOW alarm, A4-1D

PZR CONTROL PRESSURE DEVIATION HIGH/LOW alarm. A4-1E, P0500D Various other PZR pressure and PRT alarms

Possible OTDT runback and rod stop. A4-4B, T0517D RO notes alarm, informs ANSS and crew refers to ARPs as necessary.

ANSS refers to ARP A4-1E, PRESSURIZER CONTROL PRESS DEVIATION HIGH/LOW

ANSS directs PORV 455C be closed and master pressure controller be placed in manual.

PO places master pressure controller in manual, closes spray valves, and manually controls heaters.

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U2DRILL846(7)REV0 **OBJECTIVE** EXPECTED STUDENT RESPONSE INSTRUCTIONAL GUIDELINES PLANT STATUS OR RESPONSE RO informs the ANSS that RCS RCS pressure continues to drop. NOTE: Crew may decide to pressure is still dropping with manual manually trip reactor prior to auto control of spray/heaters and that trip setpoint. 2RCS\*PCV455C indicates partially open. RO notes a reactor trip has not EVENT #6 occurred and attempts to trip the **ATWS** MAL ACT PPL1A 2,0,D reactor, informs ANSS of ATWS MAL ACT PPL1B 2,0,D condition. Low PRZR pressure reactor trip (Preload) annunciator actuates. First Out: A5-4H, P0488D. CT #1 - Crew inserts negative Reactor trip failure. reactivity into the core by inserting RCCAs before completing the immediate action steps of FR-S.1 Operators commence immediate actions for E-O and FR-S.1; ANSS refers to E-O and makes transition to FR-S.1.

Rods inserting.

RO uses auto or manual rod control to insert rods.

Crew sounds standby alarm and announces Unit 2 reactor trip failure.

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# U2DRILL846(8)REV0

| INSTRUCTIONAL GUIDELINES                                                                                         | PLANT STATUS OR RESPONSE                                                                                               | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Two minutes after receiving<br>direction to locally open reactor trip<br>breakers, insert<br>MAL PPL2A ACT,0,0,D |                                                                                                                        |           | Crew dispatches an operator to open<br>the reactor trip breakers.                                                                                                                               |
| MAL PPL2B ACT,0,0,D<br>Then report RTBs manually<br>opened.                                                      | Reactor tripped                                                                                                        |           | NSS evaluates EPP, declares a Site<br>Area Emergency due to ATWS/FR-<br>S.1 entry (TAB 2.3) within 15 minutes<br>of first out annunciator, informs crew,<br>provides AA with notification form. |
|                                                                                                                  | Turbine manually tripped.                                                                                              |           | PO manually trips turbine                                                                                                                                                                       |
|                                                                                                                  | Throttle, governor, reheat stop,<br>and interceptor valves all closed.                                                 |           | PO verifies turbine trip.                                                                                                                                                                       |
|                                                                                                                  | Steam dump bypass interlock selector switches in off.                                                                  |           | PO places condenser steam dump<br>Selector Switches in OFF                                                                                                                                      |
|                                                                                                                  | MSR steam supply block valves<br>closed.<br>Reheat controller reset.                                                   |           | PO ensures reheat steam isolation<br>and depresses reheat controller<br>RESET pushbutton.                                                                                                       |
| <u>EVENT #7</u><br>2FWE*P23A fails to auto start<br>MAL ACT PPL7A 6,0,D<br>(Preload)                             | MD AFW pump running.<br>(2FWE*P23A manually started).<br>TD AFW pump running if required.<br>2FWE*HCV100A-F full open. |           | PO verifies AFW status, reports<br>2FWE*P23A auto start failure,<br>manually starts pump.                                                                                                       |

U2DRILL846(9)REV0

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|---------------------------------------|--------------------------|-----------|---------------------------|
| INSTRUCTIONAL GUIDELINES              | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
| INSTRUCTIONAL GUIDELINES              | PLANT STATUS OK KESPUNSE | UDJECTIVE | EAPECIED STUDENT RESPONSE |
|                                       |                          |           |                           |

#### **EVENT #8**

VLV BAT14 3,0,D (Preload) HHSI pumps running. 2CHS\*MOV350 failed closed

2CHS\*SOV206 open Makeup Mode Selector in BORATE 2CHS\*FCV113A set to > 30 gpm Boric Acid Flow Totalizer set to > 1000 gpm Boric acid pump in Auto BA Makeup Blender Control in Start 2CHS-FR113 BA to Blender flow > 30 gpm 2CHS\*FCV122 manually opened Charging flow > 40 gpm

PRZR pressure < 2335 psig.

SI Annunciator A5-4G, PZR LOW PRESSURE SAFETY INJECTION/REACTOR TRIP lit

SG levels < 5% NR.

Crew attempts to initiates emergency boration.

Crew establishes alternate emergency boration

RO checks PRZR pressure less than 2235 psig.

Crew checks SI signal states, performs first fifteen steps of E-0 when time permits

PO checks SG levels, verifies AFW flow is greater than 700 gpm. PO controls feed flow to maintain 5 - 50% SG narrow range level.

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# U2DRILL846(10)REV0

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| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                       | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                      |
|--------------------------|--------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------|
|                          | 2CHS*FCV113B closed.<br>2CHS*FCV114A closed.<br>2CHS*FCV114B closed.           |           | RO verifies dilution paths isolated.                                                                           |
|                          | Uncontrolled cooldown not in progress.                                         |           | RO monitors RCS for uncontrolled cooldown.                                                                     |
|                          |                                                                                |           | ANSS goes to Step 16 of FR-S.1.                                                                                |
|                          | PR NIs less than 5%.<br>IR NIs negative SUR.                                   |           | RO verifies reactor subcritical.                                                                               |
|                          |                                                                                |           | ANSS makes transition from FR-S.1<br>back to E-0 and informs control room<br>to perform E-0 immediate actions. |
|                          | Reactor locally tripped<br>Rods bottom lights lit<br>Flux decreasing           |           | RO verifies reactor trip                                                                                       |
|                          |                                                                                |           | RO sounds standby alarm, and announces Unit 2 reactor trip.                                                    |
|                          |                                                                                |           | NSS informed to evaluates EPP                                                                                  |
|                          | Throttle or governor valves closed,<br>reheat stops or interceptors<br>closed. |           | PO verifies turbine trip.                                                                                      |

# U2DRILL846(11)REV0

| INSTRUCTIONAL GUIDELINES    | PLANT STATUS OR RESPONSE                                                                                                | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                            |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------|
|                             | MSR steam supply block valves<br>closed.<br>Reheat controller reset pushbutton<br>depressed.                            |           | PO ensures reheat steam isolation.                                                   |
|                             | Main generator output breakers<br>open.<br>Exciter circuit breaker open.                                                |           | PO verifies generator trip.                                                          |
|                             | 2AE and 2DF busses energized.                                                                                           |           | PO verifies power to AC emergency busses.                                            |
|                             | SI annunciator A5-4G, PZR LOW<br>PRESSURE SAFETY<br>INJECTION/REACTOR TRIP lit<br>SI actuation status light, A12-1D lit |           | Crew checks if SI is actuated/required.                                              |
| Immediate actions complete. | Both trains of SI manually initiated<br>EDGs running.                                                                   |           | ANSS directs RO to manually initiate<br>SI, both trains<br>PO verifies EDGs running. |
|                             | 2FWE*P23A running (2FWE*P23B<br>OOS).<br>2MSS*SOV105A-F open.<br>2FWE*HCV100A-F open.                                   |           | PO verifies AFW status.                                                              |
|                             | Two service water pumps running<br>(one per train).<br>Service water header pressure 60-<br>124 psig.                   |           | RO verifies service water system in service                                          |

# U2DRILL846(12)REV0

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                            | OBJECTIVE | EXPECTED STUDENT RESPONSE                                         |
|--------------------------|---------------------------------------------------------------------|-----------|-------------------------------------------------------------------|
|                          | 2CHS*P21A and C running<br>2SIS*943 indicates 400 gpm of SI<br>flow |           | RO verifies SI pump status                                        |
|                          | SI valve alignment - all indicating lights with red SIS marks lit   |           | RO/PO verify SI status                                            |
|                          | CIA actuated, all indicating lights with orange CIA marks LIT.      |           | RO/PO verify CIA                                                  |
|                          | All indicating lights with green marks lit.                         |           | RO/PO verify FWI                                                  |
|                          | MSLI NOT required                                                   |           | RO/PO check MSLI required.                                        |
|                          | CIB and Containment Spray NOT required.                             |           | RO verifies CIB and containment spray status                      |
|                          | 2CCS-AOV118 opened. One station air compressor running.             |           | PO establishes filtered water cooling to station air compressors. |
|                          | Both CCP pumps running                                              |           | RO/PO verify CCP in service.                                      |
|                          | SR channels aligned properly.                                       |           | RO verifies SR detector high voltage switches in NORMAL.          |
|                          | Total AFW flow > 365 gpm.                                           |           | PO verifies AFW flow greater than 365 gpm.                        |
|                          |                                                                     |           |                                                                   |

# U2DRILL846(13)REV0

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| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                          | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                                       |
|--------------------------|-------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------|
|                          | Plant cooling down due to hot leg<br>break, RNO actions complete  |           | RO verifies RCS Tavg stable at or trending to 547°F. RNO actions performed                                                      |
|                          | Recirc spray pumps secured.                                       |           | ANSS directs performance of<br>emergency safety function checklists<br>when time permits<br>RO checks recirc spray pump status. |
|                          | PORV 2RCS*PCV455C NOT<br>closed and NOT isolated                  |           | RO checks PRZR isolated.<br>(Transition required by RNO)                                                                        |
|                          |                                                                   |           | ANSS makes transition to E-1, informs crew.<br>Briefing held                                                                    |
|                          | CREBAPS not required.                                             |           | PO checks control room habitability.                                                                                            |
|                          | RCPs running. HHSI flow indicated, D/P and CCP flow satisfactory. |           | RO checks if RCPs should be stopped.                                                                                            |
|                          | Recirc spray pumps not running.                                   |           | RO rechecks recirc spray pump status.                                                                                           |
|                          | CNMT sample amber lights lit.                                     |           | RO verifies both H <sub>2</sub> analyzers running.                                                                              |
|                          | All SGs intact                                                    |           | PO checks if any SG is faulted.                                                                                                 |
|                          |                                                                   |           |                                                                                                                                 |

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# U2DRILL846(14)REV0

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| INSTRUCTIONAL GUIDELINES                                                 | PLANT STATUS OR RESPONSE                                                                                   | OBJECTIVE | EVECTED STUDENT DESPONSE                             |
|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------|
| Instruction AL GOIDEEINES                                                |                                                                                                            | ODJECTIVE | EXPECTED STUDENT RESPONSE                            |
|                                                                          | SG level between 5% and 50%                                                                                |           | PO maintains intact SG levels 5% to 50%.             |
|                                                                          | PORV 2RCS*PCV455C open<br>PORV 2RCS*PCV455D in auto<br>with block valve energized                          |           | RO checks PORVs and block valves.                    |
|                                                                          | Subcooling > 41°F.<br>Secondary heat sink satisfactory<br>RCS pressure stable or rising<br>PRZR level > 4% |           | RO/PO check if SI can be terminated.                 |
|                                                                          |                                                                                                            |           | ANSS makes transition to ES-1.1, informs crew.       |
| Collect and review logs after<br>allowing operators to complete<br>them. |                                                                                                            |           | Operator logs should be clear, accurate and concise. |

# **CHANGES TO THE DRILL OUTLINES**

The only changes made to the drill outlines were to support the running of the drills. There were no content changes. Examples of the changes were changes to the initial equipment that was out of service, and reordering the sequence of the malfunctions.

#### SCENARIO OVERVIEW

| Facility: Bea                                                            | aver Valley Pow                                                                                           | ver Station Unit                                                                                    | <u>2</u> Scenario No.: _1_ Op-Test No.: <u>2LO</u>                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Examiners:                                                               |                                                                                                           |                                                                                                     | Operators:                                                                                                                                                                                                                                                                                    |
| Response prostruck rod, a pump trippin<br>Initial Condit<br>Charging Pur | ocedures to raise<br>load rejection, a<br>g and one chargin<br>ions: <u>IC-47, 75%</u><br>np and one Moto | power and response<br>steam line break<br>ng pump failing to<br>power, BOL, ste<br>or Driven AFW pu | o use Normal, Abnormal, Emergency and Alarn<br>and to a VCT problem, a steam flow problem, a<br>outside containment, coincident with one char<br>o auto start.<br>eady state conditions. Rods are in auto. One<br>mp are out of service. One PZR PORV is isolat<br>ue to tube leak on SG "B". |
| steps. [2CH<br>2FWE-36 shi                                               | S*P21B] and [2F<br>ut; 2FWE-102 ope<br>tep 18 due to 20                                                   | WE*P23B] are O<br>en. 2RCS*PCV45                                                                    | oron 982 PPM. Rods in auto with CBD at 190<br>OS. 2FWE*38 shut, 2FWE*P22 aligned to 'B' ho<br>6 is isolated per T.S. 3.4.11.b action. AOP 6.4 is<br>SG "B". Tornado watch in effect. AOP 75.1                                                                                                 |
| Event No.                                                                | Malf. No.                                                                                                 | Event Type*                                                                                         | Event Description                                                                                                                                                                                                                                                                             |
| N/A                                                                      | N/A                                                                                                       | N RO/PO/<br>SRO                                                                                     | Raise power at 10%/hr                                                                                                                                                                                                                                                                         |
| 1                                                                        | XMT LDS3<br>1,100,120,0<br>,D                                                                             | I RO/SRO                                                                                            | VCT level transmitter 2CHS*115 fails hig<br>diverting letdown and loss of auto make                                                                                                                                                                                                           |
| 2                                                                        | MAL EHC1B<br>ACT,0,30,0,<br>D                                                                             | R RO/SRO<br>C PO                                                                                    | Load rejection, 15% (Governor valve #2 closed)                                                                                                                                                                                                                                                |
| 3                                                                        | MAL CRF8A<br>ACT,B8,1,0,<br>D                                                                             | C RO<br>N PO/SRO                                                                                    | Stuck rod, B8 (Preload)                                                                                                                                                                                                                                                                       |
| 4                                                                        | XMT<br>2MSS22<br>1,2.8,0,0,D                                                                              | I PO/SRO                                                                                            | SG "B" steam flow transmitter 2MSS*FT fails as is                                                                                                                                                                                                                                             |
| 5                                                                        | MAL MSS2B<br>ACT,1,5E <sup>6</sup><br>,300,0,D                                                            | M RO/<br>PO/<br>SRO                                                                                 | Steam line break outside containment on "B"                                                                                                                                                                                                                                                   |
| 6                                                                        | PMP CHS1<br>2,0,C,PPLSI<br>A.EQ.1                                                                         | C RO/SRO                                                                                            | 2CHS*P21A trips on SI initiation (Preload                                                                                                                                                                                                                                                     |
| 7                                                                        | MAL PPL7B                                                                                                 | C RO/SRO                                                                                            | 2CHS*P21C fails to auto start (Preload)                                                                                                                                                                                                                                                       |

\* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

#### U2LOT-SIM-NRC EXAM-2LOT2B.1 (ic) REV 0

#### INITIAL CONDITIONS: Drill File 845 IC-47

.

Reactor power = 75%, BOL, RCS boron = 982 ppm, CBD = 190 steps

| ADDITIONAL LINEUP CHANGES                      | STICKERS         | VOND MARKINGS                                          |
|------------------------------------------------|------------------|--------------------------------------------------------|
| Set CBD step counters at 190 steps             | 2RCS*MOV536 RED  | 2FWE*38 shut 24-3 (G-6) 2FWE*P22 aligned to 'B' header |
| Place BOL $\Delta I$ curve in RO operator aids | 2CHS-P21B RED    | 2FWE*36 shut; 2FWE*102 open 24-3 (E-6)                 |
| 2000 - 4000 MWD/MTU Reactivity Plan            | 2FWE*P23B RED    | 2MSS-16 shut 21-2 (C-1)                                |
|                                                | 2MSS*SOV120 YCT  | 2SVS*28 shut 21-2 (E-9)                                |
|                                                | 2MSS*SOV105C YCT |                                                        |
|                                                | 2SVS*PCV101B YCT |                                                        |
|                                                | 2SVS*HCV104 YCT  |                                                        |
| EQUIPMENT STATUS                               | DATE/TIME OOS    | TECHNICAL SPECIFICATION(S)                             |
| 2RCS*PCV456                                    | 6 days ago/0759  | 3.4.11.b                                               |
| 2CHS*P21B                                      | 4 days ago/1610  | 3.1.2.4 & 3.5.2 (Info Only)                            |
| 2FWE*P23B                                      | 6 hrs ago/1031   | 3.7.1.2.b                                              |
|                                                |                  |                                                        |

#### SHIFT TURNOVER INFORMATION

- 1. <u>The plant is at 75% power, BOL. RCS boron 982 ppm. Rods in auto with CBD at 190 steps.</u> Power was reduced 70 hours ago per System's request.
- 2. [2CHS-P21B] is removed from service for motor rewind. Motor is presently off site.
- 3. [2FWE\*P23B] is OOS to replace the pump inboard bearing, return expected in 24 hours. Its discharge valve 2FWE\*38 is shut.
- 4. 2FWE\*P22 aligned to 'B' AFW header 2FWE-36 shut; 2FWE-102 open.
- 5. 2RCS\*PCV456 OOS with block valve 2RCS\*MQV536 closed with power removed.
- 6. AOP 6.4 is complete to step 18. Approximately 44 hours ago a tube leak was detected in SG "B". The leak rate is 20 gpd on the last HP and Chemistry estimate (Monitoring at 2 hour intervals IAW the AOP).
- 7. 2MSS-16 shut, 2MSS-15 and 17 verified open.
- 8. 2SVS\*28 shut.
- 9. 2MSS\*PCV101B auto with setpoint adjusted to 100%.
- 10.2MSS\*SOV105C open.
- 11.2MSS\*SOV120 open.
- 12. Raise power at 10%/hour to 100%.

#### SCENARIO SUPPORT MATERIAL REQUIRED

1/20M-48.1.C(ISS3) Figure 48.1.C-2 (ANSS Turnover Checklist) 20M-54.2.S1 Log S1-2 (NSS Operating Report) 20M-54.2.S1 Log S1-5 (NCO Report) 20M-54.2.S1 Log S1-17 (ANSS Operating Report) 20M-52.4.B (Load Following)

Training Administrative Manual

# U2DRILL845(1)REV0

| TIVE EXPECTED STUDENT RESPONSE                                                              |
|---------------------------------------------------------------------------------------------|
|                                                                                             |
|                                                                                             |
|                                                                                             |
|                                                                                             |
|                                                                                             |
|                                                                                             |
| Oncoming ANSS should complete the required checklist and carry out a formal shift turnover. |
| ANSS assumes control and directs operators to commence raising power IAW 20M-52.4.B.        |
|                                                                                             |

#### U2DRILL845(2)REV0

#### **EVENT #1**

After power is raised > 5% insert: XMT LDS3 1,100,120,0,D VCT level transmitter 2CHS\*LT115 fails high causing letdown to divert to the Waste Collection Tank and loss of Auto makeup VCT level lowers, alarm A2-2G, VCT TROUBLE comes in

RO compares 2CHS\*LI115 with 2CHS\*LI112 and determines that 2CHS\*LT115 has failed high

ANSS refers to alarm response procedure, failed instrument section and directs RO to place 2CHS\*LCV115A, VCT Level Control Switch in the V.C. TANK position

RO verifies 2CHS\*LCV112 and 2CHS\*LCV115A aligned to the VCT

Crew refers to 2OM-7.4.N, Blender Manual Makeup Operation

NOTE: Crew may initiate a Temporary Log to track VCT level

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Training Administrative Manual

| U2DRILL845(3)REV0                        | C C                                                                                                                                                                                                                      |           |                                                                                                                                                                                                       |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUCTIONAL GUIDELINES                 | PLANT STATUS OR RESPONSE                                                                                                                                                                                                 | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                                                                                                             |
| VENTS #2, 3 & 4                          |                                                                                                                                                                                                                          |           |                                                                                                                                                                                                       |
| Vhen ARP VCT trouble complete,<br>nsert: |                                                                                                                                                                                                                          |           |                                                                                                                                                                                                       |
| IONV FMS:484                             | Monitor 2MSS*FT484 (Ch. III).                                                                                                                                                                                            |           |                                                                                                                                                                                                       |
| MAL EHC1B ACT,0,30,0,D                   | Governor Valve #2 fails closed resulting in a 15% load rejection and SGWLC upset                                                                                                                                         |           |                                                                                                                                                                                                       |
| KMT MSS22 1,2.8,0,0,D                    | B SG channel IV steam flow transmitter 2MSS*FT485 fails as is.                                                                                                                                                           |           |                                                                                                                                                                                                       |
| NOTE: Event #2 starts                    | Rods stepping in (in Auto) due to<br>load rejection.<br>Various annunciators related to<br>temperature, rod position, delta I,<br>and PZR pressure in alarm<br>A12-4A, > 15% LOAD REJECTION<br>(C-7A), steam dumps armed |           | Crew determines load rejection in progress. ANSS refers to <u>AOP 2.35.2</u>                                                                                                                          |
|                                          | GV #2 closed<br>Turbine transfer from partial arc to<br>full arc, power stable at<br>approximately 60%                                                                                                                   |           | PO reports that GV #2 did not close in<br>sequence and that it is full closed<br>RO reviews alarms reports delta flux<br>outside target band and DNB T.S.<br>exceeded to ANSS<br>T.S. 3.2.1 and 3.2.5 |

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Training Administrative Manual

# U2DRILL845(4)REV0

| INSTRUCTIONAL GUIDELINES                                    | PLANT STATUS OR RESPONSE                                                                                              | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                              |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------|
| NOTE: Event #3 starts<br>MAL CRF8A ACT,B8,1,0,D<br>Preload) | Load greater than 270 Mwe.<br>Condenser vacuum greater than<br>26.5 inches Hg<br>Rod B8 stuck                         |           | Crew checks plant status IAW AOP<br>2.35.2                                             |
|                                                             | Annunciator A4-6D, DELTA FLUX<br>OUT OF TARGET BAND lit<br>Must borate approximately 120 gal.<br>For 10% power change |           | RO develops reactivity plan based on power change and rod position change              |
|                                                             | Rod B8 does not move                                                                                                  |           | RO borates and withdraws rod to return<br>dI to Target band                            |
|                                                             | Rods in manual                                                                                                        |           | ANSS refers to AOP 2.1.8<br>RO places rod control in Manual                            |
|                                                             |                                                                                                                       |           | ANSS notifies I & C that rod B8 is not moving with rest of bank                        |
| NOTE: Event #4 starts                                       | During the load rejection SG "B"<br>FRV 2FWS*FCV488 modulates<br>open                                                 |           | PO acknowledges alarms, reviews indications, informs ANSS that                         |
|                                                             | B SG feed flow and level rising.<br>A6-10F SG "B" FEED FLOW ><br>STEAM FLOW in alarm                                  |           | ANSS refers to ARPs and 20M-<br>24.4.IF, Instrument Failure Procedure,<br>Attachment 3 |

# U2DRILL845(5)REV0

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                                                                          | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                                                                        |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | Following the load rejection A6-<br>10H, SG 'B' STEAM FLOW > FEED<br>FLOW and A6-10E SG "B" LEVEL<br>DEVIATION are still in alarm |           | PO identifies 2MSS*FT485 as the failed instrument                                                                                                                |
|                          | 2FWS*FCV488 in Manual                                                                                                             |           | ANSS directs PO to take manual<br>control of MFRV 2FWS*FCV488 and<br>restore SG level to normal.                                                                 |
|                          | A6-10E clears as NR level returns to normal band                                                                                  |           | ANSS directs PO to select feedwater control channel III                                                                                                          |
|                          | SG B SGWLC selected to channel                                                                                                    |           | ANSS contacts I & C and directs that steam flow control be selected to Channel III                                                                               |
|                          | 2FWS*FCV488 in automatic.                                                                                                         |           | ANSS directs PO to return MFRV<br>2FWS*FCV488 controller to automatic.                                                                                           |
|                          |                                                                                                                                   |           | SG "B" level channel 2FWS*LT486<br>declared inoperable, T.S. 3.3.1.1 Table<br>3.3-1, item 14 (trip within 6 hrs)                                                 |
|                          |                                                                                                                                   |           | ANSS contacts I & C and directs that<br>2LS/486A, SG "B" Lo-Lo level Rx trip,<br>2LS/486C, Hi-Hi level turbine trip and<br>FW isolation bistables placed in trip |

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# Training Administrative Manual

#### U2DRILL845(6)REV0

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| INSTRUCTIONAL GUIDELINES                                                                                                      | PLANT STATUS OR RESPONSE                                                                                             | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------|
| To open cabinet door and trip<br>bistables, insert;<br>LOA PCS2 T,0,D<br>BST PCS41 1,0,D<br>BST PCS32 1,0,D<br>LOA PCS2 F,0,D | 2LS/486A, SG "B" Lo-Lo level Rx<br>trip, 2LS/486C, Hi-Hi level turbine<br>trip and FW isolation bistables<br>tripped |           | RO/PO verifies I & C in correct rack,<br>monitors bistable trip evolution, informs<br>ANSS upon completion |
| Event #5                                                                                                                      |                                                                                                                      |           |                                                                                                            |
| When 2.24.IF complete, insert:                                                                                                |                                                                                                                      |           |                                                                                                            |
| MAL ACT MSS2B 1,5E <sup>6</sup> ,300,0,D                                                                                      | SG "B" Steam line break outside<br>containment<br>A10-4F MAIN STEAM VALVE<br>AREA TEMPERATURE HIGH lit               |           |                                                                                                            |
|                                                                                                                               | Steam flow and reactor power<br>increase<br>Tave lowering                                                            |           | ANSS directs RO to manually trip<br>reactor <b>after diagnos</b> ing second <b>ary</b><br>break            |
|                                                                                                                               | Reactor trip.<br>First Out: Manual reactor trip A5-<br>5H, Y0004D.                                                   |           | RO manually trips reactor.                                                                                 |
|                                                                                                                               |                                                                                                                      |           | ANSS refers to E-0 to verify immediate actions while RO and PO commence immediate actions.                 |
|                                                                                                                               |                                                                                                                      |           | RO sounds standby alarm, and announces Unit 2 reactor trip.                                                |
|                                                                                                                               |                                                                                                                      |           | NSS informed to evaluate EPP                                                                               |
|                                                                                                                               |                                                                                                                      |           |                                                                                                            |

# U2DRILL845(7)REV0

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| INSTRUCTIONAL GUIDELINES   | PLANT STATUS OR RESPONSE                                                                              | OBJECTIVE | EXPECTED STUDENT RESPONSE                            |
|----------------------------|-------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------|
|                            | Throttle or governor valves closed, reheat stops or interceptors closed.                              |           | PO verifies turbine trip.                            |
|                            | MSR steam supply block valves<br>closed.<br>Reheat controller reset pushbutton<br>depressed.          |           | PO ensures reheat steam isolation.                   |
|                            | Main generator output breakers<br>open.<br>Exciter circuit breaker open.                              |           | PO verifies generator trip.                          |
|                            | 2AE and 2DF busses energized.                                                                         |           | PO verifies power to AC emergency busses.            |
|                            | SI annunciator A5-4G lit<br>SI actuation status light A12-1D lit                                      |           | Crew checks if SI is actuated/required.              |
| nmediate actions complete. | Both trains of SI manually initiated                                                                  |           | ANSS directs RO to manually initiate SI, both trains |
|                            | EDGs running.                                                                                         |           | PO verifies EDGs running.                            |
|                            | 2FWE*P23B running (2FWE*P23A<br>OOS).<br>2MSS*SOV105A-F open.<br>2FWE*HCV100A-F open.                 |           | PO verifies AFW status.                              |
|                            | Two service water pumps running<br>(one per train).<br>Service water header pressure 60-<br>124 psig. |           | RO verifies service water system in service.         |

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# U2DRILL845(8)REV0

| INSTRUCTIONAL GUIDELINES                            | PLANT STATUS OR RESPONSE                                       | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                     |
|-----------------------------------------------------|----------------------------------------------------------------|-----------|-------------------------------------------------------------------------------|
|                                                     |                                                                |           | RO verifies SI status.                                                        |
| EVENT #6<br>PMP CHS1 2,0,C,PPLSIA.EQ.1<br>(Preload) | 2CHS*P21A trips on SI initiation                               |           |                                                                               |
|                                                     | 2CHS*P21C HHSI pump fails to<br>auto start                     |           | RO determines no HHSI pumps<br>running, starts 2CHS*P21C and<br>notifies ANSS |
|                                                     | No HHSI flow until 2CHS*P21C is<br>manually started            |           | ·                                                                             |
|                                                     | CIA actuated, all indicating lights with orange CIA marks LIT. |           | RO/PO verify CIA.                                                             |
|                                                     | All indicating lights with green marks lit.                    |           | RO/PO verify FWI.                                                             |
|                                                     | All indicating lights with yellow marks lit.                   |           | RO/PO check MSLI is required.                                                 |
|                                                     | CIB and containment spray NOT required.                        |           | RO verifies CIB and containment spray status                                  |
|                                                     | 2CCS-AOV118 opened. One station air compressor running.        |           | PO establishes filtered water cooling to station air compressors.             |
|                                                     | Both CCP pumps running                                         |           | RO/PO verify CCP in service.                                                  |

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Training Administrative Manual

#### U2DRILL845(9)REV0

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|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------|
| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                                                      | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                        |
|                          | SR channels aligned properly.                                                                                 |           | RO verifies SR detector high voltage switches in normal.                         |
|                          | Total AFW flow > 365 gpm.                                                                                     |           | PO verifies AFW flow greater than 365 gpm.                                       |
|                          | Plant cooling down due to<br>unisolable steam line break, RNO<br>actions complete                             |           | RO verifies RCS Tavg stable at or<br>trending to 547°F. RNO actions<br>performed |
|                          | Recirc spray pumps secured.                                                                                   |           | RO checks recirc spray pump status.                                              |
|                          | PORVs closed (not leaking).<br>Spray valves closed.<br>Safeties closed (PSMS data).<br>PRT conditions normal. |           | RO checks PRZR isolated.                                                         |
|                          | RCPs running.<br>CCP flow to RCPs.                                                                            |           | RO checks if RCPs should be stopped.                                             |
|                          | SG "B" pressure dropping.                                                                                     |           | PO checks if any SGs are faulted.                                                |
|                          |                                                                                                               |           | ANSS makes transition to E-2, and<br>informs crew.<br>Crew briefing held         |
|                          | Control room radiation not in high alarm, CIB has not occurred.<br>CREBAPS not required.                      |           | PO checks control room habitability.                                             |
|                          | All yellow SLI marks lit.                                                                                     |           | PO verifies steam line isolation.                                                |

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# U2DRILL845(10)REV0

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| INSTRUCTIONAL GUIDELINES                                                                                                                                            | PLANT STATUS OR RESPONSE                                                                                                                                | OBJECTIVE | EXPECTED STUDENT RE          | SPONSE |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------|--------|
| Note: A and C SG pressures may be dropping due to effects of SG "B" fault, but should not be diagnosed as faulted.                                                  | A and C SG pressure stable.                                                                                                                             |           | PO checks for any non-faulte | ed SG. |
|                                                                                                                                                                     | B SG pressure dropping uncontrollably.                                                                                                                  |           | PO identifies faulted SG.    |        |
| CT #2 - Crew isolates faulted SG<br>and directs operator to close<br>isolation valve(s) from outside the<br>control room prior to transition out of<br>E-2. (E-2.A) |                                                                                                                                                         |           | Crew isolates B SG.          | (CT 1) |
|                                                                                                                                                                     | CNMT isolation valve<br>2FWS*HYV157B closed.<br>MFRV 2FWS*FCV488 closed.<br>BFRV 2FWS*FCV489 closed.<br>AFW throttle valves<br>2FWE*HCV100C & D closed. |           | Crew verifies valves closed  |        |
|                                                                                                                                                                     | One MDAFW pump running. TD<br>AFW pump running                                                                                                          |           |                              |        |
| If directed to verify 2MSS*16 closed,<br>check IDA Status for<br>LOA AFW26 0,0,0,D                                                                                  | 2MSS*16 previously closed.                                                                                                                              |           |                              |        |
| If directed to check 2SVS*28 closed,<br>Check IDA Status for<br>LOA MSS10 0,0,0,D                                                                                   | 2SVS*28 previously closed.                                                                                                                              |           |                              |        |
|                                                                                                                                                                     |                                                                                                                                                         |           |                              |        |

#### U2DRILL845(11)REV0

|  |  | INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|--|--|--------------------------|--------------------------|-----------|---------------------------|
|--|--|--------------------------|--------------------------|-----------|---------------------------|

Report when above actions completed.

| Atmospheric dump valve<br>2SVS*PCV101B Closed with<br>setpoint at 100%.<br>RHR valve 2SVS*HCV104 closed.<br>SG blowdown valve<br>2BDG*AOV100B1 closed.<br>Blowdown sample valves<br>2SSR*AOV117A,B,C closed. | Crew verifies valves closed                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| No SG levels rising uncontrollably.                                                                                                                                                                          | Crew checks if SG tubes are intact.<br>ANSS makes transition to E-1, informs<br>crew.<br>Crew briefing held |
| CREBAPS not required.                                                                                                                                                                                        | PO rechecks control room habitability.                                                                      |
| RCPs running. HHSI flow<br>indicated, D/P and CCP flow<br>satisfactory.                                                                                                                                      | RO checks if RCPs should be stopped.                                                                        |
| Recirc spray pumps not running.                                                                                                                                                                              | RO rechecks recirc spray pump status.                                                                       |
| CNMT sample amber lights lit.                                                                                                                                                                                | RO verifies both H <sub>2</sub> analyzers running.                                                          |
| B SG previously diagnosed as faulted and isolated (pending reports of local operator actions).                                                                                                               | PO checks if any SG is faulted.                                                                             |

# U2DRILL845(12)REV0

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                                                      | OBJECTIVE | EXPECTED STUDENT RESPONSE                                               |
|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------|
| Ą                        | and C SGs intact.                                                                                             |           | PO maintains intact SG levels 5% to 50%.                                |
| -                        | ORVs shut in auto and block<br>alves energized.                                                               |           | RO checks PORVs and block valves.                                       |
| S                        | Subcooling > 41°F.<br>Secondary heat sink satisfactory.<br>RCS pressure stable or rising.<br>PRZR level > 4%. |           | RO/PO check if SI can be terminated.                                    |
|                          |                                                                                                               |           | ANSS makes transition to ES-1.1,<br>informs crew.<br>Crew briefing held |
| 2                        | CVS-P21A, B in PTL.<br>DAS-P204A, B in STOP.<br>DGS-P21A, B in PTL.                                           |           | RO isolates CNMT vents and drains system.                               |
|                          | SI, CIA, (CIB) reset, A12-1C lit,<br>\12-1D not lit.                                                          |           | RO resets SI, CIA, (CIB), SI Recirc (both trains).                      |
| [                        | Domestic water previously aligned                                                                             |           | PO verifies domestic water aligned to station air compressors           |
| npressor drain valves.   | CCS-AOV118 opened (filtered vater to station air compressors). Station air compressor running.                |           | Checks station air compressor status                                    |

#### SCENARIO OVERVIEW

Facility: Beaver Valley Power Station Unit 2 Scenario No.: 4 Op-Test No.: 2LOT2B

Examiners: Operators:

Objectives: To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm Response procedures to respond to a failure of the flow totalizer which does not terminate dilution flow at the setpoint, failure of controlling steam flow channel pressure compensation for SG "C", PZR pressure control problem, and a SGTR with loss of PZR pressure control

Initial Conditions: IC-50, BOL, 48% power, steady state conditions. Rods are in Manual. 2CHS\*P21B and 2FWE\*P23B are OOS. 2RCS\*PCV456 is isolated. 2RCS\*PCV455A OOS. Tornado Warning in effect. Tube leak on SG "B". Ready to raise power to 100%.

Turnover: The plant is at 48% power. RCS boron 1061 PPM. Rods in auto with CBD at 166 steps. [2CHS\*P21B] and [2FWE\*P23B] are OOS. 2FWE\*38 shut, 2FWE\*P22 aligned to 'B' header, 2FWE-36 shut; 2FWE-102 open. 2RCS\*PCV455C is isolated per T.S. 3.4,11-b action. 2RCS\*PCV455A OOS due to a ruptured diaphram. AOP 6.4 is complete to step 18 due to 10 gpd tube leak on SG "B". Tornado watch in effect. AOP 75.1 complete through step 5.

|           |                                                                   | r                |                                                                               |
|-----------|-------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------|
| Event No. | Malf. No.                                                         | Event Type*      | Event Description                                                             |
| N/A       | N/A                                                               | R RO<br>N PO/SRO | Raise power at 12%/hr                                                         |
| 1         | OVR BAT8A<br>2,0,D                                                | I RO/SRO         | Total makeup flow totalizer fails to terminate dilution at setpoint (Preload) |
| 2         | XMT MS\$50<br>1,10,10,0,D                                         | I PO/SRO         | Steam flow pressure compensation failure<br>2MSS*PT486 fails low              |
| 3         | MAL RCS4C<br>ACT,600,60,<br>0,D                                   | M ALL            | Start as small leak that progressively worsens until SGTR SG "B" (600 GPM)    |
| 4         | CNH PCS10<br>5,0,20,0,D<br>VLV RCS33<br>3,0,C,PRC:44<br>4.LT.2230 | C RO/SRO         | PZR Master Pressure Controller fails and 2RCS*PCV455D sticks open             |
| 5         | MAL RCP4C<br>ACT,0,0,C,JP<br>PLP4.EQ.1                            | C RO/SRO         | RCP "C" trips when reactor tripped (Preload)                                  |
| 6         | VLV RCS13<br>3,0,C,JPPLP<br>4.EQ.1                                | C RO/SRO         | PORV Block valve 2RCS*MOV537 fails closed on reactor trip (Preload)           |
| 7         | VLV RCS32<br>4,0,0,0,C,<br>JPPLP4.EQ.1                            | C RO/SRO         | PORV 2RCS*PCV455C fails closed (conditional on Rx trip) Preload               |
| (N)ormal  | (R)eactivity                                                      | (I)nstrument     | (C)omponent (M)ajor                                                           |

\* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

BVPS 2LOT2B Rev. 0

#### U2LOT-SIM-NRC EXAM-2LOT2B.4 (ic) REV 0

#### INITIAL CONDITIONS: Drill File 848 IC-??

Reactor power = 48%, BOL, RCS boron = 1061 ppm, CBD = 166 steps

| ADDITIONAL LINEUP CHANGES                      | STICKERS         | VOND MARKINGS                                          |
|------------------------------------------------|------------------|--------------------------------------------------------|
| Set CBD step counters at 166 steps             | 2RCS*MOV536 RED  | 2FWE*38 shut 24-3 (G-6) 2FWE*P22 aligned to 'B' header |
| Place BOL $\Delta I$ curve in RO operator aids | 2CHS-P21B RED    | 2FWE*36 shut; 2FWE*102 open 24-3 (E-6)                 |
| 2,000 - 4,000 MWD/MTU Reactivity Plan          | 2FWE*P23B RED    | 2MSS-16 shut 21-2 (C-1)                                |
| Place rods in Manual                           | 2MSS*SOV120 YCT  | 2SVS*28 shut 21-2 (E-9)                                |
|                                                | 2MSS*SOV105C YCT |                                                        |
|                                                | 2SVS*PCV101B YCT |                                                        |
|                                                | 2SVS*HCV104 YCT  |                                                        |
|                                                | 2RCS*PCV455A RED | · ·                                                    |
| EQUIPMENT STATUS                               | DATE/TIME OOS    | TECHNICAL SPECIFICATION(S)                             |
| 2RCS*PCV456                                    | 6 days ago/0759  | 3.4.11.b                                               |
| 2CHS*P21B                                      | 4 days ago/1610  | 3.1.2.4 & 3.5.2 (Info Only)                            |
| 2FWE*P23B                                      | 6 hrs ago/1031   | 3.7.1.2.b                                              |
|                                                |                  |                                                        |

#### SHIFT TURNOVER INFORMATION

- 1. <u>The plant is at 48% power, BOL. RCS boron 1061 ppm. Rods in manual with CBD at 166 steps.</u> Power has been at 48% for the past 4 days.
- 2. [2CHS-P21B] is removed from service for motor rewind. Motor is presently off site.
- 3. [2FWE\*P23B] is OOS to replace the pump inboard bearing, return expected in 24 hours. Its discharge valve 2FWE\*38 is shut.
- 4. 2FWE\*P22 aligned to 'B' AFW header 2FWE-36 shut; 2FWE-102 open.
- 5. 2RCS\*PCV456 OOS with block valve 2RCS\*MOV536 closed with power removed.
- 6. 2RCS\*PCV455A OOS due to a ruptured diaphram.
- 7. AOP 6.4 is complete to step 18. Approximately 44 hours ago a tube leak was detected in SG "B". The leak rate is 10 gpd and has remained there for the past 24 hours. (Monitoring at 2 hour intervals IAW the AOP).

- 8. 2MSS-16 shut, 2MSS-15 and 17 verified open.
- 9. 2SVS\*28 shut.
- 10. 2MSS\*PCV101B auto with setpoint adjusted to 100%.
- 11. 2MSS\*SOV105C open.
- 12.2MSS\*SOV120 open.
- 13. Raise power at 12%/hr to 100% IAW 2OM-52.4.B, Load Following.

# U2DRILL845(1)REV0

| INSTRUCTIONAL GUIDELINES                                                            | PLANT STATUS OR RESPONSE                                                                                                                          | OBJECTIVE | EXPECTED STUDENT RESPONSE             |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------|
|                                                                                     |                                                                                                                                                   |           |                                       |
| Select DRILL 848,<br>Initialize IC - 50, and establish<br>initial plant conditions. | Reactor at approximately 48%<br>power, BOL, steady state<br>condition. Ready to raise power to<br>100%. RCS boron _1061_ ppm,<br>CBD _166_ steps. |           |                                       |
| Insert:                                                                             |                                                                                                                                                   |           |                                       |
| VLV RCS33<br>3,0,C,PRC:444.LT.2230                                                  | 2RCS*PCV455D fails open                                                                                                                           |           |                                       |
| VLV RCS32<br>4.0.0.0.C,JPPLP4.EQ.1                                                  | 2RCS*PCV455C fails closed                                                                                                                         |           |                                       |
| VLV RCS13 3,0,C,JPPLP4.EQ.1<br>MAL RCP4C                                            | 2RCS*MOV537 fails closed                                                                                                                          |           |                                       |
| ACT,0,0,C,JPPLP4.EQ.1                                                               | RCP 'C' trips after reactor trip                                                                                                                  |           |                                       |
| OVR (SW) BAT8A 2,0,D                                                                | Blender total makeup flow totalizer does not stop makeup at setpoint                                                                              |           |                                       |
| File STUFFON<br>File LRTM5IC                                                        |                                                                                                                                                   |           |                                       |
| Assign shift positions.                                                             |                                                                                                                                                   |           | · · · · · · · · · · · · · · · · · · · |
| NSS                                                                                 | Simulator Frozen until after shift                                                                                                                |           |                                       |
| ANSS                                                                                | _ turnover unless it needs to be run<br>momentarily for an alignment                                                                              |           |                                       |
| RO<br>PO                                                                            | _ momentarily for an alignment                                                                                                                    |           |                                       |
| STA                                                                                 | _ onengo.                                                                                                                                         |           |                                       |

# U2DRILL845(2)REV0

| INSTRUCTIONAL GUIDELINES                                                                 | PLANT STATUS OR RESPONSE                                                                                   | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                            |
|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------|
| Conduct a shift turnover with oncoming operators.                                        |                                                                                                            |           | Oncoming ANSS should complete the required checklist and carry out a formal shift turnover.                          |
| When the shift turnover is completed, place the simulator in RUN and commence the drill. | Simulator running/VCR recording                                                                            |           | ANSS assumes control and directs operators to commence raising power IAW 20M-52.4.B.                                 |
| Depress VCR PLAY/RECORD                                                                  |                                                                                                            |           |                                                                                                                      |
| EVENT #1                                                                                 |                                                                                                            |           | Crew develops reactivity plan and commences power escalation                                                         |
| OVR BAT8A 2,O,D                                                                          | Blender makeup flow totalizer fails<br>to stop flow at setpoint resulting in<br>an over dilution (Preload) |           | Dilution started                                                                                                     |
|                                                                                          | RCS temperature and pressure rising                                                                        |           | Annunciator A4-3C, TAVE DEV FROM<br>TREF (2RCS-TS408S High)<br>Crew determines that an over dilution<br>has occurred |
|                                                                                          |                                                                                                            |           | ANSS refers to ARP A4-3C                                                                                             |
|                                                                                          | Tave within 2°F of Tref                                                                                    |           | Crew reduces Tave by borating, inserting rods or raising turbine load                                                |

#### U2DRILL845(3)REV0

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|--------------------------|--------------------------|-----------|---------------------------|
|                          |                          |           |                           |

# <u>EVENT #2</u>

| XMT MSS50 1,10,10,0,D | Steam flow pressure<br>compensation failure<br>2MSS*PT486 fails low causing SG<br>"B" steam flow 2MSS*FI485 to<br>indicate lower than actual<br>SG "B" feed flow and level<br>lowering<br>Annunciators A6-10G, LOOP B<br>STEAMLINE PRESSURE LOW;<br>A6-10E, STM GEN 21B LEVEL<br>DEVIATION FROM SETPOINT;<br>A6-1-F, LOOP B FEED FLOW ><br>STEAM FLOW lit | PO announces SG "B" alarms                                                                        |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
|                       |                                                                                                                                                                                                                                                                                                                                                           | ANSS refers to ARPs                                                                               |
|                       | SG "B" level returning to program                                                                                                                                                                                                                                                                                                                         | SG "B" MFRV 2FWS*FCV488 placed<br>in manual and level controlled within <u>+</u><br>5% of program |
|                       |                                                                                                                                                                                                                                                                                                                                                           | ANSS refers to 20M-24.4.IF,<br>Attachment 4                                                       |
|                       |                                                                                                                                                                                                                                                                                                                                                           | PO identifies 2MSS*PT486 as the<br>failed instrument                                              |

# U2DRILL845(4)REV0

| INSTRUCTIONAL GUIDELINES                                                                             | PLANT STATUS OR RESPONSE                                                                                             | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                                                                        |
|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                      | A6-10E clears as NR level returns to normal band                                                                     |           | ANSS directs PO to select feedwater control channel III (487)                                                                                                    |
| To select steam flow channel III,<br>clear<br>OVR PCS9                                               | SG B SGWLC selected to channel III                                                                                   |           | ANSS contacts I & C and directs that steam flow control be selected to Channel III (484)                                                                         |
|                                                                                                      | 2FWS*FCV488 in automatic                                                                                             |           | ANSS directs PO to return MFRV<br>2FWS*FCV488 controller to automatic                                                                                            |
|                                                                                                      |                                                                                                                      |           | SG "B" level channel 2FWS*LT486<br>declared inoperable                                                                                                           |
|                                                                                                      |                                                                                                                      |           | ANSS contacts I & C and directs that<br>2LS/486A, SG "B" Lo-Lo level Rx trip,<br>2LS/486C, Hi-Hi level turbine trip and<br>FW isolation bistables placed in trip |
| To trip bistables, insert;<br>LOA PCS2 T,0,D<br>BST PCS41 1,0,D<br>BST PCS32 1,0,D<br>LOA PCS2 F,0,D | 2LS/486A, SG "B" Lo-Lo level Rx<br>trip, 2LS/486C, Hi-Hi level turbine<br>trip and FW isolation bistables<br>tripped |           | RO/PO verifies I & C in correct rack,<br>monitors bistable trip evolution,<br>informs ANSS upon completion                                                       |
| EVENT #3                                                                                             |                                                                                                                      |           |                                                                                                                                                                  |
| MAL RCS4B ACT,0.05,120,0,D                                                                           | SG "B" tube leak (0.05 gpm, 72<br>gpd)                                                                               |           |                                                                                                                                                                  |

# U2DRILL845(5)REV0

| INSTRUCTIONAL GUIDELINES                                                                     | PLANT STATUS OR RESPONSE                                                       | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                   |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------|
| SG blowdown automatically isolates upon 2SSR-RQ100 high alarm actuation                      | Rad monitor alarms on condenser<br>air ejector and SG blowdown.<br>A4-5A, -5C. |           |                                                                                             |
|                                                                                              |                                                                                |           | Crew notes alarms and informs ANSS of indications of a SG tube leak, verifies alarms valid. |
|                                                                                              |                                                                                |           | Crew refers to ARPs as necessary.                                                           |
|                                                                                              |                                                                                |           | Crew monitors DRMS RM-11 console for affected radiation monitor channels.                   |
|                                                                                              |                                                                                |           | ANSS refers to AOP-2.6.4.                                                                   |
|                                                                                              |                                                                                |           | Crew requests Chemistry support (leak rate and isotopic analysis).                          |
| 20ST-6.2 is applicable at this leak rate.                                                    |                                                                                |           | Crew requests Health Physics support (leak rate).                                           |
|                                                                                              | 0.05 gpm leak < T.S. limit.<br>Activity value pending Chemistry<br>reports.    |           | NSS verifies compliance with T.S. 3.4.6.2 and 3.7.1.4.                                      |
| After a reasonable time has<br>elapsed, report Air Ejector Charcoal<br>Delay Beds in service |                                                                                |           | Operator dispatched to place the Air<br>Ejector Charcoal Delay Beds in service              |

# U2DRILL845(6)REV0

| INSTRUCTIONAL GUIDELINES                                                                                                      | PLANT STATUS OR RESPONSE                          | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------|
| Note: Crew may wait for Rad Con<br>or Chemistry verification of tube<br>leak prior to isolating SG.                           | Steamline monitors in service (2MSS*SOV120 open). |           | PO verifies main steamline radiation monitors available.                                                         |
|                                                                                                                               | 2MSS*16 closed<br>2MSS*15, 17 open                |           | Steam supply from "B" SG to<br>2FWE*P22 previously closed and<br>other two steam supply valves verified<br>open. |
|                                                                                                                               |                                                   |           | 2MSS*SOV105C previously hardened                                                                                 |
|                                                                                                                               | 2SVS*PCV101B controller setpoint = 100%.          |           | "B" SG atmospheric steam dump valve controller setpoint verified at 100%.                                        |
|                                                                                                                               | 2SVS*28 closed.                                   |           | RHR valve from "B" SG previously closed.                                                                         |
| Five minutes after being contacted<br>as Rad Con, report "B" SG<br>radiation is significantly higher than<br>"A" and "C" SGs. |                                                   |           | Crew requests Health Physics to<br>perform water and air sampling and<br>survey SG blowdown                      |
| AOP-2.6.4 complete.                                                                                                           |                                                   |           | Crew may transfer auxiliary steam to Unit 1 or aux. boilers.                                                     |
| After high rad monitor alarm comes<br>in inform crew that SG "B" leak rate<br>has risen to 800 gpd                            | High rad monitor alarm                            |           |                                                                                                                  |

#### U2DRILL845(7)REV0

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|--------------------------|--------------------------|-----------|---------------------------|
|                          |                          |           |                           |

#### EVENT #3A

After reporting leaking SG, insert;

MAL RCS4B ACT, 10, 180, 0, 0, D

"B" SG tube leak rises to 10 gpm over 3 minutes.

Charging flow rises to maintain PZR level

If required, contact crew as U2 Operations Manager and direct a plant shutdown commence at 1%/min.

Crew may have previously implemented AOP 2.51.1.

Two PORVs in Auto with block valves open

RO notes changing RCS parameters and informs ANSS.

Crew determines that leakage exceeds 150 gpd plant must be in Mode 3 within 5 hours. NSS/ANSS directs crew to commence a normal plant shutdown, refers to 20M-52.4.B Load Following.

NSS evaluates EPP

NSS either directs crew to raise rate of load reduction or implement Emergency Shutdown AOP 2.51.1.

RO sounds standby alarm and announces Unit 2 Emergency Shutdown

RO ensures one PORV in auto with its associated block valve open.

# U2DRILL845(8)REV0

| INSTRUCTIONAL GUIDELINES                                                                                           | PLANT STATUS OR RESPONSE                                                             | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                    |                                                                                      |           | PO sets turbine load setter as directed<br>by ANSS<br>RO utilizes Reactivity Plan for rapid<br>power reduction activities<br>RO commences boration<br>RO ensures rods in Auto and verifies |
|                                                                                                                    |                                                                                      |           | maintaining Tavg within 5°F of Tref.<br>PO depresses Reference Control GO<br>pushbutton                                                                                                    |
|                                                                                                                    |                                                                                      |           | System Operator notified of emergency<br>load reduction and rate                                                                                                                           |
| EVENT #4                                                                                                           |                                                                                      |           |                                                                                                                                                                                            |
| 3 minutes after load reduction<br>commenced, insert;<br>CNH PCS10 5,0,20,0,D<br>VLV RCS33<br>3,0,C,PRC:444.LT.2230 | PZR master pressure controller<br>fails high<br>PZR PORV 2RCS*PCV455D<br>sticks open |           |                                                                                                                                                                                            |
|                                                                                                                    | Annunciator A4-1D,<br>PRESSURIZER CONTROL<br>PRESSURE HIGH/LOW lit                   |           | RO announces alarm and attempts to<br>close PORV, then closes<br>2RCS*MOV537, informs ANSS                                                                                                 |
|                                                                                                                    |                                                                                      |           | RO verifies spray valves closed                                                                                                                                                            |

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# U2DRILL845(9)REV0

| INSTRUCTIONAL GUIDELINES                       | PLANT STATUS OR RESPONSE                                                                                             | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                           |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------|
|                                                | Pressurizer pressure and level stable                                                                                |           | RO keeps crew informed of PRZR pressure and level.                                                  |
| EVENT #3B                                      |                                                                                                                      |           |                                                                                                     |
| When pressurizer parameters stabilized, insert |                                                                                                                      |           |                                                                                                     |
| MAL RCS4B ACT,600,240,0,D                      | SGTR (600 gpm, ramped over 4 minutes)                                                                                |           |                                                                                                     |
|                                                | PZR pressure and level lowering,<br>charging flow rising                                                             |           |                                                                                                     |
|                                                |                                                                                                                      |           | Crew determines that a manual reactor trip is required                                              |
| <u>EVENT #5</u>                                | Reactor trip, turbine trip, RCS<br>pressure drops.<br>First Out: PRZR pressure low<br>reactor trip.<br>A5-4H, P0488D |           | RO informs ANSS of a reactor trip.                                                                  |
| MAL RCP4C<br>ACT,60,0,C,JPPLP4.EQ.1            | RCP "C" trip one minute after reactor trip (Preload)                                                                 |           |                                                                                                     |
| Steps 1-7 of E-0 are immediate actions.        |                                                                                                                      |           | RO and PO commence immediate<br>actions of E-0. ANSS references E-0<br>to verify immediate actions. |
|                                                | Turbine trip due to reactor trip<br>alarm A5-6D lit.<br>Rod bottom lights lit.<br>Neutron flux dropping.             |           | RO verifies reactor trip.                                                                           |

# U2DRILL845(10)REV0

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| INSTRUCTIONAL GUIDELINES    | PLANT STATUS OR RESPONSE                                                                     | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                               |
|-----------------------------|----------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------|
| •                           |                                                                                              |           | RO sounds standby alarm, announces<br>Unit 2 reactor trip.                              |
|                             |                                                                                              |           | NSS evaluates the EPP.                                                                  |
|                             | Throttle or governor valves closed.<br>Reheat stop or interceptor valves closed.             |           | PO verifies turbine trip.                                                               |
|                             | MSR steam supply block valves<br>closed.<br>Reheat controller reset pushbutton<br>depressed. |           | PO ensures reheat steam isolation.                                                      |
|                             | PCBs 352 and 362 open, ACB 41 open                                                           |           | PO verifies generator trip.                                                             |
|                             | 2AE and 2DF energized by offsite power                                                       |           | PO verifies power to AC emergency busses.                                               |
|                             | SI actuated/required                                                                         |           | RO checks if SI is actuated.<br>RO manually actuates both trains of<br>Safety Injection |
| Immediate actions complete. | Both EDGs running.                                                                           |           | PO verifies EDGs running.                                                               |

# U2DRILL845(11)REV0

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                                                                       | OBJECTIVE | EXPECTED STUDENT RESPONSE                          |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------|
|                          | MDAFW pumps running.<br>TDAFW pump steam supply<br>valves open.<br>AFW throttle valves full open.                              |           | PO verifies AFW status.                            |
|                          | Service water pumps running (one<br>per train).<br>Service water header pressure 60-<br>124 psig.                              |           | RO verifies service water system in service.       |
|                          | Two HHSI pumps running.<br>HHSI flow indicated.<br>Both LHSI pumps running.<br>All indicating lights with red SI<br>marks lit. |           | RO/PO verifies SI status.                          |
|                          | All indicating lights with orange<br>CIA marks lit.                                                                            |           | RO/PO verifies CIA.                                |
|                          | All indicating lights with green FWI marks lit.                                                                                |           | RO/PO verifies FWI.                                |
|                          | CNMT pressure < 3 psig.<br>Steamline pressure > 500 psig.<br>No steamline pressure high rate<br>bistables lit.                 |           | RO/PO checks if main steamline isolation required. |
|                          | Annunciator A1-2H not lit.<br>CNMT pressure < 8 psig.                                                                          |           | RO checks CIB and CNMT spray status.               |

# U2DRILL845(12)REV0

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                                                      | OBJECTIVE | EXPECTED STUDENT RESPONSE                                          |
|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------|
|                          | 2CCS-AOV118 opened. One station air compressor running.                                                       |           | PO establishes filtered water cooling to station air compressors.  |
|                          | Two CCP pumps running.                                                                                        |           | RO/PO verify CCP in service.                                       |
|                          | SR channels in proper alignment.                                                                              |           | RO verifies source range detector high voltage switches in normal. |
|                          | Total AFW flow > 365 gpm.                                                                                     |           | PO verifies total AFW flow > 365 gpm.                              |
|                          | Tavg dropping under the influence of AFW flow.                                                                |           | RO checks RCS Tavg stable at or<br>trending to 547°F.              |
|                          |                                                                                                               |           | PO stops dumping steam and reduces AFW flow.                       |
| •                        |                                                                                                               |           | ANSS directs performance of ESF checklists.                        |
|                          | Recirc spray pumps secured.                                                                                   |           | RO checks recirc spray pump status.                                |
|                          | PORVs closed (not leaking).<br>Spray valves closed.<br>Safeties closed (PSMS data).<br>PRT conditions normal. |           | RO checks PRZR isolated.                                           |
|                          | 2RCS*P21A&B running.<br>CCP flow indicated.                                                                   |           | RO checks if RCPs should be stopped.                               |
|                          | No SGs are faulted.                                                                                           |           | PO checks if any SGs are faulted.                                  |

# U2DRILL845(13)REV0

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                          | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                                                    |
|--------------------------|-----------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------|
|                          | SG "B" level rising uncontrollably.<br>Secondary radiation high. SGTR.            |           | RO/PO check if SG tubes are intact.                                                                                                          |
|                          |                                                                                   |           | ANSS makes transition to E-3 and informs crew.                                                                                               |
|                          |                                                                                   |           | NSS declares an Alert due to entry into<br>E-3 required by EOPs (TAB 1.2.4),<br>informs crew, provides AA with Initial<br>Notification Form. |
|                          |                                                                                   |           | STA begins monitoring status trees.                                                                                                          |
|                          | CREBAPS not actuated.<br>CR radiation not in high alarm.<br>CIB has not occurred. |           | PO verifies control room habitability.                                                                                                       |
|                          | 2RCS*P21A&B running.<br>CCP flows indicated.                                      |           | RO checks RCPs should be stopped.                                                                                                            |
|                          | 2CVS-P21A,B PTL.<br>2DAS-P204A,B STOP.<br>2DGS-P21A,B PTL.                        |           | RO isolates CNMT vents and drains system.                                                                                                    |
|                          | Auto SI blocked A12-1C lit.<br>SI signal A12-1D not lit.                          |           | RO resets SI (both trains).                                                                                                                  |
|                          | Both trains of CIA reset.                                                         |           | RO resets CIA and CIB (both trains).                                                                                                         |
|                          |                                                                                   |           |                                                                                                                                              |

# U2DRILL845(14)REV0

| INSTRUCTIONAL GUIDELINES                                                                                                 | PLANT STATUS OR RESPONSE                                                                                                                                       | OBJECTIVE | EXPECTED STUDENT RESPONSE                           |
|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------|
|                                                                                                                          | SG "B" ruptured.<br>Unexpected rise in level.<br>Rad Con survey results.                                                                                       |           | Crew identifies ruptured SG.                        |
|                                                                                                                          |                                                                                                                                                                |           | ANSS directs Rad Con to initiate steamline surveys. |
| CT #1 - Crew isolates feed flow into                                                                                     | 2SVS*PCV101B setpoint = 100%                                                                                                                                   |           | Crew isolates flow from the ruptured                |
| and steam flow from the ruptured<br>SG before a transition to ECA-3.1<br>occurs. (E-3.A)<br>No action necessary to close | and closed.<br>2MSS*AOV101B, 102B closed.<br>2SVS*HCV104 closed.<br>2SVS*28 previously closed.<br>2MSS*16 previously closed.<br>2BDG*AOV100B1 closed.          |           | SG. CT #1                                           |
| TDAFW pump drains 2MSS*348<br>and 2SDS-261.                                                                              | 2SDS*AOV111B1 closed.<br>2SDS*AOV129A closed.                                                                                                                  |           |                                                     |
|                                                                                                                          | SG "B" level > 5%.                                                                                                                                             |           | PO checks ruptured SG level.                        |
|                                                                                                                          | Main feedwater isolated.<br>AFW throttle valves closed.                                                                                                        |           | Crew isolates feed flow to SG "B".                  |
|                                                                                                                          | Power to MOV isolation valves<br>available.<br>PORVs closed (not leaking).<br>At least one MOV open.<br>Safeties closed (PSMS data).<br>PRT conditions normal. |           | RO checks PORVs, block valves, and safeties.        |
|                                                                                                                          | No SGs are faulted.                                                                                                                                            |           | PO checks if any SGs are faulted.                   |

# U2DRILL845(15)REV0

| INSTRUCTIONAL GUIDELINES                                                                                                                                                                                                                                                                                                                                                                                      | PLANT STATUS OR RESPONSE  | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------|-----------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                               |                           |           | PO checks intact SG levels > 5%,<br>maintains 5-50%.                              |
|                                                                                                                                                                                                                                                                                                                                                                                                               | RCS pressure > 185 psig.  |           | RO checks if LHSI pumps should be<br>stopped, stops LHSI pumps places in<br>auto. |
|                                                                                                                                                                                                                                                                                                                                                                                                               | A SG pressure > 265 psig. |           | PO checks ruptured SG pressure > 265 psig.                                        |
| CT #2 - Crew establishes/maintains<br>an RCS temperature so that<br>transition from E-3 does not occur<br>because the RCS temperature is in<br>either of the following conditions:<br>Too high to maintain required<br>subcooling for subsequent RCS<br>depressurization<br>-OR-<br>Below the RCS temperature that<br>causes a red or orange path<br>challenge to subcriticality or<br>integrity CSF. (E-3.B) |                           |           | ANSS determines target cooldown<br>temperature.<br>CT #2                          |
|                                                                                                                                                                                                                                                                                                                                                                                                               |                           |           | STA trends cooldown rate.                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                               |                           |           | PO verifies condenser available and initiates cooldown at maximum rate.           |

# U2DRILL845(16)REV0

| INSTRUCTIONAL GUIDELINES                                                       | PLANT STATUS OR RESPONSE                                                       | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                        |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------|
|                                                                                |                                                                                |           | RO blocks steamline SI when RCS pressure is below 1950 psig.                     |
|                                                                                | LO-LO Tavg interlock defeated                                                  |           | PO places both Steam Dump Bypass<br>Selector Switches to DEFEAT TAVG<br>position |
|                                                                                |                                                                                |           | PO recommences dumping steam                                                     |
|                                                                                |                                                                                |           | PO stops cooldown at target temperature.                                         |
|                                                                                | SG "B" pressure stable.                                                        |           | PO checks ruptured SG pressure stable or rising.                                 |
|                                                                                | Subcooling > 61°F.                                                             |           | PO checks RCS subcooling greater than 61°F.                                      |
| With RCPs "A" & "B" running, spray<br>flow through 2RCS*PCV455B is<br>unlikely | No spray valves available. RCP<br>"C" tripped. 2RCS*PCV455A OOS                |           | RO determines that no spray valves are available                                 |
| EVENTS #6 & 7                                                                  | No PZR PORVs are available<br>2RCS*PCV456 turned over OOS                      |           | RO attempts to depressurize RCS<br>using PZR PORV                                |
| VLV RCS13 3,0,C,JPPLP4.EQ.1<br>(Preload)                                       | 2RCS*PCV455D block,<br>2RCS*MOV537 failed closed<br>2RCS*PCV455C failed closed |           |                                                                                  |
| VLV RCS32<br>4,0,0,0,C,JPPLP4.EQ.1 (Preload)                                   |                                                                                |           |                                                                                  |

# U2DRILL845(17)REV0

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| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                                                                       | OBJECTIVE | EXPECTED STUDENT RESPONSE                                     |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------|
|                          |                                                                                                                                |           | ANSS transitions to ECA-3.3, SGTR without Pressurizer Control |
|                          | SG "B" level < 75%                                                                                                             |           | PO checks ruptured SG level                                   |
|                          | All 4 kv busses energized by offsite power                                                                                     |           | PO verifies all 4 kv busses energized by offsite power        |
|                          | 2IAC-MOV 130 and 131 open<br>CNMT instrument air header<br>pressure > 85 psig                                                  |           | PO establishes instrument air to CNMT                         |
|                          | Normal spray and PZR PORV<br>NOT available                                                                                     |           | Crew attempts to restore normal spray or PORV                 |
|                          | Intact SG levels between 5-50%                                                                                                 |           | PO checks intact SG levels                                    |
|                          | PZR level . 4%                                                                                                                 |           | RO checks PZR level                                           |
|                          | Subcooling > 41°F<br>AFW available > 365 gpm<br>Intact SG levels > 5%<br>RVLIS dynamic head > 43%<br>Ruptured SG level onscale |           | Crew checks if SI flow can be terminated                      |
|                          | One HHSI pump stopped                                                                                                          |           | RO stops one HHSI pump                                        |
|                          | 2CHS*MOV289 and 310 open<br>2CHS*FCV122 adjusted to<br>maintain PZR level                                                      |           | RO establishes normal charging                                |

## U2DRILL845(18)REV0

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| INSTRUCTIONAL GUIDELINES                                          | PLANT STATUS OR RESPONSE                                                                                                                       | OBJECTIVE | EXPECTED STUDENT RESPONSE                           |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------|
|                                                                   | 2SIS*MOV867A, B, C, & D closed                                                                                                                 |           | RO closes high head SI cold leg<br>injection valves |
|                                                                   | Subcooling > 41°F<br>RVLIS dynamic head > 43%                                                                                                  |           | Crew verifies high head flow not required           |
|                                                                   | 2CHS*MOV311 open<br>2CHS*MOV310 closed<br>2CHS*FCV122 throttled                                                                                |           | RO establishes Aux spray                            |
|                                                                   | PZR level stable or rising and > 4%                                                                                                            |           | RO checks PZR level                                 |
|                                                                   |                                                                                                                                                |           | ANSS transitions to E-3, SGTR, step 16.b            |
| ·                                                                 | PRZR level > 76%, or RCS<br>subcooling < Attachment A-5.1, or<br>RCS pressure < A SG pressure<br>and PRZR level > 4%.                          |           | RO stops depressurization by closing spray valve.   |
|                                                                   | RCS subcooling > 41°F.<br>SG NR level(s) > 5% or > 365 gpm<br>total feed flow available.<br>RCS pressure stable or rising.<br>PRZR level > 4%. |           | Crew checks if SI can be terminated.                |
| Terminate scenario upon<br>completion of RCS<br>depressurization. |                                                                                                                                                |           |                                                     |

#### U2DRILL845(19)REV0

|                              | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE     |
|------------------------------|--------------------------|-----------|-------------------------------|
| INIGTOUCTIONIAL CEITINELINES |                          |           | I EXPELIED STUDENT KESPUNSE I |
| INSTRUCTIONAL GUIDELINES     |                          |           |                               |
|                              |                          |           |                               |

Collect and review logs after allowing crew time to complete them. Crew logs should be accurate, clear, and concise.

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#### SCENARIO OVERVIEW

| Facility: Beaver Valley Power Station Unit 2 | Scenario No.: _3_ | Op-Test No.: 2LOT2B |
|----------------------------------------------|-------------------|---------------------|
| Examiners:                                   | Operators:        |                     |

Objectives: <u>To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm</u> <u>Response procedures to respond to a plugged boric acid filter, NI failure, MFW pump trip,</u> <u>LOOP, one EDG trips, one EDG breaker fails to close (loss of all AC power), TD AFW pump</u> <u>trips on overspeed (able to reset), RCP "C" #1 seal leak (50 gpm).</u>

Initial Conditions: <u>IC-49, 20% power, BOL, steady state conditions. Rods are in Manual.</u> <u>2CHS\*P21B, 2FWE\*P23B and 2FWS-P21A are OOS. 2RCS\*PCV456 is isolated. Tornado</u> <u>Warning in effect. Tube leak on SG "B". Shutdown in progress.</u>

Turnover: <u>The plant is at 20% power</u>. <u>BOL, RCS boron 1333 PPM</u>. <u>Rods in Manual with CBD</u> at 149 steps. [2CHS-P21B] and [2FWE\*P23B] are OOS. 2FWE\*38 shut, 2FWE\*P22 aligned to 'B' header 2FWE-36 shut; 2FWE-102 open. 2FWS-P21A OOS to repair motor MB1 leads. 2RCS\*PCV456 is isolated per T.S. 3.4.11.b action. AOP 6.4 is complete to step 18 due to 75 gpd tube leak on SG "B". Tornado watch in effect. AOP 75.1 complete through step 5. 2OM52.4.C complete to step 20. Continue shutdown.

|            |                                   | 1               |                                                                                                                       |
|------------|-----------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------|
| Event No.  | Malf. No.                         | Event Type*     | Event Description                                                                                                     |
| N/A        | N/A                               | N               | Continue plant shutdown IAW 20M-52.4.C                                                                                |
| 1          | MAL LDS3D<br>ACT,95,0,0,D         | C RO/SRO        | F21, Boric Acid Filter to Blender plugs (Preload)                                                                     |
| 2          | MAL NIS7A<br>ACT,1,0,0,D          | I PO/SRO        | IR N35 blown instrument power fuse, must<br>manually energize both source ranges when power<br>drops to less than P-6 |
| 3          | BST CFW24<br>1,0,D                | I RO/SRO        | 2CNM-PS118B, MFW Pump suction pressure fails low causing trip of running MFW pump                                     |
|            | VLV CFW27<br>1,0,D                |                 | SU FW Pump recirc valve fails closed (Preload)                                                                        |
| 4          | MAL SWD1<br>ACT,0,0,D             | M ALL           | LOOP                                                                                                                  |
| 5          | MAL DSG1A                         | C ALL           | EDG 2-1 trips (Preload)                                                                                               |
|            | ACT,0,0,D<br>BKR HIV13            |                 | EDG 2-2 output breaker trips (Preload)                                                                                |
|            | 2,0,D                             |                 | Loss of ALL AC power                                                                                                  |
| 6          | MAL AFW3A<br>ACT,5440,0,<br>D     | C RO/PO/<br>SRO | TD AFW Pump trips (able to reset) (Preload)                                                                           |
| 7          | MAL RCP1B<br>ACT,50,300,<br>0,0,D | M ALL           | RCP "C" #1 seal leak (50 gpm)                                                                                         |
| * /N)ormal | (P)eactivity /                    | Destrument (C   | )omponent (M)aior                                                                                                     |

\* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

BVPS 2LOT2B Rev. 0

#### U2LOT-SIM-NRC EXAM-2LOT2B.3 (ic) REV 0

#### INITIAL CONDITIONS: Drill File 847 IC-49

Reactor power = 20%, BOL, RCS boron = 1333 ppm, CBD = 149 steps

| ADDITIONAL LINEUP CHANGES                                                                                                                    | STICKERS                                                                                                                                                             | VOND MARKINGS                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Set CBD step counters at 149 steps<br>Place BOL ΔI curve in RO operator aids<br>0000 - 2000 MWD/MTU Reactivity Plan<br>Ensure Rods in Manual | 2RCS*MOV536 RED<br>2CHS-P21B RED<br>2FWE*P23B RED<br>2FWS-P21A RED<br>2FWS-MOV150A RED<br>2MSS*SOV120 YCT<br>2MSS*SOV105C YCT<br>2SVS*PCV101B YCT<br>2SVS*HCV104 YCT | 2FWE*38 shut 24-3 (G-6) 2FWE*P22 aligned to 'B' header<br>2FWE*36 shut; 2FWE*102 open 24-3 (E-6)<br>2MSS-16 shut 21-2 (C-1)<br>2SVS*28 shut 21-2 (E-9)<br>2FWS-MOV150A shut 24-1 (B-8)<br>2FWR-7 shut 24-1 (B-7) |
| EQUIPMENT STATUS<br>2RCS*PCV456<br>2CHS*P21B<br>2FWE*P23B                                                                                    | DATE/TIME OOS<br>6 days ago/0759<br>4 days ago/1610<br>6 hrs ago/1031                                                                                                | TECHNICAL SPECIFICATION(S)<br>3.4.11.b<br>3.1.2.4 & 3.5.2 (Info Only)<br>3.7.1.2.b                                                                                                                               |

#### SHIFT TURNOVER INFORMATION

- 1. The plant is at 20% power, BOL. RCS boron 1333 ppm. Rods in manual with CBD at 149 steps.
- 2. [2CHS-P21B] is removed from service for motor rewind. Motor is presently off site.
- 3. [2FWE\*P23B] is OOS to replace the pump inboard bearing, return expected in 24 hours. Its discharge valve 2FWE\*38 is shut.
- 4. 2FWE\*P22 aligned to 'B' AFW header 2FWE-36 shut; 2FWE-102 open.
- 5. 2RCS\*PCV456 OOS with block valve 2RCS\*MOV536 closed with power removed.
- 6. AOP 6.4 is complete to step 18. Approximately 44 hours ago a tube leak was detected in SG "B". The initial leak rate was 20 gpd. 6 hours ago the leak rose to 50 gpd and has slowly raised to its present value of 75 gpd. (Monitoring at 15 minute intervals IAW the AOP). The decision was made to shutdown and repair the leaking tube following the leak rate rise to 50 gpd. The shutdown was started three hours ago.
- 7. 2MSS-16 shut, 2MSS-15 and 17 verified open.
- 8. 2SVS\*28 shut.
- 9. 2MSS\*PCV101B auto with setpoint adjusted to 100%.
- 10.2M\$\$\*SOV105C open.
- 11.2MSS\*SOV120 open.

# DUQUESNE LIGHT COMPANY

Nuclear Power Division

Training Administrative Manual

#### U2DRILL847(1)REV0

|                          |                            | · · · · · · · · · · · · · · · · · · · |                           |
|--------------------------|----------------------------|---------------------------------------|---------------------------|
| DICTRUCTIONAL CURDED DEC | DI ANTE CTATUS OD DECDONCE |                                       |                           |
| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE   | OBJECTIVE                             | EXPECTED STUDENT RESPONSE |
|                          |                            |                                       |                           |

#### Select DRILL 847, Initialize IC - 49, and establish initial plant conditions.

Reactor at approximately 20% power, BOL. Shutting down to repair SGTL. RCS boron \_1333\_ ppm, CBD at \_149\_ steps.

Insert:

| MAL DSG1A ACT,0,0,D<br>BKR HIV13 2,0,D<br>MAL AFW3A ACT,5440,0,0,0,D<br>MAL LDS3D ACT,95,0,0,0,D | Trip of EDG 2-1<br>Trip of EDG 2-2 Output Breaker<br>Trip of TD AFW Pump (can reset)<br>F21, Boric Acid Filter to Blender |
|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| VLV CFW27 1,0,D                                                                                  | plugs<br>SU FW pump recirc valve fails                                                                                    |
| File STUFFON<br>File LRTM5IC                                                                     | closed                                                                                                                    |

Assign shift positions.

| NSS  | Simulator Frozen until after shift |
|------|------------------------------------|
| ANSS | turnover unless it needs to be run |
| RO   | momentarily for an alignment       |
| PO   | change.                            |
| STA  |                                    |

Conduct a shift turnover with oncoming operators.

Oncoming ANSS should complete the required checklist and carry out a formal shift turnover.

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# U2DRILL847(2)REV0

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| INSTRUCTIONAL GUIDELINES                                                                                                  | PLANT STATUS OR RESPONSE                                                                    | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                   |
|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------|
| When the shift turnover is<br>completed, place the simulator in<br>RUN and commence the drill.<br>Depress VCR PLAY/RECORD | Simulator running/VCR recording                                                             |           | ANSS assumes control and directs operators to continue the shutdown IAW 20M-52.4.C, step 20 |
|                                                                                                                           | Turbine load and reactor power lowering                                                     |           |                                                                                             |
| EVENT #1                                                                                                                  |                                                                                             |           |                                                                                             |
| After boration is started:<br>MAL LDS3D ACT,95,0,0,0,D<br>(Preload)                                                       | F21, Boric Acid Filter to Blender plugs                                                     |           |                                                                                             |
|                                                                                                                           | Boric acid flow to blender low<br>A2-2E, BORIC ACID BLENDER<br>INLET/OUTLET DEV FROM SP lit |           | RO announces alarm A23-2E<br>ANSS refers to ARP                                             |
| After an appropriate time delay report filter d/p is 24 psid                                                              | Filter d/p > 20 psid                                                                        |           | Crew dispatches PAB operator to check Boric Acid Filter d/p                                 |
| After an appropriate time delay<br>Clear MAL LDS3D and report<br>Filter Bypass Valve open                                 | Filter Bypass Valve open                                                                    |           | ANSS directs PAB operator to open BA<br>Filter Bypass Valve                                 |
|                                                                                                                           | Plant shutdown continues                                                                    |           | ANSS directs crew to continue the shutdown                                                  |

#### U2DRILL847(3)REV0

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE | l |
|--------------------------|--------------------------|-----------|---------------------------|---|
|                          |                          |           |                           | 4 |

#### EVENT #2

When power is 12-15%, insert; MAL NIS7A ACT,1,0,0,D

IR N35 blown instrument power fuse

Annunciator A4-4E, NIS DETECTOR/COMPENSATOR LOSS OF VOLTAGE lit

The following status lights are lit on the N35 drawer: LOSS OF COMP VOLTS BISTABLE TRIP SPARE LOSS OF DETECTOR VOLTS INSTRUMENT PWR ON status light is off

Power is greater than P10

RO announces alarm A4-4E

ANSS refers to ARP A4-4E and directs PO to check LOSS OF COMP VOLT status light on IR drawer ON

ANSS refers to AOP 2.2.1B, IR Channel Malfunction

Crew places both IR train A & B Block switches in INTERRANGE BLOCK position

ANSS directs crew to place a Caution Tag on SR N31 stating "Manually unblock Source Range on Shutdown"

# U2DRILL847(4)REV0

| INSTRUCTIONAL GUIDELINES                                                   | PLANT STATUS OR RESPONSE                                                                                           | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                              |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------|
|                                                                            | Status light "LEVEL TRIP BYPASS"<br>lit<br>Annunciator A4-5E, NIS<br>SOURCE/INT RANGE HIGH FLUX<br>TRIP BYPASS lit |           | Crew places "Level Trip Switch" to<br>BYPASS on N35 drawer and to affix a<br>Caution Tag to the switch |
|                                                                            | Computer point N0096D tripped<br>Level Trip Switch caution tagged                                                  |           | Computer point status verified using CRT Inter Range screen                                            |
| <u>EVENT #3</u><br>2FWS-P21B Suction Pressure<br>Switch 2FWS-PSL118B fails |                                                                                                                    |           | 2FWS-P21B Trips<br>MD AFW pump 2FWE*P23A Auto start                                                    |
| BST CFW24 1,0,D                                                            | 2FWS-P21B trips (loss of all main feedwater)                                                                       |           |                                                                                                        |
| VLV CFW27 1,0,D                                                            | Fail 2FWR*FCV155, SU Feed Pump<br>Recirc shut (Preload)                                                            |           |                                                                                                        |
|                                                                            | A6-10A, STM GEN FEEDPUMP<br>21A/B AUTO STOP lit<br>A6-11A, AUX FW PUMP AUTO<br>START/AUTO STOP                     |           | PO announces alarm A6-10A and 11A                                                                      |
|                                                                            | SG levels lowering                                                                                                 |           | ANSS refers to ARP A6-10A                                                                              |
|                                                                            | Startup Feedwater Pump Recirc<br>Valve does not fully open, unable to<br>start the Startup Feedwater Pump          |           | ANSS directs PO to start the Startup<br>Feedwater Pump                                                 |
|                                                                            | SG levels lowering                                                                                                 |           |                                                                                                        |

| U2DRILL847(5)REV0        |                                                                                                      |           |                                                                                                                                                                                                                    |
|--------------------------|------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                                             | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                                                                                                                          |
|                          |                                                                                                      |           | ANSS refers to AOP 2.24.1, Loss of Main Feedwater                                                                                                                                                                  |
|                          | Two Condensate pumps and heater drain pumps running                                                  |           | Crew checks condensate pump, heater<br>drain pump and seperator drain pump<br>status                                                                                                                               |
|                          |                                                                                                      |           | ANSS directs RO to manually trip the reactor and refers to E-O to verify immediate actions while operators perform immediate actions                                                                               |
|                          | Turbine trip due to reactor trip alarm<br>A5-6D lit. Rod bottom lights lit.<br>Neutron flux dropping |           | RO verifies reactor trip.                                                                                                                                                                                          |
|                          |                                                                                                      |           | RO/PO sounds standby alarm,<br>announces Unit 2 reactor trip<br>NSS evaluates EPP, declares an Alert<br>due to automatic reactor trip failure per<br>TAB 2.3, informs crew, provides AA<br>with notification form. |
|                          |                                                                                                      |           | PO verifies turbine trip                                                                                                                                                                                           |
|                          | MSR steam supply block valves<br>closed. Reheater controller reset<br>pushbutton depressed.          |           | PO ensures reheat steam isolation                                                                                                                                                                                  |

U2DRILL847(6)REV0 INSTRUCTIONAL GUIDELINES PLANT STATUS OR RESPONSE **OBJECTIVE EXPECTED STUDENT RESPONSE** Main generator output breakers PO verifies generator trip open. Exciter circuit breaker open. 2AE and 2DF busses energized. PO verifies power to AC emergency busses NOTE: If SIS pocurs, ensere No SI annunciator or SI actuation RO checks if SI is actuated or required crew implements E-0 and ES-1.1 status light lit. CNMT pressure < 1.5 correctly (SI is not anticipated for psig. PRZR pressure > 1855 psig. this transient SG pressure > 500 psig. SI is not required. ANSS makes a transition to ES-0.1 and informs the control room EVENT #4 STA monitors status trees One minutes after completion of LOOP shift brief for ES-0.1 entry, Insert: MAL SWD1 ACT.0,0,D EVENT #5 MAL DSG1A ACT.0.0,D EDG 2-1 trips (Preload) PO announces loss of all power to AC **BKR HIV13 2,0,D** EDG 2-2 output breaker trips emergency busses (Preload) ANSS makes transition to ECA-0.0, Loss of all AC power EDG 2-1 tripped directs RO and PO to perform

EDG 2-2 running, output breaker

will not close. No cooling water

S/U

appropriate immediate actions.

| U2DRILL847(7)REV0        |                                                                                         |           |                                                                                                                                                                                                                                                                                                          |
|--------------------------|-----------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                                | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                                                                                                                                                                                                                |
|                          |                                                                                         |           | STA monitors CSF status trees for information only.                                                                                                                                                                                                                                                      |
| -                        | Annunciator A5-6D lit.<br>Neutron flux dropping.                                        |           | RO reverifies reactor trip.<br>S/U                                                                                                                                                                                                                                                                       |
|                          |                                                                                         |           | RO sounds standby alarm and<br>announces Unit 2 loss of power.<br>S/U                                                                                                                                                                                                                                    |
|                          |                                                                                         |           | <ul> <li>NSS reevaluates the EPP, declares the following EALs as applicable:</li> <li>Site Area Emergency due to loss of all feedwater/Heat Sink red path condition (TABs 1.1.1 and 1.2.1 Potential Losses).</li> <li>SAE due to loss of offsite and onsite power for &gt; 15 mins. (TAB 3.1)</li> </ul> |
|                          | SLI manually actuated.<br>MSIVs and bypass valves closed.                               |           | PO ensures steamlines isolated.                                                                                                                                                                                                                                                                          |
|                          | Exciter and output breakers open.                                                       |           | PO verifies generator trip.                                                                                                                                                                                                                                                                              |
| i                        | PRZR PORVs closed, orifice<br>isolation valves closed, Regen HX<br>inlet valves closed. |           | RO checks if RCS is isolated                                                                                                                                                                                                                                                                             |
|                          |                                                                                         |           |                                                                                                                                                                                                                                                                                                          |

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#### U2DRILL847(8)REV0

|  | INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE | OBJECTIVE | EXPECTED STUDENT RESPONSE |
|--|--------------------------|--------------------------|-----------|---------------------------|
|--|--------------------------|--------------------------|-----------|---------------------------|

## EVENTS #6 & 7

| MAL AFW3A ACT,5440,0,D<br>(Preload)                                                                                                                                     | TD AFW Pump trips<br>No AFW flow (all AFW pumps<br>stopped).<br>2MSS*SOV105A - F open. | PO reports no AFW flow                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Two minutes after ECA-0.0<br>entered, insert;<br>MAL RCP1B ACT,50,300,0,0,D                                                                                             | RCP 'C' #1 seal leak (50 gpm)                                                          |                                                                                                                                      |
| CT #2 - Orew establishes the<br>minimum required AFW flow to<br>the SGs before SG dry out<br>occurs.                                                                    |                                                                                        | Crew dispatches plant operator to<br>South Safeguards to restore AFW flow<br>using Attachments A-1.12 and A-1.11<br>CT 2             |
| Ten minutes after being directed<br>to locally restore AFW flow, report<br>that 2FWE*P22 has apparently<br>tripped on overspeed, and can<br>reset and open TTV. Insert: |                                                                                        |                                                                                                                                      |
| MAL AFW3A CLR,0<br>LOA AFW22 0,0,D                                                                                                                                      | Governor failure cleared. TTV<br>reset, 2FWE*P22 starts. AFW flow<br>available to SGs. | PO notes AFW flow to SGs, informs ANSS.                                                                                              |
|                                                                                                                                                                         | SR channels aligned properly.                                                          | RO verifies source range detector high<br>voltage switches in NORMAL, transfers<br>NR45 to operable Source and<br>Intermediate Range |

## U2DRILL847(9)REV0

| INSTRUCTIONAL GUIDELINES                                                                                                                                      | PLANT STATUS OR RESPONSE                                                  | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                               | IR 36 less than P6, 10 <sup>-10</sup> amps<br>Both SR detectors energized |           | RO manually enrgizes both Source<br>Range detectors                                                                                                                                    |
|                                                                                                                                                               | 2-2 EDG breaker will not manually close                                   |           | PO tries to restore power to any AC<br>emergency bus using diesel generator.<br>EDG 2-2 stopped, personnel<br>dispatched to investigate EDG 2-1<br>failure and EDG 2-2 breaker failure |
|                                                                                                                                                               | AC emergency busses deenergized.                                          |           | ANSS goes to Step 11 after PO verifies<br>emergency busses deenergized and<br>reports same to ANSS.                                                                                    |
| As System Operator, report that<br>several lightning strikes have<br>deenergized offsite busses and<br>transformers; investigation<br>commencing immediately. |                                                                           |           | PO attempts to restore offsite power with Attachment A-1.4.                                                                                                                            |
|                                                                                                                                                               |                                                                           |           | Crew checks power restored to AC<br>emergency bus (go to procedure step<br>34 when power is restored).                                                                                 |
|                                                                                                                                                               | 2AE bus selected as cross-tie path.                                       |           | Crew selected cross-tie path.                                                                                                                                                          |
|                                                                                                                                                               |                                                                           |           | Crew dispatches operator(s) to perform<br>Attachment A-1.13AE.                                                                                                                         |

**OBJECTIVE** 

# U2DRILL847(10)REV0 INSTRUCTIONAL GUIDELINES PLANT STATUS OR RESPONSE Service water pump 2SWS\*P21B should remain in auto for possible automatic loading (EDG 2-2 cooling). Local reset and EDG control actions per Attachment A-1.5 are in progress. After appropriate delay, use the

following for local actions: LOA SEA1 0,0,0,D LOA SEA2 0,0,0,D LOA SEA3 0,0,0,D VLV SEA16 3,0,D VLV CCP58 3,0,D VLV CCP60 3,0,D

2CHS\*178 closed. 2CHS\*179 closed. 2CHS\*180 closed. 2CHS\*MOV381 closed. 2CCP\*MOV156-1 closed. 2CCP\*MOV157-1 closed.

Report valves closed.

Crew notifies U1 NSS/ANSS that Attachment A-1.14 should be performed by BV-1 personnel.

**EXPECTED STUDENT RESPONSE** 

ANSS reviews SWS pump caution, informs crew.

RO/PO place switches in pull-to-lock for equipment listed in Step 15.

Crew dispatches plant personnel to locally restore power using Attachment A-1.5. Emphasis is placed on local start of Emergency Generator 2-1.

Crew requests Rad Con support to isolate RCP seals, dispatches plant operator to locally close valves.

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## U2DRILL847(11)REV0

| <br>INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                               | OBJECTIVE | EXPECTED STUDENT RESPONSE                                     |
|------------------------------|----------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------|
| I                            | Blowdown isolation valves closed.<br>Main and bypass feed regulating<br>valves closed. |           | Crew checks SG isolation.                                     |
| ,                            | All PORVs closed.                                                                      |           | RO checks PRZR PORVs.                                         |
|                              | No SG pressure dropping in an<br>uncontrolled manner or completely<br>depressurized.   |           | PO checks if any SGs are faulted.                             |
|                              | No SG levels rising in an<br>uncontrolled manner.                                      |           | Crew checks if SG tubes are intact, requests Rad Con surveys. |
|                              | SG levels responding to AFW flow.                                                      |           | PO checks intact SG levels.                                   |
|                              | Annunciator A6-4A not lit.                                                             |           | PO checks, PDWST level greater than 80 inches.                |
|                              | Air temperature normal.                                                                |           | Crew checks control room ambient air less than 104°F.         |
|                              | All PORVs closed.                                                                      |           | RO checks PRZR PORVs.                                         |
|                              |                                                                                        |           |                                                               |

U2DRILL847(12)REV0

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| INSTRUCTIONAL GUIDELINES                                                                                  | PLANT STATUS OR RESPONSE                                                               | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                 |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------|
| When the RCP seals are isolated,<br>clear the LOOP and insert<br>LOA SWD4 1,0,D<br>LOA HIV1 1,0,D         | Power restored to 138 kv bus 1.<br>4 kv relays reset                                   |           | ANSS directs plant operator to energize<br>2DF IAW Attachment A-1.4<br>PO closes breakers 2D10 and 2F7 to |
| As System Operator report that                                                                            |                                                                                        |           | energize 2DF                                                                                              |
| power is available to Switchyard<br>138 kv bus 1                                                          |                                                                                        |           |                                                                                                           |
|                                                                                                           |                                                                                        |           | PO monitors 2DF bus, informs, ANSS that bus is energized.                                                 |
| Transition to Step 34 directed by continuous action Step 12.                                              |                                                                                        |           | ANSS proceeds to ECA-0.0 Step 34, informs crew.                                                           |
| Insert the following to energize<br>the train "B" 480 volt busses<br>LOA LOV1 1,0,D<br>LOA LOV86-92 1,0,D | Train "B" 480 volt busses energized                                                    |           |                                                                                                           |
|                                                                                                           | SI annunciator status dependent on RCP "C" #1 seal leak                                |           | RO checks SI signal status, resets SI (if required).                                                      |
| Note: Alarm A1-1C actuated due to vital bus 1 and 3 powered from respective batteries.                    | 480V emergency bus 2P energized.<br>Battery charger 2-2 and inverter 2-4<br>energized. |           | Crew verifies equipment loaded on 2DF<br>emergency bus.                                                   |

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# U2DRILL847(13)REV0

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| INSTRUCTIONAL GUIDELINES                                                                                                | PLANT STATUS OR RESPONSE                                                                                                   | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                               |
|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------|
|                                                                                                                         | 2SWS*P21B running.<br>Service water header pressure<br>between 60 and 124 psig.<br>EDG cooling valve<br>2SWS*MOV113D open. |           | RO verifies service water system in service.                                                            |
|                                                                                                                         |                                                                                                                            |           | Crew dispatches operator(s) to restore<br>Unit 2 station blackout equipment per<br>Attachment A-1.16AE. |
|                                                                                                                         | RCS subcooling > Attachment A-5.1<br>value.<br>PRZR level > 4%.<br>SI valves not automatically aligned<br>in SI mode.      |           | ANSS selects recovery procedure based on operator reports.                                              |
| Scenario assumes that SI is NOT<br>required; if conditions warrant a<br>transition to ECA-0.2, monitor<br>crew actions. |                                                                                                                            |           | ANSS makes transition to ECA-0.1, informs crew.                                                         |
|                                                                                                                         | No SI annunciator or SI actuation status light lit                                                                         |           | RO checks SIS status                                                                                    |
|                                                                                                                         | CCP pumps stopped<br>2CCP*AOV107A, B & C closed<br>HHSI pumps stopped<br>RCP seals isolated                                |           |                                                                                                         |
|                                                                                                                         | CIA and CIB reset                                                                                                          |           | RO resets CIA and CIB                                                                                   |

# U2DRILL847(14)REV0

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                                                                | OBJECTIVE | EXPECTED STUDENT RESPONSE                                                                                  |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------|
|                          | One Station Air Compressor running                                                                                      |           | PO checks Station Air Compressors<br>PO dispatches operator to locally start<br>one Station Air Compressor |
|                          | 2AIC*MOV130 has no power,<br>cannot be opened                                                                           |           | PO cross connects station instrument air with CNMT instrument air                                          |
|                          | One CCP pump running                                                                                                    |           | Crew starts one CCP pump                                                                                   |
|                          | HHSI pumps all stopped                                                                                                  |           | Crew checks HHSI pump status                                                                               |
|                          | 2CHS*LCV115C & E open (suction<br>from VCT)<br>VCT makeup in Auto at > RCS C <sub>B</sub><br>2CHS*MOV289 and 310 closed |           | Crew verifies charging system<br>alignment                                                                 |
|                          | Normal charging flow established                                                                                        |           | RO establishes normal charging flow                                                                        |
|                          | One CCP pump running<br>CRDM shroud fans running<br>CNMT recirc fans running                                            |           | Crew starts One CCP pump, CRDM shroud fans, CNMT recirc fans                                               |
|                          | PDWST level greater than 80 inches                                                                                      |           | PO checks PDWST level                                                                                      |
|                          | SG narrow range level between 5% and 50%                                                                                |           | PO checks SG narrow range level greater than 5% and controls AFW flow to maintain 5-50% level              |
|                          | All train "B" CIA components<br>correctly aligned                                                                       |           | ANSS directs RO/PO to verify all<br>indicating lights with orange CIA marks<br>lit                         |

## U2DRILL847(15)REV0

| INSTRUCTIONAL GUIDELINES                 | PLANT STATUS OR RESPONSE                                                    | OBJECTIVE | EVDECTED STUDENT DESPONSE                             |
|------------------------------------------|-----------------------------------------------------------------------------|-----------|-------------------------------------------------------|
|                                          | I BART STATUS OK KESPONSE                                                   | OBJECTIVE | EXPECTED STUDENT RESPONSE                             |
|                                          | Annunciator A1-2H not lit<br>CNMT pressure has remained less<br>than 8 psig |           | RO checks CIB and spray status                        |
|                                          | Quench and Recirc Spray Pumps in<br>Auto<br>Chemical Injection Pump in Auto |           | RO places Quench and Recirc Spray pumps in Auto       |
| Insert;                                  | CCP supply temperature is less than 105°                                    |           | Crew establishes seal cooling IAW<br>Attachment A-1.5 |
| VLV CCP58 2,0,D<br>VLV CCP60 2,0,D       | 2CCP*MOV156-1,157-1 are open                                                |           |                                                       |
|                                          | 2CCP*107A, B & C are open                                                   |           |                                                       |
|                                          | VCT temperature is less than 235°F<br>2CHS*178, 179, 180 checked<br>closed  |           |                                                       |
| To open 2CHS*178, 179, 180,<br>Insert;   | 2CHS*MOV308A, B & C checked open                                            |           |                                                       |
| LOA SEA1 0.1,0,0,D                       | 2CHS*HCV186 checked open                                                    |           |                                                       |
| LOA SEA2 0.1,0,0,D<br>LOA SEA3 0.1,0,0,D | 2CHS*178, 179, 180 opened until flow just indicated                         |           |                                                       |
| Collect and review logs after            |                                                                             |           | Crew logs should be accurate, clear,                  |

allowing crew time to complete.

Crew logs should be accurate, clear, and concise.

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# U2DRILL845(13)REV0

| INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE                                                                                                         | OBJECTIVE | EXPECTED STUDENT RESPONSE                         |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------|
|                          | 2IAC-MOV131, 130 opened (station<br>to CNMT instrument air cross-<br>connect). CNMT instrument air<br>header pressure > 85 psig. |           | PO establishes instrument air to containment.     |
|                          | Pressure stable or rising.                                                                                                       |           | RO checks RCS pressure stable or rising.          |
|                          | 2CHS*FCV122 closed.<br>2CHS*MOV289, 310 opened.<br>FCV adjusted to maintain PRZR<br>level.                                       |           | RO to establish normal charging flow.             |
|                          | 2SIS*MOV867A,B,C,D closed.                                                                                                       |           | RO closes HHSI cold leg isolation valves.         |
|                          | •                                                                                                                                |           | RO controls charging flow to maintain PRZR level. |
|                          | LHSI pumps stopped and in auto.                                                                                                  |           | RO stops LHSI pumps and places in auto.           |
|                          | RCS subcooling > 41°F.<br>PRZR level > 4%.                                                                                       |           | RO verifies SI flow not required.                 |
|                          | No quench or recirc spray pumps running.                                                                                         |           | RO checks if CNMT spray should be stopped.        |
|                          |                                                                                                                                  |           |                                                   |

## DUQUESNE LIGHT COMPANY Nuclear Power Division

Training Administrative Manual

# U2DRILL845(14)REV0

| INSTRUCTIONAL GUIDELINES                                                            | PLANT STATUS OR RESPONSE                                                                                                                                                                                                                                                                                                                                                                                       | OBJECTIVE | EXPECTED STUDENT RESPONSE                                             |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------|
|                                                                                     | PRZR level > 14%.<br>One CCP pump running.<br>2CHS*FCV122 adjusted to<br>establish 30 - 50 gpm charging<br>flow.<br>2CHS*AOV204 opened.<br>2CHS*PCV145 in manual and 50%<br>open.<br>2CHS*LCV460A, B opened.<br>2CHS*AOV200A, B, C opened as<br>appropriate.<br>2CHS*PCV145 adjusted to 260 psig<br>and placed in auto.<br>CCP supply/return valves open<br>2CCP*175-1 & 2<br>2CCP*176-1 & 2<br>2CCP*177-1 & 2 |           | RO checks if letdown can be<br>established, then establishes letdown. |
|                                                                                     | Makeup control in Manual (due to 2CHS*LT115 failure) and set to greater than RCS boron concentration.                                                                                                                                                                                                                                                                                                          |           | RO checks VCT makeup control system.                                  |
|                                                                                     | 2CHS*LCV115C, E opened.<br>2CHS*LCV115B, D closed.                                                                                                                                                                                                                                                                                                                                                             |           | RO aligns HHSI pump suction to VCT.                                   |
| Terminate scenario at Step 18 of ES-<br>1.1. (align charging pumps suction to VCT). |                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                       |

U2DRILL845(15)REV0

| 1 | INSTRUCTIONAL GUIDELINES | PLANT STATUS OR RESPONSE       |           |                           |
|---|--------------------------|--------------------------------|-----------|---------------------------|
| 1 | INSTRUCTIONAL GUIDELINES | E PLANT STATUS OK KESPONSE – I | OBJECTIVE |                           |
| - |                          |                                | ODJECTIVE | EXPECTED STUDENT RESPONSE |
|   |                          |                                |           |                           |

Collect and review logs after allowing operators to complete them.

Operator logs should be clear, accurate and concise.

|    | N X 1 2                                                                               |   |
|----|---------------------------------------------------------------------------------------|---|
|    | (As submitted produin                                                                 |   |
| 1. | The NCO is recovering a rod misaligned from its group in accordance with 20M-1.4.P    | 9 |
|    | "RCCA or RCCA Group Misalignment". Reactor Engineering has specified that the rod     |   |
|    | should be withdrawn at no greater than 20 steps per hour. If the NCO were to withdraw |   |
|    | rods at a higher rate than specified which of the following is a consequence of that  |   |
|    | action?                                                                               |   |

A. Low Xenon concentration causes neutron flux peaks in the affected quadrant.

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B. Low Xenon concentration causes axial flux peaks in the bottom half of the core.

C. Intermediate Range Start Up Rate will exceed 0.5 dpm in the affected quadrant.

D. Heat Up Rate will exceed 100% F per hour across the affected quadrant.

Answer: A

K/A 00005 K1.03:

Importance:3.2

Cognitive Level: Knowledge

Reference: Basis for Tech Specs 3/4.1.3, page B3/4 1-5, 2OM-52.2.A, Issue 4, Rev. 2, P&L 24

and 25.

LP # : 2LP-SQS-1.3

Obj: 18

| History: N/A    |                   |
|-----------------|-------------------|
| Source: NEW     | Type: CLOSED BOOK |
| JTA: 0000080401 |                   |

| 2. Unit 2 is operating at 100% power with a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Unit 2 is operating at 100% power with all systems NSA. Reactor Coolant Pump 21C    |  |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|
| Upper Motor Bearing High Temperature computer alarm is received. The Alarm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                     |  |  |  |  |
| Response Procedure requires that the F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Response Procedure requires that the RCP be tripped. Choose from the list below the |  |  |  |  |
| <ul> <li>Response Procedure requires that the RCP be tripped. Choose from the list below the correct sequence of actions and the reason for those actions?</li> <li>A. Trip the Reactor Coolant pump and allow Doppler Power Coefficient to lower reactor power before tripping the reactor.</li> <li>B. Trip the Reactor to prevent violation of DNB parameters before tripping the reactor coolant pump.</li> <li>C. Trip the Reactor Coolant Pump to minimize flow oscillations in the core region from a pump coast down before tripping the Rx.</li> <li>D. Trip the reactor to prevent 2/3 RCP bus Underfrequency Rx trip before tripping Reactor Coolant Pump</li> </ul> |                                                                                     |  |  |  |  |
| ANSWER: B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | I                                                                                   |  |  |  |  |
| K/A: 000015/17 K3.03:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Importance:3.7                                                                      |  |  |  |  |
| Cognitive Level: Knowledge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                     |  |  |  |  |
| Reference: Tech Spec. Basis/ 3/4.1.1, 2 and 3 page 4-1 First sentence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                     |  |  |  |  |
| Lesson Plan #: 2LP-SQS-6.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Obj. #: 10                                                                          |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                     |  |  |  |  |
| History: NEW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                     |  |  |  |  |
| Source:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Type: CLOSED BOOK                                                                   |  |  |  |  |
| JTA: 003AAA0401                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                     |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                     |  |  |  |  |

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| 3. A                                                                                       | A natural circulation cooldown has been in progress using ES-0.2 " Natural Circulation |                                   |                            | Natural Circulation |
|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------|----------------------------|---------------------|
| c                                                                                          | Cooldown". The RHS system is in service.                                               |                                   |                            |                     |
| v                                                                                          | Vhy m                                                                                  | nust the entire RCS be brought to | less than 200 degrees pric | or to               |
| d                                                                                          | epres                                                                                  | ssurization?                      |                            |                     |
|                                                                                            | A. To augment heat removal from the head structure.                                    |                                   |                            |                     |
|                                                                                            | B. To bypass the requirement for soaking the head for 29 hours.                        |                                   |                            | rs.                 |
|                                                                                            | C. To maximize loop flow on continued natural circulation.                             |                                   |                            |                     |
|                                                                                            | D. To prevent void formation in stagnant loops.                                        |                                   |                            |                     |
|                                                                                            |                                                                                        |                                   |                            | :                   |
| ANSWE                                                                                      | R:D                                                                                    |                                   |                            |                     |
| K/A: W/E                                                                                   | K/A: W/E09/E10 K2.2: Importance:3.6                                                    |                                   |                            | Importance:3.6      |
| Cognitive Level: Comprehension                                                             |                                                                                        |                                   |                            |                     |
| References: 20M-53B.4.ES-0.2 Background for Natural Circulation, Issue 1B, Rev. 4, Step 23 |                                                                                        |                                   |                            |                     |
| Lesson Plan #:2LP-SQS-53.3 Obj. #:3                                                        |                                                                                        |                                   |                            |                     |
|                                                                                            |                                                                                        |                                   |                            |                     |
| History: NEW                                                                               |                                                                                        |                                   |                            |                     |
| Source:                                                                                    |                                                                                        |                                   | Type: CLOSED BOOK          |                     |
| JTA:                                                                                       |                                                                                        |                                   |                            |                     |

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| 1. The unit is conducting a natural circulation cooldown in accordance with ES-0.2 "Natural       |                                            |  |  |
|---------------------------------------------------------------------------------------------------|--------------------------------------------|--|--|
| Circulation Cooldown <sup>*</sup> . Cooldown rates are limited by procedure to less than 25°F per |                                            |  |  |
| hour for which of the following reasons                                                           | ?                                          |  |  |
| A. Limit steam generator pressure                                                                 | drops to less than 25psig/min.             |  |  |
| B. Limit subcooling rate of rise to le                                                            | ess than 25°F/hr.                          |  |  |
| C. Maintain RCS subcooling greate                                                                 | er than 200 degrees during reactor coolant |  |  |
| depressurization.                                                                                 |                                            |  |  |
| D. Maintain subcooled liquid in the                                                               | reactor vessel head region during reactor  |  |  |
| coolant depressurization.                                                                         |                                            |  |  |
| ANSWER:D                                                                                          |                                            |  |  |
| K/A:W/E09/10 K3.1                                                                                 | Importance:3.3                             |  |  |
| Cognitive Level: Application                                                                      |                                            |  |  |
| References: 20M-53B.1.ES-0.2 Background for Natural Circulation Cooldown, Issue 1B, Rev.          |                                            |  |  |
| 4, Steps 6, 13 and 15                                                                             |                                            |  |  |
| Lesson Plan #:2LP-SQS-53.3                                                                        | Obj. #:3                                   |  |  |
|                                                                                                   |                                            |  |  |
| History: NEW                                                                                      |                                            |  |  |
| Source:                                                                                           | Type: CLOSED BOOK                          |  |  |
| JTA:3010010601                                                                                    |                                            |  |  |
|                                                                                                   |                                            |  |  |

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| 5.    | The unit is at 100% with all syste                                                          | ms NSA. The core age is MOL at 8000 MWD/MTU              |  |
|-------|---------------------------------------------------------------------------------------------|----------------------------------------------------------|--|
|       |                                                                                             | rbine load to be runback at 5% per minute to 70%         |  |
|       | reactor power.                                                                              |                                                          |  |
|       |                                                                                             | Plan, what is the total amount of boron injected into th |  |
|       |                                                                                             | Valve [2CHS*MOV350] and at what position should          |  |
|       | the control rods be found?                                                                  |                                                          |  |
|       | A. 443 gallons and Bank D at 151 steps.                                                     |                                                          |  |
|       | B. 294 gallons and Bank D at 170 steps.                                                     |                                                          |  |
|       | C. 332 gallons and Bank D at 175 steps.                                                     |                                                          |  |
|       | D. 113 gallons and Bank D at 200 steps.                                                     |                                                          |  |
|       |                                                                                             |                                                          |  |
| ANS   | WER: C                                                                                      |                                                          |  |
| K/A:  | 000024 K1.02                                                                                | Importance: 3.6                                          |  |
| Coa   | nitive Level: Application                                                                   |                                                          |  |
|       | erences: Reactivity Plan for Routine Operations Activities - Valid for burnups of 7000 - 90 |                                                          |  |
|       |                                                                                             |                                                          |  |
|       |                                                                                             | Obj. #: 8                                                |  |
| Less  | son Plan #: 2LP-SQS-7.1                                                                     |                                                          |  |
| Hiet/ | story: NEW                                                                                  |                                                          |  |
|       | ······································                                                      | Type: OPEN BOOK                                          |  |
| Sou   |                                                                                             |                                                          |  |
| JTA   | : 004EEE0101                                                                                | Give copy of Reactivity Plan                             |  |
|       |                                                                                             | Direct look up                                           |  |
|       |                                                                                             |                                                          |  |
|       |                                                                                             |                                                          |  |

| isolated by automatic valve closure on Surge Tanks [2CCP*TK21A, 21B]? | Which of the following Primary Component Cooling system loads in the letdown path is isolated by automatic valve closure on a Low Level in Primary Component Cooling Surge Tanks [2CCP*TK21A, 21B]? |  |  |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| A. Non Regenerative Heat                                              | 2CHS*E23]                                                                                                                                                                                           |  |  |
| B. Excess Letdown Heat E                                              | xchanger [2CHS*E24]                                                                                                                                                                                 |  |  |
| C. Degassifier Vent Chiller                                           | s [2BRS*E22A,22B]                                                                                                                                                                                   |  |  |
| D. Seal Water Heat Exchan                                             | nger[2CHS*E21]                                                                                                                                                                                      |  |  |
|                                                                       |                                                                                                                                                                                                     |  |  |
| ANSWER: C                                                             |                                                                                                                                                                                                     |  |  |
| K/A:000026 AK2.03                                                     |                                                                                                                                                                                                     |  |  |
| Cognitive Level: Knowledge                                            |                                                                                                                                                                                                     |  |  |
| References 20M-15.5, Figure 15-1, 20M-15.3.B, Iss. 4, Rev. 10         |                                                                                                                                                                                                     |  |  |
| Lesson Plan #:: 2LP-SQS-15.1 Obj. #: 6                                |                                                                                                                                                                                                     |  |  |
|                                                                       |                                                                                                                                                                                                     |  |  |
| History: NEW                                                          |                                                                                                                                                                                                     |  |  |
| Source:                                                               | Type: CLOSED BOOK                                                                                                                                                                                   |  |  |
| JTA:: 0000060121                                                      |                                                                                                                                                                                                     |  |  |

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| 7. The unit is at 75% power and preparing to escalate power to 100%. The Pressurizer Pressure Control Station [2RCS*PK444A] is in Automatic and the output is at 50%. All systems are NSA with PZR Control Heater Control Group [2RCS*H2C] and [2RCS*H2D] selected to "ON". Which of the following is the expected status of PZR pressure control equipment at this |                                            |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--|--|
| point?                                                                                                                                                                                                                                                                                                                                                              | Pressurizer Spray [2RCS*PCV455A] OPEN.     |  |  |
|                                                                                                                                                                                                                                                                                                                                                                     | , Pressurizer Spray [2RCS*PCV455A] CLOSED. |  |  |
|                                                                                                                                                                                                                                                                                                                                                                     |                                            |  |  |
| C. Heater Groups C and D ON, Pro                                                                                                                                                                                                                                                                                                                                    | essurizer Spray [2RCS*PCV455A] OPEN.       |  |  |
| D. All Heater Groups OFF, Pressu                                                                                                                                                                                                                                                                                                                                    | rizer Spray [2RCS*PCV455A] OPEN.           |  |  |
| ANSWER: C                                                                                                                                                                                                                                                                                                                                                           |                                            |  |  |
| K/A: 000027 A2.03                                                                                                                                                                                                                                                                                                                                                   | Importance:2.6                             |  |  |
| Cognitive Level: Application                                                                                                                                                                                                                                                                                                                                        |                                            |  |  |
| References: Curve Book CB-18, Rev. 0                                                                                                                                                                                                                                                                                                                                |                                            |  |  |
| Lesson Plan #: 2LP-SQS-6.4 Obj. #: 11                                                                                                                                                                                                                                                                                                                               |                                            |  |  |
|                                                                                                                                                                                                                                                                                                                                                                     |                                            |  |  |
| History: NEW                                                                                                                                                                                                                                                                                                                                                        |                                            |  |  |
| Source:                                                                                                                                                                                                                                                                                                                                                             | Type: CLOSED BOOK                          |  |  |
| .ITA: 0020090101                                                                                                                                                                                                                                                                                                                                                    |                                            |  |  |

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| 8.           | The crew is responding to a S                                                      | Secondary Side Steam Break Accident using ECA-         |  |
|--------------|------------------------------------------------------------------------------------|--------------------------------------------------------|--|
|              | 2.1, "Uncontrolled Depressuria                                                     | zation of All Steam Generators." All steam generators  |  |
|              | depressurized to containment                                                       | t pressure and all steam generator levels are OFF-SCA  |  |
|              | low on the narrow range. The                                                       | e ANSS orders the NCO to throttle AFW flow to all thre |  |
|              | steam generators to a minimu                                                       | um 50 gpm to each steam generator.                     |  |
|              | Maintaining a 50 gpm minimu                                                        | m AFW flow is designed to acomplish which of the       |  |
|              | following functions?                                                               |                                                        |  |
|              | A. Provide minimum flow                                                            | through the operating Auxiliary Feedwater pumps.       |  |
|              | B. Prevent exceeding pu                                                            | mp runout on the operating Auxiliary Feedwater pump    |  |
|              | C. Provide thermal stress relief by maintaining wetted surfaces on the interior of |                                                        |  |
|              | steam generators.                                                                  |                                                        |  |
|              | D. Prevent overflow of the steam generators during restoration of narrow range     |                                                        |  |
|              | levei.                                                                             |                                                        |  |
|              |                                                                                    |                                                        |  |
| ANS          | SWER: C                                                                            |                                                        |  |
| <b>K/A</b> : | :000040 (W/E12) K3.2                                                               | Importance:3.3                                         |  |
|              | nitive Level: Knowledge                                                            |                                                        |  |
|              |                                                                                    | ss. 1B, Rev. 6, Background for CAUTION before step (   |  |
|              | son Plan #: 2LP-SQS-53.3                                                           | Obj. #: 3                                              |  |
| Les          | SUIT FIAIT #. 221 - 5000-50.0                                                      |                                                        |  |
| •            |                                                                                    |                                                        |  |
| Hist         | ory: NEW                                                                           |                                                        |  |
|              | Irce:                                                                              | Type: CLOSED BOOK                                      |  |
| Sou          |                                                                                    |                                                        |  |

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| 9.                                                                                       | . Following an overcooling transient, the crew is responding to an Integrity Red Path                                                           |                                                           |  |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--|
| using FR-P.1," Response to Imminent Pressurized Thermal Shock Condition." The ${\cal R}$ |                                                                                                                                                 |                                                           |  |
| 1                                                                                        | RCS is saturated at 400 psig. SI can NOT be terminated.<br>Why should a Reactor Coolant Pump be started even if support conditions are missing? |                                                           |  |
|                                                                                          |                                                                                                                                                 |                                                           |  |
|                                                                                          | A. To establish Loop flow                                                                                                                       | to stabilize Tavg and stop the cooldown.                  |  |
|                                                                                          | B. To mix heated loop wat                                                                                                                       | ter and SI flow to limit temperature stress on the vessel |  |
|                                                                                          | wall-                                                                                                                                           |                                                           |  |
|                                                                                          | C. Use forced flow to colla                                                                                                                     | pse voids in the core outlet plenum and vessel head.      |  |
|                                                                                          | D. To equalize RCS press                                                                                                                        | ures, allowing uniform SI flow to the vessel.             |  |
|                                                                                          |                                                                                                                                                 |                                                           |  |
| ANS                                                                                      | WER:B                                                                                                                                           |                                                           |  |
| K/A:                                                                                     | W/EO8 K3.2                                                                                                                                      | Importance:3.6                                            |  |
| Cog                                                                                      | nitive Level: Knowledge                                                                                                                         |                                                           |  |
| Refe                                                                                     | rences: 2OM-53B.4.FR-P.1, Bacl                                                                                                                  | kground for Step 6, Issue 1B, Rev. 1, page 21             |  |
| Less                                                                                     | on Plan #:2LP-SQS-53.3                                                                                                                          | Obj. #: 3                                                 |  |
|                                                                                          |                                                                                                                                                 |                                                           |  |
| Histo                                                                                    | ory: NEW                                                                                                                                        |                                                           |  |
| Sou                                                                                      | rce:                                                                                                                                            | Type: CLOSED BOOK                                         |  |
| JTA:                                                                                     | 3110140601                                                                                                                                      |                                                           |  |
|                                                                                          |                                                                                                                                                 |                                                           |  |
|                                                                                          |                                                                                                                                                 |                                                           |  |
|                                                                                          |                                                                                                                                                 |                                                           |  |
|                                                                                          |                                                                                                                                                 |                                                           |  |
|                                                                                          |                                                                                                                                                 |                                                           |  |

| 10.    | The unit is operating at 100% powers                                       | with all systems NSA when the Section A1 M |  |
|--------|----------------------------------------------------------------------------|--------------------------------------------|--|
| 10.    |                                                                            |                                            |  |
|        | Condenser Water Box Outlet Valve [2CWS*MOV100A] malfunctions and closes. U |                                            |  |
|        | power remains constant.                                                    |                                            |  |
|        | As a result, the temperature of CWS                                        | to the cooling tower will (1) and conde    |  |
|        | absolute pressure will (2).                                                |                                            |  |
|        | A. (1) rise, (2) rise                                                      |                                            |  |
|        | B. (1) fall, (2) fall                                                      |                                            |  |
|        | C. (1) rise, (2) fall                                                      |                                            |  |
|        | D. (1) fall, (2) rise                                                      |                                            |  |
|        |                                                                            |                                            |  |
| ANSV   | NSWER:A                                                                    |                                            |  |
| K/A:0  | 00051 K1.01                                                                | Importance:2.4                             |  |
| Cogni  | itive Level: Comprehension                                                 |                                            |  |
| Refer  | ences: Component Fundamentals, To                                          | opic 1, Section B, Heat Exchangers and     |  |
|        | Condensers, Page 16 (See W                                                 | /estinghouse HTFF Book page 9-33 & 34      |  |
| Lesso  | on Plan #: 2LP-SQS-26.2                                                    | Obj. #: 6                                  |  |
|        |                                                                            |                                            |  |
| Histor | ry: NEW                                                                    |                                            |  |
|        |                                                                            | Type: CLOSED BOOK                          |  |
| Sourc  |                                                                            |                                            |  |
|        | 0550110101                                                                 |                                            |  |
|        |                                                                            |                                            |  |
|        | 0550110101                                                                 |                                            |  |
|        | 0550110101                                                                 |                                            |  |

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| 11. The unit has tripped from 100% power coincident with a complete loss of the |                                                   |  |  |  |
|---------------------------------------------------------------------------------|---------------------------------------------------|--|--|--|
| switchyard.                                                                     | switchyard.                                       |  |  |  |
| All RCP pumps are off.                                                          |                                                   |  |  |  |
| RVLIS is available.                                                             |                                                   |  |  |  |
| RCS temperature and pres                                                        | sure are trending toward no-load values.          |  |  |  |
| 4Kv Emergency Bus 2AE a                                                         | nd 2DF failed to load on the EDG's.               |  |  |  |
| Based on these symptoms, which of the                                           | ne following procedures could be entered directly |  |  |  |
| without entering E-0 *Reactor Trip and                                          | Safety Injection?"                                |  |  |  |
| A. FR-C.1 "Response to Inadequate Core Cooling"                                 |                                                   |  |  |  |
| B. ECA-0.1 "Loss of All AC Power Recovery Without SI Required"                  |                                                   |  |  |  |
| C. ES-0.2 "Natural Circulation Cooldown"                                        |                                                   |  |  |  |
| D. ECA-0.0 "Loss of All AC Power"                                               |                                                   |  |  |  |
| ANSWER:D                                                                        |                                                   |  |  |  |
| K/A: 000055 G 2.4.1                                                             | Importance:4.3                                    |  |  |  |
| Cognitive Level: Comprehension                                                  |                                                   |  |  |  |
| References: 20M-53B.2 Section IV, Issue 1B, Rev 4, Page 13                      |                                                   |  |  |  |
| Lesson Plan #: 2LP-SQS-53.1 Obj. #: 1                                           |                                                   |  |  |  |
|                                                                                 |                                                   |  |  |  |
| History: NEW                                                                    |                                                   |  |  |  |
| Source:                                                                         | Type: CLOSED BOOK                                 |  |  |  |
| JTA: 3010060601                                                                 |                                                   |  |  |  |

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| 12. Due to performing a maintainence work order, the 21B Steam Gene                      |                                                              | e work order, the 21B Steam Generator level control |  |  |  |
|------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------|--|--|--|
|                                                                                          | inputs are selected as follows:                              |                                                     |  |  |  |
| S/G B Feedwater Flow [2FWS-FI486] is on Channel IV                                       |                                                              |                                                     |  |  |  |
|                                                                                          | S/G B Steam Flow [2MSS-FI485] is on Channel IV               |                                                     |  |  |  |
|                                                                                          | ressure is selected to Position PT446 (Channel III)          |                                                     |  |  |  |
| What will be the initial response of SG Main Feedwater Control Valve [2FWS*FCV488]       |                                                              |                                                     |  |  |  |
| on Steam Generator 21B to the loss of 120 Vital Bus 3?                                   |                                                              |                                                     |  |  |  |
| A. The valve opens as S/G B Feedwater Flow 2FWS*FT486 fails low.                         |                                                              |                                                     |  |  |  |
|                                                                                          | S/G B Steam Flow 2MSS*FT485 fails low.                       |                                                     |  |  |  |
| C. The valve closes as Turbine First Stage Pressure 2MSS*PT446 fails lo                  |                                                              |                                                     |  |  |  |
|                                                                                          | D. The valve opens as S/G B Steam Flow 2MSS*PT485 fails low. |                                                     |  |  |  |
|                                                                                          |                                                              |                                                     |  |  |  |
| ANSWER:C                                                                                 |                                                              |                                                     |  |  |  |
| K/A: 000057 A2.19                                                                        |                                                              | Importance:4.0/4.3                                  |  |  |  |
| Cognitive Level: Application                                                             |                                                              |                                                     |  |  |  |
| References: 2OM-38.4.V, Issue 1, Rev. 6, 2OM-24.4,IF, Issue 4,Rev. 5, USFSAR Fig. 7-3.18 |                                                              |                                                     |  |  |  |
| Lesso                                                                                    | n Plan #: 2SQS-24.1                                          | Obj. #: 5                                           |  |  |  |
|                                                                                          |                                                              |                                                     |  |  |  |
| History: NEW                                                                             |                                                              |                                                     |  |  |  |
| Histor                                                                                   | y: NEW                                                       |                                                     |  |  |  |
| Histor<br>Source                                                                         | · ·                                                          | Type: OPEN Book                                     |  |  |  |
| Source                                                                                   | · ·                                                          |                                                     |  |  |  |
| Source                                                                                   | e:                                                           | Type: OPEN Book                                     |  |  |  |
| Source                                                                                   | e:                                                           | Type: OPEN Book<br>Give UFSAR Figure 7-3.18         |  |  |  |
| Source                                                                                   | e:                                                           | Type: OPEN Book<br>Give UFSAR Figure 7-3.18         |  |  |  |

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| 13.  | A fire has started in the Cable Spr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | eading Room [CB-2]. The fire is now out of control    |  |        |  |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--|--------|--|
|      | and the fire brigade has not been                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | able to enter the area. Smoke is entering the control |  |        |  |
|      | room and the ANSS has implemented 20M-56C *Alternate Safe Shutdown From                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |  |        |  |
|      | Outside Control Room".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                       |  |        |  |
|      | <ul> <li>Which of the methods is to be used bring the unit to Cold Shutdown?</li> <li>A. Conduct a natural circulation cooldown using only the Train B (Purple) equipment from the control room.</li> <li>B. Conduct a forced circulation cooldown using only Train A (Orange) Train equipment from the Alternate Shutdown Panel.</li> <li>C. Transfer all Train B (Purple) equipment to the Emergency Shutdown Panel and conduct a natural circulation cooldown.</li> <li>D. Transfer all Train A (Orange) equipment to the Alternate Shutdown Panel and conduct a natural circulation cooldown.</li> </ul> |                                                       |  |        |  |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                       |  |        |  |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                       |  |        |  |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                       |  |        |  |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                       |  |        |  |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                       |  |        |  |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                       |  |        |  |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                       |  |        |  |
| ANS  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                       |  | WER: D |  |
| K/A: | 000067 K3.02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Importance: 2.5                                       |  |        |  |
| Cogr | nitive Level: Knowledge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |  |        |  |
|      | rences: 20M-53B.4. 20M-56C.4.B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | , Issue 1, Rev. 14                                    |  |        |  |
|      | on Plan #: 2LP-SQS-56C.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Obj. #: 2                                             |  |        |  |
| 2000 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                       |  |        |  |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                       |  |        |  |
|      | ory: NEW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                       |  |        |  |
| Sour | ce:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Type: Closed Book                                     |  |        |  |
| JTA: | 0000020401                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                       |  |        |  |

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| 14.                                                                               | The control room was evacuated due to a fire. Procedure 20M-56C.4.A" Alternate Safe   |                                        |  |  |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|--|--|
| Shutdown from Outside the Control Room" is in progress. Control has been establis |                                                                                       |                                        |  |  |
|                                                                                   | at the Alternate Shutdown Panel.                                                      |                                        |  |  |
|                                                                                   | Which of the following steam release paths is available to cooldown the unit from the |                                        |  |  |
|                                                                                   | ASP?                                                                                  |                                        |  |  |
|                                                                                   | A. Atmospheric Dump Valve [25                                                         | SVS*PCV101A] and Residual Heat Release |  |  |
|                                                                                   | [2SVS*HCV104].                                                                        |                                        |  |  |
| B. Atmospheric Dump Valve [2SVS*101B] and the Residual Heat Rele                  |                                                                                       |                                        |  |  |
|                                                                                   | [2SVS*HC104].                                                                         |                                        |  |  |
|                                                                                   | C. Atmospheric Dump Valves [2SVS*PCV101A, 101C].                                      |                                        |  |  |
|                                                                                   | D. Atmospheric Dump Valves [2                                                         | SVS*PCV101A, 101B].                    |  |  |
|                                                                                   |                                                                                       |                                        |  |  |
| ANSWER: D                                                                         |                                                                                       |                                        |  |  |
| к/а: ,0                                                                           | 000068 K3.06                                                                          | Importance: 3.9                        |  |  |
| Cognitive Level: Knowledge                                                        |                                                                                       |                                        |  |  |
| References: 20M-56C.4.A, Issue 1, Rev. 8, Page A 3                                |                                                                                       |                                        |  |  |
|                                                                                   | on Plan #: 2LP-SQS-56C.1                                                              | Obj. #: 6                              |  |  |
|                                                                                   |                                                                                       |                                        |  |  |
| History: NEW                                                                      |                                                                                       |                                        |  |  |
| Source                                                                            | · ·                                                                                   | Type: Closed Book                      |  |  |
|                                                                                   | 0000020401                                                                            |                                        |  |  |
|                                                                                   |                                                                                       |                                        |  |  |

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| 15. Unit 2 Containment operates at sub-atn     | nospheric pressure. Maintenance of sub-                                 |  |
|------------------------------------------------|-------------------------------------------------------------------------|--|
| atmospheric pressure is required to me         | et which one of the following criteria?                                 |  |
| A. Maintain minimum flow to Co                 | A. Maintain minimum flow to Containment Radiation Monitors 2RQ-303A and |  |
| 303B for leakage detection.                    | 303B for leakage detection.                                             |  |
| B. Ensure containment pressur                  | Ensure containment pressure can be restored to sub-atmospheric pressure |  |
| within 1 hour after a Design                   | within 1 hour after a Design Basis Accident.                            |  |
| C. Maintain leakage for all at po              | C. Maintain leakage for all at power operational modes up to Technical  |  |
| Specification limits.                          | Specification limits.                                                   |  |
| D. Ensure containment tempera                  | ature can be maintained at a minimum of 85                              |  |
| degrees in Modes 1 to 4.                       |                                                                         |  |
|                                                |                                                                         |  |
| ANSWER: B                                      |                                                                         |  |
| K/A: 000069 K1.01                              | Importance: 2.6                                                         |  |
| Cognitive Level: Knowledge                     |                                                                         |  |
| References: Basis for Tech Spec. 3/4.6.1.4 and | d 6.1.5 Page B 3/4 6-9, Amendment 80                                    |  |
| Lesson Plan #: 2LP-SQS-13.1                    | Obj. #: 1                                                               |  |
|                                                |                                                                         |  |
| History: NEW                                   |                                                                         |  |
| Source:                                        | Type: Closed Book.                                                      |  |
| JTA: 0260060201                                |                                                                         |  |

Sistactora . Do they go with question ?

| 5. Unit 2 is at 100% power with all systems NSA. Which of the following detectors will |                   |  |
|----------------------------------------------------------------------------------------|-------------------|--|
| indicate a failed fuel pin leaking into into the RCS?                                  |                   |  |
| A. Aerated Vent Transfer Line Monitor [2GWS-RQ103]                                     |                   |  |
| B. Elevated Release Monitor [2HVS-RQ109A, 109B]                                        |                   |  |
| C. Reactor Containment Area Low Range [2RMR-RQ201]                                     |                   |  |
| D. Reactor Coolant Letdown Monitor [2CHS-RQ101A,B]                                     |                   |  |
| ANSWER: D                                                                              |                   |  |
| K/A: 000076 K2.01                                                                      | Importance:2.6    |  |
| Cognitive Level: Knowledge                                                             |                   |  |
| References: 20M-43.1.C, Issue 4, Rev. 3, Page 8                                        |                   |  |
| Lesson Plan #: 2LP-SQS-43.1 Obj. #: 2                                                  |                   |  |
|                                                                                        |                   |  |
| History: NEW                                                                           |                   |  |
| Source:                                                                                | Type: CLOSED BOOK |  |
| JTA: 072BBB0221                                                                        |                   |  |

| 17. The unit is operating at 100% Rated Thermal Power when control rods H2 and H4                                                                                                        |                                         |                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------------|
|                                                                                                                                                                                          |                                         |                                                  |
|                                                                                                                                                                                          |                                         | rder to meet power distribution limits specified |
|                                                                                                                                                                                          | the FSAR, which of the following action | s is required from 2OM-53C.4.2.1.8 " Rod         |
|                                                                                                                                                                                          | Inoperability?                          |                                                  |
|                                                                                                                                                                                          | A. Lower turbine load to less than      | 75% power at 5% per minute.                      |
| B. Trip the reactor and go to E-0 "Reactor Trip and Safety Injection" Step 1.<br>$N \not\in \mathcal{P}$ C. Dilute until Control Bank D reads zero steps and Bank D rod bottom lights ar |                                         | Reactor Trip and Safety Injection" Step 1.       |
|                                                                                                                                                                                          |                                         | •                                                |
| ANSV                                                                                                                                                                                     | VER:B                                   |                                                  |
| K/A:0                                                                                                                                                                                    | 00003 K3.04                             | Importance:3.8                                   |
| Cogn                                                                                                                                                                                     | itive Level: Memory                     |                                                  |
| Refer                                                                                                                                                                                    | ences: 20M-53C.4.2.1.8, Issue 1A, Rev.  | 0                                                |
| Lesso                                                                                                                                                                                    | on Plan #: 2LP-SQS-53C.1                | Obj. #: 1                                        |
|                                                                                                                                                                                          |                                         |                                                  |
| Histo                                                                                                                                                                                    | ry: NEW                                 |                                                  |
| Sourc                                                                                                                                                                                    | ce:                                     | Type Closed Book                                 |
| JTA:                                                                                                                                                                                     | 0000070401                              |                                                  |
|                                                                                                                                                                                          |                                         |                                                  |

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| 18.                                                              | The unit has tripped but a Safety Injection was NOT required. The crew has     |                                                                       |  |
|------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------|--|
|                                                                  | transitioned to ES-0.1" Reactor Trip Reponse." The following conditions exist: |                                                                       |  |
|                                                                  | All steam generators a                                                         | are below the narrow range                                            |  |
|                                                                  | All reactor coolant pur                                                        | mps are operating                                                     |  |
|                                                                  | Steam Dumps are opt                                                            | en to the condenser and Tave is trending to 547                       |  |
|                                                                  | Auxiliary Feedwater is                                                         | 200 gpm to each steam generator                                       |  |
|                                                                  | Is the requirement for a seconda                                               | ry heat sink met?                                                     |  |
| A. Yes, the steam dumps are open and the condenser is available. |                                                                                | s are open and the condenser is available.                            |  |
|                                                                  | B. Yes, total auxiliary fee                                                    | B. Yes, total auxiliary feedwater flow is greater than 365 gpm.       |  |
|                                                                  | C. No, all steam generator levels are less than 5% in the narrow range.        |                                                                       |  |
|                                                                  | D. No, auxiliary feedwate                                                      | D. No, auxiliary feedwater must be greater than 365 gpm to each steam |  |
|                                                                  | generator.                                                                     |                                                                       |  |
| ANSV                                                             | VER: B                                                                         |                                                                       |  |
| K/A: (                                                           | 000007 G.2.4.8                                                                 | Importance: 3.0                                                       |  |
| Cogn                                                             | gnitive Level: Comprehension                                                   |                                                                       |  |
| Refer                                                            | ences: 20M-53B.4.ES-0.1' Reacto                                                | r Trip Response Background" Issue 1B, Rev. 5                          |  |
|                                                                  | sson Plan #: 2LP-SQS-53.3 Obj. #: 3                                            |                                                                       |  |
|                                                                  |                                                                                |                                                                       |  |
| Histo                                                            | ry: NEW                                                                        |                                                                       |  |
| Sourc                                                            | Xe:                                                                            | Type: Closed Book                                                     |  |
|                                                                  | 3010010601                                                                     |                                                                       |  |

| 19.                                                                       | The unit has tripped from 100% power due to a PZR Power Operated Relief Valve                                                                |                                                                               |  |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--|
|                                                                           | which has failed full open. What conditions will develop in the RCS if the Motor                                                             |                                                                               |  |
|                                                                           | Operated Isolation Valve fails to                                                                                                            | •                                                                             |  |
|                                                                           | •                                                                                                                                            | apacity of normal charging line flow, so RCS pressure                         |  |
|                                                                           | will stabilize at or near 2235 psig.                                                                                                         |                                                                               |  |
|                                                                           | B. HHSI flow will be initiated via the cold leg SI injection and RCS pressure will<br>Whate shat of head?<br>stabilize at or near 2235 psig. |                                                                               |  |
|                                                                           |                                                                                                                                              |                                                                               |  |
| C. Breakflow will be within capacity of normal charging flow, so RCS pres |                                                                                                                                              |                                                                               |  |
|                                                                           | stabilizes at or near 1200                                                                                                                   | psig.                                                                         |  |
|                                                                           | D. HHSI flow will be initiated                                                                                                               | D. HHSI flow will be initiated via the cold leg SI injection and RCS pressure |  |
|                                                                           | stabilizes at or near 1200                                                                                                                   | psig.                                                                         |  |
| ANS                                                                       | WER: D                                                                                                                                       |                                                                               |  |
|                                                                           | 000008 AA2.25                                                                                                                                | Importance:2.8                                                                |  |
| Cogr                                                                      | itive Level: Comprehension                                                                                                                   |                                                                               |  |
|                                                                           |                                                                                                                                              | round, Issue 1B, Rev. 6, page 11 and 20                                       |  |
|                                                                           | on Plan #: 2LP-SQS-11.1                                                                                                                      | Obj. #: 5                                                                     |  |
|                                                                           |                                                                                                                                              |                                                                               |  |
| Histo                                                                     | bry: NEW                                                                                                                                     |                                                                               |  |
| Sour                                                                      |                                                                                                                                              | Type: CLOSED BOOK                                                             |  |
|                                                                           | 3110060601                                                                                                                                   |                                                                               |  |

| 20.                            | A large LOCA has occurred on                                                                        | Unit 2.                                                    | Containment is at design maximum pressur                 |
|--------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------|
|                                | The RCS is at saturation with system pressure matching containment pressure. All                    |                                                            |                                                          |
|                                | equipment has responded as re                                                                       | quired I                                                   | by the SSPS. The RWST is 600 inches and                  |
|                                | dropping.                                                                                           |                                                            |                                                          |
|                                |                                                                                                     | tion for t                                                 | the Low Head Safety Injection Pumps                      |
|                                | [2SIS*P21A, 21B] under these                                                                        |                                                            |                                                          |
|                                | A. Operating at maxim                                                                               | um rateo                                                   | d flow of both pumps.                                    |
|                                | B. Operating at shutoff                                                                             | head wi                                                    | ith recirculation flow to the RWST.                      |
|                                | C. Shutdown on Refue                                                                                | C. Shutdown on Refueling Water Storage Tank Low Low level. |                                                          |
|                                | D. Flow limited by the t                                                                            | hrottled                                                   | settings for RCS Cold Leg SI Throttle valve              |
|                                |                                                                                                     |                                                            |                                                          |
| ANS                            | WER: A                                                                                              |                                                            |                                                          |
|                                | 000011 K2.02                                                                                        |                                                            | Importance: 2.6                                          |
|                                |                                                                                                     |                                                            |                                                          |
| Coar                           | itive Level: Comprehension                                                                          |                                                            |                                                          |
|                                | itive Level: Comprehension                                                                          | <b>0</b>                                                   |                                                          |
| Refe                           | rences 2OM-11.1.C, Issue 4, Rev                                                                     | . 0 page                                                   | 93, 20M-11.1.D, Iss. 4, Rev. 0, page 3, 20M              |
| Refe                           |                                                                                                     | . 0 page                                                   | 3, 20M-11.1.D, Iss. 4, Rev. 0, page 3, 20M               |
| Refe<br>11.2.                  | rences 2OM-11.1.C, Issue 4, Rev                                                                     | . 0 page                                                   | 93, 20M-11.1.D, Iss. 4, Rev. 0, page 3, 20M<br>Obj. #: 5 |
| Refe<br>11.2.                  | rences 2OM-11.1.C, Issue 4, Rev<br>B, Issue 4, Rev. 2 Page 3.                                       | . 0 page                                                   | I                                                        |
| Refe<br>11.2.<br>Less          | rences 2OM-11.1.C, Issue 4, Rev<br>B, Issue 4, Rev. 2 Page 3.<br>on Plan #: 2LP-SQS-11.1            | . 0 page                                                   | I                                                        |
| Refe<br>11.2.<br>Less<br>Histo | rences 2OM-11.1.C, Issue 4, Rev<br>B, Issue 4, Rev. 2 Page 3.<br>on Plan #: 2LP-SQS-11.1<br>ry: NEW | . 0 page                                                   |                                                          |
| Refe<br>11.2.<br>Less<br>Histo | rences 2OM-11.1.C, Issue 4, Rev<br>B, Issue 4, Rev. 2 Page 3.<br>on Plan #: 2LP-SQS-11.1<br>ry: NEW | . 0 page                                                   | I                                                        |

| 21. Following a Safety Injection signal, Letdown Orifice Isolation [2CHS-AOV200B] failed to رواب المروبين المر |                                       |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|--|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                       |  |
| which of the following results can be expected?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                       |  |
| A. Thermal shock to the charging line penetration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                       |  |
| B. Rapid core uncovery and fuel damage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                       |  |
| C. Loss of recirculation capability from the Containment Sump.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |  |
| D. Loss of injection flow to the RCS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | loop 21A.                             |  |
| ANSWER: C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                       |  |
| K/A: W/E04 EK2.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Importance: 3.8                       |  |
| Cognitive Level: Knowledge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       |  |
| References: 20M-7.5, Issue 4, Rev. 0, Figure 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 7-1A, Rev. 7                          |  |
| Lesson Plan #: 2LP-SQS-7,1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Obj. #: 1                             |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                       |  |
| History: NEW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                       |  |
| Source:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Type: Closed Book                     |  |
| JTA: 0040150101                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                       |  |
| JTA: 0040150101<br>Horre SI thur ge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | + ID live look?                       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | · · · · · · · · · · · · · · · · · · · |  |

| The actions of E-1" Loss of Primary or Secondary Coolant" are in progress. |                                                  |  |
|----------------------------------------------------------------------------|--------------------------------------------------|--|
| Annunciator A1-2E * RECIRCULATION MODE INITIATION is lit. All systems      |                                                  |  |
| associated with this alarm perform as required.                            |                                                  |  |
| If the Containment Emergency Sump is empty, which of the following pump    |                                                  |  |
| combinations may be damaged?                                               |                                                  |  |
| A. Quench Spray Pumps [2QSS*P21A, 21B]                                     |                                                  |  |
| B. Low Head Safety Injection F                                             | umps [2SIS*P21A, P21B]                           |  |
| C. Residual Heat Removal Pur                                               | C. Residual Heat Removal Pumps [2RHR*P21A, 21B]. |  |
| D. High Head Safety Injection                                              | Pumps [2CHS*P21A and B]                          |  |
| ANSWER: D                                                                  |                                                  |  |
| K/A: W/E11 K1.3 Importance: 3.6                                            |                                                  |  |
| Cognitive Level: Knowledge                                                 |                                                  |  |
| References: 20M-11.1.D. Issue 4, Rev. 0, page 2                            |                                                  |  |
| Lesson Plan #: 2LP-SQS-11.1 Obj. #: 5                                      |                                                  |  |
|                                                                            |                                                  |  |
| History: NEW                                                               |                                                  |  |
| Source:                                                                    | Type: Closed Book                                |  |
| JTA:0060160102                                                             |                                                  |  |

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| 23.    | The unit operators are recovering from an Inadvertent SI. The following annunciators |  |  |
|--------|--------------------------------------------------------------------------------------|--|--|
|        | are verified:                                                                        |  |  |
|        | <ul> <li>A12-1C, "AUTO SAFETY INJECTION BLOCKED" is lit</li> </ul>                   |  |  |
|        | A12-1D, "SAFETY INJECTION SIGNAL" is off.                                            |  |  |
|        | <ul> <li>CIA and CIB (Both Trains) reset pushbuttons have been actuated.</li> </ul>  |  |  |
|        | While attempting to restore charging flow, Charging I solation Valve [2CHS*MOV310]   |  |  |
|        | opens and remains open, Charging Isolation Valve [2CHS*MOV289] recloses when the     |  |  |
|        | control switch is released.                                                          |  |  |
|        | Which operator action is required to open 2CHS*MOV289?                               |  |  |
|        | A. Open and verify P-4 signal from Reactor Trip Breaker A on PSMS, Data Page 1       |  |  |
|        | B. Reset Train A CIA signal using "Containment Isolation Phase A Reset"              |  |  |
|        | pushbutton on BB-A                                                                   |  |  |
|        | C. Push and verify "Manual Action System Bypass Status Train A - HHSI" light lit on  |  |  |
|        | panel 1069                                                                           |  |  |
|        | D. Reset Train A SI slave relays using switch S821 at Safeguards Test Cabinet.       |  |  |
| ANSV   | /ER: D                                                                               |  |  |
|        | I/E02 K2.1 Importance: 3.4                                                           |  |  |
|        | ive Level: Application                                                               |  |  |
|        |                                                                                      |  |  |
| Heter  | ences: 2OM-53B.4.ES-1.1, Issue 1B Rev 6 Background for step 2 Note 1                 |  |  |
| Lesso  | n Plan #: 2LP-SQS-53.3 Obj. #: 6                                                     |  |  |
|        |                                                                                      |  |  |
| Histor | y: NEW                                                                               |  |  |
| Sourc  | e: Type: OPEN BOOK                                                                   |  |  |
| JTA: 3 | Copy of ES 1.1                                                                       |  |  |

| 24.   | Unit 2 is cooling down and has reach                              | ed Mode 4. RHS is valved in for service and 2A   |  |
|-------|-------------------------------------------------------------------|--------------------------------------------------|--|
|       | RHS Pump [2RHS*P21A] is running.                                  |                                                  |  |
|       | <ul> <li>RCS temperature is being</li> </ul>                      | maintained at 325°F                              |  |
|       | RCS pressure is at 335 ps                                         | sig                                              |  |
|       | All RHS system compone                                            | nts are NSA                                      |  |
|       | B RHS train is available for                                      | or service                                       |  |
|       | According to the VOND, if RCS Pres                                | sure Transmitter [2RCS*PT440] fails high, which  |  |
|       | the following describes what will hap                             | pen to the RHS system?                           |  |
|       | A. 2RHS*MOV701A and 2R                                            | HS*701B close and A RHS pump trips.              |  |
|       | B. 2RHS*MOV701A and 2RHS*702A close and A RHS pump trips.         |                                                  |  |
|       | C. 2RHS*MOV701B and 2RHS*702B close and B RHS pump is inoperable. |                                                  |  |
|       | D. 2RHS*MOV702A and 2RHS*702B close and B RHS pump is inoperable. |                                                  |  |
| ANS   | WER: A                                                            |                                                  |  |
| K/A:  | 000025 K3.02                                                      | Importance: 3.3                                  |  |
| Cogr  | gnitive Level: Application                                        |                                                  |  |
| Refe  | rences: 20M-10.5, Issue 4, Rev. 0 Figu                            | ire 10-1, 2OM-10.1.D, Issue 4, Rev. 0, page 3 to |  |
|       | on Plan #: 2LP-SQS-10.1                                           | Obj. #: 9                                        |  |
|       |                                                                   |                                                  |  |
| Histo | ory: NEW                                                          |                                                  |  |
| Sour  | ce:                                                               | Type: OPEN BOOK                                  |  |
| JTA:  | 0050080101                                                        | Open- Give figure 10-1                           |  |
|       |                                                                   |                                                  |  |

| 25.                                                                                      | The NCO manually actuates a reactor trip but the trip breakers fail to open. The plant                                                                                                                       |                                                                                                             |
|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| operator must manually trip the turbine because of the failure of which of the following |                                                                                                                                                                                                              | because of the failure of which of the following                                                            |
|                                                                                          | 2MSS*PT447] still indicate g                                                                                                                                                                                 | essure Transmitters [2MSS*PT446,<br>greater than 40% power.<br>g due to both Reactor Trip Breakers [RTA and |
|                                                                                          | <ul> <li>C. SSPS Train A and B signals for Turbine Trip on Reactor Trip above P-9 were not generated.</li> <li>D. AMSAC Timer B-3 is blocked because both Main Feedwater Pumps are still running.</li> </ul> |                                                                                                             |
| ANSW                                                                                     | /ER: B                                                                                                                                                                                                       |                                                                                                             |
| K/A: 0                                                                                   | 00029 A2.09                                                                                                                                                                                                  | Importance:4.4                                                                                              |
| Cogni                                                                                    | tive Level: Comprehension                                                                                                                                                                                    |                                                                                                             |
| Refere                                                                                   | ences: FSAR Figure 7.3-20                                                                                                                                                                                    |                                                                                                             |
| Lesso                                                                                    | n Plan #: 2LP-SQS-26.3                                                                                                                                                                                       | Obj. #: 4                                                                                                   |
| Histor                                                                                   | y: NEW                                                                                                                                                                                                       |                                                                                                             |
| Sourc                                                                                    |                                                                                                                                                                                                              | Type: CLOSED BOOK                                                                                           |
| JTA: (                                                                                   | 0450070101                                                                                                                                                                                                   |                                                                                                             |

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| 26.    | The unit is operating with a steam ger | erator tube leak in Steam Generator 21C. Air  |
|--------|----------------------------------------|-----------------------------------------------|
|        | Ejector Discharge [2ARC-RQ100] rad     | ation monitor is in "ALERT." Over the next 60 |
|        |                                        | alarm setpoint. What action should be taken?  |
|        | A. Perform an emergency                | shutdown in accordance with AOP 2.51.1 and b  |
|        | in MODE 3 as quickly a                 | as possible.                                  |
|        | B. Shutdown the plant and              | d be in MODE 3 within 6 hours.                |
|        | C. Trip the Reactor and To             | urbine go to E-0 "Reactor Trip and Safety     |
|        | Injection" Step 1.                     |                                               |
|        | D. Continue to monitor the             | e affected Steam Generator and prepare for a  |
| ·      | normal plant shutdown                  | ·                                             |
|        | WER: A                                 | ·                                             |
| K/A: ( | 000037 K3.02                           | Importance: 3.2                               |
| Cogn   | itive Level: Application               |                                               |
| Refer  | rences: 20M-53C.4.2.6.4, Issue 1A, Rev | v. 9, Step 3                                  |
| Lesso  | on Plan #: 2LP-SQS-53C.1               | Obj. #: 8                                     |
|        |                                        |                                               |
| Histo  | ry: NEW                                |                                               |
| Sourc  | ce:                                    | Type OPEN BOOK.                               |
|        | 0000110101                             | Give student AOP 4.6.4                        |
| JTA:   | 0000110401                             |                                               |
| JTA:   | 0000110401                             |                                               |

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| 27.   | A steam generator tube has r                                                        | uptured in the 21C Steam Generator. The crew is                    |
|-------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------|
|       | performing the actions require                                                      | ed by E-3" Steam Generator Tube Rupture". The                      |
|       | cooldown of the RCS has be                                                          | en completed and RCS pressure matches steam generat                |
|       | pressure. Leakage into the a complete which of the following                        | ffected steam generator will continue until the operators ng task? |
|       | A. Isolate the 21C steam                                                            | generator and depressurize 21A and 21B steam                       |
|       | generators by at least                                                              | 100 psig.                                                          |
|       | B. Isolate the 21C steam                                                            | generator and raise level in 21C steam generator to a              |
|       | minimum of 5% level                                                                 | n the narrow range.                                                |
|       | lpha C. Spray the pressurizer as needed to minimize subcooling and hold the RCS     |                                                                    |
|       | <ul> <li>pressure equals steam pressure in the affected steam generator.</li> </ul> |                                                                    |
|       | D. Restore normal charging and letdown and balance RCS pressure to match 210        |                                                                    |
|       | steam generator pres                                                                | sure.                                                              |
|       |                                                                                     |                                                                    |
| ANS   | WER: D                                                                              |                                                                    |
| K/A:  | 000038 K1.02                                                                        | Importance: 3.2                                                    |
|       | nitive Level: Knowledge                                                             |                                                                    |
|       | rences: 20M-53B.E-3 Backgrou                                                        | ind Issue 1B Bey 7 page                                            |
|       |                                                                                     | Obj. #: 3                                                          |
| Less  | on Plan #: 2LP-SQS-53.3                                                             | Obj. #. 3                                                          |
|       |                                                                                     |                                                                    |
| Histo | ry: NEW                                                                             |                                                                    |
|       | <b>AA:</b>                                                                          | Type: Closed Book                                                  |
| Sour  |                                                                                     |                                                                    |

| 28.                                                          | Unit 2                                                                                | has tripped from 100% power due                                                  | e to a small break LOCA. All RCP pump   |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------|
|                                                              | operations were terminated when RCS pump trip criteria were met. With the 21C         |                                                                                  |                                         |
|                                                              | Steam Generator isolated and a natural circulation cooldown in progress, which of the |                                                                                  |                                         |
|                                                              | following responses may be expected from Loop 21C due to "loop stagnation"?           |                                                                                  |                                         |
|                                                              | A. Tcold follows Loops 21A and 21B as steam pressure falls in Steam Generators        |                                                                                  |                                         |
|                                                              |                                                                                       | 21A and 21B.                                                                     |                                         |
|                                                              | В.                                                                                    | Tcold falls rapidly as SI flows fills                                            | s the cold leg and RCP casing.          |
|                                                              | C.                                                                                    | C. Tcold remains at or near saturation temperature for Steam Generator 21C steam |                                         |
|                                                              |                                                                                       | pressure.                                                                        |                                         |
|                                                              | D.                                                                                    | Tcold rises as Loop 21C stagnat                                                  | es during cooldown of loops 21A and 21B |
|                                                              |                                                                                       |                                                                                  |                                         |
| ANSW                                                         | ER: B                                                                                 |                                                                                  |                                         |
| K/A: 00                                                      | 00038 I                                                                               | <1.01                                                                            | Importance: 4.1                         |
| Cognitive Level: Knowledge                                   |                                                                                       |                                                                                  |                                         |
| References: 2OM-53B.5.GI-12, Issue 1b, Rev. 1, Pages 1 and 4 |                                                                                       |                                                                                  |                                         |
| Lessor                                                       | n Plan #                                                                              | #: 2LP-SQS-53.2                                                                  | Obj. #: 9                               |
|                                                              |                                                                                       |                                                                                  |                                         |
| History                                                      | /: NEW                                                                                |                                                                                  |                                         |
| Source                                                       | э:                                                                                    |                                                                                  | Type: CLOSED BOOK                       |
| JTA: 3                                                       | 010040                                                                                | )601                                                                             |                                         |
|                                                              |                                                                                       |                                                                                  |                                         |

| 29. Unit 2 is operating at 30% Rated Therr                                                                               |                                                                                   |  |  |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--|--|
|                                                                                                                          | Unit 2 is operating at 30% Rated Thermal Power with all systems NSA. Which one of |  |  |
| the following will actuate the Motor Driven Auxiliary Feedwater Pump [2FWE*23A]?                                         |                                                                                   |  |  |
| A. 4Kv Emergency Bus 2AE at 75                                                                                           | A. 4Kv Emergency Bus 2AE at 75% of rated voltage on 1 of 3 phases.                |  |  |
| B. 2RCS*SG21A Narrow Range L                                                                                             | B. 2RCS*SG21A Narrow Range Level Transmitter [2FWS*LT474] less than 5%.           |  |  |
| C. Low Pressurizer Pressure signa                                                                                        | al at 1845 psig on 2RCS*PT455 and 456.                                            |  |  |
| D. 2RCS*SG21A Feed Flow mism                                                                                             | natch on 2FWS*FT476 for 25 seconds.                                               |  |  |
|                                                                                                                          |                                                                                   |  |  |
| ANSWER: C                                                                                                                |                                                                                   |  |  |
| K/A: 000054 A2.03 Importance: 4.1                                                                                        |                                                                                   |  |  |
|                                                                                                                          |                                                                                   |  |  |
|                                                                                                                          |                                                                                   |  |  |
| Cognitive Level: Knowledge                                                                                               |                                                                                   |  |  |
| Cognitive Level: Knowledge<br>References: 20M-24.1.D, Issue 4, Rev. 2 and                                                |                                                                                   |  |  |
| Cognitive Level: Knowledge                                                                                               | 20M-24.1.E, Issue 4, Rev. 1                                                       |  |  |
| Cognitive Level: Knowledge<br>References: 20M-24.1.D, Issue 4, Rev. 2 and                                                | 20M-24.1.E, Issue 4, Rev. 1                                                       |  |  |
| Cognitive Level: Knowledge<br>References: 2OM-24.1.D, Issue 4, Rev. 2 and<br>Lesson Plan #: 2LP-SQS-24.1                 | 20M-24.1.E, Issue 4, Rev. 1                                                       |  |  |
| Cognitive Level: Knowledge<br>References: 20M-24.1.D, Issue 4, Rev. 2 and<br>Lesson Plan #: 2LP-SQS-24.1<br>History: NEW | 20M-24.1.E, Issue 4, Rev. 1<br>Obj. #: 10                                         |  |  |

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| 30.                        | With RCP's off and the unit on Natural (                                               | Circulation, Main Stm Manifold Press Control |  |
|----------------------------|----------------------------------------------------------------------------------------|----------------------------------------------|--|
|                            | [2MSS*PK464] is placed in STM PRESS mode. A large reduction in steam pressure          |                                              |  |
|                            | would produce a Low Pressure Steam Line Safety Injection due to which of the following |                                              |  |
|                            | reasons?                                                                               |                                              |  |
|                            | A. Reactor Coolant Heat transfer rate to the steam generator is slowed.                |                                              |  |
|                            | B. Reactor Coolant Heat transfer rate to the steam generator is enhanced.              |                                              |  |
|                            | C. Steam generator feedwater flows rise at a higher rate.                              |                                              |  |
|                            | D. Pressurizer pressures drop at a                                                     | higher rate.                                 |  |
|                            |                                                                                        |                                              |  |
| ANSV                       | ANSWER: A                                                                              |                                              |  |
| K/A: W/E05 K1.2            |                                                                                        | Importance:3.9                               |  |
| Cognitive Level: Knowledge |                                                                                        |                                              |  |
| Refer                      | References: 2OM-53B.4.FR-H.1, Issue 1B, Rev 6, Step 5                                  |                                              |  |
| Lesso                      | on Plan #:2LP-SQS-53.3                                                                 | Obj. #: 3                                    |  |
|                            | •                                                                                      |                                              |  |
| Histo                      | History: NEW                                                                           |                                              |  |
| Sourc                      |                                                                                        | Type: CLOSED BOOK                            |  |
| JTA:                       | 3110060601                                                                             |                                              |  |
|                            | ~                                                                                      | male upont onot                              |  |

Just southy in Ston River Mode would onot durit on this .- Breakly aske why a large other do this .- Breakly in low prose on Nat. Receive . demand would result in low prose on Nat. Receive .

| 31. 5                                                                      | Steam Generator Blowdown Test Tank                                              | [2SGC-TK23A] discharge is in progress when |  |  |
|----------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------|--|--|
| L                                                                          | Liquid Waste Effluent Radiation Monitor [2SGC-RQI100] "Monitor Loss of Process  |                                            |  |  |
| F                                                                          | Flow" alarm annuciates on DRMS Console. The sample pump for 2SGC-RQI100 is      |                                            |  |  |
| ۲                                                                          | NOT running. Which of the following actions should be taken?                    |                                            |  |  |
|                                                                            | A. Verify Liquid Waste Eff High Rad Isol. Valve [2SGC-HCV100] has automatically |                                            |  |  |
|                                                                            | closed.                                                                         |                                            |  |  |
|                                                                            | B. Dispatch an operator to locally start 2SGC-RQI100 sample pump at the monitor |                                            |  |  |
|                                                                            | skid.                                                                           |                                            |  |  |
|                                                                            | C. Start 2SGC-RQI100 sample pump manually from the DRMS Console.                |                                            |  |  |
|                                                                            | D. Manually close Liquid Waste Eff High Rad Isol. Valve [2SGC-HCV100]           |                                            |  |  |
| ANSWER: D                                                                  |                                                                                 |                                            |  |  |
| K/A: 000                                                                   | 59 AK2.01                                                                       | Importance: 2.7                            |  |  |
| Cognitive Level: Comprehension                                             |                                                                                 |                                            |  |  |
| References: 20M-25.4.L, Issue 4, Rev. 9, Page 14, CAUTION before step 13.g |                                                                                 |                                            |  |  |
| Referen                                                                    |                                                                                 |                                            |  |  |
|                                                                            | Plan #: 2LP-SQS-25.1                                                            | Obj. #: 5                                  |  |  |
|                                                                            |                                                                                 |                                            |  |  |
|                                                                            | Plan #: 2LP-SQS-25.1                                                            |                                            |  |  |
| Lesson                                                                     | Plan #: 2LP-SQS-25.1                                                            |                                            |  |  |

| 32.                        | A fuel assembly had been in the spent fuel pool for a year. While being moved to a new   |                   |  |
|----------------------------|------------------------------------------------------------------------------------------|-------------------|--|
|                            | location, the assembly was snagged and damaged. Bubbles are observed rising from         |                   |  |
|                            | the fuel assembly. Which monitor would warn the operators of the rising radiation levels |                   |  |
|                            | due to the gas release in the spent fuel                                                 | pool?             |  |
|                            | A. Auxiliary Building - 755B Airborne Monitor [2RMP-RQI312].                             |                   |  |
|                            | B. Fuel Handing Building Vent Airborne Monitor [2RMF-RQI301B]                            |                   |  |
|                            | C. Elevated Release Detector Skid Monitor [2HVS-RQ109C].                                 |                   |  |
|                            | D. Fuel Pit Bridge Area Radiation Monitor [2RMF-RQ202].                                  |                   |  |
|                            | •                                                                                        |                   |  |
| ANSWER: B                  |                                                                                          |                   |  |
| K/A: 000061 AK1.01         |                                                                                          | Importance: 2.5   |  |
| Cognitive Level: Knowledge |                                                                                          |                   |  |
|                            | References: 20M-43.1.C, Issue 4, Rev. 3, page 22 and 23                                  |                   |  |
|                            |                                                                                          | Obj. #: 1         |  |
|                            |                                                                                          |                   |  |
| History: NEW               |                                                                                          |                   |  |
| Sourc                      |                                                                                          | Type: Closed Book |  |
| JTA: 072BBB0221            |                                                                                          |                   |  |

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|               | Containment pressure peaked a Which of the following describes                    | tem/hr and now , 24 hours later, are 5,000 Rem/hr.<br>It 15 psig and now has returned to 0.5 psig.<br>Is the correct use of "Adverse Containment" values. |  |
|---------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|               | Which of the following describes                                                  |                                                                                                                                                           |  |
|               |                                                                                   | s the correct use of "Adverse Containment" values.                                                                                                        |  |
|               | A. Discontinue use of "adve                                                       |                                                                                                                                                           |  |
|               |                                                                                   | erse containment" values due to containment pressu                                                                                                        |  |
|               | dropping below 5 psig.                                                            |                                                                                                                                                           |  |
|               | B. Discontinue use of adv                                                         | erse containment" values due to containment radiati                                                                                                       |  |
|               | levels below 10 <sup>5</sup> Rads/hi                                              | r.                                                                                                                                                        |  |
|               | C. Continue use of "adverse containment" values until integrated radiation dose i |                                                                                                                                                           |  |
|               | confirmed to be below 10 <sup>6</sup> Rads.                                       |                                                                                                                                                           |  |
|               | D. Continue use of "adverse containment" values until containment pressure is     |                                                                                                                                                           |  |
|               | restored to subatmospheric pressure.                                              |                                                                                                                                                           |  |
|               |                                                                                   |                                                                                                                                                           |  |
| ANSW          | ER: C                                                                             |                                                                                                                                                           |  |
| <u>K/A: W</u> | /E16 A1.2                                                                         | Importance: 2.9                                                                                                                                           |  |
| Cogniti       | ive Level: Application                                                            |                                                                                                                                                           |  |
| Refere        | nces: 20M53B.5.GI-2, Issue 1B                                                     | , Revision 1, page 13                                                                                                                                     |  |
| Lessor        | n Plan #: 2LP-SQS-53.3                                                            | Obj. #:6                                                                                                                                                  |  |
|               |                                                                                   |                                                                                                                                                           |  |
| Histor        | /: NEW                                                                            |                                                                                                                                                           |  |
| Source        |                                                                                   | Type: CLOSED BOOK                                                                                                                                         |  |
| <u> </u>      | 01AAA0601                                                                         |                                                                                                                                                           |  |

| 34.                        | Pressurizer Level Control Selector Selector Switch is in Position I & II. Pressurizer |                   |  |
|----------------------------|---------------------------------------------------------------------------------------|-------------------|--|
|                            | Level Transmitter [2RCS*LT461] fails high. Which of the following control actions     |                   |  |
|                            | should be confirmed as having occured?                                                |                   |  |
|                            | A. PZR High Level RX Trip Channel III Bistable light lit.                             |                   |  |
|                            | B. Charging Flow Control Valve [2CHS*FCV122] closes to minimum flow                   |                   |  |
|                            | C. Pressurizer Back up Heater Groups A,B, D and E come on                             |                   |  |
|                            | D. Letdown Orifice Isolation Valves [2CHS*AOV200A, B, C] close.                       |                   |  |
|                            |                                                                                       |                   |  |
| ANSW                       | ANSWER: A                                                                             |                   |  |
| K/A:: 0                    | 000028 G 2.4.4                                                                        | Importance: 4.0   |  |
| Cognitive Level: Knowledge |                                                                                       |                   |  |
| Refere                     | References: 2OM-6.4.IF, Issue 4, Revision 5, page 13                                  |                   |  |
| Lesson Plan #: 2LP-SQS-6.4 |                                                                                       | Obj. #: 13        |  |
|                            |                                                                                       |                   |  |
| History: NEW               |                                                                                       |                   |  |
| Source                     | e:                                                                                    | Type: CLOSED BOOK |  |
| JTA:01                     | 110030101                                                                             |                   |  |

| 35.                                                      | Technical Specification 3.9.11 "Refueling Operation - Storage Pool Water Level"          |                               |  |
|----------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------|--|
|                                                          | requires a minimum of 23 feet of water over irradiated fuel assemblies in the Spent Fuel |                               |  |
|                                                          | Storage Pool? This level is required to limit what hazard during fuel handling?          |                               |  |
|                                                          | A. Potential for criticality involving two spent fuel assemblies.                        |                               |  |
|                                                          | B. Exposure to lodine release from a damaged fuel assembly.                              |                               |  |
|                                                          | C. Overheating damage to a fuel assembly from a loss of cooling.                         |                               |  |
|                                                          | D. Damage to fuel handling equipm                                                        | nent from radiation exposure. |  |
| ANSWER: B                                                |                                                                                          |                               |  |
| K/A: 00036 AK1.01 Importance: 3.5                        |                                                                                          | Importance: 3.5               |  |
| Cognitive Level: Knowledge                               |                                                                                          |                               |  |
| References: Bases for Tech Spec. 3/4.9.11 page B 3/4 9-3 |                                                                                          |                               |  |
|                                                          | Lesson Plan #: 2LP-SQS-20.1 Obj. #:10                                                    |                               |  |
|                                                          |                                                                                          |                               |  |
| History: NEW                                             |                                                                                          |                               |  |
| Source                                                   |                                                                                          | Type: Closed Book             |  |
|                                                          | 330150101                                                                                |                               |  |

| 36.               | The crew is performing step 25 of ECA-0.0 " Loss of All AC Power" and depressurizing |                                                                            |  |  |
|-------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------|--|--|
|                   | all three steam generators to 300 psi                                                | g. The cooldown is stopped at 300 psig in order                            |  |  |
|                   | accomplish which one of the following                                                | g functions?                                                               |  |  |
|                   | A. Block the Steam Line Isola                                                        | Block the Steam Line Isolation signal and Low Steam Line Pressure SI.      |  |  |
|                   | B. Allow Auxiliary Feedwater                                                         | B. Allow Auxiliary Feedwater Flow to fill all steam generators to above 5% |  |  |
|                   | Narrow Range Level.                                                                  |                                                                            |  |  |
|                   | C. Maintain RCS subcooling                                                           | greater than 50°F and PRZR level on scale.                                 |  |  |
|                   | D. Maximize injection of SI a                                                        | ccumulator water and limit nitrogen injection into                         |  |  |
|                   | RCS                                                                                  |                                                                            |  |  |
| ANS               | WER: D                                                                               |                                                                            |  |  |
| K/A: 000056 K3.02 |                                                                                      | Importance: 4.4                                                            |  |  |
| Cogn              | nitive Level: Knowledge                                                              |                                                                            |  |  |
| Refe              | rences: 2OM-53B.4.ECA-0.0 Issue 1B,                                                  | Rev. 4, page 114                                                           |  |  |
| Less              | on Plan #: 2LP-SQS-53.3                                                              | Obj. #: 3                                                                  |  |  |
|                   |                                                                                      |                                                                            |  |  |
| Histo             | ory: 2LOT 2A Question 17 NRC                                                         |                                                                            |  |  |
| Sour              | ce: Modified from Q17 on 2LOT2A                                                      | Type: CLOSED BOOK                                                          |  |  |
| OCU               | -                                                                                    | I                                                                          |  |  |

| 37. The unit is at 100% power with all syste                                      | The unit is at 100% power with all systems NSA. *A* Train SSPS testing is in progress. |  |  |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|--|--|
| The "A" Train Reactor Trip Bypass brea                                            | The "A" Train Reactor Trip Bypass breaker[BYA] is racked in and closed. The Train "A"  |  |  |
| SSPS Input Error Inhibit Switch is in "INHIBIT". A 2 out 3 Reactor Trip signal is |                                                                                        |  |  |
| generated on low pressurizer pressure                                             | . Which of the following actions will produce the                                      |  |  |
| acutal reactor trip?                                                              |                                                                                        |  |  |
| A. Train A Reactor Trip Breake                                                    | er [RTA] opens on loss of voltage to the UV coil.                                      |  |  |
| B. Train A Reactor Trip Bypass                                                    | s Breaker [BYA] opens when the shunt trip coil                                         |  |  |
| energizes.                                                                        |                                                                                        |  |  |
| C. Train B Reactor Trip Breake                                                    | er [RTB] opens on loss of voltage to the UV coil.                                      |  |  |
| D. Train B Reactor Trip Bypass Breaker [BYB] opens when the shunt trip co         |                                                                                        |  |  |
| energizes.                                                                        |                                                                                        |  |  |
|                                                                                   |                                                                                        |  |  |
| ANSWER: C                                                                         |                                                                                        |  |  |
| K/A: 001 K1.05                                                                    | Importance: 4.5                                                                        |  |  |
| Cognitive Level: Application                                                      |                                                                                        |  |  |
| References: 2OM-1.1.D, Issue 4, Rev. 0, page 5, page 8,                           |                                                                                        |  |  |
| Lesson Plan #: 2LP-SQS-1.2                                                        | Obj. #: 8                                                                              |  |  |
|                                                                                   |                                                                                        |  |  |
| History: NEW                                                                      |                                                                                        |  |  |
| Source:                                                                           | Type: CLOSED BOOK                                                                      |  |  |
| JTA: 0120080101                                                                   |                                                                                        |  |  |

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| The unit is in Mode 5 in preparation for heating up. Annunciator A2-5D "NIS SOURCE |                                            |  |
|------------------------------------------------------------------------------------|--------------------------------------------|--|
| RANGE HIGH FLUX AT SHUTDOWN" comes into alarm. This is to alert the operator       |                                            |  |
| to perform which of the following actions                                          | s?                                         |  |
| A. Block the source range high flux trips in preparation for reactor startup.      |                                            |  |
| B. Emergency borate the RCS to restore core shutdown margin.                       |                                            |  |
| C. Turn off the source range high voltages for protection of the instrumentation.  |                                            |  |
| D. Verify all control rods fully in                                                | serted and the reactor trip breakers open. |  |
|                                                                                    |                                            |  |
| ANSWER: B                                                                          |                                            |  |
| K/A: 001 K6.08                                                                     | Importance: 2.9                            |  |
| Cognitive Level: Comprehension                                                     |                                            |  |
| References: 20M-2.4.AAQ, Issue 1, Rev. 4                                           |                                            |  |
| Lesson Plan #:: 2LP-SQS-2.1                                                        | Obj. #: 10                                 |  |
|                                                                                    |                                            |  |
| History: NEW                                                                       |                                            |  |
| Source:                                                                            | Type: CLOSED BOOK                          |  |
| JTA:0150050101                                                                     |                                            |  |

| 39.                                                                           | The Unit is critical and stabilized                                                                                                                                                                                                                        | at 1E-8         | 3 amps in the Intermediate Range. The operator |  |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------|--|
|                                                                               | <ul> <li>records the following data in the Daily Journal:</li> <li>Control Bank C is at 100 steps</li> <li>Control Bank D is at 0 steps.</li> <li>Reactor Coolant system boron is 575 ppm</li> <li>Reactor Coolant system temperature is 547°F.</li> </ul> |                 |                                                |  |
|                                                                               | Exhibiting a questioning attitude t                                                                                                                                                                                                                        | the Pla         | nt Operator states that the rod configuration  |  |
| seems improper and consults Plant Curve CB-15. Which of the following actions |                                                                                                                                                                                                                                                            |                 | ve CB-15. Which of the following actions is    |  |
|                                                                               | required?                                                                                                                                                                                                                                                  |                 |                                                |  |
|                                                                               | A. Manually trip the reactor a                                                                                                                                                                                                                             | and cor         | mmence emergency boration.                     |  |
| B. Insert Control Banks A, B, C and D and re-calculate the Estimated Critical |                                                                                                                                                                                                                                                            |                 | D and re-calculate the Estimated Critical      |  |
|                                                                               | Position.                                                                                                                                                                                                                                                  | Position.       |                                                |  |
|                                                                               | C. Request permission from General Manager Operations to enter Mode 1.                                                                                                                                                                                     |                 |                                                |  |
|                                                                               | D. Request Nuclear Enginee                                                                                                                                                                                                                                 | ring va         | alidation of the current rod configuration.    |  |
| ANS                                                                           | WER: A                                                                                                                                                                                                                                                     |                 |                                                |  |
| K/A:                                                                          | 001 K5.04 <u>K/A CHANGE</u>                                                                                                                                                                                                                                |                 | Importance: 4.3                                |  |
| Coar                                                                          | nitive Level: Application                                                                                                                                                                                                                                  |                 |                                                |  |
|                                                                               | rences: CB-15 Issue 7, Rev. 0, 20M                                                                                                                                                                                                                         | <i>I-</i> 50.4. | D. Issue 1, Rev. 31, Step 19                   |  |
|                                                                               | on Plan #: 2LP-SQS-50.1                                                                                                                                                                                                                                    |                 | Obj. #: 7                                      |  |
| L000                                                                          |                                                                                                                                                                                                                                                            | ليستعم          |                                                |  |
| Histo                                                                         | ry: NEW                                                                                                                                                                                                                                                    |                 |                                                |  |
| Sour                                                                          | ce:                                                                                                                                                                                                                                                        |                 | Type: OPEN BOOK                                |  |
|                                                                               |                                                                                                                                                                                                                                                            |                 |                                                |  |

|        |                                                            | •                                                |  |
|--------|------------------------------------------------------------|--------------------------------------------------|--|
| 40.    | At low RCS pressures, and with proce                       | ecedural restrictions, the RCP Seal Water Bypass |  |
|        | Isolation Valve [2CHS*MOV307] may                          | be opened. Opening this valve will produce whi   |  |
|        | of the following?                                          |                                                  |  |
|        | A. Number 2 Seal leakoff flow will rise above 1 gpm.       |                                                  |  |
|        | B. Number 1 Seal leakoff flow will rise above 0.2 gpm.     |                                                  |  |
|        | C. Elevated cooling flow through RCP Lower Radial Bearing. |                                                  |  |
|        | D. Elevated cooling flow through                           | RCP Thermal Barrier.                             |  |
|        | WER: C                                                     |                                                  |  |
| K/A: ( | 003 K1.03                                                  | Importance: 3.3                                  |  |
| Cogn   | itive Level: Comprehension                                 |                                                  |  |
| Refer  | rences: 20M-6.4.AAB, Issue 4, Rev. 1,                      | Page 4 and 5, 2OM-6.1.C, Issue 4, Rev.0, page 2  |  |
| Lesso  | on Plan #: 2LP-SQS-6.3                                     | Obj. #: 4.c                                      |  |
|        | <u> </u>                                                   |                                                  |  |
| Histo  | ry: NEW                                                    |                                                  |  |
| Sourc  | ce:                                                        | Type: Closed Book                                |  |
|        | 0030020101                                                 |                                                  |  |
|        |                                                            |                                                  |  |

| 41. The RCS is at 240 c                                                                      | egrees and 325 psig. The operator is reviewing 2OM-6.4.A,                         |  |  |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--|--|
| "Reactor Coolant Pu                                                                          | "Reactor Coolant Pump Startup", Section IV, A in preparation for starting Reactor |  |  |
| <ul> <li>Reactor (<br/>[2CHS*F</li> <li>Primary (<br/>[2CCP-T</li> <li>RCP Seation</li></ul> | [2CCP-TI107A] Thermal Barrier Temperature.                                        |  |  |
|                                                                                              | A. Raise seal leakoff flow to greater than 0.2 gpm.                               |  |  |
| B. Lower Pr                                                                                  | B. Lower Primary Coolant Water Temperature to less than 105°F.                    |  |  |
| C. Raise se                                                                                  | C. Raise seal injection flow to greater than 6 gpm.                               |  |  |
| D. Lower V                                                                                   | D. Lower VCT pressure to less than 15 psig.                                       |  |  |
| ANSWER: A                                                                                    |                                                                                   |  |  |
| K/A: 003 K4.07                                                                               | Importance: 3.2                                                                   |  |  |
| Cognitive Level: Application                                                                 |                                                                                   |  |  |
| References: 20M-6.4.A, Issue 4, Rev. 6, page 3                                               |                                                                                   |  |  |
| Lesson Plan #: 2LP-SQS-6                                                                     | .3 Obj. #: 12                                                                     |  |  |
|                                                                                              |                                                                                   |  |  |
| History: NEW                                                                                 |                                                                                   |  |  |
| Source:                                                                                      | Type: OPEN BOOK                                                                   |  |  |
| JTA: 0030010101                                                                              | Provide section of 6.4.A for pump 21A                                             |  |  |

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cloud munice.

| 42.    | The unit is at 100% power with all systems NSA Aty 15 days after completion of |           |                                            |
|--------|--------------------------------------------------------------------------------|-----------|--------------------------------------------|
|        | refueling. Due to an erroneous                                                 | chemist   | ry sample, the mixed bed demineralizer Di  |
|        | 21B is placed in service with a f                                              | fresh res | in charge. Which one of the following resu |
|        | should be anticipated by the op                                                | erator?   |                                            |
|        | A. A significant rise in Tavg.                                                 |           |                                            |
|        | B. An insignificant rise                                                       | in Tavg.  |                                            |
|        | C. A significant drop in                                                       | Tavg      |                                            |
|        | D. A insignificant drop i                                                      | in Tavg   |                                            |
|        | WER: A                                                                         |           |                                            |
| K/A: ( | 004 A2.32                                                                      |           | Importance: 3.4                            |
| Cogn   | itive Level: Comprehension                                                     |           |                                            |
|        |                                                                                | leactor T | heory Fundamentals, Topic 3: Control Rea   |
|        |                                                                                |           | 9, 2OM-7.2.A, Issue 4, Rev. 7 page 2,      |
|        |                                                                                | , բ       |                                            |
|        |                                                                                |           | Obj. #: 8                                  |
| Lesso  | on Plan #: 2LP-SQS-7.1                                                         |           | 00                                         |
|        |                                                                                | <u></u>   |                                            |
| Histo  | ry: NEW                                                                        |           |                                            |
| 1      |                                                                                |           |                                            |
| Sourc  | ce:                                                                            |           | Type: CLOSED BOOK                          |

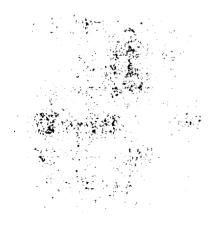
| 43.   | The unit is in Mode 1 returning to power after a reactor trip. The operator is borating to |                                               |                      |  |
|-------|--------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------|--|
|       | counteract the burnout of xenon and hold rods at current positions. 2OM-7.2.A *            |                                               |                      |  |
|       | Chemical and Volumne Control                                                               | System Precautions and Limitati               | ons require that the |  |
|       | boron concentration of the press                                                           | surizer must be maintained withir             | 1 50 ppm of the RCS  |  |
|       | Which of the following is procedu                                                          | urally allowed to accomplish this             | task?                |  |
|       | A. Throttle open one pre                                                                   | A. Throttle open one pressurizer spray valve. |                      |  |
|       | B. Energize pressurizer                                                                    | heaters.                                      |                      |  |
|       | C. Cycle one pressurize                                                                    | r PORV.                                       |                      |  |
|       | D. Align excess letdown                                                                    | to the VCT.                                   |                      |  |
|       |                                                                                            | ·                                             |                      |  |
| ANS   | WER: B                                                                                     |                                               |                      |  |
| K/A:  | 004 A4.15 K/A CHANGE                                                                       | Importance: 3.6                               |                      |  |
| Cogr  | nitive Level: Application                                                                  |                                               | ****                 |  |
| Refe  | rences: 2OM-7.4.K, "Blender Borat                                                          | tion Operations", Issue 4, Rev. 1             | , Page 2, Step 9     |  |
|       | on Plan #: 2LP-SQS-7.1                                                                     | Obj. #: 8                                     |                      |  |
|       |                                                                                            |                                               |                      |  |
| Histo | ory: NEW                                                                                   |                                               |                      |  |
| Sour  |                                                                                            | Type: OPEN Book                               |                      |  |
| JTA:  | 0040080101                                                                                 | Copy of procedure                             |                      |  |
|       |                                                                                            |                                               |                      |  |
|       |                                                                                            |                                               | A statement          |  |

| 44. The unit is operating in Mode 3 at normal temperature and pressure with Charging Flo                                                                                                                             |                                                                         |                                                  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------|--|--|
| <b>---.</b>                                                                                                                                                                                                          | ,                                                                       | ng at 60 gpm. Letdown Orifice 23 Isolation Valve |  |  |
|                                                                                                                                                                                                                      | -                                                                       | flow at 60 gpm. The ANSS wants to close          |  |  |
|                                                                                                                                                                                                                      | Charging Flow Control Valve [2CHS*FCV122] for troubleshooting.          |                                                  |  |  |
|                                                                                                                                                                                                                      | Failure to close 2CHS*AOV200B before closing 2CHS*FCV122 will result in |                                                  |  |  |
|                                                                                                                                                                                                                      | which of the following?                                                 |                                                  |  |  |
|                                                                                                                                                                                                                      | · · · · ·                                                               | ative Heat Exchanger (2CHS*E23).                 |  |  |
| <ul> <li>A. Overcooling of the Regenerative Heat Exchanger [2CHS*E2:</li> <li>B. Thermal shock to the reactor vessel in loop 21A.</li> <li>C. Flashing of letdown flow downstream of the letdown orifice.</li> </ul> |                                                                         |                                                  |  |  |
|                                                                                                                                                                                                                      |                                                                         |                                                  |  |  |
|                                                                                                                                                                                                                      |                                                                         |                                                  |  |  |
| D. Thermal shock to the Mixed Bed Demineralizers. ANSWER: C                                                                                                                                                          |                                                                         |                                                  |  |  |
|                                                                                                                                                                                                                      | 004 K5.09                                                               | Importance: 3.7                                  |  |  |
| Cogn                                                                                                                                                                                                                 | Cognitive Level: Application.                                           |                                                  |  |  |
| Refer                                                                                                                                                                                                                | ences: 20M-7.2A, Issue 4, Rev. 5, Page                                  | 2 of 7                                           |  |  |
| Lesso                                                                                                                                                                                                                | on Plan #: 2LP-SQS-7.1                                                  | Obj. #: 3                                        |  |  |
|                                                                                                                                                                                                                      |                                                                         |                                                  |  |  |
| Histor                                                                                                                                                                                                               | ry: NEW                                                                 |                                                  |  |  |
|                                                                                                                                                                                                                      |                                                                         |                                                  |  |  |
| Sourc                                                                                                                                                                                                                | 2 <b>6:</b>                                                             | Type: OPEN Book                                  |  |  |
|                                                                                                                                                                                                                      | xe:                                                                     |                                                  |  |  |

| 45.                                                                                                                                                                          | 45. 120 VAC Vital AC Bus II [UPS*VITBS2-2] is completely lost and all attached AC panels |                   |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------|--|
| are deenergized. Which of the following describes how the "A" and "B" Train of                                                                                               |                                                                                          |                   |  |
|                                                                                                                                                                              | will react to a signal requiring Safety Injection to be actuated?                        |                   |  |
| <ul> <li>A. Train Equipment actuates; "B" Train slave relays are deenergized.</li> <li>B. "A" and "B" Train require manual actuation, slave relays are deenerging</li> </ul> |                                                                                          |                   |  |
|                                                                                                                                                                              |                                                                                          |                   |  |
| <ul> <li>D. "A" equipment actuates "B" Train slave relays remain energized.</li> <li>Train</li> </ul>                                                                        |                                                                                          |                   |  |
| ANS                                                                                                                                                                          | WER: A                                                                                   |                   |  |
| K/A: 013 K2.01 Importance:3.6                                                                                                                                                |                                                                                          |                   |  |
| Cognitive Level: Comprehension                                                                                                                                               |                                                                                          |                   |  |
| Refe                                                                                                                                                                         | References: 2OM-1.5 Issue 4, Rev. 3, Figure 1-41                                         |                   |  |
|                                                                                                                                                                              | on Plan #: 2LP-SQS-1.2                                                                   | Obj. #: 7         |  |
|                                                                                                                                                                              |                                                                                          |                   |  |
| Histo                                                                                                                                                                        | History: NEW                                                                             |                   |  |
| Sour                                                                                                                                                                         |                                                                                          | Type: Closed Book |  |
| JTA:                                                                                                                                                                         | 0130010101                                                                               |                   |  |
|                                                                                                                                                                              |                                                                                          |                   |  |

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| 46.                             | The unit has experienced a large LOCA. With regards to the CIB (Containment             |                                  |  |  |  |
|---------------------------------|-----------------------------------------------------------------------------------------|----------------------------------|--|--|--|
|                                 | Isolation Phase B) signal which of the following must be true in order to reset the CIB |                                  |  |  |  |
|                                 | signal?                                                                                 |                                  |  |  |  |
|                                 | A. The SI (Safety Injection) signal must be reset prior resetting the CIB.              |                                  |  |  |  |
|                                 | B. The Reactor Trip Breakers (RTA and RTB) must be closed.                              |                                  |  |  |  |
|                                 | C. The containment pressure must be less than the HI-1 setpoint.                        |                                  |  |  |  |
|                                 | D. The containment pressure r                                                           | nust be less than HI-3 setpoint. |  |  |  |
|                                 |                                                                                         | ۲.<br>                           |  |  |  |
| ANSW                            | 'ER: D                                                                                  |                                  |  |  |  |
| K/A: 0                          | 13 A 3.02                                                                               | Importance: 4.1                  |  |  |  |
| Cognit                          | Cognitive Level: Application                                                            |                                  |  |  |  |
| References: FSAR Figure 7.3-13, |                                                                                         |                                  |  |  |  |
| Lesso                           | Lesson Plan #: 2LP-SQS-1.2 Obj. #: 10                                                   |                                  |  |  |  |
|                                 |                                                                                         |                                  |  |  |  |
| History: NEW                    |                                                                                         |                                  |  |  |  |
| Source                          | Source: Type OPEN BOOK                                                                  |                                  |  |  |  |
| JTA: 0                          | TA: 0130010101 Give FSAR Figure 7.3-13                                                  |                                  |  |  |  |

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| 47. | The RCS pressure drops below 1800 psig and a reactor trip and safety injection signal       |
|-----|---------------------------------------------------------------------------------------------|
|     | is generated. All ESF equipment responds as required. RCS pressure stabilizes at            |
|     | 1500 psig with flow indicated on High Head Safety Injection Flow [2SIS*FI943].              |
|     | With the Safety Injection system in this condition, which of the following failures is most |
|     | likely to result in fuel damage in this condition?                                          |

A. LHSI Pumps [2SIS\*P21A, 21B] fail to start.

B. HHIS Pumps [2CHS\*P21A, 21B] trip after starting.

- C. Motor Driven Auxiliary Feedwater Pumps [2FWE\*21A, 21B] trip after starting.
- A D. Recirculation Spray Pumps [2RSS\*P21C, 21D] fail to start.

| ANSWER: B                                               |                 |  |  |
|---------------------------------------------------------|-----------------|--|--|
| K/A: 013 K3.01                                          | Importance: 4.4 |  |  |
| Cognitive Level: Comprehension                          |                 |  |  |
| References: 2OM-53B.E-1, Issue 1B, Rev 6, pages 1 to 25 |                 |  |  |
| Lesson Plan #: 2LP-SQS-11.1                             | Obj. #: 2       |  |  |
|                                                         |                 |  |  |
| History: NEW                                            |                 |  |  |
| Source: Type: Closed Book                               |                 |  |  |
| JTA:3010020601                                          |                 |  |  |

|                                                                                                                | The unit is in MODE 2 and is critical at 1%. The Plant Operator informs the Reactor Operator that N-35 "LOSS OF COMP VOLT" light is lit on the NI cabinet. Which of the |                                                                 |  |  |  |
|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--|--|--|
| -                                                                                                              | es the impact of the los                                                                                                                                                |                                                                 |  |  |  |
| -                                                                                                              | vill indicate higher amp                                                                                                                                                |                                                                 |  |  |  |
|                                                                                                                | vill indicate higher amp                                                                                                                                                |                                                                 |  |  |  |
|                                                                                                                | C. P-10 would actuate at a higher indicated power level.                                                                                                                |                                                                 |  |  |  |
|                                                                                                                |                                                                                                                                                                         | indicated power level.                                          |  |  |  |
|                                                                                                                |                                                                                                                                                                         |                                                                 |  |  |  |
| ANSWER: A                                                                                                      |                                                                                                                                                                         |                                                                 |  |  |  |
| K/A: 015 A 2.02                                                                                                |                                                                                                                                                                         | Importance: 3.1                                                 |  |  |  |
|                                                                                                                | itive Level: Comprehension                                                                                                                                              |                                                                 |  |  |  |
| Cognitive Level: Compre                                                                                        |                                                                                                                                                                         |                                                                 |  |  |  |
|                                                                                                                |                                                                                                                                                                         |                                                                 |  |  |  |
| References:                                                                                                    |                                                                                                                                                                         | TOR TROUBLE" Issue 1 Bey 3 Page 3                               |  |  |  |
| References:<br>20M-2.4.AAC " NIS DET                                                                           |                                                                                                                                                                         | TOR TROUBLE", Issue 1, Rev. 3 Page 3                            |  |  |  |
| References:<br>20M-2.4.AAC * NIS DET<br>20M-53C.4.2.2.18 * Inte                                                |                                                                                                                                                                         | nel Malfunction <sup>®</sup> Issue 1A, Rev. 1, Step 4           |  |  |  |
| References:<br>20M-2.4.AAC " NIS DET                                                                           |                                                                                                                                                                         |                                                                 |  |  |  |
| References:<br>2OM-2.4.AAC * NIS DET<br>2OM-53C.4.2.2.18 * Inte                                                |                                                                                                                                                                         | nel Malfunction <sup>®</sup> Issue 1A, Rev. 1, Step 4           |  |  |  |
| References:<br>2OM-2.4.AAC " NIS DET<br>2OM-53C.4.2.2.18 " Inte<br>LP#: 2LP-SQS-2.1<br>History: NEW            |                                                                                                                                                                         | nel Malfunction <sup>*</sup> Issue 1A, Rev. 1, Step 4<br>OBJ: 2 |  |  |  |
| References:<br>2OM-2.4.AAC " NIS DET<br>2OM-53C.4.2.2.18 " Inte<br>LP#: 2LP-SQS-2.1<br>History: NEW<br>Source: |                                                                                                                                                                         | nel Malfunction <sup>®</sup> Issue 1A, Rev. 1, Step 4           |  |  |  |
| References:<br>2OM-2.4.AAC " NIS DET<br>2OM-53C.4.2.2.18 " Inte<br>LP#: 2LP-SQS-2.1<br>History: NEW<br>Source: |                                                                                                                                                                         | nel Malfunction <sup>*</sup> Issue 1A, Rev. 1, Step 4<br>OBJ: 2 |  |  |  |
| References:<br>2OM-2.4.AAC " NIS DET<br>2OM-53C.4.2.2.18 " Inte<br>LP#: 2LP-SQS-2.1<br>History: NEW<br>Source: |                                                                                                                                                                         | nel Malfunction <sup>*</sup> Issue 1A, Rev. 1, Step 4<br>OBJ: 2 |  |  |  |
| References:<br>2OM-2.4.AAC " NIS DET<br>2OM-53C.4.2.2.18 " Inte<br>LP#: 2LP-SQS-2.1<br>History: NEW<br>Source: |                                                                                                                                                                         | nel Malfunction <sup>*</sup> Issue 1A, Rev. 1, Step 4<br>OBJ: 2 |  |  |  |
| References:<br>2OM-2.4.AAC " NIS DET<br>2OM-53C.4.2.2.18 " Inte<br>LP#: 2LP-SQS-2.1                            |                                                                                                                                                                         | nel Malfunction <sup>*</sup> Issue 1A, Rev. 1, Step 4<br>OBJ: 2 |  |  |  |
| References:<br>2OM-2.4.AAC " NIS DET<br>2OM-53C.4.2.2.18 " Inte<br>LP#: 2LP-SQS-2.1<br>History: NEW<br>Source: |                                                                                                                                                                         | nel Malfunction <sup>*</sup> Issue 1A, Rev. 1, Step 4<br>OBJ: 2 |  |  |  |
| References:<br>2OM-2.4.AAC " NIS DET<br>2OM-53C.4.2.2.18 " Inte<br>LP#: 2LP-SQS-2.1<br>History: NEW<br>Source: |                                                                                                                                                                         | nel Malfunction <sup>*</sup> Issue 1A, Rev. 1, Step 4<br>OBJ: 2 |  |  |  |

| 9. The unit is operating at 100% power with all systems NSA. Which of the following |                                       |  |  |  |
|-------------------------------------------------------------------------------------|---------------------------------------|--|--|--|
| interlocks prevents energizing the Source Range High Voltage [N31, N32] while       |                                       |  |  |  |
| operating in the power range?                                                       |                                       |  |  |  |
| A. P-6                                                                              | A. P-6                                |  |  |  |
| B. P-8                                                                              | B. P-8                                |  |  |  |
| C. P-9                                                                              |                                       |  |  |  |
| D. P-10                                                                             | •                                     |  |  |  |
|                                                                                     |                                       |  |  |  |
| ANSWER: D                                                                           |                                       |  |  |  |
| K/A:: 015 K4.01                                                                     | Importance: 3.1                       |  |  |  |
| Cognitive Level: Knowledge                                                          | · · · · · · · · · · · · · · · · · · · |  |  |  |
| References: 20M-2.1.C, Issue 4, Revision 1, Page 13, 14, and 15                     |                                       |  |  |  |
| Lesson Plan #: 2SQS-LP-2.1 Obj. #: 6                                                |                                       |  |  |  |
|                                                                                     |                                       |  |  |  |
| History: NEW                                                                        |                                       |  |  |  |
| Source:                                                                             | Type: CLOSED BOOK                     |  |  |  |
| JTA: 0150050101                                                                     |                                       |  |  |  |

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| 50. The highest reading Core Exit Thermocouple tri-sector average temperature provides |                   |
|----------------------------------------------------------------------------------------|-------------------|
| which one of the following temperature inputs?                                         |                   |
| A. Rod Control Program Median Tavg Selector.                                           |                   |
| B. OPPS Train "A "Arming circuit.                                                      |                   |
| C. A4-3C "Tavg DEVIATION FROM Tref" deviation alarm.                                   |                   |
| D. Vertical board Subcooling Monitor [2RCS*YI001].                                     |                   |
| ANSWER: D                                                                              |                   |
| K/A: 017 K4.01                                                                         | Importance: 3.4   |
| Cognitive Level: Knowledge                                                             |                   |
| References: 20M-5D.1.C, Issue 4, Revision 0, page 18 and 19                            |                   |
| Lesson Plan #: 2LP-SQS-5.2                                                             | Obj. #: 4         |
|                                                                                        |                   |
| History: NEW                                                                           |                   |
| Source:                                                                                | Type: Closed Book |
| JTA: 0830040101                                                                        |                   |



| 51. Containment Recircula        | ation Fan 2HVR*F                       | N201C is aligned to 480V Emergency Bus 2-9     |  |  |  |
|----------------------------------|----------------------------------------|------------------------------------------------|--|--|--|
| and running. Under th            | is alignment whic                      | ch of the following signals will STOP the fan? |  |  |  |
| A. Safety Injection              | n Signal.                              |                                                |  |  |  |
| B. Containment Is                | B. Containment Isolation Signal (CIA). |                                                |  |  |  |
| C. Containment S                 | pray Actuation Si                      | gnal (CIB).                                    |  |  |  |
| D. High Containm                 | ent Pressure Rea                       | actor Trip.                                    |  |  |  |
| ANSWER: A                        | ······                                 |                                                |  |  |  |
| K/A: 022 A3.01 <i>K/A CHANGE</i> |                                        | Importance: 4.1                                |  |  |  |
| Cognitive Level: Knowledge       |                                        |                                                |  |  |  |
| References: 20M-44C.1.D, Is      | sue 4, Rev. 0, Pa                      | ages 2 and 3                                   |  |  |  |
| Lesson Plan #: 2LP-SQS-440       | 2.1                                    | Obj. #: 7                                      |  |  |  |
|                                  |                                        |                                                |  |  |  |
| History: NEW                     |                                        |                                                |  |  |  |
| Source:                          |                                        | Type: Closed Book                              |  |  |  |
| JTA: 0880040101                  |                                        |                                                |  |  |  |

| 52. The 2 <sup>nd</sup> Point Heater [2FWS-H22A] mus                                | The 2 <sup>nd</sup> Point Heater [2FWS-H22A] must be removed from service. Which of the |  |  |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|--|--|
| following actions is needed to maintain reactor power within limits?                |                                                                                         |  |  |
| A. Reactor power must be redu                                                       | ced to 95% prior to removal from service.                                               |  |  |
| B. Turbine load must be reduce                                                      | ed to 40% load to remove the entire heater train                                        |  |  |
| from service.                                                                       |                                                                                         |  |  |
| C. Turbine load must be reduce                                                      | ed until Condensate Pump Discharge Pressure is                                          |  |  |
| greater than 650 psig.                                                              |                                                                                         |  |  |
| D. 2nd Point Heater [2FWS-H2                                                        | 2B] must be removed from service to limit delta                                         |  |  |
| T across turbine to less than 50°F.                                                 |                                                                                         |  |  |
| ANSWER: B                                                                           |                                                                                         |  |  |
| K/A:056 A2.12                                                                       | Importance: 2.8                                                                         |  |  |
| Cognitive Level: Application                                                        |                                                                                         |  |  |
| References: 20M-23B.4.C, Issue 1, Rev. 6 pages 4 and 5, 20M-23A.2.A Issue 4, Rev. 1 |                                                                                         |  |  |
| Lesson Plan #: 2LP-SQS-23.1 Obj. #: 13                                              |                                                                                         |  |  |
|                                                                                     |                                                                                         |  |  |
| History: NEW                                                                        |                                                                                         |  |  |
| Source:                                                                             | Type: OPEN BOOK                                                                         |  |  |
| JTA: 06EEE0101                                                                      |                                                                                         |  |  |

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| 53.                  | Total steam flow out of all steam generators at current reactor power is 2 million     |                                                                                             |  |  |
|----------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--|--|
|                      | pounds-mass per hour. Which of the following is the minimum required main              |                                                                                             |  |  |
|                      | feed/condensate pump combination required by 20M-24.2.A "Main Feedwater                |                                                                                             |  |  |
|                      | Precautions and Limitations" for                                                       | Precautions and Limitations <sup>®</sup> for maintaining steam generator levels on program? |  |  |
|                      | A. One Main Feedwate                                                                   | er Pump and One condensate Pump.                                                            |  |  |
|                      | B. One Main Feedwate                                                                   | er Pump and Two Condensate Pumps.                                                           |  |  |
|                      | C. Two Main Feedwate                                                                   | er Pumps and One Condensate Pump.                                                           |  |  |
|                      | D. Two Main Feedwater Pumps and Two Condensate Pumps.                                  |                                                                                             |  |  |
| ANS                  | WER: B                                                                                 |                                                                                             |  |  |
|                      |                                                                                        |                                                                                             |  |  |
| K/A:                 | 059 A1.03                                                                              | Importance: 2.7                                                                             |  |  |
|                      | 059 A1.03<br>hitive Level: Application                                                 | Importance: 2.7                                                                             |  |  |
| Cogr                 | nitive Level: Application                                                              | 0.5                                                                                         |  |  |
| Cogr<br>Refe         | nitive Level: Application<br>rences: 20M-24.2.A, Issue 4, Rev                          | 0.5                                                                                         |  |  |
| Cogr<br>Refe         | nitive Level: Application                                                              | v. 4 Precautions 2, 10, 16 and 17                                                           |  |  |
| Cogr<br>Refe<br>Less | nitive Level: Application<br>rences: 20M-24.2.A, Issue 4, Rev<br>on Plan #: 2LP-SQS-SC | v. 4 Precautions 2, 10, 16 and 17                                                           |  |  |
| Cogr<br>Refe<br>Less | nitive Level: Application<br>rences: 20M-24.2.A, Issue 4, Rev<br>on Plan #: 2LP-SQS-SC | v. 4 Precautions 2, 10, 16 and 17                                                           |  |  |

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| 54.                                   | Unit 2 is escalating power after a 4                                                                                        | week Mode 5 outage. The unit is operating at 25% |  |  |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--|--|
|                                       | power with all systems NSA for this power level. The operating Main Feedwater Pump                                          |                                                  |  |  |
|                                       | trips.                                                                                                                      |                                                  |  |  |
|                                       | Which of the following would be the                                                                                         | first automatic action?                          |  |  |
|                                       | A. All three auxiliary feedwater pumps start after 150 seconds on the AMSAC timer.                                          |                                                  |  |  |
|                                       | B. Both Motor Driven Auxiliary                                                                                              | Feedwater Pumps [2FWE*P22A, 22B] start on low    |  |  |
|                                       | S/G level.                                                                                                                  |                                                  |  |  |
|                                       | C. Turbine Driven Auxiliary Fee                                                                                             | edwater Pump [2FWE*P23] starts on low S/G levels |  |  |
|                                       | D. Both Motor Driven Auxiliary                                                                                              | Feedwater Pumps [2FWE*P22A, 22B] start on trip   |  |  |
|                                       | the Main Feedwater Pump.                                                                                                    |                                                  |  |  |
|                                       |                                                                                                                             |                                                  |  |  |
|                                       |                                                                                                                             |                                                  |  |  |
| ANS                                   | WER: D                                                                                                                      |                                                  |  |  |
|                                       | WER: D<br>059 K3.02                                                                                                         | Importance: 3.6                                  |  |  |
| K/A:                                  |                                                                                                                             | Importance: 3.6                                  |  |  |
| K/A:<br>Cogr                          | 059 K3.02<br>nitive Level: Knowledge                                                                                        | Importance: 3.6                                  |  |  |
| K/A:<br>Cogr<br>Refe                  | 059 K3.02<br>hitive Level: Knowledge<br>rences: 20M-24.1.D, Issue 4, Rev. 2                                                 | Importance: 3.6<br>Obj. #: 10                    |  |  |
| K/A:<br>Cogr<br>Refe                  | 059 K3.02<br>nitive Level: Knowledge                                                                                        |                                                  |  |  |
| K/A:<br>Cogr<br>Refe<br>Less          | 059 K3.02<br>hitive Level: Knowledge<br>rences: 20M-24.1.D, Issue 4, Rev. 2                                                 |                                                  |  |  |
| K/A:<br>Cogr<br>Refe<br>Less          | 059 K3.02<br>hitive Level: Knowledge<br>rences: 20M-24.1.D, Issue 4, Rev. 2<br>on Plan #:: 2LP-SQS-24.1<br>bry: NEW         |                                                  |  |  |
| K/A:<br>Cogr<br>Refe<br>Less<br>Histo | 059 K3.02<br>nitive Level: Knowledge<br>rences: 20M-24.1.D, Issue 4, Rev. 2<br>on Plan #:: 2LP-SQS-24.1<br>ory: NEW<br>rce: | Obj. #: 10                                       |  |  |
| K/A:<br>Cogr<br>Refe<br>Less<br>Histo | 059 K3.02<br>hitive Level: Knowledge<br>rences: 20M-24.1.D, Issue 4, Rev. 2<br>on Plan #:: 2LP-SQS-24.1<br>bry: NEW         | Obj. #: 10                                       |  |  |

| 55. | The unit is holding at HOT SHUTDOWN following a unit trip. Over the next hour, which |
|-----|--------------------------------------------------------------------------------------|
|     | of the following adjustments should the operator expect to make to maintain steam    |
|     | generator levels at no load values?                                                  |

- A. Raise feedwater flow to match decay heat load steam flow.
- B. Drop feedwater flow to match decay heat load steam flow.
- C. Reset and restart one Main Feedwater pump to match steam flow.
- D. Maintain 365 gpm minimum feedwater flow to each steam generator.

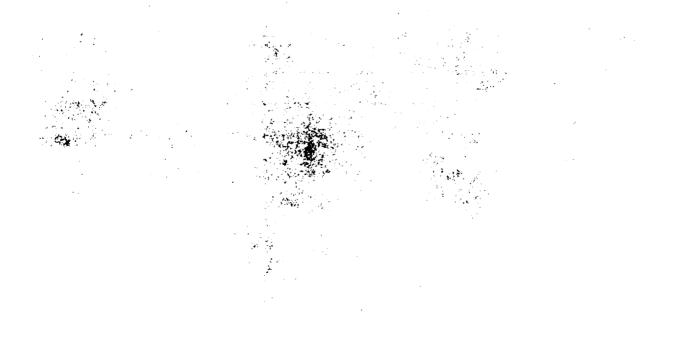
| ANSWER: B                                    |                   |
|----------------------------------------------|-------------------|
| K/A: 061 K1.01                               | Importance: 4.1   |
| Cognitive Level: Comprehension               |                   |
| References: 2OM-53B.5.GI-4, issue 1B, Rev. 1 | , page 4 and 5    |
| Lesson Plan #:2LP-SQS-24.1                   | Obj. #:8          |
|                                              |                   |
| History: NEW                                 |                   |
| Source:                                      | Type: CLOSED BOOK |
| JTA: 0610040101                              |                   |

| 56.       | With both M     | otor Driven Auxiliary | Feedw    | ater Pumps [2FWE*P22A,2       | 2B] in service and  |
|-----------|-----------------|-----------------------|----------|-------------------------------|---------------------|
|           | taking suction  | on from the Primary I | Plant De | emineralized Water Storage    | Tank                |
|           | [2FWE*TK2       | 10].                  |          |                               |                     |
|           | Which of the    | following Motor Driv  | ven Aux  | iliary Feedwater Pump indi    | cations would alert |
|           | the operator    | to the loss of suctio | n to the | operating pumps?              |                     |
|           | -               | Pump Amps             | Di       | scharge Pressure              | Flow                |
|           | Α.              | LOW                   |          | HIGH                          | LOW                 |
|           | В.              | HIGH                  |          | LOW                           | HIGH                |
|           | С.              | ZERO                  |          | Equal to Suction              | ZERO                |
|           | D.              | LOW                   |          | LOW                           | LOW                 |
| ANSV      | VER: D          |                       |          |                               |                     |
| K/A: 0    | )61 A1.05       |                       |          | Importance: 3.6               |                     |
|           | itive Level: Ap | plication             |          |                               |                     |
|           |                 |                       | imp Per  | formance with loss of suction | on                  |
|           | on Plan #: 2LP  |                       |          | Obj. #: 8                     |                     |
|           |                 |                       |          |                               |                     |
|           |                 |                       | ·····    | <u> </u>                      |                     |
| Histor    | y: NEW          |                       |          |                               |                     |
| Sourc     | ;e:             | <u>, ,</u>            |          | Type: Closed Book             |                     |
| JTA:0     | 610050101       |                       |          |                               |                     |
| مربع برون | 5 M.            |                       |          |                               |                     |

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| 57. A change in setpoint   | A change in setpoint for Process Effluent Radiation Monitor [2SGC-RQI100] is needed |                                                 |  |  |  |
|----------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------|--|--|--|
| to release a Steam G       | to release a Steam Generator Blowdown Evaporator Test Tank [2SGC-TK23A(B).          |                                                 |  |  |  |
| This setpoint change       | can only be impler                                                                  | mented under which of the following conditions? |  |  |  |
| A. "Supervis               | or Mode" at the He                                                                  | alth Physics RM-23A console.                    |  |  |  |
| B. "Supervis               | or Mode" at the Co                                                                  | ntrol Room RM-23A console.                      |  |  |  |
| C. At 2SGC-                | DAU100 (RM-80) c                                                                    | on the monitor skid.                            |  |  |  |
| D. At the RM               | 1-11 Local Panel co                                                                 | insole.                                         |  |  |  |
| ANSWER: B                  |                                                                                     |                                                 |  |  |  |
| K/A: 068 2.3.11 K/A CHANG  | ìE                                                                                  | Importance: 2.7                                 |  |  |  |
| Cognitive Level: Knowledge |                                                                                     |                                                 |  |  |  |
| References: 20M-43.1.C, Is |                                                                                     | e 2                                             |  |  |  |
| Lesson Plan #: 2LP-SQS-43  |                                                                                     | Obj. #: 7                                       |  |  |  |
|                            |                                                                                     |                                                 |  |  |  |
| History: NEW               |                                                                                     |                                                 |  |  |  |
| Source:                    |                                                                                     | Type: Closed Book                               |  |  |  |
| JTA: 0720030101            |                                                                                     |                                                 |  |  |  |
|                            | :                                                                                   |                                                 |  |  |  |

| 58.                                                                                | Annuciator A1-5A " GASEOUS WASTE SYSTEM TROUBLE" is in alarm. Computer                               |                                                                              |  |  |  |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--|--|--|
|                                                                                    | points 1/Y6557D and Y6558D " GWS OXY ANALYZER GWS-OA100A (B) WARN" are                               |                                                                              |  |  |  |
| in alarm. Failure to respond to this alarm could result in which of the following? |                                                                                                      |                                                                              |  |  |  |
|                                                                                    | A. Increased corrosion to the inner                                                                  | surface of Waste Gas Tanks.                                                  |  |  |  |
|                                                                                    | B. Loss of water seal to the operat                                                                  | ing Waste Gas Compressors.                                                   |  |  |  |
|                                                                                    | C. Buildup to flammable concentra                                                                    | tions of gasses in the Waste Gas Tanks.                                      |  |  |  |
|                                                                                    | D. Corrosion damage to the Waste                                                                     | Gas System Charcoal Delay Beds.                                              |  |  |  |
|                                                                                    |                                                                                                      |                                                                              |  |  |  |
| ANSV                                                                               | VER: C                                                                                               |                                                                              |  |  |  |
| K/A: 071 A4.29 Importance: 3.0                                                     |                                                                                                      |                                                                              |  |  |  |
| K/A: 0                                                                             | 071 A4.29                                                                                            | Importance: 3.0                                                              |  |  |  |
|                                                                                    | 071 A4.29<br>tive Level: Knowledge                                                                   | Importance: 3.0                                                              |  |  |  |
| Cogni                                                                              | tive Level: Knowledge                                                                                |                                                                              |  |  |  |
| Cogni<br>Refer                                                                     | tive Level: Knowledge<br>ences: 2OM-19.1.B, Issue 4, Rev 5, Page                                     | Importance: 3.0<br>e 2, 2OM-19.2, Issue 4, Rev. 1, Precaution 9<br>Obj. #: 3 |  |  |  |
| Cogni<br>Refer                                                                     | tive Level: Knowledge                                                                                | e 2, 2OM-19.2, Issue 4, Rev. 1, Precaution 9                                 |  |  |  |
| Cogni<br>Refere                                                                    | tive Level: Knowledge<br>ences: 20M-19.1.B, Issue 4, Rev 5, Page<br>on Plan #:2LP-SQS-19.1           | e 2, 2OM-19.2, Issue 4, Rev. 1, Precaution 9                                 |  |  |  |
| Cogni<br>Refere                                                                    | tive Level: Knowledge<br>ences: 20M-19.1.B, Issue 4, Rev 5, Page<br>on Plan #:2LP-SQS-19.1<br>y: NEW | e 2, 2OM-19.2, Issue 4, Rev. 1, Precaution 9                                 |  |  |  |



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| 59. If Control Room Area Radition Monitor [   | [2RMC*RQ201, 202] goes into ALERT what |
|-----------------------------------------------|----------------------------------------|
| radiation concern would exist?                |                                        |
| A. Control room personnel exposur             | re to gamma.                           |
| B. Control room air intake of alpha           | particulate release.                   |
| C. Control room air intake of beta p          | articulate release.                    |
| D. Control room personnel exposur             | re to neutrons.                        |
| ANSWER: A                                     |                                        |
| K/A: 072 K5.01                                | Importance: 2.7                        |
| Cognitive Level: Knowledge                    |                                        |
| References: 2OM-43.1.B, Issue 4, Rev. 1, page | e 4                                    |
| Lesson Plan #: 2LP-SQS-43.1                   | Obj. #: 3                              |
|                                               |                                        |
| History: NEW                                  |                                        |
| Source:                                       | Type: Closed Book                      |
| JTA: 0720030101                               |                                        |

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Now Quicinmations 

| 60.     | The Unit is in MC | DE 5:                                 |                                            |        |
|---------|-------------------|---------------------------------------|--------------------------------------------|--------|
|         | • RHS i           | s in service with the e               | ntire RCS at 130°F                         |        |
|         | • OPPS            | is NSA for MODE 5 a                   | and in service                             |        |
|         | How many React    | or Coolant Pumps ma                   | ty be started for heat up of the RCS under | r this |
|         | condition?        |                                       |                                            |        |
|         | A. NONE           |                                       |                                            |        |
|         | B. ONE            |                                       |                                            |        |
|         | C. TWO            |                                       | · · · ·                                    |        |
|         | D. THREE          |                                       |                                            |        |
|         | ive Level: Compre |                                       | p Startup" Issue 4, Rev. 6, Page 1         |        |
| Lessor  | n Plan #: 2LP-SQS | 3-6.3                                 | Obj. #: 12                                 |        |
|         |                   |                                       |                                            |        |
| History | : NEW             |                                       |                                            |        |
| Source  |                   | · · · · · · · · · · · · · · · · · · · | Type: OPEN BOOK                            |        |
| JTA: 0  | 03AAA0401         |                                       | Copy of procedure                          |        |
|         |                   |                                       |                                            |        |

| 61.   | A natural circulation cooldown is in progress in accordance with ES-0.2 "Natural    |                                                                                             |  |  |
|-------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--|--|
|       | Circulation Cooldown." The following information is available to the operator from  |                                                                                             |  |  |
|       | PSMS.                                                                               |                                                                                             |  |  |
|       | Core Exit Thermocouples (PSMS)                                                      |                                                                                             |  |  |
|       | Trisector 1=                                                                        | = 495                                                                                       |  |  |
|       | Trisector 2                                                                         |                                                                                             |  |  |
|       | • Trisector 3                                                                       |                                                                                             |  |  |
|       |                                                                                     | Pressure Indicator [2RCS*PT440] = 1185 psig                                                 |  |  |
|       |                                                                                     | Pressure Indicator [2RCS*PT441] = 1200 psig.<br>Pressure Indicator [2RCS*PT442] = 1205 psig |  |  |
|       |                                                                                     |                                                                                             |  |  |
|       | Using the listed information, which of the following would be the most conservative |                                                                                             |  |  |
|       | reading that should appear on the Subcooling Monitor [2RCS*YI001] on VB-B           |                                                                                             |  |  |
|       | subcooling?                                                                         | meat what we have have here here here here here here here he                                |  |  |
|       | A. 41 degrees Super                                                                 | neat without                                                                                |  |  |
|       | B. Zero (0) degrees -                                                               | saturated                                                                                   |  |  |
|       | C. 41 degrees subco                                                                 | TOF                                                                                         |  |  |
|       | D, 92 degrees subco                                                                 | bled                                                                                        |  |  |
| ANS   | WER: D                                                                              |                                                                                             |  |  |
|       | 006 A1.16                                                                           | Importance: 4.1                                                                             |  |  |
| Cogr  | nitive Level: Application                                                           |                                                                                             |  |  |
|       | rences: Steam Tables 20M-53.                                                        | BB ES-0.2. Foldout page.                                                                    |  |  |
|       | on Plan #: 2LP-SQS-6.7                                                              | Obj. #: 7                                                                                   |  |  |
| Less  | UIT FIAIT #. 22F-500-0.7                                                            |                                                                                             |  |  |
|       |                                                                                     |                                                                                             |  |  |
| Histo | ory: NEW                                                                            |                                                                                             |  |  |
|       | ce:                                                                                 | Type: OPEN REFERNCE                                                                         |  |  |
| Sour  |                                                                                     |                                                                                             |  |  |

| 62. The u     | nit is in mode 3 with th              | e RCS at n  | o load operating temperature and pressure.                                                                                                                                                    |
|---------------|---------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |                                       |             | ould provide the operator with the most effective                                                                                                                                             |
|               | urizer spray ?                        | -           |                                                                                                                                                                                               |
| А.            | Reactor Coolant Pur                   | np 2A [2RC  | S*P21A] ON and Pressurizer Spray Valves                                                                                                                                                       |
|               | [2RCS*PCV455A]·O                      | PEN, [2RC   | S*PCV455B] CLOSED.                                                                                                                                                                            |
| B.            | Reactor Coolant Pur                   | np 2C [2RC  | S*P21C] ON and Pressurizer Spray Valves                                                                                                                                                       |
|               | [2RCS*PCV455B] O                      | PEN, [2RCS  | S*PCV455A] CLOSED.                                                                                                                                                                            |
| C.            | Reactor Coolant Pur                   | np 2A [2RC  | S*P21A] ON and Pressurizer Spray Valves                                                                                                                                                       |
|               | [2RCS*PCV455B] O                      | PEN, [2RC   | S*PCV455A] CLOSED.                                                                                                                                                                            |
| D.            | Reactor Coolant Pur                   | np 2B [2RC  | S*P21B] ON and Pressurizer Spray Valves                                                                                                                                                       |
| <u> </u>      | [2RCS*PCV455A] O                      | PEN, [2RC   | S*PCV455B] CLOSED.                                                                                                                                                                            |
| ANSWER: B     |                                       |             |                                                                                                                                                                                               |
| K/A: 010 K1.0 | )3                                    |             | Importance: 3.6                                                                                                                                                                               |
| Cognitive Lev | el: Comprehension                     | <u></u>     |                                                                                                                                                                                               |
| References: 2 | 2OM-6.1.C, Issue 4, R                 | ev. 0, Page | 28                                                                                                                                                                                            |
| Lesson Plan   | #: 2LP-SQS-6.4                        |             | Obj. #: 8                                                                                                                                                                                     |
|               |                                       |             | $\mathcal{L}_{\mathrm{eff}}$ , where $\mathcal{L}_{\mathrm{eff}}$ , $\mathcal{L}_{\mathrm{eff}}$ , $\mathcal{L}_{\mathrm{eff}}$ , $\mathcal{L}_{\mathrm{eff}}$ , $\mathcal{L}_{\mathrm{eff}}$ |
| History: NEW  | ,                                     |             |                                                                                                                                                                                               |
| Source:       |                                       |             | Type: Closed Book                                                                                                                                                                             |
| JTA: 0020090  | 0101                                  |             |                                                                                                                                                                                               |
|               |                                       |             |                                                                                                                                                                                               |
|               |                                       |             |                                                                                                                                                                                               |
|               |                                       | •           |                                                                                                                                                                                               |
|               | · · · · · · · · · · · · · · · · · · · |             |                                                                                                                                                                                               |

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| 63.                        | Pressuizer Control Level Switch is sele              | ected to position I & III. Which of the following |  |
|----------------------------|------------------------------------------------------|---------------------------------------------------|--|
|                            | instruments will turn off all the operatin           | g heater groups on low level?                     |  |
|                            | A. 2RCS*LT459 OR 2RCS*LT461                          |                                                   |  |
|                            | B. 2RCS* LT460 OR 2RCS*LT462.                        |                                                   |  |
|                            | C. 2RCS*LT459 OR 2RCS*LT460                          |                                                   |  |
|                            | D. 2RCS*LT461 OR 2RCS*LT462                          |                                                   |  |
| ANS                        | WER: A                                               |                                                   |  |
| K/A:                       | 011 K4.01                                            | Importance: 3.3                                   |  |
| Cognitive Level: Knowledge |                                                      |                                                   |  |
| Refe                       | References: 20M-6.4.IF, Issue 4, Revision 5, Page 13 |                                                   |  |
| Less                       | on Plan #: 2LP-SQS-6.4                               | Obj. #: 13                                        |  |
|                            |                                                      |                                                   |  |
| Histo                      | bry: NEW                                             |                                                   |  |
| Sour                       | ce:                                                  | Type: CLOSED BOOK                                 |  |
| .ITA·                      | 0020090101                                           |                                                   |  |

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| 64.    | 64. During a depressurization of the RCS, which of the following trips is designed |                                                 |  |  |
|--------|------------------------------------------------------------------------------------|-------------------------------------------------|--|--|
|        | specifically to prevent DNBR from react                                            | hing the safety limit specified in Section 2 of |  |  |
|        | Technical Specifications?                                                          |                                                 |  |  |
|        | A. Pressurizer High Pressure.                                                      |                                                 |  |  |
|        | B. Power Range High Neutron Flux.                                                  |                                                 |  |  |
|        | C. Overtemperature Delta-Temperature.                                              |                                                 |  |  |
|        | D. Overpower Delta-T.                                                              |                                                 |  |  |
| ANSV   | ANSWER: C                                                                          |                                                 |  |  |
| K/A: ( | K/A: 012 K5.01 Importance: 3.3                                                     |                                                 |  |  |
| Cogn   | Cognitive Level: Knowledge                                                         |                                                 |  |  |
|        | References: 20M-1.1.B, Issue 4, Rev. 1 pages 5 and 6                               |                                                 |  |  |
|        | Lesson Plan #: 2LP-SQS-1.1 Obj. #: 5                                               |                                                 |  |  |
|        |                                                                                    |                                                 |  |  |
| Histor | History: NEW                                                                       |                                                 |  |  |
| Sourc  |                                                                                    | Type: Closed Book                               |  |  |
| JTA:   | JTA: 0120050101                                                                    |                                                 |  |  |

| 65. The annuciator A4-8G " ROD POSITION       | N DEVIATION ALARM" informs the operator of     |
|-----------------------------------------------|------------------------------------------------|
| which of the following deviations in the I    | Rod Position Indication System?                |
| A. At least one DRPI signal deviate           | es 12 steps from the Group Demand for that     |
| group.                                        |                                                |
| B. At least one Group Demand sigr             | nal deviates 12 steps from the Bank Demand     |
| signal.                                       |                                                |
| C. There is a one bit difference bet          | ween Data Cabinet A and Data Cabinet B.        |
| D. Group demand signal is within 1            | 0 steps of the calculated Rod Insertion Limit. |
|                                               | · .                                            |
| ANSWER: A                                     |                                                |
| K/A: 014 A1.02                                | Importance: 3.2                                |
| Cognitive Level: Knowledge                    |                                                |
| References: 20M-1.1.B, Issue 4, Rev. 1 page 2 | 20, 2OM-1.4.ACF, Issue 4, Rev. 1               |
| Lesson Plan #:2LP-SQS-1.1                     | Obj. #: 8                                      |
| · ·                                           | 3                                              |
| History: NEW                                  |                                                |
| Source:                                       | Type: Closed Book                              |
| JTA: 0140030101                               |                                                |
|                                               |                                                |

| <b>6</b> 6. | The unit is at 100% power with all syste                         | ems NSA. Main Condenser Vacuum [2CNM-           |  |  |  |  |
|-------------|------------------------------------------------------------------|-------------------------------------------------|--|--|--|--|
|             | CND21A] Section A Condenser Vacuu                                | m Transmitter [2CNM-PT103A] is damaged.         |  |  |  |  |
|             | Section B Condenser Vacuum Transmi                               | tter [2CNM-PT103B] is intact. Annuciator A12-   |  |  |  |  |
|             | 4C CONDENSER UNAVAILABLE (C-                                     | 9) is lit.                                      |  |  |  |  |
|             | If the unit suffered a large load rejection                      | n at this point, which of the following steam   |  |  |  |  |
|             | release pathways would open first?                               |                                                 |  |  |  |  |
|             | A. 1 <sup>st</sup> and 2 <sup>nd</sup> Bank Steam Bypass Valves. |                                                 |  |  |  |  |
|             | B. 3 <sup>rd</sup> and 4 <sup>th</sup> Bank Steam Bypass Valves. |                                                 |  |  |  |  |
|             | C. Residual Heat Release Valve [2                                | SVS*HCV104].                                    |  |  |  |  |
|             | D. Atmospheric Steam Dumps [2S                                   | VS*AOV101A, 101B, 101C].                        |  |  |  |  |
| ANS         | WER: D                                                           |                                                 |  |  |  |  |
| K/A:        | 016 K1.03                                                        | Importance: 3.2                                 |  |  |  |  |
| Cogr        | nitive Level: Comprehension                                      |                                                 |  |  |  |  |
| Refe        | rences: 2OM-22A.5, Issue 4, Rev. 0, Figu                         | re 22A-1, 2OM-21.5, Issue 4, Rev. 2, Figure 21- |  |  |  |  |
| 9B (1       | 2241-LSK-11-14B)                                                 |                                                 |  |  |  |  |
| Less        | on Plan #: 2LP-SQS-21.1                                          | Obj. #: 3                                       |  |  |  |  |
|             |                                                                  |                                                 |  |  |  |  |
| Histo       | ry: NEW                                                          |                                                 |  |  |  |  |
| Sour        | <b>Ce:</b>                                                       | Type: CLOSED BOOK                               |  |  |  |  |
|             | 0410030101                                                       |                                                 |  |  |  |  |
|             |                                                                  |                                                 |  |  |  |  |
|             |                                                                  |                                                 |  |  |  |  |
|             |                                                                  |                                                 |  |  |  |  |
|             |                                                                  |                                                 |  |  |  |  |

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| B. Recirculation Mode Initiation Signal is delayed by the slower RWST depletion rate.         C. Containment pressure would exceed the shutoff head of Recirculation Spray Pumps A and B [2RSS*P21A, 21B].         D. Start up of Recirculation Spray Pumps C and D [2RSS*P21C, 21D] is delaye slower RWST depletion.         ANSWER: B         K/A: 026 K3.02       Importance: 4.2         Cognitive Level: Comprehension         References: 20M-13.1.D, Issue 4, Rev. 0         Lesson Plan #:: 2LP-SQS-13.1         Obj. #: 4         History: NEW         Source:       Type: Closed Book         JTA:0060150101 |        | entered due to the lack        | of sump level.                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| C. Containment pressure would exceed the shutoff head of Recirculation Spray<br>Pumps A and B [2RSS*P21A, 21B].<br>D. Start up of Recirculation Spray Pumps C and D [2RSS*P21C, 21D] is delaye<br>slower RWST depletion.<br>ANSWER: B<br>K/A: 026 K3.02 Importance: 4.2<br>Cognitive Level: Comprehension<br>References: 20M-13.1.D, Issue 4, Rev. 0<br>Lesson Plan #:: 2LP-SQS-13.1 Obj. #: 4<br>History: NEW<br>Source: Type: Closed Book<br>By inspection. OSS flow is approx. 6000 or                                                                                                                              |        |                                | ation Signal is delayed by the slower RWST depletion                                                                                        |
| D. Start up of Recirculation Spray Pumps C and D [2RSS*P21C, 21D] is delayer<br>slower RWST depletion.<br>ANSWER: B<br>K/A: 026 K3.02 Importance: 4.2<br>Cognitive Level: Comprehension<br>References: 20M-13.1.D, Issue 4, Rev. 0<br>Lesson Plan #:: 2LP-SQS-13.1 Obj. #: 4<br>History: NEW<br>Source: Type: Closed Book<br>By inspection_OSS flow is approx. 6000 or                                                                                                                                                                                                                                                 |        |                                | would exceed the shutoff head of Recirculation Spray                                                                                        |
| slower RWST depletion.         ANSWER: B         K/A: 026 K3.02       Importance: 4.2         Cognitive Level: Comprehension         References: 2OM-13.1.D, Issue 4, Rev. 0         Lesson Plan #:: 2LP-SQS-13.1         Obj. #: 4         History: NEW         Source:       Type: Closed Book         By inspection       OSS flow is approx.6000 or                                                                                                                                                                                                                                                                | 1      | Pumps A and B [2RSS            | P21A, 21B].                                                                                                                                 |
| ANSWER: B<br>K/A: 026 K3.02 Importance: 4.2<br>Cognitive Level: Comprehension<br>References: 20M-13.1.D, Issue 4, Rev. 0<br>Lesson Plan #:: 2LP-SQS-13.1 Obj. #: 4<br>History: NEW<br>Source: Type: Closed Book<br>By inspection_QSS flow is approx_6000 or                                                                                                                                                                                                                                                                                                                                                            |        | •                              |                                                                                                                                             |
| Cognitive Level: Comprehension         References: 2OM-13.1.D, Issue 4, Rev. 0         Lesson Plan #:: 2LP-SQS-13.1         Obj. #: 4         History: NEW         Source:       Type: Closed Book         By inspection       OSS flow is approx 6000 gr                                                                                                                                                                                                                                                                                                                                                              | ANS    |                                |                                                                                                                                             |
| References: 20M-13.1.D, Issue 4, Rev. 0         Lesson Plan #:: 2LP-SQS-13.1         Obj. #: 4         History: NEW         Source:         Type: Closed Book         By inspection_OSS flow is approx_6000 gr                                                                                                                                                                                                                                                                                                                                                                                                         | K/A: ( | 026 K3.02                      | Importance: 4.2                                                                                                                             |
| Lesson Plan #:: 2LP-SQS-13.1     Obj. #: 4       History: NEW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Cogn   | itive Level: Comprehension     |                                                                                                                                             |
| History: NEW Source: Type: Closed Book By inspection_OSS flow is approx_6000 gr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Refer  | ences: 2OM-13.1.D, Issue 4, Re | v. 0                                                                                                                                        |
| Source: Type: Closed Book By inspection_OSS flow is approx_6000 gr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Less   | on Plan #:: 2LP-SQS-13.1       | Obj. #: 4                                                                                                                                   |
| Source: Type: Closed Book By inspection_OSS flow is approx_6000 gr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                                |                                                                                                                                             |
| By inspection OSS flow is approx 6000 gr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                                |                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        | ж:                             | Type: Closed Book<br>By inspection. QSS flow is approx. 6000 gp                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Sourc  | 0060150101                     |                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Sourc  | 060150101                      | less and will slow rate of depletion of RWST<br>DBA so sump level will be present.<br>RSS pump capability is above design basis<br>pressure |

| 68. Unit 2 is at 100% power with all system  | s NSA. Which of the following is used to     |
|----------------------------------------------|----------------------------------------------|
| maintain the Containment at subatmos         | pheric conditions?                           |
| A. Containment Vacuum Air Ejecto             |                                              |
|                                              | CVS-P21A,P21B] selected to AUTO.             |
|                                              | CVS-P21A,P21B] manually started as required. |
|                                              | IAC-C21A,C21B] aligned to take suction on    |
| Containment.                                 |                                              |
| ANSWER: C                                    |                                              |
| K/A: 029 K. 4.02                             | Importance: 2.9                              |
| Cognitive Level: Knowledge                   |                                              |
|                                              |                                              |
| References: 20M-12.1.C, Issue 4, Rev. 0, 20I |                                              |
| Lesson Plan #: 2LP-SQS-12.1                  | Obj. #: 3                                    |
|                                              |                                              |
| History: NEW                                 |                                              |
| Source:                                      | Type: CLOSED BOOK                            |
|                                              |                                              |
| JTA: 0260060101                              |                                              |
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|                                              |                                              |
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|                                              |                                              |
|                                              |                                              |

| 69. New fuel with an enrichment of 4.2% is being placed in the spent fuel pool. Which of |                                                                                |                                                    |  |  |
|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------|--|--|
| the following co                                                                         | omplies with the Technica                                                      | al Specification Limiting Condition for Operation? |  |  |
| A. Stor                                                                                  | rage is allowed in Region                                                      | 2 of the Spent Fuel Pool with no restrictions.     |  |  |
| B. Stor                                                                                  | B. Storage is allowed in Region 1 of the Spent Fuel Pool with no restrictions. |                                                    |  |  |
| C. Fue                                                                                   | C. Fuel with this enrichment must be stored in a 3 out of 4 Checkerboard       |                                                    |  |  |
| patt                                                                                     | pattern in Region 1.                                                           |                                                    |  |  |
| D. Fue                                                                                   | el with this enrichment ma                                                     | y be stored in a 3 out of 4 Checkerboard pattern   |  |  |
| in R                                                                                     | in Region 2.                                                                   |                                                    |  |  |
| ANSWER: C                                                                                |                                                                                |                                                    |  |  |
| K/A: 033 G 2.2.30                                                                        |                                                                                | Importance: 2.6                                    |  |  |
| Cognitive Level: Application                                                             |                                                                                |                                                    |  |  |
| References: BVPS Technical Specifications 3/4.9.14                                       |                                                                                |                                                    |  |  |
| Lesson Plan #: 2LP-SQS-20.1 Obj. #: 10                                                   |                                                                                |                                                    |  |  |
|                                                                                          |                                                                                |                                                    |  |  |
| History: NEW                                                                             |                                                                                |                                                    |  |  |
| Source:                                                                                  |                                                                                | Type: OPEN BOOK                                    |  |  |
| JTA: 033A0101                                                                            |                                                                                | Tech Spec Reference for Student                    |  |  |



| 70.   | The unit is stable at 8% power with                                                                                          | n the Main Turbine off-line. The | Main Feedwater                        |
|-------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------|
|       | Regulating Bypass Valves are in a                                                                                            | utomatic and controlling at prog | ram level.                            |
|       | Inadvertently, loop 21A Main Stear<br>الروس                                                                                  | n Atmospheric Vent Valve [2SV    | S*PCV101A] fails full                 |
|       | Inadvertently, loop 21A Main Stear<br>مالاموس<br>open. Which of the following <del>is the</del><br>A. Intermediate Range Hig | a result of the valve opening?   | Ammed or h. tan                       |
|       | A. Intermediate Range Hig                                                                                                    | gh Reactor Power Trip is genera  | ited. Grin Es                         |
|       | B. Reactor Trip due to Ste                                                                                                   | am Generator 21A Low-Low lev     | vel.                                  |
|       | C. Steam Generator 21A I                                                                                                     | evel rises on increased steam d  | emand.                                |
|       | D. Steam Generator 21 A                                                                                                      | level rises to new program level | •                                     |
|       |                                                                                                                              |                                  |                                       |
| ANS   | WER: C                                                                                                                       | I                                |                                       |
| K/A:  | 035 K6.02                                                                                                                    | Importance: 3.1                  | <u> </u>                              |
| Cogr  | nitive Level: Comprehension                                                                                                  |                                  |                                       |
| Refe  | rences: Generic Fundamentals, 20M                                                                                            | -21.1.D, Issue 4, Rev. 2, page   | <b>.</b>                              |
| Less  | on Plan #: 2LP-SQS-24.1                                                                                                      | Obj. #: 8                        |                                       |
|       | •                                                                                                                            |                                  |                                       |
| Histo | ory: NEW                                                                                                                     |                                  |                                       |
| Sour  | ce:                                                                                                                          | Type: Closed Book                |                                       |
| JTA:  | 0350060101                                                                                                                   | ·                                |                                       |
|       |                                                                                                                              |                                  |                                       |
|       |                                                                                                                              |                                  | · · · · · · · · · · · · · · · · · · · |
|       |                                                                                                                              |                                  |                                       |
|       |                                                                                                                              |                                  |                                       |
| •     |                                                                                                                              |                                  |                                       |

| 71. The unit is in Mode 3 after shutdown fro           | The unit is in Mode 3 after shutdown from extended full power operations. Stm Dump |  |  |  |
|--------------------------------------------------------|------------------------------------------------------------------------------------|--|--|--|
|                                                        | SURE mode. The operator adjusts the setpoint                                       |  |  |  |
|                                                        | [2MSS*PK422] from 8.8 turns to 8.5 turns. The                                      |  |  |  |
| operator observes Tavgand Loop Delta T?                |                                                                                    |  |  |  |
| A. Drop and drop.                                      | A. Drop and drop.                                                                  |  |  |  |
| B. Drop and remain the same.                           | B. Drop and remain the same.                                                       |  |  |  |
| C. Rise and rise.                                      | C. Rise and rise.                                                                  |  |  |  |
| D. Rise and drop.                                      |                                                                                    |  |  |  |
| ANSWER: B                                              |                                                                                    |  |  |  |
| K/A: 039 A1.05                                         | Importance: 3.2                                                                    |  |  |  |
| Cognitive Level: Comprehension                         |                                                                                    |  |  |  |
| References: See heat exchanger behavior GF. 20M-21.1.C |                                                                                    |  |  |  |
| Lesson Plan #: 2LP-SQS-21                              | Obj. #: 3.                                                                         |  |  |  |
|                                                        |                                                                                    |  |  |  |
| History: NEW/                                          |                                                                                    |  |  |  |
| History: NEW                                           | Type: CLOSED BOOK                                                                  |  |  |  |
| Source:                                                |                                                                                    |  |  |  |
| JTA: 0410050101                                        |                                                                                    |  |  |  |

| 72.    | 72. Annuciator A6-5G "CONDENSER VACUUM LOW/LOW-LOW" alarm is lit. The      |                                                |  |  |  |
|--------|----------------------------------------------------------------------------|------------------------------------------------|--|--|--|
|        | operators are verifying criteria for prope                                 | er operation of the Air Ejectors. Which of the |  |  |  |
|        | following operating conditions could cause this alarm?                     |                                                |  |  |  |
|        | A. Auxiliary Steam Supply to the Air Ejectors is 150 psig.                 |                                                |  |  |  |
|        | B. Condensate Temperatures leaving the air ejectors indicates 105 degrees. |                                                |  |  |  |
|        | C. Intercondenser Loop Seals [2ASS-LG101A, B] indicate drained.            |                                                |  |  |  |
|        | . D. Mezzanine vents 2ARC-357 and 2ARC-930 are open.                       |                                                |  |  |  |
| ANSV   | ANSWER: C                                                                  |                                                |  |  |  |
| K/A: ( | K/A: 055 K3.01 Importance: 2.5                                             |                                                |  |  |  |
|        | Cognitive Level: Comprehension                                             |                                                |  |  |  |
|        | References: 20M-26.4.H, Issue 1, Rev. 10, Attachment 1                     |                                                |  |  |  |
|        | Lesson Plan #: 2LP-SQS-26.2 Obj. #: 7                                      |                                                |  |  |  |
|        |                                                                            |                                                |  |  |  |
| Histor | History: NEW                                                               |                                                |  |  |  |
| Sourc  | •                                                                          | Type: OPEN Book                                |  |  |  |
| JTA:   | 0550040101                                                                 | Give copy of Attachment 1                      |  |  |  |

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| 73. The unit is in Mode 4 and heating up. A                  | Il reactor coolant pumps are running. The 4KV                |  |  |  |
|--------------------------------------------------------------|--------------------------------------------------------------|--|--|--|
| Normal Electrical System is in NSA for N                     | Node 4. Which of the following is the source of              |  |  |  |
| power to Reactor Coolant Pump 21A [2]                        | RCS*P21A]?                                                   |  |  |  |
| A. 138 kV Bus # 2 via System S                               | A. 138 kV Bus # 2 via System Station Service Transformer 2A. |  |  |  |
| B. 138 kV Bus # 1 via System Station Service Transformer 2B. |                                                              |  |  |  |
| C. 345 kV Bus 3 via Unit Station Service Transformer 2C.     |                                                              |  |  |  |
| D. Unit 1 4KV Bus 2A via Unit 1                              | to 2A Cross-Tie [ACB-2A2].                                   |  |  |  |
|                                                              |                                                              |  |  |  |
| ANSWER: A                                                    |                                                              |  |  |  |
| K/A:: 062 K2.01                                              | Importance: 3.3                                              |  |  |  |
| Cognitive Level: Comprehension                               |                                                              |  |  |  |
| References: 20M-36.1.B, Issue 4, Rev. 0, Page 1              |                                                              |  |  |  |
| Lesson Plan #: 2LP-SQS-36.1                                  | Obj. #: 4                                                    |  |  |  |
|                                                              |                                                              |  |  |  |
| History: NEW                                                 |                                                              |  |  |  |
| Source:                                                      | Type: OPEN BOOK                                              |  |  |  |
| JTA: 0620040101                                              | Give basic electrical print?                                 |  |  |  |

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| 74.                            | Annuciator A8-10A "125 VDC BUS 2-1 GROUND" is lit. NO. 2-1 DC Bus Ground |                                                    |  |
|--------------------------------|--------------------------------------------------------------------------|----------------------------------------------------|--|
|                                | Detector indicates a -75 VDC grou                                        | nd. Under these conditions, which of the follow    |  |
|                                | a concern?                                                               |                                                    |  |
|                                | A. The 2-1 Battery may be inc                                            | perable due to low voltage.                        |  |
|                                | B. The 2-1 Battery Charger O                                             | utput Breaker may trip on overcurrent.             |  |
|                                | C. A 125 VDC Bus 2-1 load c                                              | ould actuate inadvertently if a positive ground or |  |
|                                | D. 125 VDC Bus 2-1 Distribut                                             | on Switchboard may trip on voltage differential.   |  |
| ANS                            | WER: C                                                                   |                                                    |  |
| K/A: 063 A2.01 Importance: 2.5 |                                                                          |                                                    |  |
| Cogr                           | nitive Level: Comprehension                                              |                                                    |  |
|                                |                                                                          | ), 2OM-39.4.F, Issue 4, Rev. 1 Section II. (This   |  |
|                                |                                                                          | N OM actually says device will actuate.)           |  |
|                                |                                                                          | Obj. #: 7. b                                       |  |
|                                | on Plan #" 21 P-505-39.1                                                 |                                                    |  |
|                                | on Plan #: 2LP-SQS-39.1                                                  |                                                    |  |
| Less                           | on Plan #: 2LP-SQS-39.1                                                  |                                                    |  |
| Less                           | ory: NEW                                                                 | Type CLOSED BOOK                                   |  |

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|     | 75. Unit 2 is at 100% power with all systems NSA. 2OST-36.1 "Emergency Diesel                                                                |                                             |  |  |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--|--|
|     | Generator [2EGS*EG2-1] Monthly Test* is in progress with the diesel paralleled to                                                            |                                             |  |  |
|     | and at 4450 KW for the last 30 minutes. Without warning the unit trips and a Safet                                                           |                                             |  |  |
|     |                                                                                                                                              | nsfer" from USST to SSST occurs with no     |  |  |
|     | •                                                                                                                                            | ency Diesel Generator [2EGS*EG2-1] at the   |  |  |
|     | completion of the transfer?                                                                                                                  |                                             |  |  |
|     |                                                                                                                                              | 2AE with Emergency Diesel Generator Breaker |  |  |
|     |                                                                                                                                              |                                             |  |  |
|     | [ACB2E10] closed.                                                                                                                            | Emergency Diesel Generator Breaker          |  |  |
|     |                                                                                                                                              | Emergency Dieser Generator Dicarch          |  |  |
|     | [ACB2E10] open.                                                                                                                              | anay Dianal Concretor Broaker (ACB2E10)     |  |  |
|     | C. In "Cooldown" cycle with Emergency Diesel Generator Breaker [ACB2E10]                                                                     |                                             |  |  |
|     | open.                                                                                                                                        |                                             |  |  |
|     | D. Tripped with Emergency Diesel Generator Breaker [ACB2E10] locked out.                                                                     |                                             |  |  |
|     | ANSWER: B                                                                                                                                    |                                             |  |  |
|     | K/A: 064 A2.16                                                                                                                               | Importance: 3.3                             |  |  |
|     | Cognitive Level: Comprehension                                                                                                               |                                             |  |  |
|     | References: 2OST-36.1, Issue 4, Rev. 24 page 7, 2OM-36.1.D, Issue 4, Rev. 3, page 31           Lesson Plan #: 2LP-SQS-36.2         Obj. #: 5 |                                             |  |  |
|     |                                                                                                                                              |                                             |  |  |
|     |                                                                                                                                              |                                             |  |  |
|     | History: NEW                                                                                                                                 |                                             |  |  |
| • • |                                                                                                                                              |                                             |  |  |
|     | Source:                                                                                                                                      |                                             |  |  |
|     | JTA: 0640040101                                                                                                                              |                                             |  |  |

| 76. The Unit is in MODE 5, Containment           | The Unit is in MODE 5, Containment Purge to the Auxiliary Bulding Ventilation Vent is |  |  |  |  |
|--------------------------------------------------|---------------------------------------------------------------------------------------|--|--|--|--|
| in progress when Containment Purge               | in progress when Containment Purge Monitor [2HVR*RQ104A, 104B] HIGH Alarm is          |  |  |  |  |
| activated. Which of the following fans           | when tripped will close the Containment Isolation                                     |  |  |  |  |
| Valves [2HVR-MOD23A,23B,25A,25E                  | 3]?                                                                                   |  |  |  |  |
| A. Containment Air Recirculation                 | Fan [2HVR-FN201B].                                                                    |  |  |  |  |
| B. Containment lodine Filtration F               | Fan [2HVR-FN203B].                                                                    |  |  |  |  |
| C. Leak Collection Filter Exhaust                | Fan [2HVS-FN204B].                                                                    |  |  |  |  |
| D. Leak Collection Normal Exhau                  | st Fan [2HVS-FN263B].                                                                 |  |  |  |  |
| ANSWER: D                                        |                                                                                       |  |  |  |  |
| K/A: 073 K4.01                                   | Importance: 4.0                                                                       |  |  |  |  |
| Cognitive Level: Comprehension                   |                                                                                       |  |  |  |  |
| References: 20M-43.1.C, Issue 4, Rev. 3, page 43 |                                                                                       |  |  |  |  |
| Lesson Plan #: 2LP-SQS-43.1 Obj. #: 7            |                                                                                       |  |  |  |  |
|                                                  |                                                                                       |  |  |  |  |
| History: NEW                                     |                                                                                       |  |  |  |  |
| Source:                                          | Type: CLOSED BOOK                                                                     |  |  |  |  |
| JTA: 072BBB0221                                  |                                                                                       |  |  |  |  |

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| 77. The Unit is at 100% power. The operat                 | The Unit is at 100% power. The operator is preparing to start Service Water pump                                               |  |  |  |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--|--|--|
|                                                           | [2SWS-P21A]. Which of the following <del>parameters</del> will prevent a pump start from the <i>Conductions</i> control board? |  |  |  |
| A. Service Water Pump [2SWS                               | -P21B] in AFTER START.                                                                                                         |  |  |  |
| B. Standby Service Water Pum                              | p [2SWE-P21A] in AFTER START.                                                                                                  |  |  |  |
| C. Secondary Component Coo                                | ing Water Heat Exchanger Service Water                                                                                         |  |  |  |
| Supply Isolation Valve [2SW                               | S*MOV107A] OPEN.                                                                                                               |  |  |  |
| D. Service Water Pump Discha                              | rge Valve [2SWS*MOV102A] OPEN.                                                                                                 |  |  |  |
|                                                           |                                                                                                                                |  |  |  |
| ANSWER: D                                                 |                                                                                                                                |  |  |  |
| K/A: 076 A4.02 Importance:2.9                             |                                                                                                                                |  |  |  |
| Cognitive Level: Knowledge                                |                                                                                                                                |  |  |  |
| References: 20M-30.1.D, Issue 4, Rev. 4, pages 4,5 and 14 |                                                                                                                                |  |  |  |
| Lesson Plan #: 2LP-SQS-30.1 Obj. #: 5.b                   |                                                                                                                                |  |  |  |
|                                                           |                                                                                                                                |  |  |  |
| History: NEW                                              |                                                                                                                                |  |  |  |
| Source: Type: CLOSED BOOK                                 |                                                                                                                                |  |  |  |
| JTA: 076CCC0121                                           |                                                                                                                                |  |  |  |

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| 78. | Containment Instrument Air Compressors [2IAC-C21A, 21B] are out of service. Station |
|-----|-------------------------------------------------------------------------------------|
|     | Air Compressor [2SAS-C21A] is supplying containment instrument air with Containment |
|     | Instrument Air Isolation Valve [2IAC-MOV130] and Containment Instrument Air Backup  |
|     | Supply Valve open [2IAC*MOV131]. A CIA signal was actuated. Which of the following  |
|     | configurations is expected?                                                         |

- A. 2IAC-MOV130 open, 2IACMOV131 open.
- B. 2IAC-MOV130 closed 2IACMOV131 open.
- C. 2IAC-MOV130 closed, 2IACMOV131 closed.
- D. 2IAC-MOV130 open, 2IACMOV131 closed.

| ANSWER: B                                       |  |  |  |
|-------------------------------------------------|--|--|--|
| K/A: 079 K4.01 Importance: 2.9                  |  |  |  |
| Cognitive Level: Knowledge                      |  |  |  |
| References: 20M-34.1.D, Issue 4, Rev. 1, page 6 |  |  |  |
| Lesson Plan #: 2LP-SQS-34.1 Obj. #: 5.a         |  |  |  |
|                                                 |  |  |  |
| History: NEW                                    |  |  |  |
| Source: Type: OPEN BOOK                         |  |  |  |
| JTA: 078AAA0101 Figure 34-1                     |  |  |  |

| 79    | A CO <sub>2</sub> discharge is imminent in a protected zone. Which of the following actions are |                                        |                       |                                                                                                                |
|-------|-------------------------------------------------------------------------------------------------|----------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------|
|       | available to alert personnel in the protected zone?                                             |                                        |                       |                                                                                                                |
|       | A. Predischarge warning horn sounds inside the protected zone.                                  |                                        |                       |                                                                                                                |
|       | В.                                                                                              | Blue rotating lights are initiated     | in all occupied areas | for the protected zone.                                                                                        |
|       | C.                                                                                              | A Wintergreen oderizer is releas       | sed in the zone prior | to discharge.                                                                                                  |
|       | D.                                                                                              | All key card controlled entrance       | doors are locked clo  | sed for the affected zone.                                                                                     |
|       |                                                                                                 |                                        | <u></u>               |                                                                                                                |
| ANS   | NER: A                                                                                          |                                        |                       |                                                                                                                |
| K/A:  | 086 A4                                                                                          | 04                                     | Importance: 3.1       |                                                                                                                |
| Cogn  | itive Lev                                                                                       | vel: Knowledge                         |                       |                                                                                                                |
| Ref.: | 20M-3                                                                                           | 3.1.D "Fire Protection Systems Ir      | nstrumentation and C  | control", Issue 4, Rev. 2,                                                                                     |
|       | 4 of 11                                                                                         |                                        |                       |                                                                                                                |
| LP#:  | 2LP-S                                                                                           | SQS-33                                 | OBJ: 4                |                                                                                                                |
|       |                                                                                                 |                                        |                       |                                                                                                                |
| Histo | ry: 2LO <sup>:</sup>                                                                            | Γ2, 11/7/97, (Fire Protection, Alt. \$ | Safe Shutdown,        | Type: CLOSED BOOK                                                                                              |
|       |                                                                                                 | sualty Control), Used on 2LOT2A        |                       |                                                                                                                |
|       |                                                                                                 | ed on SQS 1132,                        |                       |                                                                                                                |
|       | 086007                                                                                          |                                        |                       |                                                                                                                |
|       |                                                                                                 |                                        |                       |                                                                                                                |
|       |                                                                                                 |                                        |                       | and a second |
|       |                                                                                                 |                                        | GHT                   |                                                                                                                |
|       |                                                                                                 | · ·                                    |                       |                                                                                                                |
|       |                                                                                                 |                                        |                       | · · ·                                                                                                          |

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| 80.    | . The unit is in MODE 5 with the RCS operating at Reduced Inventory. Procedure 20M-     |                                                    |  |  |
|--------|-----------------------------------------------------------------------------------------|----------------------------------------------------|--|--|
|        | 10.4.D RHS Operation With RCS At Reduced Inventory/Midloop Condition <sup>®</sup> is in |                                                    |  |  |
|        | progress. The RCS is drained to 3 feet below the flange. Which of the following is an   |                                                    |  |  |
|        | acceptable flow configuration for the R                                                 | HR pumps?                                          |  |  |
|        | A. RHR Pumps [2RHR*P21A,                                                                | and 21B] running with total system flow limited to |  |  |
|        | 3000 gpm including letdow                                                               | n flow and recirculation for the pumps.            |  |  |
|        | (B.)RHR Pumps [2RHR*P21A]                                                               | OR [RHR*P21B] operating at less than 3000          |  |  |
|        | gpm.                                                                                    |                                                    |  |  |
|        | C. RHR Pumps [2RHR*P21A]                                                                | OR [2RHR*P21B] operating at less than 4000         |  |  |
|        | gpm.                                                                                    |                                                    |  |  |
|        | D. RHR Pumps [2RHR*P21A,                                                                | and 21B] running with total system flow limited to |  |  |
|        | 4350 gpm including letdow                                                               | n flow and recirculation for the pumps.            |  |  |
| ANS    | WER: C                                                                                  |                                                    |  |  |
| K/A: ( | 005 K3.01                                                                               | Importance: 3.9                                    |  |  |
| Cogn   | Cognitive Level: Comprehension                                                          |                                                    |  |  |
| Refer  | rences: 20M-10.2.A, Issue 4, Rev. 6, Pa                                                 | ge 2                                               |  |  |
| Less   | on Plan #: 2LP-SQS-10.1                                                                 | Obj. #: 10.a                                       |  |  |
|        | <u>, , , , , , , , , , , , , , , , , , , </u>                                           |                                                    |  |  |
| Histo  | History: NEW                                                                            |                                                    |  |  |
| Sourc  |                                                                                         | Type: OPEN BOOK                                    |  |  |
| JTA:   | 005AAA0101                                                                              | Limits and precautions in reference                |  |  |
|        |                                                                                         | :3                                                 |  |  |
|        |                                                                                         | J. T. C.                                           |  |  |
|        | When we B+C<br>when the precedulations in restorence                                    |                                                    |  |  |
|        |                                                                                         | DU                                                 |  |  |
|        |                                                                                         | -                                                  |  |  |

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| 81. | The plant is in Mode 4 on RHR with a cooldown to Mode 5 in progress. The "A" Train of       |
|-----|---------------------------------------------------------------------------------------------|
|     | RHS is in service. During the construction of scaffolding on the RHR platform, the          |
|     | instrument air line to [2RHS*HCV758A] is broken, resulting in the loss of air to the valve. |
|     | Which of the following describes the impact on RHS Heat Exchanger Outlet Flow               |
|     | Control Valve 2RHS*HCV758A and RHS system flow?                                             |

- A. The valve fails open. [2RHS\*FCV605A] automatically closes to control flow.
- B. The valve fails open. The RHR pump will run out at maximum system flow.
- C. The valve fails closed. [2RHS\*FCV605A] automatically opens to maintain flow.
- D. The valve fails closed. [2RHS\*FCV605A] must be manually opened to maintain flow.

| ANSWER: A                                                                  |  |  |  |
|----------------------------------------------------------------------------|--|--|--|
| K/A: 005A2.04 Importance: 2.9/2.9                                          |  |  |  |
| Cognitive Level: Comprehension                                             |  |  |  |
| Ref.: 20M10.5"Residual Heat Removal Systems Figures and Tables" Figure10.1 |  |  |  |
| LP#: 2LP-SQS-10.1 OBJ: 8                                                   |  |  |  |
| History NEW                                                                |  |  |  |
| Source:                                                                    |  |  |  |
| JTA: 0050080101 Type: CLOSED BOOK                                          |  |  |  |

| 2<br>MOV516].                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 82.   | Which of the following describes the function of the sparger installed in the Pressuizer                                                                                                         |          |                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------|
| Pumps [2DGS*P21A, 21B].                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       | Relief Tank [2RCS*TK22]?                                                                                                                                                                         |          |                                            |
| <ul> <li>B. Reduces pressure by spray from Pressurizer Relief Tank Spray Valve [2R MOV516].</li> <li>C. Directs steam discharge from Pressurizer PORV's [2RCS*455C,D, 2RCS* to bottom of tank.</li> <li>D. Mixes nitrogen cover gas into tank volume via Nitrogen Supply Valve [2RCS*AOV101].</li> </ul> ANSWER: C K/A: 007 K4.01 K/A CHANGE Importance: 2.6 Cognitive Level: Knowledge References: 2OM-6.1.C, Issue 4, Rev. 0, page 33 Lesson Plan #: 2LP-SQS-6.4 Obj. #: 7 History: NEW Source: Type: CLOSED BOOK |       | A. Allows drainage of the P                                                                                                                                                                      | ressuriz | er Relief Tank via Primary Drains Transfer |
| MOV516].<br>C. Directs steam discharge from Pressurizer PORV's [2RCS*455C,D, 2RCS*<br>to bottom of tank.<br>D. Mixes nitrogen cover gas into tank volume via Nitrogen Supply Valve<br>[2RCS*AOV101].<br>ANSWER: C<br>K/A: 007 K4.01 <u>K/A CHANGE</u><br>Importance: 2.6<br>Cognitive Level: Knowledge<br>References: 2OM-6.1.C, Issue 4, Rev. 0, page 33<br>Lesson Plan #: 2LP-SQS-6.4<br>Obj. #: 7<br>History: NEW<br>Source:<br>Type: CLOSED BOOK                                                                |       | Pumps [2DGS*P21A, 21                                                                                                                                                                             | B].      |                                            |
| C. Directs steam discharge from Pressurizer PORV's [2RCS*455C,D, 2RCS*<br>to bottom of tank.<br>D. Mixes nitrogen cover gas into tank volume via Nitrogen Supply Valve<br>[2RCS*AOV101].<br>ANSWER: C<br>K/A: 007 K4.01 <i>K/A CHANGE</i> Importance: 2.6<br>Cognitive Level: Knowledge<br>References: 2OM-6.1.C, Issue 4, Rev. 0, page 33<br>Lesson Plan #: 2LP-SQS-6.4 Obj. #: 7<br>History: NEW<br>Source: Type: CLOSED BOOK                                                                                     |       | <ul> <li>C. Directs steam discharge from Pressurizer PORV's [2RCS*455C,D, 2RCS*456 to bottom of tank.</li> <li>D. Mixes nitrogen cover gas into tank volume via Nitrogen Supply Valve</li> </ul> |          |                                            |
| to bottom of tank.<br>D. Mixes nitrogen cover gas into tank volume via Nitrogen Supply Valve<br>[2RCS*AOV101].<br>ANSWER: C<br>K/A: 007 K4.01 K/A CHANGE<br>K/A: 007 K4.01 K/A CHANGE<br>Importance: 2.6<br>Cognitive Level: Knowledge<br>References: 2OM-6.1.C, Issue 4, Rev. 0, page 33<br>Lesson Plan #: 2LP-SQS-6.4<br>Obj. #: 7<br>History: NEW<br>Source: Type: CLOSED BOOK                                                                                                                                   |       |                                                                                                                                                                                                  |          |                                            |
| D. Mixes nitrogen cover gas into tank volume via Nitrogen Supply Valve<br>[2RCS*AOV101].<br>ANSWER: C<br>K/A: 007 K4.01 K/A CHANGE Importance: 2.6<br>Cognitive Level: Knowledge<br>References: 2OM-6.1.C, Issue 4, Rev. 0, page 33<br>Lesson Plan #: 2LP-SQS-6.4 Obj. #: 7<br>History: NEW<br>Source: Type: CLOSED BOOK                                                                                                                                                                                            |       |                                                                                                                                                                                                  |          |                                            |
| [2RCS*AOV101].          ANSWER: C         K/A: 007 K4.01 K/A CHANGE       Importance: 2.6         Cognitive Level: Knowledge         References: 2OM-6.1.C, Issue 4, Rev. 0, page 33         Lesson Plan #: 2LP-SQS-6.4       Obj. #: 7         History: NEW         Source:       Type: CLOSED BOOK                                                                                                                                                                                                                |       |                                                                                                                                                                                                  |          |                                            |
| ANSWER: C<br>K/A: 007 K4.01 K/A CHANGE Importance: 2.6<br>Cognitive Level: Knowledge<br>References: 2OM-6.1.C, Issue 4, Rev. 0, page 33<br>Lesson Plan #: 2LP-SQS-6.4 Obj. #: 7<br>History: NEW<br>Source: Type: CLOSED BOOK                                                                                                                                                                                                                                                                                        |       |                                                                                                                                                                                                  |          |                                            |
| K/A: 007 K4.01 K/A CHANGE       Importance: 2.6         Cognitive Level: Knowledge                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                                                                                                                                                                                  |          |                                            |
| K/A: 007 K4.01 K/A CHANGE       Importance: 2.6         Cognitive Level: Knowledge                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                                                                                                                                                                                  |          |                                            |
| Cognitive Level: Knowledge         References: 2OM-6.1.C, Issue 4, Rev. 0, page 33         Lesson Plan #: 2LP-SQS-6.4       Obj. #: 7         History: NEW         Source:       Type: CLOSED BOOK                                                                                                                                                                                                                                                                                                                  | ANS   | WER: C                                                                                                                                                                                           |          |                                            |
| References: 2OM-6.1.C, Issue 4, Rev. 0, page 33         Lesson Plan #: 2LP-SQS-6.4       Obj. #: 7         History: NEW         Source:       Type: CLOSED BOOK                                                                                                                                                                                                                                                                                                                                                     | K/A:  | 007 K4.01 <u>K/A CHANGE</u>                                                                                                                                                                      |          | Importance: 2.6                            |
| Lesson Plan #: 2LP-SQS-6.4     Obj. #: 7       History: NEW                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Cogr  | nitive Level: Knowledge                                                                                                                                                                          |          |                                            |
| Lesson Plan #: 2LP-SQS-6.4     Obj. #: 7       History: NEW                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Refe  | rences: 2OM-6.1.C, Issue 4, Rev.                                                                                                                                                                 | 0, page  | 33                                         |
| History: NEW Source: Type: CLOSED BOOK                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                                                                                                                                                                  |          |                                            |
| Source: Type: CLOSED BOOK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                                                                                                                                                                  |          |                                            |
| Source: Type: CLOSED BOOK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Histo | ory: NEW                                                                                                                                                                                         |          |                                            |
| 174.0070030101                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Sour  | ce:                                                                                                                                                                                              |          | Type: CLOSED BOOK                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                                                                                                                                                                  |          |                                            |

| 83.                                    | 83. The Containment Iodine Filtration Charcoal adsorbers [2HVR-FLTA211A(B)] are       |                                                       |  |  |  |
|----------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------|--|--|--|
| c                                      | designed for iodine removal from containment during which of the following scenerios? |                                                       |  |  |  |
|                                        | A. Normal subatmospheric a                                                            | and shutdown plant operations for normal              |  |  |  |
|                                        | containment access.                                                                   |                                                       |  |  |  |
|                                        | B. Post Design Basis LOCA                                                             | atmospheric clean up of containment prior to any      |  |  |  |
|                                        | release to the Uncontrolle                                                            | ed Area.                                              |  |  |  |
|                                        | C. Scrubbing of Containmen                                                            | t Purge Exhaust during Containment RWDA-G             |  |  |  |
|                                        | releases.                                                                             |                                                       |  |  |  |
|                                        | D. Filtering exhaust during the                                                       | he initial lift of the vessel head prior to refueling |  |  |  |
|                                        | canal flooding.                                                                       |                                                       |  |  |  |
| ANSWE                                  | ER: A                                                                                 |                                                       |  |  |  |
| K/A: 027 K5.01 Importance: 3.1         |                                                                                       | Importance: 3.1                                       |  |  |  |
| Cognitive Level: Knowledge             |                                                                                       |                                                       |  |  |  |
| References: 20M-44C.1.B                |                                                                                       |                                                       |  |  |  |
| Lesson Plan #: 2LP-SQS-44C.1 Obj. #: 1 |                                                                                       |                                                       |  |  |  |
|                                        |                                                                                       |                                                       |  |  |  |
| History: NEW                           |                                                                                       |                                                       |  |  |  |
| Source: Type: CLOSED BOOK              |                                                                                       |                                                       |  |  |  |
| JTA: 02                                | JTA: 0270010101                                                                       |                                                       |  |  |  |
|                                        |                                                                                       |                                                       |  |  |  |

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| 84.                         | Step 29 of E-1 " Loss of Reactor or Secondary Coolant" checks H2 concentration ir                                                                                                  |                                                                            |  |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|--|
|                             | preparation for startup of the Hydrogen Recombiners. If H2 concentration is 4.5%,                                                                                                  |                                                                            |  |
|                             | must the TSC be consulted prior to                                                                                                                                                 | startup of the Hydrogen Recombiners?                                       |  |
|                             | A. The hydrogen recombiner could ignite a hydrogen burn during on line                                                                                                             |                                                                            |  |
|                             | operations.                                                                                                                                                                        |                                                                            |  |
|                             | <ul><li>B. Hydrogen concentration is above the design capacity of the recombiner.</li><li>C. Core damage is indicated and dose rates will be higher than projected while</li></ul> |                                                                            |  |
|                             |                                                                                                                                                                                    |                                                                            |  |
|                             |                                                                                                                                                                                    | D. Containment depressurization to subatmospheric conditions must be compl |  |
|                             | prior to recombiner startup.                                                                                                                                                       |                                                                            |  |
|                             | WER: A                                                                                                                                                                             |                                                                            |  |
| K/A: (                      | 028 A2.02                                                                                                                                                                          | Importance: 3.5                                                            |  |
| Cogn                        | itive Level: Knowledge                                                                                                                                                             |                                                                            |  |
| Refe                        | rences: 20M-53B.4.E-1 Background, I                                                                                                                                                | ssue 1B, Rev. 6, step 29                                                   |  |
| Lesson Plan #: 2LP-SQS-53.3 |                                                                                                                                                                                    | Obj. #: 3                                                                  |  |
|                             |                                                                                                                                                                                    |                                                                            |  |
| Histo                       | ry: NEW                                                                                                                                                                            |                                                                            |  |
| Sour                        | <b>ce:</b>                                                                                                                                                                         | Type: Closed Book                                                          |  |
|                             | 3010020601                                                                                                                                                                         |                                                                            |  |

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| 85.    | Unit 2 is at 100% with all systems                                                 | NSA and control rods in MANUAL. Without wa      | ming  |  |
|--------|------------------------------------------------------------------------------------|-------------------------------------------------|-------|--|
|        |                                                                                    | 4-8A * ROD CONTROL SYSTEM URGENT ALA            |       |  |
|        | annunciates. Which of the following actions occur or must be completed due to this |                                                 |       |  |
|        | alarm?                                                                             |                                                 |       |  |
|        | A. Rods step in at the fixed s                                                     | peed rate of 48 steps per minute.               |       |  |
| ·      | B. Control Rod Bank Selector                                                       | r Switch must be placed in AUTO to allow rods t | o ste |  |
|        | in.                                                                                |                                                 |       |  |
|        | C. Operator must insert rods                                                       | in MANUAL to clear Tavg-Tref mismatch.          |       |  |
|        | D. Steam Dumps are forced to control a higher Tave-Tref mismatch.                  |                                                 |       |  |
|        | WER:D                                                                              |                                                 |       |  |
| K/A: ( | 041 K6.03                                                                          | Importance: 2.7                                 |       |  |
| Coan   | itive Level: Comprehension                                                         |                                                 |       |  |
|        | rences: 2OM-1.1.C, Issue 4, Rev. 0                                                 |                                                 |       |  |
|        | on Plan #: 2LP-SQS-21.1                                                            | Obj. #: 5.c                                     |       |  |
| 2000   |                                                                                    |                                                 |       |  |
|        | n NIE)4/                                                                           |                                                 |       |  |
| Sour   | ry: NEW                                                                            | Type: Closed Book                               |       |  |
|        | 0410030101                                                                         |                                                 |       |  |
| JIA.   |                                                                                    |                                                 |       |  |
|        |                                                                                    |                                                 |       |  |
|        |                                                                                    |                                                 |       |  |
|        |                                                                                    |                                                 |       |  |
|        | · .                                                                                |                                                 |       |  |

| 5. The Unit is at 100 % with all systems NSA. The unit experiences an Overtemperature |                   |  |  |  |  |  |  |
|---------------------------------------------------------------------------------------|-------------------|--|--|--|--|--|--|
| Delta T runback. The runback signal clears. Which one of the following indicates the  |                   |  |  |  |  |  |  |
| expected response of the main turbine?                                                |                   |  |  |  |  |  |  |
| A. Main Turbine Governor valves will hold at the runback position.                    |                   |  |  |  |  |  |  |
| B Main Turbine Governor valves will return to original load position.                 |                   |  |  |  |  |  |  |
| C. Turbine Load Control drops output to minimum load at the selected loading rate.    |                   |  |  |  |  |  |  |
| D. Main Turbine Governor valves control turbine speed to 1800 rpm at minimum          |                   |  |  |  |  |  |  |
| load.                                                                                 |                   |  |  |  |  |  |  |
| ANSWER: A                                                                             |                   |  |  |  |  |  |  |
| K/A: 045 K4.12                                                                        | Importance: 3.3   |  |  |  |  |  |  |
| Cognitive Level: Knowledge                                                            |                   |  |  |  |  |  |  |
| References: 2OM-26.1.D, Issue 4, Rev. 2, page 31 and 32                               |                   |  |  |  |  |  |  |
| Lesson Plan #: 2LP-SQS-26.3                                                           | Obj. #: 4         |  |  |  |  |  |  |
|                                                                                       |                   |  |  |  |  |  |  |
| History: NEW                                                                          |                   |  |  |  |  |  |  |
| Source:                                                                               | Type: Closed Book |  |  |  |  |  |  |
| JTA: 0450070101                                                                       |                   |  |  |  |  |  |  |

| 87.                         | The Unit is at 100% power with all syste                                     | ems NSA. Service Water is 75°F. Containment |  |  |  |
|-----------------------------|------------------------------------------------------------------------------|---------------------------------------------|--|--|--|
|                             | temperature is 90°F. Which of the following is the Maximum Allowable Primary |                                             |  |  |  |
|                             | Containment Air Pressure?                                                    |                                             |  |  |  |
|                             | A. Less than or equal to 9.0 psia.                                           |                                             |  |  |  |
|                             | B. Greater than 9.0 psia and less than 9.65 psia.                            |                                             |  |  |  |
|                             | C. Greater than 9.65 psia and less than 10.5 psia.                           |                                             |  |  |  |
|                             | D. Greater than 10.5 psia.                                                   |                                             |  |  |  |
| ANSV                        | NER: B                                                                       |                                             |  |  |  |
| K/A: 1                      | 103 A1.01                                                                    | Importance: 3.7                             |  |  |  |
| Cogni                       | itive Level: Application                                                     |                                             |  |  |  |
|                             | ences 20M-12.5 Figure 12-1, Technical S                                      | Specification 3.6.1.4                       |  |  |  |
| Lesson Plan #: 2LP-SQS-12.1 |                                                                              | Obj. #: 9.d                                 |  |  |  |
|                             |                                                                              |                                             |  |  |  |
| Histor                      | ry: NEW                                                                      |                                             |  |  |  |
| Sourc                       |                                                                              | Type: OPEN BOOK                             |  |  |  |
|                             | 103DDD0101                                                                   | Figure 12.1                                 |  |  |  |

opiniational but Viery eary. A & D Not planable.

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| 88.                           | Unit 2 is in Mode 1 with all systems NSA. You are assigned as the on duty NCO.        |                   |  |
|-------------------------------|---------------------------------------------------------------------------------------|-------------------|--|
|                               | Which of the following Control Room areas are within the assigned "At Controls" area? |                   |  |
|                               | A. Unit 1/Unit 2 Control Room s                                                       | separation doors. |  |
|                               | B. Inside the Unit 2 Nuclear Shift Supervisor's Office.                               |                   |  |
|                               | C. Unit 2 Digital Radiation Monitor Console.                                          |                   |  |
|                               | D. Inside the Unit 2 Vertical Board [VB-A].                                           |                   |  |
| ANSV                          | ANSWER: C                                                                             |                   |  |
| K/A: 2.1.1                    |                                                                                       | Importance: 3.7   |  |
| Cogni                         | Cognitive Level: Knowledge                                                            |                   |  |
|                               | References: 1/2OM-48.1.A, Issue 3, Rev. 15, page 5 and 8                              |                   |  |
| Lesson Plan #: 1/2LP-SQS-48.1 |                                                                                       | Obj. #: 4         |  |
|                               |                                                                                       |                   |  |
| Histor                        | History: NEW                                                                          |                   |  |
| Sourc                         |                                                                                       | Type: CLOSED BOOK |  |
| JTA:119CCC0301                |                                                                                       |                   |  |

| 89.   | The unit has operated at 100% power for                                          | or 100 days and all systems are NSA. The      |  |  |
|-------|----------------------------------------------------------------------------------|-----------------------------------------------|--|--|
|       | power range Nuclear Instruments read                                             | as follows                                    |  |  |
|       | • N-41 - 99%                                                                     |                                               |  |  |
|       | • N-42 - 99.7%                                                                   |                                               |  |  |
|       | <ul> <li>N-43 - 99.6%</li> <li>N-44 - 09.8%</li> </ul>                           |                                               |  |  |
|       | <ul> <li>N-44 - 98.8%</li> <li>At the completion of 20M-54 4 C1 * Dai</li> </ul> | ily Heat Balance" calculated Net Reactor Powe |  |  |
|       |                                                                                  | e nuclear instrument gains must be adjusted?  |  |  |
|       | A. N-41 and N-44                                                                 | · · · · · · · · · · · · · · · · · · ·         |  |  |
|       | B. N-42 and N-43                                                                 |                                               |  |  |
|       | C. N-41, N-43 and N-44                                                           | C. N-41. N-43 and N-44                        |  |  |
|       | D. N-41, N-42, N-43 and N-44                                                     |                                               |  |  |
|       |                                                                                  |                                               |  |  |
|       |                                                                                  |                                               |  |  |
| ANS   | SWER: C                                                                          | 1                                             |  |  |
| K/A:  | 2.1.7                                                                            | Importance: 3.7                               |  |  |
| Coa   | nitive Level: Application                                                        |                                               |  |  |
|       | erences: 20M-54.4.C1, Issue 1, Revision 1                                        | 1 nage 2                                      |  |  |
| Hele  | Sterices: 2014-54.4.CT, ISSUE T, Revision                                        |                                               |  |  |
| Less  | son Plan #:2LP-SQS-RI                                                            | Obj. #: 5                                     |  |  |
|       | •                                                                                |                                               |  |  |
| Histo | ory: NEW                                                                         |                                               |  |  |
| Sou   | rce:                                                                             | Type: OPEN BOOK                               |  |  |
| JTA   | : 0150050201                                                                     | Give procedure to candidates.                 |  |  |
|       |                                                                                  | MAL-BURGER DK                                 |  |  |
|       |                                                                                  | Miner OK                                      |  |  |

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| 1                                                                             |                                              |                                            |
|-------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------|
| 90.                                                                           | The Unit is at 1% power with all system      | s NSA for the current power level. The 21A |
|                                                                               | Irops from 548°F to 543°F. What action is an |                                            |
|                                                                               | authorized reponse for this situation?       | A                                          |
|                                                                               | A. Lower feedwater flow and restore Ta       | avg 548°F.                                 |
| B. Trip the reactor and go to E-0 "Reactor Trip or Safety Injection", Step 1. |                                              |                                            |
| C. Raise control rods in 5 step increments or less.                           |                                              |                                            |
|                                                                               | D. Place the unit in HOT STANDBY with        | th all rods inserted within 15 minutes.    |
| ANSV                                                                          | WER: A                                       |                                            |
| K/A: 2                                                                        | 2.1.11                                       | Importance: 3.0                            |
| Cogni                                                                         | itive Level: Knowledge                       | ·                                          |
|                                                                               | rences: Ops Standards Page 3                 |                                            |
| Lesson Plan #: 2LP-SQS-50.1                                                   |                                              | Obj. #: 9                                  |
|                                                                               |                                              |                                            |
| Histor                                                                        | ry: NEW                                      |                                            |
| Sourc                                                                         |                                              | Type: CLOSED BOOK                          |
| JTA:                                                                          |                                              |                                            |

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| The unit is at 100% power with all systems NSA. At 0100, SI Accumlator 21A                                                                                                                                                                                                                                                                      |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| [2SIS*TK21A] low pressure alarm annunciated. Pressure continues to decline.                                                                                                                                                                                                                                                                     |  |  |  |
| Technical Specification 3.5.1 contains the following action statement:<br>With one accumulator inoperable, except as a result of a closed<br>isolation valve, restore the inoperable accumulator to OPERABLE<br>status within 1 hour or be in at least HOT STANDBY/within the next 6<br>hours and in HOT SHUTDOWN within the following 6 hours. |  |  |  |
| Which of the following will meet the Technical Specification Definitions of HOT                                                                                                                                                                                                                                                                 |  |  |  |
| STANDBY and HOT SHUTDOWN to complete the mode changes required by the listed                                                                                                                                                                                                                                                                    |  |  |  |
| action statement?                                                                                                                                                                                                                                                                                                                               |  |  |  |
| A. At 0800 reactor power must be less than 5% Rated Thermal Power and at 1400                                                                                                                                                                                                                                                                   |  |  |  |
| Tavg must be less than 350°F.                                                                                                                                                                                                                                                                                                                   |  |  |  |
| B. At 0800 reactor power must be 0% Rated Thermal Power and at 1400 Tavg must be                                                                                                                                                                                                                                                                |  |  |  |
| less than 350°F.                                                                                                                                                                                                                                                                                                                                |  |  |  |
| C. At 0800 Keff must be less than 0.99 and at 1400 Tavg must be less than $200^{\circ}$ F.                                                                                                                                                                                                                                                      |  |  |  |
| D. At 0800 Keff must be less than or equal to 0.95 and at 1400 Tavg must be less than                                                                                                                                                                                                                                                           |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                 |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                 |  |  |  |
| Importance: 2.8                                                                                                                                                                                                                                                                                                                                 |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                 |  |  |  |
| able 1.1, page 1-8 and 3.5.1                                                                                                                                                                                                                                                                                                                    |  |  |  |
| Obj. #: 2                                                                                                                                                                                                                                                                                                                                       |  |  |  |
| and the second second second                                                                                                                                                                                                                                                                                                                    |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                 |  |  |  |
| Type: OPEN BOOK                                                                                                                                                                                                                                                                                                                                 |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                 |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                 |  |  |  |

| 92. A RWDA-G is in progress from Unit 2 Gaseous Waste Tanks in accordance with |                                                                                  |  |  |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--|--|
| 1/20M-19.4A.B "Unit 2 GW S                                                     | 1/2OM-19.4A.B "Unit 2 GW Storage Tk Disch to Unit 1 Atmos. Vent". Two hours afte |  |  |
| the release has begun, the op                                                  | berator has verified the release rate being 3 SCFM. Wh                           |  |  |
| of the following actions must                                                  | be completed?                                                                    |  |  |
| A. Contact the shift chen                                                      | nist and verify tritium samples are complete for each tan                        |  |  |
| contained in the RWD                                                           | A-G.                                                                             |  |  |
| B. Notify Health Physics                                                       | to reset the HI and HI-HI alarm setpoints in accordance                          |  |  |
| with the Radiation Co                                                          | ntrol Manual.                                                                    |  |  |
| C. Notify the ANSS to re                                                       | ANSS to review the RWDA-G and confirm data entered is complete                   |  |  |
| and all steps taken in                                                         | and all steps taken in procedure are correct.                                    |  |  |
| D. Hand carry the procee                                                       | D. Hand carry the procedure to Unit 1 and have Unit 1 NCO close Decay Tank       |  |  |
| Bleed Control Valve [                                                          | FCV-1GW-105].                                                                    |  |  |
| ANSWER: D                                                                      |                                                                                  |  |  |
| K/A: 2.2.4                                                                     | Importance: 2.8                                                                  |  |  |
| Cognitive Level: Knowledge                                                     |                                                                                  |  |  |
|                                                                                | 3, Rev. 3, page 1 and page B.7.a and 8.                                          |  |  |
| Lesson Plan #: 2LP-SQS-19.1                                                    | Obj. #: 9 h                                                                      |  |  |
| L0001171011 #. 2LF-040-10.1                                                    |                                                                                  |  |  |
|                                                                                |                                                                                  |  |  |
| History: NEW                                                                   | Type: OPEN BOOK                                                                  |  |  |
| •                                                                              | I IVDE: UPEN BUUK                                                                |  |  |
| Source:                                                                        | Give copy of procedure                                                           |  |  |

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| 93.    | The Low Head SI Pump [2SIS*P21A] must be put on clearance to repair the pump     |                                                     |  |
|--------|----------------------------------------------------------------------------------|-----------------------------------------------------|--|
|        | casing vent [2SIS-899]. Two of the clearance points are:                         |                                                     |  |
|        | Low Head SI Pump Suc                                                             | ction Valve [2SIS*MOV8809A]                         |  |
|        | Low Head SI Discharge                                                            | e Valve [2SIS*3]                                    |  |
|        | In accordance with NPDAP 3.4 °C                                                  | learance/Tagout Procedure" practices for clearing a |  |
|        | pump, which of the following is req                                              | uired?                                              |  |
|        | A. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be declutched and         |                                                     |  |
|        | closed manually.                                                                 |                                                     |  |
|        | B. Low Head SI Pump Suction Valve [2SIS*MOV8809A] must be closed first to        |                                                     |  |
|        | prevent pressure buildup in the suction line.                                    |                                                     |  |
|        | C. Low Head SI Pump Discharge Valve [2SIS*3] must be closed prior to seating the |                                                     |  |
|        | suction valve.                                                                   |                                                     |  |
|        | D. Low Head SI Pump Vent Valve [2SIS*899] must be tagged open to prevent         |                                                     |  |
|        | pressure buildup in the suction line.                                            |                                                     |  |
|        | WER: C                                                                           |                                                     |  |
| K/A: : | 2.2.13                                                                           | Importance: 3.6                                     |  |
| Cogn   | nitive Level: Application                                                        |                                                     |  |
| Refe   | rences: NPDAP 3.4, Revision 10, pag                                              | ge 22                                               |  |
| Less   | on Plan #: 1/2LP-SQS-AP.2                                                        | Obj. #: 6.                                          |  |
|        |                                                                                  |                                                     |  |
| Histo  | ory: NEW                                                                         |                                                     |  |
| Sour   | ce:                                                                              | Type: OPEN BOOK                                     |  |
| JTA:   | 119A0301                                                                         | Give NPDAP 3.4                                      |  |

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| 94. Reactor Coolant System pressure falls with the Unit at 100% Rated The                                                                |                                                                                        | pressure falls with the Unit at 100% Rated Thermal Power and |  |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------|--|
|                                                                                                                                          | all systems NSA. Based on the Safety Limits contained in Technical Specification 2.1.1 |                                                              |  |
|                                                                                                                                          | Safety Limts-Reactor Co                                                                | e, which of the following is occuring?                       |  |
|                                                                                                                                          | A. Margin to DN                                                                        | B is rising as Critical Heat Flux rises.                     |  |
| <ul><li>B. Margin to DNB is falling as Critical Heat Flux falls.</li><li>C. Margin to DNB is rising as Actual Heat Flux rises.</li></ul> |                                                                                        |                                                              |  |
|                                                                                                                                          |                                                                                        |                                                              |  |
| ANSV                                                                                                                                     | VER: B                                                                                 |                                                              |  |
| K/A:2                                                                                                                                    | .2.22                                                                                  | Importance: 3.4                                              |  |
| Cogni                                                                                                                                    | itive Level: Comprehensio                                                              |                                                              |  |
| Refer                                                                                                                                    | ences: Basis for Technica                                                              | Specification 2.1.1,                                         |  |
|                                                                                                                                          | on Plan #: 2LP-SQS-1.1                                                                 | Obj. #: 7                                                    |  |
|                                                                                                                                          |                                                                                        |                                                              |  |
| Histor                                                                                                                                   | y: NEW                                                                                 |                                                              |  |
| Sourc                                                                                                                                    | 4                                                                                      | Type: CLOSED BOOK                                            |  |
| Jouro                                                                                                                                    |                                                                                        |                                                              |  |

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| 95.                     | A meter qualified operator is to enter a High Radiation Area that is 250 mrem/hr genera  |                           |  |
|-------------------------|------------------------------------------------------------------------------------------|---------------------------|--|
|                         | area to perform a short task. Which of the following is NOT required for the operator to |                           |  |
|                         | enter the area?                                                                          |                           |  |
|                         | A. Heath Physic coverage at the job location.                                            |                           |  |
|                         | B. High Radiation briefing from Health Physics.                                          |                           |  |
|                         | C. Alarming Radiation Dosimeter.                                                         |                           |  |
|                         | D. Thermoluminescent Dosimeter.                                                          |                           |  |
| ANSW                    | VER: A                                                                                   |                           |  |
| K/A:2.                  | 3.1                                                                                      | Importance: 2.6           |  |
| Cogni                   | tive Level: Knowledge                                                                    |                           |  |
|                         | ences: GERT Student Handout, Rev. 19,                                                    | May 1998, page 7-3 to 7-5 |  |
| Lesson Plan #: LP-RC-02 |                                                                                          | Obj. #:7-2                |  |
|                         |                                                                                          |                           |  |
| Histor                  | y: NEW                                                                                   |                           |  |
| Source                  |                                                                                          | Type: Closed Book         |  |
| JTA:3410040302          |                                                                                          |                           |  |

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| <b>96</b> . | Unit 2 is in Mode 3 with the following conditions:                                              |                                                                                                                                                                                                  |  |  |
|-------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|             | Tavg is at 450°F and stable                                                                     | )                                                                                                                                                                                                |  |  |
|             | RCS Pressure is at 1500 psig and rising<br>Steam Generator Pressures are at 430 psig and stable |                                                                                                                                                                                                  |  |  |
|             |                                                                                                 |                                                                                                                                                                                                  |  |  |
|             | actuations should occur first?                                                                  |                                                                                                                                                                                                  |  |  |
|             |                                                                                                 | <ul> <li>A. Safety Injection Signal on low steam line pressure.</li> <li>B. Safety Injection Signal on low RCS pressure.</li> <li>C. AMSAC actuation on low steam generator pressure.</li> </ul> |  |  |
|             |                                                                                                 |                                                                                                                                                                                                  |  |  |
|             |                                                                                                 |                                                                                                                                                                                                  |  |  |
|             | D. Reactor Trip signal generated on High RCS pressure.                                          |                                                                                                                                                                                                  |  |  |
|             | WER: A<br>2.4.2 <b>K/A CHANGE</b>                                                               | Importance: 3.9                                                                                                                                                                                  |  |  |
| ·····       |                                                                                                 | Importance. 5.5                                                                                                                                                                                  |  |  |
|             | hitive Level: A: Comprehension                                                                  |                                                                                                                                                                                                  |  |  |
| Ref.:       | 20M-1.2.B *Reactor Protection Set                                                               | points", Issue 4, Rev. 3, pages 4 and 5                                                                                                                                                          |  |  |
| LP#:        | 2LP-SQS-1.1                                                                                     | OBJ: 5. b                                                                                                                                                                                        |  |  |
|             |                                                                                                 |                                                                                                                                                                                                  |  |  |
|             |                                                                                                 | Modified from Question 49, 2LOT 2A                                                                                                                                                               |  |  |
| Histo       | ory LRT 1997 Module IV Written exam                                                             |                                                                                                                                                                                                  |  |  |
| Histo       |                                                                                                 |                                                                                                                                                                                                  |  |  |
| Sour        |                                                                                                 | CLOSED BOOK                                                                                                                                                                                      |  |  |

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| 7. The unit is critical at 5E-8 amps. Intermediate Range Channel N-35 high voltage is lost |                                                  |  |
|--------------------------------------------------------------------------------------------|--------------------------------------------------|--|
| Which of the following is an appropriate response?                                         |                                                  |  |
| A. Restore the channel prior to raising thermal power above P-6.                           |                                                  |  |
| B. Restore the channel prior to rais                                                       | ing thermal power above 5%.                      |  |
| C. Place the unit in Mode 3 with the                                                       | e Reactor Trip Breaker Open until the channel is |  |
| restored.                                                                                  |                                                  |  |
| D. Place the unit in Mode 1 with reactor power greater than P-10 then restore the          |                                                  |  |
| inoperable channel.                                                                        |                                                  |  |
| ANSWER: B                                                                                  |                                                  |  |
| K/A: 2.4.4                                                                                 | Importance: 4.0                                  |  |
| Cognitive Level: Application                                                               |                                                  |  |
| References: 20M-53C.4.2.2.1B, Issue 1A, Rev                                                | ·. 1                                             |  |
| Lesson Plan #: 2LP-SQS-2.1                                                                 | Obj. #: 16                                       |  |
|                                                                                            |                                                  |  |
| History: NEW                                                                               |                                                  |  |
| Source:                                                                                    | Type: OPEN BOOK                                  |  |
| JTA: 0000100401                                                                            | Give AOP 2, 2, 1B                                |  |

Justing P6 Knowledge

| 98.           | The unit has undergone a Los                                                      | s of Cool | ant Accident. Both trains of Safety Injection a |
|---------------|-----------------------------------------------------------------------------------|-----------|-------------------------------------------------|
|               | in service and High Head SI Flow [2SIS*FI943] indicates 500 gpm. Coolant system   |           |                                                 |
|               | pressure is only 50 psig above highest steam generator pressure.                  |           |                                                 |
|               | , , , ,                                                                           | •         | required at this time to accomplish which of t  |
|               | following strategies? *                                                           | • -       | · ·                                             |
|               |                                                                                   | actor Coo | plant Pumps operating in a highly voided syst   |
|               | B. Prevent Reactor Coola                                                          | Int Pump  | overspeed and generation of missile fragmer     |
|               | C. Limit heat input to the RCS during an inadequate core-cooling situation.       |           |                                                 |
|               | D. Limit the loss of reactor coolant after system drainage to the break location. |           |                                                 |
| ANS           | WER: D                                                                            |           |                                                 |
| K/A:          | 2.4.6                                                                             |           | Importance: 3.1                                 |
|               | nitive Level: Knowledge                                                           |           |                                                 |
|               | rences: 20M-53B.5.GI-6, Issue 1                                                   | 1B. Rev 1 | 1. page 9                                       |
|               | on Plan #:2LP-SQS-53.2                                                            |           | Obj. #: 11                                      |
| LESS          | UT FIAN #.2LF-3Q3-33.2                                                            |           |                                                 |
|               | ory: NEW                                                                          |           |                                                 |
| Histo         | ······                                                                            |           |                                                 |
| Histo<br>Sour | ce:                                                                               |           | Type: Closed Book                               |

| 99. The U                                                                             | The Unit is in Mode 4 at 325 psig and 322 degrees. All systems are NSA for the current |                   |  |  |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------|--|--|
| plant c                                                                               | plant condition. Pressurizer level suddenly drops rapidly and subcooling in the RCS    |                   |  |  |
| falls to 0 degrees. The operator has entered AOP 2.6.5 "Shutdown LOCA". Under         |                                                                                        |                   |  |  |
| these conditions, which of the following mitigation strategies is designed to restore |                                                                                        |                   |  |  |
| subcooling but limit overpressure conditions in the RCS?                              |                                                                                        |                   |  |  |
| А.                                                                                    | . Manually initiate both trains of High Head Safety Injection.                         |                   |  |  |
| B.                                                                                    | Stop all but one operating Reactor Coolant Pump.                                       |                   |  |  |
| C.                                                                                    | Isolate all letdown pathways and open Charging Flow Control Valve                      |                   |  |  |
|                                                                                       | [2CHS*FCV122].                                                                         |                   |  |  |
| D.                                                                                    | Depressurize the RCS to refill the Pressurizer.                                        |                   |  |  |
|                                                                                       |                                                                                        |                   |  |  |
| ANSWER: C                                                                             |                                                                                        |                   |  |  |
| K/A: 2.4.9                                                                            |                                                                                        | Importance: 3.3   |  |  |
| Cognitive Level: Knowledge                                                            |                                                                                        |                   |  |  |
| References: 20M-53C.4.2.6.5, Issue 1A, Rev. 9, Caution before step 1, Steps 2 and 3   |                                                                                        |                   |  |  |
| Lesson Plan #:2LP-SQS-53C.1                                                           |                                                                                        | Obj. #:4          |  |  |
|                                                                                       |                                                                                        |                   |  |  |
| History: NEW                                                                          |                                                                                        |                   |  |  |
| Source:                                                                               |                                                                                        | Type: Closed Book |  |  |
| JTA: 0000560401                                                                       |                                                                                        |                   |  |  |

| 100.                                               | 100. A fire is in progress in the 480 V Substation 2-4 Bus 2G. The MCC is energized and the |                                                |  |  |
|----------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------|--|--|
|                                                    | MCC fire is spreading rapidly. Water is                                                     | the only fire fighting medium available. Which |  |  |
|                                                    | of the following is the minimum safe recommended fire fighting configuration for using      |                                                |  |  |
| water on the energized MCC?                        |                                                                                             |                                                |  |  |
|                                                    | A. High velocity fog at least 15 feet from the MCC.                                         |                                                |  |  |
|                                                    | B. High velocity fog at least 30 feet from the MCC.                                         |                                                |  |  |
|                                                    | C. High pressure stream at least 45 feet from MCC.                                          |                                                |  |  |
| D. High pressure stream at least 60 feet from MCC. |                                                                                             |                                                |  |  |
| ANSWER: A                                          |                                                                                             |                                                |  |  |
| K/A:2                                              | .4.25                                                                                       | Importance: 2.9                                |  |  |
| Cognitive Level: Knowledge                         |                                                                                             |                                                |  |  |
| References: 20M53.4.B, Issue 1, Rev. 10, page 7    |                                                                                             |                                                |  |  |
| Lesson Plan #: Fire Brigade Training               |                                                                                             | Obj. #:                                        |  |  |
| Objective:                                         |                                                                                             |                                                |  |  |
|                                                    |                                                                                             |                                                |  |  |
| History: NEW                                       |                                                                                             |                                                |  |  |
| Sourc                                              | ce:                                                                                         | Type: Closed Book                              |  |  |
| JTA:0                                              | 0860040101                                                                                  | Knowledge for Brigade Captain's                |  |  |