12/27/94

NOTE TO: NRC Document Control Desk
Mail Stop 0-5-D-24

FROM: Virgil Curley, Licensing Assistant
Operating Licensing Branch, RI

SUBJECT: OPERATOR LICENSING EXAMINATION ADMINISTERED ON March 22, 23-25 94, AT Beaver Valley Unit 2
DOCKET #50-412

On March 22, 23-25, 1995 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. (proposed)

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.

A070

PDR ADOCK 05000412

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.

A070

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

A	B	C	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.

Facility: BVPS Unit 2		Date of Exam:											Exam Level: RO
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	
1. Emergency & Abnormal Plant Evolutions	1	4	3	6				0	2			1	16
	2	5	4	3				1	3			1	17
	3	1	0	1				0	0			1	3
	Tier Totals	10	7	10				1	5			3	36
2. Plant Systems	1	3	1	3	3	3	1	2	3	1	2	1	23
	2	3	1	2	4	1	1	3	3	0	1	1	20
	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. Generic Knowledge and Abilities		Cat 1			Cat 2			Cat 3			Cat 4		13
		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 Examination Outline (Follows Form ES-401-4)

Emergency and Abnormal Plant Evolutions - Tier 1 /Group 1

E/APE # / Name / Safety Function	K 1	K 2	K 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				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						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 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 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				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					Relation of RCS activity to radiation monitors	2.6	1
K/A Category Totals:	4	3	6	0	2	1	Group Point Total:		16

PWR RO Examination Outline (Follows Form ES-401-4)									
Emergency and Abnormal Plant Evolutions - Tier 1 /Group 2									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
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						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

PWR RO Examination Outline (Follows Form ES-401-4) Emergency and Abnormal Plant Evolutions - Tier 1 /Group 3									
E/APE # / Name / Safety Function	K 1	K 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				Actions in EOP for loss of Offsite Power	4.4	1
K/A Category Totals:	1		1			1	Group Point Total:		3

PWR RO Examination Outline Plant Systems - Tier 2 /Group 1												(Follows Form ES-401-4)		
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					**5.04**							**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								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										**4.15**		**Use of heater for uniform boron concentration**	**3.6**	**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								Design Feature; SR shutoff	3.1	1
017 In-core Temperature Monitor				4.01								ITM input to subcooling	3.4	1
022 Containment Cooling			**3.01**			**X**						**Signals to stop CAR fans**	**4.1**	**1**
056 Condensate					X	X	X	2.12				Impact of bypassing LP heaters	2.8	1
059 Main Feedwater		X			X	X	1.03					Power level restrictions	2.7	1
059 Main Feedwater		X	3.02		X	X						Effect of loss of MFW on AFW	3.6	1
061 Auxiliary/Emergency Feedwater	1.01											Relation of AFW to SG	4.1	1
061 Auxiliary/Emergency Feedwater							1.05					Changes in Flow/motor amps	3.6	1
068 Liquid Radwaste		**X**	**X**				**X**				**2.3.11**	**Control of release setpoints**	**2.7**	**1**
071 Waste Gas Disposal		X				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 Examination Outline Plant Systems - Tier 2 /Group 2												(Follows Form ES-401-4)		
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
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								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		X			Impact of DRPI switches on indication	3.2	1
016 Non-Nuclear Instrumentation	1.03						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										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		X			X			Termination of release on high activity	4.0	1
076Circulating Water						**X**	**X**	**2.01**	**X**			**Service Water Start-UP**	**2.9**	**1**
079 Station Air		X	X	4.01	X	X	X		X			Cross-connect with instrument air	2.9	1
086 Fire Protection										**4.04**		**CO2 Discharge Warning**	**3.1**	**1**
K/A Category Point Totals:	3	1	2	4	1	1	3	3	0	1	1	Group Point Total:		20

PWR RO Examination Outline Plant Systems - Tier 2 /Group 3												(Follows Form ES-401-4)		
System # / Name	K 1	K 2	K 3	K 4	K 5	K 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								**2.04**				**Effects of a loss of RHR on the RCS**	**2.9**	**1**
007 Pressurizer Relief/Quench Tank		**X**				**X**				**4.01**		**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			LOCA hydrogen concerns	3.5	1
~~**034 Fuel Handling Equipment**~~	~~**1.04**~~	~~**X**~~	~~**X**~~		~~**X**~~							~~**Relation with NIS**~~	~~**2.6**~~	~~**1**~~
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

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

Facility: BVPS2 Date of Examination: 3/22/99

Exam Level (circle one): **RO** / 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
3. 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)
5. 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
7. 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)
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (P)lant, (R)CA		

2/3/99 telecon

ES-301 Administrative Topics Outline Form ES-301-1

Facility: BVPS2 Date of Examination: 3/22/99

Examination Level (circle one): **RO** / SRO Operating Test Number: ____

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. on out spec instrument
A.2	**2.2.22,** Knowledge of LCOs and Safety Limits	2. Determine pressures and temperatures at which safety limit curve would be violated. give trace — JPM 2. 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. meter qualified Valve lineup Map Survey look at ~~Roof~~ ask question about Stay time
A.4	**2.4.6,** Symptom based EOP mitigation strategies.	1. New JPM, determine highest priority critical safety function from simulator control board indications.

SCENARIO OVERVIEW

Facility: Beaver Valley Power Station Unit 2 Scenario No.: 1 Op-Test No.: 2LOT2B

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm Response procedures to raise power and respond to a VCT problem, a steam flow problem, a stuck rod, a load rejection, a steam line break outside containment, coincident with one charging pump tripping and one charging pump failing to auto start.

Initial Conditions: IC-47, 75% power, BOL, steady state conditions. Rods are in auto. One Charging Pump and one Motor Driven AFW pump are out of service. One PZR PORV is isolated. Tornado watch in effect. AOP 6.4 in effect due to tube leak on SG "B".

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 2FWE-36 shut; 2FWE-102 open. 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
1	N/A	N RO/PO/ SRO	Raise power at 10%/hr
2	XMT LDS3 1,100,120,0 ,D	I RO/SRO	VCT level transmitter 2CHS*115 fails high diverting letdown and loss of auto makeup
3	XMT 2MSS22 1,2.8,0,0,D	I PO/SRO	SG "B" steam flow transmitter 2MSS*FT485 fails as is
4	MAL ACT EHC1B 0,30,0,D	R RO/SRO C PO	Load rejection, 15% (Governor valve #2 fails closed)
5	MAL ACT CRF8A H2,1,0,D	C RO N PO/SRO	Stuck rod, H2 (Preload)
6	MAL ACT MSS2B 1,5E^6 ,300,0,D	M RO/ PO/ SRO	Steam line break outside containment on SG "B"
7	PMP CHS1 2,0,C,PPLSI A	C RO/SRO	2CHS*P21A trips on SI initiation (Preload)
8	MAL PPL7B 2,0,D	C RO/SRO	2CHS*P21C fails to auto start (Preload)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (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: Beaver Valley Power Station Unit 2 Scenario No.: _2_ 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 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: IC-47, 75% power, BOL, steady state conditions. Rods are in Manual. 2CHS*P21B and 2FWE*P23B are OOS. 2RCS*PCV456 is isolated. Tornado Warning in effect. Tube leak on SG "B".

Turnover: The plant is at 75% power. BOL, 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. 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. Lower power to 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

Facility: Beaver Valley Power Station Unit 2 Scenario No.: _3_ 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 plugged boric acid filter, MFW pump trip, LOOP, one EDG trips, one EDG breaker fails to close (loss of all AC power), TD AFW pump trips on overspeed (able to reset), RCP "C" #1 seal leak (50 gpm).

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

Turnover: 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. 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 2OM-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 NOT 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: 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 controlling steam flow channel pressure compensation for SG "C", the flow totalizer does not terminate dilution flow at the setpoint, PZR pressure control problem, and a SGTR with loss of PZR pressure control

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

Turnover: The plant is at 48% power. RCS boron 318 PPM. Rods in auto with CBD at 171 steps. [2CHS*P21B] and [2FWE*P23B] are OOS. 2FWS-MOV152 de-energized shut. 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 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
1	N/A	R RO N PO/SRO	Raise power at 10%/hr
2	XMT MSS47 1,10,10,0,D	I PO/SRO	Steam flow pressure compensation failure 2MSS*PT486 fails low
3	OVR BAT8A 2,0,D	I RO/SRO	Total makeup flow totalizer fails to terminate dilution at setpoint (Preload)
4	MAL RCS4C 600,60,0,D	M ALL	Start as small leak that progressively worsens until SGTR SG "B" (600 GPM)
5	CNH PCS10 5,0,20,0,D	C RO/SRO	PZR Master Pressure Controller fails high
6	VLV RCS11 3,0,C	C RO/SRO	PORV Block valve 2RCS*MOV535 fails closed after manual close
7	VLV RCS13 3,0,C	C RO/SRO	PORV Block valve 2RCS*MOV537 breaker trips after manual close
8	MAL RCP4C 0,D	C RO/SRO	RCP "C" trips when reactor tripped

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

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.

° Prepare tear off sheets
for all JPM's & questions
JUST INITIAL Conditions & Cues
No other info.

ES-301 Administrative Topics Outline Form ES-301-1

Facility: BVPS2 Date of Examination: 3/22/99

Examination Level (circle one): **RO** / SRO Operating Test Number: _____

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, determine highest priority critical safety function from list of parameters.*** OKay
	2.1.12, Ability to apply TS for a system	1. ***New JPM, Determine Tech Spec requirements for a failed PZR pressure transmitter.*** OKay
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*** OKay
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*** Beef up or replace DET level
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. Beef up

BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

JPM Number: ADM-IF TS (2LOT2B NRC) Rev:0 System #:2.1
JPM Title: Determine TS Requirements for Failed PZR Pressure Xmitter

K/A Reference: 2.1.12 [2.9] Task ID #: 1190150301

JPM Application: ☐ Requal ☒ Initial Exam ☐ Training

Evaluation Method
- ☒ Perform
- ☐ Simulate

LOCATION
- ☐ Plant Site
- ☐ Simulator
- ☒ Classroom

TYPE
- ☐ Training
- ☐ Annual Requal. Exam
- ☐ OJT
- ☒ Initial Operator Exam
- ☐ Other: _____

Administered By:
- ☐ BV-T
- ☒ NRC
- ☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: _____

Results
- ☐ SAT
- ☐ UNSAT*

Time (minutes) 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	Results UNSAT*
Question #1	_____	N/A	_____	☐	☐
Employee No:	_____				
Question #1	_____	N/A	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation): _____

_____

Evaluator (Print): _____ Organization: _____
Evaluator Signature _____ Date: _____

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

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.

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 pressure transmitters are operable.
INIT. CUE:	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:	

RTL #A5.635.J

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	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 identified. The JPM is written using the figure on page 22 of 2OM-6.4.IF
Check reference	
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 NRC)	Determine TS Requirements for Failed PZR 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 Comments:

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
4.C Determine Tech Spec requirements.	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) Comments: _____ EVALUATOR NOTE: SDP action is NOT applicable since the minimum channels operable is still met. Comments: _____ STOP TIME _____

BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

JPM Number: ADM-S TREES (2LOT2B NRC) Rev: 0 System #: 2.1
JPM Title: Determine FRPs to Enter and Priority

K/A Reference: 2.1.20 [4.3] Task ID #: 301AAA0601

JPM Application: ☐ Requal ☒ Initial Exam ☐ Training

Evaluation Method
- ☒ Perform
- ☐ Simulate

LOCATION
- ☐ Plant Site
- ☐ Simulator
- ☒ Classroom

TYPE
- ☐ Training
- ☐ Annual Requal. Exam
- ☐ OJT
- ☒ Initial Operator Exam
- ☐ Other: _____

Administered By:
- ☐ BV-T
- ☒ NRC
- ☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☐ SAT ☐ UNSAT*

Time (minutes) 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	Results UNSAT*
Question #1	_____	N/A	_____	☐	☐
Employee No:	_____				
Question #1	_____	N/A	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation): _____

_____

Evaluator (Print): _____ Organization: _____
Evaluator Signature _____ Date: _____

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

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

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%

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.

☐ 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-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:	

RTL #A5.635.J

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:

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.

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.	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:
9. Report results	9. Candidate reports results to supervisor. _____ Comments: STOP TIME _____

BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

JPM Number: ADM-Safety Limit (2LOT2B NRC) Rev:0 System #:2.2
JPM Title: Determine If Tech Spec Safety Limit has been Violated.

K/A Reference: 2.2.22 [3.4] Task ID #: 1190150301

JPM Application: ☐ Requal ☒ Initial Exam ☐ Training

Evaluation Method	LOCATION	TYPE
☒ Perform	☐ Plant Site	☐ Training
☐ Simulate	☐ Simulator	☐ Annual Requal. Exam
	☒ Classroom	☐ OJT
		☒ Initial Operator Exam
		☐ Other: _____

Administered By:

☐ 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results 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: _____

RTL #A5.635.J 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 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.

☐ 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.

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:	

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.)
	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 ± 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:

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: STOP TIME _____

BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

JPM Number: ADM-RAD (2LOT2B NRC) Rev: 0 System #: 2.3
JPM Title: Determine Stay Time in High Rad Area

K/A Reference: 2.3.10 [2.9] 2.1.25 [2.8] Task ID #: 301AAA0601

JPM Application: ☐ Requal ☒ Initial Exam ☐ Training

Evaluation Method
- ☒ Perform
- ☐ Simulate

LOCATION
- ☐ Plant Site
- ☐ Simulator
- ☒ Classroom

TYPE
- ☐ Training
- ☐ Annual Requal. Exam
- ☐ OJT
- ☒ Initial Operator Exam
- ☐ Other: _____

Administered By:
- ☐ BV-T
- ☒ NRC
- ☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: _____

Results
- ☐ SAT
- ☐ UNSAT*

Time (minutes) 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	Results UNSAT*
Question #1	_____	N/A	_____	☐	☐
Employee No:	_____				
Question #1	_____	N/A	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation): _____

_____

Evaluator (Print): _____ Organization: _____
Evaluator Signature _____ Date: _____

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.

RIL #A5.635.J 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 STARTING LOCATION:	Control Room/Simulator
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:	

RTL #A5.635.J

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.
1. Determine dose rate at the valve.	1. 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.** = x _____ 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: _____ DATE: _____
Director, Operations Training,
or Designee

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 No.	Brief Description	Revised by:	Approval Signature	Approval Date

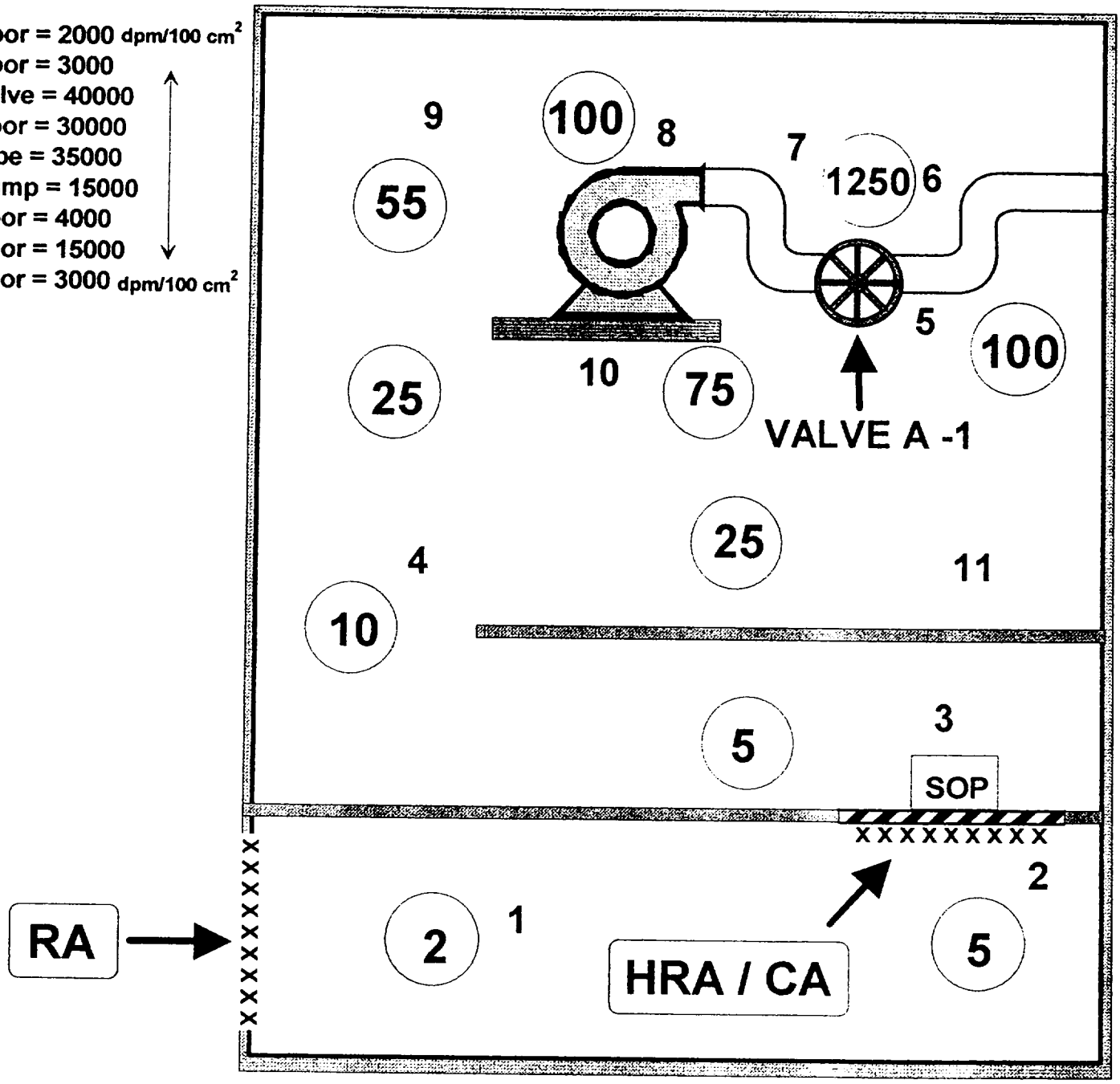
REACTOR POWER ___100%_____
SURVEY DATE _Current_____TIME _0800_____
SURVEYED BY __Randy Radtech_____
BADGE # ___7777_____
RWP # ___399-8000_____
INST. TYPE _RO2_____ SR # __1234_____
INST. TYPE _RM-14_____SR # __5678_____

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
▨ = Contaminated Area Boundry

* 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/100cm^2 EXCEPT:

3) floor = 2000 dpm/100 cm^2
4) floor = 3000
5) valve = 40000
6) floor = 30000
7) pipe = 35000
8) pump = 15000
9) floor = 4000
10) floor = 15000
11) floor = 3000 dpm/100 cm^2



Reviewed By: __H.P. Supervisor_____

(FOR TRAINING ONLY)

RTL #A5.635.J

* * 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?

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

KSA #: 2.4.39 3.3/3.1
2.4.43 2.8/3.5

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

COMMENTS: _____

_____

_____

_____

RTL #A5.635.J

* * 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?.

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 ALLOTTED: 3 minutes

KSA #: 2.4.34 3.8/3.6

REF: EPP Vol 1 section 2 page 5-9 item 5.2.7.3 rev. 11

COMMENTS: _____

_____

_____

_____

Facility: BVPS2 Date of Examination: 3/22/99

Exam Level (circle one): **RO** / 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 JPM Okay	1.	a. 003AK1.07 - 3.1 - Explain affect of dropped rod on Shutdown Margin
		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 Alt path	2.	a. 009EK3.04 - 4.1 - Determine High Head Safety Injection Requirements
		b. 009EA1.01 - 4.4 - Determine Cold Overpressure Protection Setpoint
3. 006/ Makeup to the Refueling Water Storage Tank (RWST)/ N,S JPM Okay	3.	a. 033K1.05 - 2.7 - Find flowpath for Alternate source of Makeup to the RWST (Spent Fuel Pool)
		b. ~~***011EA1.11, 4.2 - Priority of keeping core covered during LOCA***~~ Delete
4. 061/Reset Terry Turbine Trip and Throttle Valve/ D,P,R Plant	4.	a. ~~***061K1.03, 3.5 - determine how to avoid steam binding of supply valves***~~ Delete
		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 Deleted	4.	a. ~~003K1.12 - 3.0 - Analyze Effects of RCS leakage through the Thermal Barrier Heat Exchanger~~ Deleted
		b. ~~003A2.01 - 3.5 - Predict effect of sudden Seal Injection on an overheated RCP seal~~ Deleted STET
6. 076/ Startup Standby Service Water System (SWS) / D,S JPM okay	4.	a. ***062AA1.02 - Contrast SWS heat load at BOL with that at EOL***
		b. 076K1.16 - 3.6 - Deduce affect of Containment Isolation Signal on the SWS and Liquid Discharge

Note: Deleted per Rich Bernhard 2/18/99 Telecon

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.**	**a.** ***062A2.12 - 3.2 - Predict impact of reenergizing a faulted bus***
		b. ***064K1.02 - 3.1 - Develop plan to mitigate reduction of cooling water***
9. 015 / Perform a Quadrant Power Tilt Factor (QPTR) (unsatisfactory result) / N,S	**7.**	**a.** 001K5.07 - 3.3 - Evaluate effect of control rod drop on QPTR
		b. 015K5.12 - 3.2 - Relate excessive power peaking to power distribution Technical Specifications
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.
		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)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (P)lant, (R)CA		

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.)

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.

RTL #A5.640U BEAVER VALLEY JOB PERFORMANCE MEASURE
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
- ☒ Perform
- ☐ Simulate

LOCATION
- ☐ Plant Site
- ☒ Simulator
- ☐ Classroom

TYPE
- ☐ Training
- ☐ Annual Requal. Exam
- ☐ OJT
- ☒ Initial Operator Exam
- ☐ Other: _____

Administered By:
- ☐ BV-T
- ☒ NRC
- ☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☐ SAT ☐ UNSAT*

Time (minutes) Allotted: 15 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
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-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 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 2OM-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 2OM-1.4.P, section IV.D. You are to perform steps D.1 through D.11.
REFERENCES:	2OM-1.4.P, " RCCA or RCCA Group Misalignment", Issue 4, Revision 2
TOOLS:	None
HANDOUT:	2OM-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

okay for RO

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.)

TIME ALLOTTED: 4 Minutes

KSA #: 003 AK 1.02 3.1/3.4

REF: 2OM-1.1

COMMENTS: _____

RTL #A5.635.J

* * 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).

RTL #A5.635.J

* * 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 2OM-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 2OM-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 #A5.635.J

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.	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 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:

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 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 Rod Step 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:

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:_____

NUMBER	TITLE
2CR-090	Recover a Dropped RCCA

STEP ("C" denotes critical 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.	10.	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: _____

NUMBER	TITLE
2CR-090	Recover a Dropped RCCA

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
11.C Replace all disconnect switches to ROD CONNECT position.	11.C Candidate places all switches for CBD to ROD CONNECT position. COMMENTS:
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. COMMENTS:

NUMBER	TITLE
2CR-090	Recover a Dropped RCCA

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.	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 Annunciator clear. Comments; Examiner Cue; Rx Engineering will perform a flux map at 75% power.

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 Control Selector 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:_____

RTL #A5.635.J

* * 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).

RTL #A5.635.J

* * 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 2OM-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 2OM-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 **BEAVER VALLEY JOB PERFORMANCE MEASURE**
EVALUATOR COVER SHEET

JPM Number: 2CR-620 Rev:4 System #: 006
JPM Title: Respond to a Shutdown LOCA

K/A Reference: 009EA1.13 4.4/4.4 Task ID #:0000560401
JPM Application: ☒ Requal ☒ Initial Exam ☐ Training

Evaluation Method
☒ Perform
☐ Simulate

LOCATION
☐ Plant Site
☒ Simulator
☐ Classroom

TYPE
☐ Training
☐ Annual Requal. Exam
☐ OJT
☒ Initial Operator Exam
☐ Other: _____

Administered By:
☐ BV-T
☒ NRC
☐ Other: _____

What makes this JPM alternate path?

Evaluation Results

Performer: Name: _____ Employee No: _____

Candidate already placed in procedure

Results ☐ SAT ☐ UNSAT*

Time (minutes) Allotted: 15 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
Question #1	_____	_____	_____	☐	☐
Employee No:	_____				
Question #2	_____	_____	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation): _____

Evaluator (Print): _____ Organization: _____

Evaluator Signature _____ Date: _____

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

EVALUATOR DIRECTION SHEET

JPM NUMBER:	2CR-620
JPM TITLE:	Respond to a Shutdown LOCA
TASK STANDARD:	1. RCS isolated and 2. HHSI flow established.
RECOMMENDED STARTING LOCATION:	Simulator
DIRECTIONS:	You are to perform the 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.
REFERENCES:	2OM-53C.4.2.6.5 (ISSUE 1A Rev 8) "Shutdown LOCA"
TOOLS:	None
HANDOUT:	AOP 2.6.5

RTL #A5.635.J

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	Start time: _____
EXAMINER NOTE: Candidate may secure the RCP during this JPM due to seal leakoff, Vibration, ect., but this is not required by the AOP.	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:

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.	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
2CR-620	Respond to a Shutdown LOCA-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 level <4% and dropping. 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.

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

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

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	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-energize [2SIS*MOV867A-D]. COMMENTS: EXAMINER CUE: Other operators will reenergize the valves.. EXAMINER NOTE: Terminate the JPM at this point. STOP TIME: _____

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: _____

RTL #A5.635.J 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)

TIME ALLOTTED: 5 minutes

KSA #: 009 EA1.01 4.4/4.3

REF: AOP 2.6.5 Attachment 1

COMMENTS: _____

_____

_____

_____

RTL #A5.635.J

* * 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.

RTL #A5.635.J

* * 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.

BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

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: ☒ Requal ☒ Initial Exam ☐ Training

Evaluation Method

☒ Perform
☐ Simulate

LOCATION

☐ Plant Site
☒ Simulator
☐ Classroom

TYPE

☐ Training
☐ Annual Requal. Exam
☐ OJT
☒ Initial Operator Exam
☐ Other: _____

Administered By:

☐ BV-T
☒ NRC
☐ Other:

need replacement grp 2

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☐ SAT ☐ UNSAT*

Time (minutes) Allotted: 15 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
Question #1	_____	_____	_____	☐	☐
Employee No:	_____				
Question #2	_____	_____	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation):

_____

Evaluator (Print): _____ Organization: _____

Evaluator Signature _____ 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 2OM-7.4.O.
REFERENCES:	ECA 1.1 2OM-7.4.O
TOOLS:	NA
HANDOUT:	ECA 1.1 pgs. 1 through 5, 2OM 7.4.O

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

Okay but fairly low discriminatory level

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

REF: ECA 1.1, 2OM-7.4.O

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

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 2OM-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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	Start time: _____ EXAMINER NOTE: Initialize simulator in Mode 1, 100% power. Act Malf RCS 3B, DBA LOCA Act Malf CCS 7,8,9,&10, =3, RRS pumps fail Perform E-0, E-1, & ECA 1.1 to step 5. Write "7480ppm" on BB A for in-service BAT. Turn sound generator off Fail SR NIs to 1,000 cps (Malf. NIS 1A&B ~ 1000 cps) Write snap. (IC 52 for exam)
1.C Directs local valve lineup. EXAMINERS CUE: Aux. Bldg operator reports; 2FNC-35,-36,&-38 verified closed 2FNC-47 has been opened	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 ("C" denotes critical step)	STANDARD (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 . EXAMINER NOTE: Emergency valves are not critical because they are initially closed and will not receive an open signal	4. 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 COMMENTS:

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
5.C Adjusts Boric Acid flow to the blender.	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: 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.

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

STEP ("C" denotes critical step)	STANDARD (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) COMMENTS: EXAMINER NOTE: If the flow is initially mis-set, but corrected in step 17, that constitutes satisfactory completion of this step. Acceptable settings are based on a concentration of 2000 to 2100 ppm with exactly 32.89gpm boric acid flow. Steps 5 and 6 are both satisfactory as long as makeup concentration is between 2000 and 2100 ppm.

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
7.C Sets Boric acid totalizer	7.C Sets Boric acid totalizer to at least 267 gallons. 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 1000 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 ("C" denotes critical step)	STANDARD (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	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:

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

STEP ("C" denotes critical step)	STANDARD (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: EXAMINER NOTE: Terminate the JPM at this point. STOP TIME_____

RTL #A5.640U **BEAVER VALLEY JOB PERFORMANCE MEASURE**

EVALUATOR COVER SHEET

JPM Number: 2PL-004 Rev: 8 System: 061

JPM Title: Reset the Terry Turbine Trip and Throttle Valve

K/A Reference: 061K4.07 3.1/3.3 Task ID #: 0610090101

JPM Application: ☒ Requal ☒ Initial Exam ☐ Training

Evaluation Method

☐ Perform
☒ Simulate

LOCATION

☒ Plant Site
☐ Simulator
☐ Classroom

TYPE

☐ Training
☐ Annual Requal. Exam
☐ OJT
☒ Initial Operator Exam
☐ Other: ________

Administered By:

☐ BV-T ☒ NRC
☐ Other: ________ Not replacement grp #1

Evaluation Results

Performer: Name: ________ Employee No: ________

Results ☐ SAT Time (minutes)
☐ UNSAT* Allotted: 10 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: ________

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
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:	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:	2OM-24.4R Issue 1 Revision 13
TOOLS:	None
HANDOUT:	2OM-24.4R

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)

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.)
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.

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.	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:

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:

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.	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: _____

RTL #A5.635.J 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 2OM-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.

TIME ALLOTTED: 5 minutes

KSA #: 061K4.01 3.9/4.2

REF: 2OM-24.1
VOND 24-3
VOND 30-3
VOND 30-1

COMMENTS: ______

Okay But not real challenging fairly low discriminatory value

RTL #A5.635.J

* * 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.

RTL #A5.635.J

* * 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

NRC # 5

OJT CHECKLIST/JPM COVER PAGE

PROGRAM TITLE: Licensed Operator Training (Retraining)

SUBDIVISION: 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

PREPARED BY: _____ DATE: _____
W. Brickenstein

APPROVED FOR IMPLEMENTATION: _____ DATE: _____
Director, Operations Training,
or Designee

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

RTL #A5.640U BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

JPM Number: New #5 Rev: 0 System #: 003

JPM Title: Respond to RCP Oil Leak

K/A Reference: 003 A3.04 3.6/3.6 Task ID #:0030010101

JPM Application: ☒ Requal ☒ Initial Exam ☐ Training

Evaluation Method
- ☒ Perform
- ☐ Simulate

LOCATION
- ☐ Plant Site
- ☒ Simulator
- ☐ Classroom

TYPE
- ☐ Training
- ☐ Annual Requal. Exam
- ☐ OJT
- ☒ Initial Operator Exam
- ☐ Other: _____

Administered By:
- ☐ BV-T
- ☒ NRC
- ☐ Other:

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☐ SAT ☐ UNSAT*

Time (minutes) Allotted: 10 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
Question #1	_____	_____	_____	☐	☐
Employee No:	_____				
Question #2	_____	_____	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation):

_____

Evaluator (Print): _____ Organization: _____

Evaluator Signature _____ Date: _____

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 LOCATION:	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 2OM-6.4.A for 2RCS*P21A.
REFERENCES:	2OM-6.4.A Issue 4, Rev. 7 2OM-6.4.AAC, Issue 4, Rev. 1
TOOLS:	Plant Computer, Stopwatch
HANDOUT:	2OM-6.4.A and 2OM-6.4.AAC

RTL #A5.635.J

NUMBER New # 5	TITLE: Respond to RCP Oil Leak

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	Start time: _____
BOOTH NOTE; monitor variables (MONV) TRCPUTB(1), XA40018R, JRCXRCS8, and JRCP417H.	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).
1. Candidate obtains a copy of OM-6, Procedure A, "Reactor Coolant System Startup".	1. Candidate locates OM-6, Procedure A. (Allow time to review the procedure.) COMMENTS: _____
2. C Place the 21A reactor coolant pump control switch to START (BB-A) "Critical Step"	2. Takes switch to the START position. COMMENTS: _____

NUMBER New # 5	TITLE: Respond to RCP Oil Leak

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)	3. 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.

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: _____ BOOTH CUE: expert; RAMP TRCPUTB(1),300,500,0 after the Low Bearing Oil reservoir alarm is received.

NUMBER New # 5	TITLE: Respond to RCP Oil Leak

STEP ("C" denotes 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. COMMENTS: _____
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".

NUMBER New # 5	TITLE: Respond to RCP Oil Leak

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: _____ 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.

NUMBER	TITLE: Respond to RCP Oil Leak
New # 5	

STEP ("C" denotes critical step)	STANDARD (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. EXAMINER CUE: Computer alarm for High Temperature is received at 195°F; "A" bearing temperature is continuing to increase. RCP control switch White light illuminates when pump is stopped. COMMENTS: _____ EXAMINER CUE: Examiner terminates JPM at this point Stop Time: _____

RTL #A5.635.J

* * 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.)

RTL #A5.635.J 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: _____

_____

_____

_____

RTL #A5.635.J

* * 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 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?")

(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: 2OM-15.1.d pg. 14 of 26

COMMENTS: _____

_____

_____

_____

RTL #A5.635.J 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.

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 PERFORMANCE MEASURE
EVALUATOR COVER SHEET

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 ☒ Initial Exam ☐ Training

Evaluation Method
- ☒ Perform
- ☐ Simulate

LOCATION
- ☐ Plant Site
- ☒ Simulator
- ☐ Classroom

TYPE
- ☐ Training
- ☒ Annual Requal. Exam
- ☐ OJT
- ☒ Initial Operator Exam
- ☐ Other: _____

Administered By:
- ☐ BV-T
- ☒ NRC
- ☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☒ SAT Time (minutes)

☐ UNSAT* Allotted: 15 Actual: _____

Time Critical: ☐ Yes ☒ No

Administrative JPM ☐ Faulted JPM ☐

*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	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
Question #1				☐	☐
Employee No:					
Question #2				☐	☐
Employee No:					

*Comments (Required for UNSAT Evaluation):

_____

Evaluator (Print): _____ Organization: _____

Evaluator Signature _____ Date: _____

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 ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
2.C Opens CCP Pump Return Header Isolation	2.1 Opens 2CCP MOV 157-1. 2.2C Directs local opening of 2CCP MOV 156-1 COMMENTS:_____ 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.

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

STEP ("C" denotes critical step)	STANDARD (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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
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 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: 2OM-15.1.d pg. 14 of 26

COMMENTS: _____

_____

_____

_____

RTL #A5.635.J 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: 2OM-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

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.

☐ 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.

#6

BEAVER VALLEY JOB PERFORMANCE MEASURE
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: ☐ NO ☒ RO ☒ SRO -

JPM Application: ☒ NRC ☒ Initial Exam ☒ Training

Evaluation Method
☒ Perform
☐ Simulate

LOCATION
☐ Plant Site
☒ Simulator
☐ Classroom

TYPE
☐ Training
☐ Annual Requal. Exam
☐ OJT
☒ Initial Operator Exam
☐ Other: _____

Administered By:
☐ 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
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-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 CONDITIONS:	The plant is at 100% power. The "A" Train 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, 2OM-30.4G. Assume all Initial Conditions are SAT.
REFERENCES:	2OM-30.4.G Issue 4 Rev. 2
TOOLS:	None
HANDOUT:	2OM-30.4.G

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.)
1. 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.	2.1 Places control switch for 2SWE*MOV116A to CLOSE. 2.2 Verifies green light illuminates. COMMENTS: EXAMINER CUE: Green light is lit.

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 than 5 psig below Service Water System pressure [2SWS-PI113A]. Then place discharge valve [2SWE*MOV116A] in AUTO, and verify that the valve opens.	4.1 Compares the two pressure indications. 4.2 Determines that pressure requirement is satisfied. EXAMINER CUE: [2SWE-PI114] indicates 140 psig. [2SWS-PI113A] indicates 50 psig.

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.
	COMMENTS:
	EXAMINER CUE: Act as NSS. Acknowledge Tech Spec report.

NUMBER	TITLE
2CR-126	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 2OM-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.
8. Verify [2SWS*MOV107A,C] are open.	8. Verifies valve open (Red) lights are lit. _____ COMMENTS: EXAMINER CUE: 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:
10. Verify 2SWS*MOV102A is closed and log time SWS pump removed from service.	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.

NUMBER	TITLE
2CR-126	Startup the Standby Service Water System

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

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #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

KSA #: 062AA1.02 3.2/3.3

REF: AOP 2.30.1

NOT really operationally oriented Q. or high safety significance but OK as

COMMENTS: _____

RTL #A5.635.J 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 actions if any should be taken?

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: _____

RTL #A5.635.J

* * 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

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

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.

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" 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, 2OM-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 MEASURE
EVALUATOR COVER SHEET

#1

JPM Number: 2CR-046 Rev: 04 System #: 013

JPM Title: Perform ESF Checklist - CIA

K/A Reference: 013A4.01 4.5/4.8 Task 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

☒ Perform
☐ Simulate

LOCATION

☐ Plant Site
☒ Simulator
☐ Classroom

TYPE

☐ Training
☐ Annual Requal. Exam
☐ OJT
☒ Initial Operator Exam
☐ Other: _____

Administered By:

☐ BV-T
☒ NRC
☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☐ SAT

☐ UNSAT*

Time (minutes)

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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
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-046
JPM TITLE:	Perform ESF Checklist - CIA
RECOMMENDED STARTING LOCATION:	Simulator
DIRECTIONS:	You are to perform the task "Perform ESF Checklist - CIA".
INITIATING 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.

RTL #A5.635.J

NUMBER	TITLE
2CR-046	Perform ESF Checklist - CIA

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	Start time: _____ EXAMINER NOTE: Only provide cues if simulating performance of this task. Init. IC-13 CLF VLV SEA 15,1,D (Loss of Power to 378) CLF VLV SEA 16,2,D (Open). Activate Malf RCS2B=12,000 gpm. Allow components to actuate. Reset SI and CIA, both trains. Clear CLF VLV SEA 16,2,D (vlv 381). Depress Reheater Reset P.B. Start second CCP pump. Reduce CCP ΔP to <95 psig. Reopen RCP thermal barrier valves if needed. (IC-48 for exam)
1. Obtain copy of Attachment A-0.2.	1. Candidate locates attachment. EXAMINER NOTE: Refer to Attachment A-0.2 and check each valve as verified by the candidate. _____ COMMENTS

RTL #A5.635.J

NUMBER	TITLE
2CR-046	Perform ESF Checklist - CIA

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	EXAMINER CUE: Prove indications for each component to support required position. All components are required in position, except "2CHS*MOV378 RCP Seal Water Cnmt Return Isol Vlv" which has neither green nor red light illuminated and 2CHS-MOV381 which has its red light lit.
2.C. Locate each component's indicated and check status vs required condition.	2.1 Candidate checks each valve on Attachment A-0.2 in the required condition. 2.2 Candidate initials each component on checklist. COMMENTS: (Cont. on next page)

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) EXAMINER NOTE: 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:

RTL #A5.635.J

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: EXAMINER CUE: Tell the candidate to stop after he verifies all components on BB-A. Stop Time: _____

RTL #A5.635.J 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?".)

TIME ALLOTTED: 5 minutes

KSA #: 103A2.03 3.5/3.8

REF: 2OM-53A.1.ECA-1.2

COMMENTS: ______________________________

Low knowledge level
Low Discriminatory value
Borderline - Should Consider replacing
depends on next questions in detail.

ORAL QUESTION #2

Question: a. 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.

ANSWER: a. 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.

TIME ALLOTTED: 4 minutes

b. With an actual CIA signal present when & why would the isolation signal be overridden to open the valve?

KSA #: 103K4.06 (3.1/3.7)
013K4.02 (3.9/4.2)

REF: 2OM-14A.1.D (I&C) page 9
Logic drawing 12241-LSK-14-15F
Electrical Schematic

COMMENTS:

RTL #A5.635.J

* * 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.

BVPS JOB PERFORMANCE MEASURE

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.

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.

☐ 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

8

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
		☐ Other:_____

Administered By:

☐ 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:_____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
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:	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 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 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).

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

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.)
	Start time: _____ EXAMINER NOTE: All actions must be simulated. The Examiner should obtain key 138 for the Excitation cabinet.
1. Obtain a copy of OM-53A, Procedure ECA-0.0, Attachment A-1.5.	1. Candidate locates procedure and the attachment. COMMENTS: _____ EXAMINER CUE: If asked, 2SWS*P21A is in AUTO.
2. C Take local control of diesel generator No. 1	2. Candidate inserts key into switch and selects the LOCAL position, at the local control panel. COMMENTS: _____

Critical ? Step ?

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:
4. C Depress the local start pushbutton until the engine starts and is self-sustaining; then release the pushbutton.	EXAMINER NOTE: Either pushbutton should be capable of starting the DG independently. 4. Candidate simulates depressing the local start pushbutton. COMMENTS: EXAMINER CUE: Diesel generator does not start.

Critical?

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.)
	EXAMINER NOTE: Provide key 138 to allow access to the Excitation Cabinet.
5.C Place key switch in AUTO and manually depress ES-1 or ES-2 emergency start relays.	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: _____

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.	6. Verifies DG engine speed is 515 rpm - 535 rpm. COMMENTS: 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:

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.

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.)
9. 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: _____

* * 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

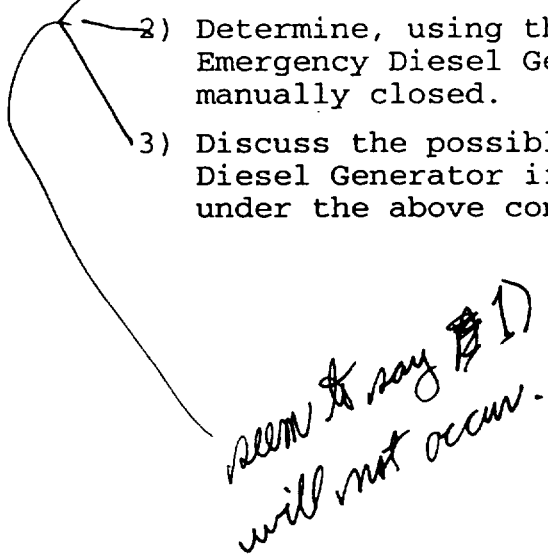
ORAL QUESTION #1

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).

1) 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.



seem to say #1 will not 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 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.

☐ 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
EVALUATOR COVER SHEET

9

JPM Number: 2CR-New #9 Rev: 0 System #:015

JPM Title: Perform a QPTR (Unsat)

K/A Reference:015A4.02 Difficulty; 3.9/3.9 Task ID #: 0150040201

JPM Application: ☒ Requal ☒ Initial Exam ☐ Training

Evaluation Method
- ☒ Perform
- ☐ Simulate

LOCATION
- ☐ Plant Site
- ☒ Simulator
- ☐ Classroom

TYPE
- ☐ Training
- ☐ Annual Requal. Exam
- ☐ OJT
- ☒ Initial Operator Exam
- ☐ Other: _____

Administered By:
- ☐ BV-T
- ☒ NRC
- ☐ Other:

New New Qtrs No. 2

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☐ SAT ☐ UNSAT*

Time (minutes) Allotted: 15 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
Question #1	_____	_____	_____	☐	☐
Employee No:	_____				
Question #2	_____	_____	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation):

_____

Evaluator (Print): _____ Organization: _____

Evaluator Signature _____ Date: _____

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:	2OST-2.4A
TOOLS:	Calculator
HANDOUT:	2OST-2.4A

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
EXAMINER NOTE: Provide candidate with Data Sheet 2OST-2.4A Page 8 with Normalization Factors inserted	Start Time:_____ EXAMINER NOTE: 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.
1. Records uncorrected detector current values.	1. 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:
4. Determines average corrected currents.	4. Divides two current sums by four. _____ COMMENTS:
5.C Checks results	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;_____

Revision:

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: 2OM Figure 2-5

COMMENTS: _____

Similar to question #2 for JPM #1

Consider replacement?

a dropped rod Q. but looking for effect on QPTR as opposed to effect on SDM. Probably OK.

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, $F_N^{\Delta H}$). (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 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.

BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

JPM Number: 2PL-019 Rev: 3 System #: 078
JPM Title: Align Air Compressor for Operation

K/A Reference: 065AA1.04 3.5/3.4 Task ID #: 0000260401

JPM Designation: [X] NO [X] RO [X] SRO
JPM Application: [X] NRC [X] Initial Exam [ ] Training

Evaluation Method
- [ ] Perform
- [X] Simulate

LOCATION
- [X] Plant Site
- [ ] Simulator
- [ ] Classroom

TYPE
- [ ] Training
- [ ] Annual Requal. Exam
- [ ] OJT
- [X] NRC Initial

Operator Exam Administered By:
- [ ] BV-T
- [X] NRC
- [ ] Other: _____
- [ ] Other: _____

Need new grps 1

Evaluation Results

Performer: Name: _____ Employee No: _____

Results
- [ ] SAT
- [ ] UNSAT*

Time (minutes) Allotted: 15 Actual: _____

Time Critical: [ ] Yes [X] No

Faulted: [ ]

*Comments (Required for UNSAT Evaluation): _____

Evaluation Results [ ] Check here if same as above

Observer: Name: _____ Employee No: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
Question #1	_____	_____	_____	[ ]	[ ]
Question #2	_____	_____	_____	[ ]	[ ]

*Comments (Required for UNSAT Evaluation): _____

Evaluator (Print): _____ Organization: _____

Evaluator Signature: _____ Date: _____

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 CUE:	The NSS hands you a copy of OM-2.56C.4, Procedure 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

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

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.

TIME 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

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 ALLOTTED: 5 minutes

KSA #: 000067EK3.04 3.3/4.1

REF: 20M-28.1

COMMENTS: _____

R/TL #A5.635.J

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.)
1.C Isolate all unnecessary loads on SAS.	Start time: _____ 1.C Candidate closes 2SAS-AOV105 by isolating and bleeding air pressure off of the valve. EXAMINER CUE: 2SAS-AOV105 is closed. Regulator shows zero pressure. COMMENTS: _____

R/TL #A5.635.J

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.	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: _____

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.	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.
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	COMMENTS: _____ Stop Time: _____

SCENARIO OVERVIEW

Facility: Beaver Valley Power Station Unit 2 Scenario No.: _2_ 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 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: IC-47, 75% power, BOL, steady state conditions. Rods are in Manual. 2CHS*P21B and 2FWE*P23B are OOS. 2RCS*PCV456 is isolated. Tornado Warning in effect. Tube leak on SG "B".

Turnover: The plant is at 75% power. BOL, 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. Lower power to remove 2FWS-P21A from service.

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 ACT,6,0,D	C PO/SRO	2FWE*P23A fails to auto start, will manually start (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

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. 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

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)

U2DRILL846(1)REV0

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

PZR PORV, 2RCS*PCV455C fails to 75% open
PORV Block 2RCS*MOV535 fails open

MAL PPL1A ACT,2,0,D
MAL PPL1B ACT,2,0,D
MAL PPL7A ACT 6,0,D
VLV BAT14 3,0,D

ATWS

2FWE*P23A fails to auto start
Emergency Borate Valve 2CHS*MOV350 fails closed

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.

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. Depress VCR PLAY/RECORD	Simulator running/VCR recording		ANSS assumes control and directs operators to commence lowering power IAW 2OM-52.4.B.
	Power lowering		RO develops reactivity plan, ANSS reviews and approves. Crew commences power reduction
<u>EVENT #1</u>			
After power is lowered $\geq$ 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

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
<u>EVENT #2</u>			
When PZR level stabilized, insert: XMT MSS42 1,0,20,D	Impulse pressure 2MSS*PT446 fails low Rods step in in Auto		

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 dI 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 2OM- 24.4.IF, Instrument Failure Procedure, Attachment 5
	SG levels lowering FRVs in Manual		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

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 2OM-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

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
<u>EVENTS #3, 4 & 5</u> XMT RCS30 1,2500,5,0,D	2RCS*PT444 fails high causing PZR spray valves and PORV 2RCS*PCV455C to open		
VLV RCS32 4,75,0,C,PRC:455C.GT.2250 (Preload)	2RCS*PCV455C fails 75% open		
VLV RCS11 2,0,D (Preload)	2RCS*MOV535, PORV Block fails open		
	PZR CONTROL PRESSURE HIGH/LOW alarm, A4-1D		RO notes alarm, informs ANSS and crew refers to ARPs as necessary.
	PZR CONTROL PRESSURE DEVIATION HIGH/LOW alarm. A4-1E, P0500D Various other PZR pressure and PRT alarms		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.
	Possible OTDT runback and rod stop. A4-4B, T0517D		PO places master pressure controller in manual, closes spray valves, and manually controls heaters.

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. CT -- 1
	Rods inserting.		RO uses auto or manual rod control to insert rods. Crew sounds standby alarm and announces Unit 2 reactor trip failure.

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.

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
EVENT #8 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 status, 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.

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.

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	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		ANSS directs RO to manually initiate SI, both trains
	EDGs running.		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

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.

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 ANSS directs performance of emergency safety function checklists when time permits
	Recirc spray pumps secured.		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.

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.

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: Beaver Valley Power Station Unit 2 Scenario No.: 1 Op-Test No.: 2LOT2B

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm Response procedures to raise power and respond to a VCT problem, a steam flow problem, a stuck rod, a load rejection, a steam line break outside containment, coincident with one charging pump tripping and one charging pump failing to auto start.

Initial Conditions: IC-47, 75% power, BOL, steady state conditions. Rods are in auto. One Charging Pump and one Motor Driven AFW pump are out of service. One PZR PORV is isolated. Tornado watch in effect. AOP 6.4 in effect due to tube leak on SG "B".

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 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,O,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

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 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. 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

1/2OM-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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U2DRILL845(1)REV0

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 2OM-52.4.B.

U2DRILL845(2)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE

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

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 AOP 2.35.2
	GV #2 closed		PO reports that GV #2 did not close in sequence and that it is full closed
	Turbine transfer from partial arc to full arc, power stable at approximately 60%		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

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	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
NOTE: Event #3 starts MAL CRF8A ACT,B8,1,0,D (Preload)			
	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 open B SG feed flow and level rising. A6-10F SG "B" FEED FLOW > STEAM FLOW in alarm		PO acknowledges alarms, reviews indications, informs ANSS that ANSS refers to ARPs and 2OM-24.4.IF, Instrument Failure Procedure, Attachment 3

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 III		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

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	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
<u>Event #5</u>			
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

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.

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
			RO verifies SI status.
EVENT #6 PMP CHS1 2,0,C,PPLSIA.EQ.1 (Preload)	2CHS*P21A trips on SI initiation		
EVENT #7 MAL PPL7B ACT,2,0,D (Preload)	2CHS*P21C HHSI pump fails to auto start		RO determines no HHSI pumps running, starts 2CHS*P21C and notifies ANSS
CT #1 - Crew manually actuates at least one train of SIS-actuated safeguards before transition to any ORP (E-0.D)	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.

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
	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.

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. One MDAFW pump running. TD AFW pump running		Crew verifies valves closed
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.		

INSTRUCTIONAL GUIDELINES	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.

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

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

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 ΔI 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. The plant is at 48% power, BOL. RCS boron 1061 ppm. Rods in manual with CBD at 166 steps. 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.

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U2DRILL845(1)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Select DRILL 848, Initialize IC - 50, and establish initial plant conditions.	Reactor at approximately 48% power, BOL, steady state condition. Ready to raise power to 100%. RCS boron _1061_ ppm, CBD _166_ steps.		
Insert:			
VLV RCS33 3,0,C,PRC:444.LT.2230	2RCS*PCV455D fails open		
VLV RCS32 4,0,0,0,C,JPPLP4.EQ.1	2RCS*PCV455C fails closed		
VLV RCS13 3,0,C,JPPLP4.EQ.1	2RCS*MOV537 fails closed		
MAL RCP4C 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 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.		

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. Depress VCR PLAY/RECORD	Simulator running/VCR recording		ANSS assumes control and directs operators to commence raising power IAW 2OM-52.4.B.
<u>EVENT #1</u>			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

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
EVENT #2			
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		PO announces SG "B" alarms
	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		ANSS refers to ARPs
	SG "B" level returning to program		SG "B" MFRV 2FWS*FCV488 placed in manual and level controlled within ± 5% of program
			ANSS refers to 2OM-24.4.IF, Attachment 4
			PO identifies 2MSS*PT486 as the failed instrument

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 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 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
<u>EVENT #3</u>			
MAL RCS4B ACT,0.05,120,0,D	SG "B" tube leak (0.05 gpm, 72 gpd)		

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).
2OST-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

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. AOP-2.6.4 complete.			Crew requests Health Physics to perform water and air sampling and survey SG blowdown 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		

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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		RO notes changing RCS parameters and informs ANSS.
If required, contact crew as U2 Operations Manager and direct a plant shutdown commence at 1%/min.			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 2OM-52.4.B Load Following.
			NSS evaluates EPP
Crew may have previously implemented AOP 2.51.1.			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
	Two PORVs in Auto with block valves open		RO ensures one PORV in auto with its associated block valve open.

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

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
EVENT #5	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.

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.

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.

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.

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).

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)	2SVS*PCV101B setpoint = 100% and closed. 2MSS*AOV101B, 102B closed. 2SVS*HCV104 closed. 2SVS*28 previously closed. 2MSS*16 previously closed.		Crew isolates flow from the ruptured SG. CT #1
No action necessary to close TDAFW pump drains 2MSS*348 and 2SDS-261.	2BDG*AOV100B1 closed. 2SDS*AOV111B1 closed. 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.

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.

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 EVENTS #6 & 7 VLV RCS13 3,0,C,JPPLP4.EQ.1 (Preload) VLV RCS32 4,0,0,0,C,JPPLP4.EQ.1 (Preload)	No spray valves available. RCP "C" tripped. 2RCS*PCV455A OOS No PZR PORVs are available 2RCS*PCV456 turned over OOS 2RCS*PCV455D block, 2RCS*MOV537 failed closed 2RCS*PCV455C failed closed		RO determines that no spray valves are available RO attempts to depressurize RCS using PZR PORV

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

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.			

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

Facility: Beaver Valley Power Station Unit 2 Scenario No.: _3_ 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 plugged boric acid filter, NI failure, MFW pump trip, LOOP, one EDG trips, one EDG breaker fails to close (loss of all AC power), TD AFW pump trips on overspeed (able to reset), RCP "C" #1 seal leak (50 gpm).

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

Turnover: 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.

Event No.	Malf. No.	Event Type*	Event Description
N/A	N/A	N	Continue plant shutdown IAW 2OM-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 VLV CFW27 1,0,D	I RO/SRO	2CNM-PS118B, MFW Pump suction pressure fails low causing trip of running MFW pump SU FW Pump recirc valve fails closed (Preload)
4	MAL SWD1 ACT,0,0,D	M ALL	LOOP
5	MAL DSG1A ACT,0,0,D BKR HIV13 2,0,D	C ALL	EDG 2-1 trips (Preload) EDG 2-2 output breaker trips (Preload) 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

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 ΔI 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

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	Trip of EDG 2-1		
BKR HIV13 2,0,D	Trip of EDG 2-2 Output Breaker		
MAL AFW3A ACT,5440,0,0,0,D	Trip of TD AFW Pump (can reset)		
MAL LDS3D ACT,95,0,0,0,D	F21, Boric Acid Filter to Blender plugs		
VLV CFW27 1,0,D	SU FW pump recirc valve fails closed		
File STUFFON File LRTM5IC			
Assign shift positions. NSS _____ ANSS _____ RO _____ PO _____ STA _____	<u>Simulator Frozen</u> 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.

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 2OM-52.4.C, step 20
	Turbine load and reactor power lowering		
<u>EVENT #1</u>			
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

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

RO announces alarm A4-4E

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

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

Power is greater than P10

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"

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 Computer point N0096D tripped Level Trip Switch caution tagged		Crew places "Level Trip Switch" to BYPASS on N35 drawer and to affix a Caution Tag to the switch Computer point status verified using CRT Inter Range screen
<u>EVENT #3</u> 2FWS-P21B Suction Pressure Switch 2FWS-PSL118B fails BST CFW24 1,0,D VLV CFW27 1,0,D	2FWS-P21B trips (loss of all main feedwater) Fail 2FWR*FCV155, SU Feed Pump Recirc shut (Preload)		2FWS-P21B Trips MD AFW pump 2FWE*P23A Auto start
	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		

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

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 STA monitors status trees
<u>EVENT #4</u>			
One minutes after completion of shift brief for ES-0.1 entry, Insert: MAL SWD1 ACT,0,0,D	LOOP		
<u>EVENT #5</u>			
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

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
			STA monitors CSF status trees for information only. S/U
	Annunciator A5-6D lit. Neutron 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)
	SLI manually actuated. MSIVs and bypass valves closed.		PO ensures steamlines isolated.
	Exciter and output breakers open.		PO verifies generator trip.
	PRZR PORVs closed, orifice isolation valves closed, Regen HX inlet valves closed.		RO checks if RCS is isolated

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; MAL RCP1B ACT,50,300,0,0,D	RCP 'C' #1 seal leak (50 gpm)		
CT #2 - Crew 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

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.

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.
			Crew requests Rad Con support to isolate RCP seals, dispatches plant operator to locally close valves.
After appropriate delay, use the following for local actions:			
LOA SEA1 0,0,0,D	2CHS*178 closed.		
LOA SEA2 0,0,0,D	2CHS*179 closed.		
LOA SEA3 0,0,0,D	2CHS*180 closed.		
VLV SEA16 3,0,D	2CHS*MOV381 closed.		
VLV CCP58 3,0,D	2CCP*MOV156-1 closed.		
VLV CCP60 3,0,D	2CCP*MOV157-1 closed.		
Report valves closed.			

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	Blowdown isolation valves closed. Main and bypass feed regulating valves closed.		Crew checks SG isolation.
	All PORVs closed.		RO checks PRZR PORVs.
	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.
	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.

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	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
As System Operator report that power is available to Switchyard 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 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.

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

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
	One CCP pump running		Crew starts one CCP pump
	HHSI pumps all stopped		Crew checks HHSI pump status
	2CHS*LCV115C & E open (suction from VCT) VCT makeup in Auto at > RCS C_B 2CHS*MOV289 and 310 closed		Crew verifies charging system alignment
	Normal charging flow established		RO establishes normal charging flow
	One CCP pump running CRDM shroud fans running 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 correctly aligned		ANSS directs RO/PO to verify all indicating lights with orange CIA marks lit

INSTRUCTIONAL GUIDELINES	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; VLV CCP58 2,0,D VLV CCP60 2,0,D	CCP supply temperature is less than 105° 2CCP*MOV156-1,157-1 are open 2CCP*107A, B & C are open		Crew establishes seal cooling IAW Attachment A-1.5
To open 2CHS*178, 179, 180, Insert; LOA SEA1 0.1,0,0,D LOA SEA2 0.1,0,0,D LOA SEA3 0.1,0,0,D	VCT temperature is less than 235°F 2CHS*178, 179, 180 checked closed 2CHS*MOV308A, B & C checked open 2CHS*HCV186 checked open 2CHS*178, 179, 180 opened until flow just indicated		
Collect and review logs after allowing crew time to complete.			Crew logs should be accurate, clear, and concise.

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.

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.		RO checks if letdown can be established, then establishes letdown.
	CCP supply/return valves open 2CCP*175-1 & 2 2CCP*176-1 & 2 2CCP*177-1 & 2 2CCP*178-1 & 2		
	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).			

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Collect and review logs after allowing operators to complete them.			Operator logs should be clear, accurate and concise.

Written
(As submitted preliminary)

1. The NCO is recovering a rod misaligned from its group in accordance with 2OM-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 of the following is a consequence of that action?

   A. Low Xenon concentration causes neutron flux peaks in the affected quadrant.
   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 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 reason for those actions?

A. Trip the Reactor Coolant pump and allow Doppler Power Coefficient to lower reactor power before tripping the reactor.
B. Trip the Reactor to prevent violation of DNB parameters before tripping the reactor coolant pump.
C. Trip the Reactor Coolant Pump to minimize flow oscillations in the core region from a pump coast down before tripping the Rx.
D. Trip the reactor to prevent 2/3 RCP bus Underfrequency Rx trip before tripping Reactor Coolant Pump

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	

3.	A natural circulation cooldown has been in progress using ES-0.2 " Natural Circulation Cooldown". The RHS system is in service. Why must the entire RCS be brought to less than 200 degrees prior to depressurization? A. To augment heat removal from the head structure. B. To bypass the requirement for soaking the head for 29 hours. C. To maximize loop flow on continued natural circulation. D. To prevent void formation in stagnant loops.

ANSWER:D	
K/A: W/E09/E10 K2.2:	Importance:3.6
Cognitive Level: Comprehension	
References: 2OM-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 Physics - CFE Limit.

4. The unit is conducting a natural circulation cooldown in accordance with ES-0.2 "Natural Circulation Cooldown". 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 less than 25°F/hr. C. Maintain RCS subcooling greater 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: 2OM-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	

5. The unit is at 100% with all systems NSA. The core age is MOL at 8000 MWD/MTU burnup. A malfuction requires turbine load to be runback at 5% per minute to 70% reactor power.

After reference to the Reactivity Plan, what is the total amount of boron injected into the RCS via the Emergency Boration 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.

ANSWER: C	
K/A: 000024 K1.02	Importance: 3.6
Cognitive Level: Application	
References: Reactivity Plan for Routine Operations Activities - Valid for burnups of 7000 - 9000 MWD/MTU.	
Lesson Plan #: 2LP-SQS-7.1	Obj. #: 8
History: NEW	
Source:	Type: OPEN BOOK
JTA: 004EEE0101	Give copy of Reactivity Plan

Direct lookup

6. 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 Exchanger [2CHS*E24] C. Degassifier Vent Chillers [2BRS*E22A,22B] D. Seal Water Heat Exchanger[2CHS*E21]	
ANSWER: C	
K/A:000026 AK2.03	Importance:3.6
Cognitive Level: Knowledge	
References 2OM-15.5, Figure 15-1, 2OM-15.3.B, Iss. 4, Rev. 10	
Lesson Plan #:: 2LP-SQS-15.1	Obj. #: 6
History: NEW	
Source:	Type: CLOSED BOOK
JTA:: 0000060121	

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, Pressurizer 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
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 ANSS 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 AFW flow is designed to acomplish which of the following functions?

A. Provide minimum flow through the operating Auxiliary Feedwater pumps.

B. Prevent exceeding pump runout on the operating Auxiliary Feedwater pumps.

C. Provide thermal stress relief by maintaining wetted surfaces on the interior of the steam generators.

D. Prevent overflow of the steam generators during restoration of narrow range level.

ANSWER: C	
K/A:000040 (W/E12) K3.2	Importance:3.3
Cognitive Level: Knowledge	
References: 2OM-53.B.4.ECA-2.1, Iss. 1B, Rev. 6, Background for CAUTION before step 6	
Lesson Plan #: 2LP-SQS-53.3	Obj. #: 3
.	
History: NEW	
Source:	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 RCS is saturated at 400 psig. SI can NOT be terminated.

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 water and SI flow to limit ~~temperature stress on the vessel wall.~~

C. Use forced flow to collapse voids in the core outlet plenum and vessel head.

D. To equalize RCS pressures, allowing uniform SI flow to the vessel.

ANSWER:B	
K/A:W/EO8 K3.2	Importance:3.6
Cognitive Level: Knowledge	
References: 2OM-53B.4.FR-P.1, Background for Step 6, Issue 1B, Rev. 1, page 21	
Lesson Plan #:2LP-SQS-53.3	Obj. #: 3
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 3110140601	

10. The unit is operating at 100% power with all systems NSA when the Section A1 Main Condenser Water Box Outlet Valve [2CWS*MOV100A] malfunctions and closes. Unit power remains constant.

As a result, the temperature of CWS to the cooling tower will___(1)___ and condenser absolute pressure will___(2)___.

A. **(1)** rise, **(2)** rise

B. **(1)** fall, **(2)** fall

C. **(1)** rise, **(2)** fall

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% power coincident with a complete loss of the switchyard.

- All RCP pumps are off.
- RVLIS is available.
- RCS temperature and pressure are trending toward no-load values.
- 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: 2OM-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	

12. Due to performing a maintainence 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
- Turbine First Stage Pressure 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.

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 fails low.

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	
Lesson Plan #: 2SQS-24.1	Obj. #: 5
History: NEW	
Source:	Type: OPEN Book
JTA: 059BBB0401	Give UFSAR Figure 7-3.18

13. A fire has started in the Cable Spreading 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 2OM-56C "Alternate Safe Shutdown From Outside Control Room".

Which of the methods is to be used to bring the unit to Cold Shutdown?

A. Conduct a natural circulation cooldown using only the Train B (Purple) 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 Panel and conduct a natural circulation cooldown.

D. Transfer all Train A (Orange) equipment to the Alternate Shutdown Panel and conduct a natural circulation cooldown.

ANSWER: D	
K/A: 000067 K3.02	Importance: 2.5
Cognitive Level: Knowledge	
References: 2OM-53B.4. 2OM-56C.4.B, Issue 1, Rev. 14	
Lesson Plan #: 2LP-SQS-56C.1	Obj. #: 2
History: NEW	
Source:	Type: Closed Book
JTA: 0000020401	

14. The control room was evacuated due to a fire. Procedure 2OM-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].

ANSWER: D	
K/A: ,000068 K3.06	Importance: 3.9
Cognitive Level: Knowledge	
References: 2OM-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: 0000020401	

15. Unit 2 Containment operates at sub-atmospheric pressure. Maintenance of sub-atmospheric pressure is required to meet which one of the following criteria?

A. Maintain minimum flow to Containment Radiation Monitors 2RQ-303A and 303B for leakage detection.

B. Ensure containment pressure can be restored to sub-atmospheric pressure within 1 hour after a Design Basis Accident.

C. Maintain leakage for all at power operational modes up to Technical Specification limits.

D. Ensure containment temperature 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 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	

Distractors - Do they go with question?

16. 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: 2OM-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 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.

NP → C. Dilute until Control Bank D reads zero steps and Bank D rod bottom lights are lit.

D. Perform 2OST-49.1 "Shutdown Margin Calculation (Plant Critical) within 1 hour.

ANSWER:B	
K/A:000003 K3.04	Importance:3.8
Cognitive Level: Memory	
References: 2OM-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 Reponse." The following conditions exist:

- All steam generators are below the narrow range
- All reactor coolant pumps are operating
- Steam Dumps are open to the condenser and Tave is trending to 547°F
- Auxiliary Feedwater is 200 gpm 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 feedwater flow is greater than 365 gpm.

C. No, all steam generator levels 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: 2OM-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	

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 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 stabilize at or near ~~2235~~ psig. What shot off head?

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	
Lesson Plan #: 2LP-SQS-11.1	Obj. #: 5
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: 000011 K2.02	Importance: 2.6
Cognitive Level: Comprehension	
References 2OM-11.1.C, Issue 4, Rev. 0 page 3, 2OM-11.1.D, Iss. 4, Rev. 0, page 3, 2OM-11.2.B, Issue 4, Rev. 2 Page 3.	
Lesson Plan #: 2LP-SQS-11.1	Obj. #: 5
History: NEW	
Source:	Type: Closed Book
JTA: 3010020601	

21. Following a Safety Injection signal, Letdown Orifice Isolation [2CHS-AOV200B] failed to close. If the letdown line were subsequently 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: 2OM-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	

Have SI then get LD line break?

22. 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 Pumps [2SIS*P21A, P21B]
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: 2OM-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	

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.

ANSWER: D	
K/A: W/E02 K2.1	Importance: 3.4
Cognitive Level: Application	
References: 2OM-53B.4.ES-1.1, Issue 1B Rev 6 Background for step 2 Note 1	
Lesson Plan #: 2LP-SQS-53.3	Obj. #: 6
History: NEW	
Source:	Type: OPEN BOOK
JTA: 3010010601	Copy of ES 1.1

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
- All RHS system components are NSA
- B RHS train is available for service

According to the VOND, if RCS Pressure Transmitter [2RCS*PT440] fails high, which of the following describes what will happen to the RHS system?

A. 2RHS*MOV701A and 2RHS*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.

ANSWER: A	
K/A: 000025 K3.02	Importance: 3.3
Cognitive Level: Application	
References: 2OM-10.5, Issue 4, Rev. 0 Figure 10-1, 2OM-10.1.D, Issue 4, Rev. 0, page 3 to 6	
Lesson Plan #: 2LP-SQS-10.1	Obj. #: 9
History: NEW	
Source:	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 actuations?

A. Both First Stage Impulse Pressure Transmitters [2MSS*PT446, 2MSS*PT447] still indicate greater 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.

ANSWER: B	
K/A: 000029 A2.09	Importance:4.4
Cognitive Level: Comprehension	
References: FSAR Figure 7.3-20	
Lesson Plan #: 2LP-SQS-26.3	Obj. #: 4
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0450070101	

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 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 Turbine go to E-0 "Reactor Trip and Safety Injection" Step 1. D. Continue to monitor the affected Steam Generator and prepare for a normal plant shutdown.	
ANSWER: A	
K/A: 000037 K3.02	Importance: 3.2
Cognitive Level: Application	
References: 2OM-53C.4.2.6.4, Issue 1A, Rev. 9, Step 3	
Lesson Plan #: 2LP-SQS-53C.1	Obj. #: 8
History: NEW	
Source:	Type OPEN BOOK.
JTA: 0000110401	Give student AOP 4.6.4

27. A steam generator tube has ruptured in the 21C Steam Generator. The crew is performing the actions required by E-3" Steam Generator Tube Rupture". The cooldown of the RCS has been completed and RCS pressure matches steam generator pressure. Leakage into the affected steam generator will continue until the operators complete which of the following task? To prevent restart

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 in the narrow range.

R C. Spray the pressurizer as needed to minimize subcooling and hold the RCS pressure equals steam pressure in the affected steam generator.

D. Restore normal charging and letdown and balance RCS pressure to match 21C steam generator pressure.

ANSWER: D	
K/A: 000038 K1.02	Importance: 3.2
Cognitive Level: Knowledge	
References: 2OM-53B.E-3 Background Issue 1B, Rev. 7, page	
Lesson Plan #: 2LP-SQS-53.3	Obj. #: 3
History: NEW	
Source:	Type: Closed Book
JTA: 3010040601	

28. Unit 2 has tripped from 100% power due 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.

B. Tcold falls rapidly as SI flows fills the cold leg and RCP casing.

C. Tcold remains at or near saturation temperature for Steam Generator 21C steam pressure.

D. Tcold rises as Loop 21C stagnates during cooldown of loops 21A and 21B

ANSWER: B	
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: 3010040601	

29. 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 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 mismatch on 2FWS*FT476 for 25 seconds.

ANSWER: C	
K/A: 000054 A2.03	Importance: 4.1
Cognitive Level: Knowledge	
References: 2OM-24.1.D, Issue 4, Rev. 2 and 2OM-24.1.E, Issue 4, Rev. 1	
Lesson Plan #: 2LP-SQS-24.1	Obj. #: 10
History: NEW	
Source:	Type: CLOSED BOOK
JTA:0130010101	

Stem focus.

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, Rev 6, Step 5	
Lesson Plan #:2LP-SQS-53.3	Obj. #: 3
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 3110060601	

Just putting in Stm Press Mode would not do this. - Q really asks why a large stm demand would result in low press on Nat. Recirc.

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" alarm annuciates on DRMS Console. The sample pump for 2SGC-RQI100 is 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: 00059 AK2.01	Importance: 2.7
Cognitive Level: Comprehension	
References: 2OM-25.4.L, Issue 4, Rev. 9, Page 14, CAUTION before step 13.g	
Lesson Plan #: 2LP-SQS-25.1	Obj. #: 5
History: NEW	
Source:	Type: OPEN Book
JTA: 072BBB0221	Copy of 2OM-25.L

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: 2OM-43.1.C, Issue 4, Rev. 3, page 22 and 23	
Lesson Plan #: 2LP-SQS-43.1	Obj. #: 1
History: NEW	
Source:	Type: Closed Book
JTA: 072BBB0221	

33. A LOCA has occurred that resulted in damage to fuel. Radiation levels in the containment reached 200,000 Rem/hr and now , 24 hours later, are 5,000 Rem/hr. Containment pressure peaked at 15 psig and now has returned to 0.5 psig.

Which of the following describes the correct use of "Adverse Containment" values.

A. Discontinue use of "adverse containment" values due to containment pressure dropping below 5 psig.

B. Discontinue use of "adverse containment" values due to containment radiation levels below 10^5 Rads/hr.

C. Continue use of "adverse containment" values until integrated radiation dose is confirmed to be below 10^6 Rads.

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: 2OM53B.5.GI-2, Issue 1B, Revision 1, page 13	
Lesson Plan #: 2LP-SQS-53.3	Obj. #:6
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 301AAA0601	

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. ?	
ANSWER: A	
K/A:: 000028 G 2.4.4	Importance: 4.0
Cognitive Level: Knowledge	
References: 2OM-6.4.IF, Issue 4, Revision 5, page 13	
Lesson Plan #: 2LP-SQS-6.4	Obj. #: 13
History: NEW	
Source:	Type: CLOSED BOOK
JTA:0110030101	

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 Iodine release from a damaged fuel assembly.

C. Overheating damage to a fuel assembly from a loss of cooling.

D. Damage to fuel handling equipment 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 Isolation 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 greater than 50°F and PRZR level on scale. D. Maximize injection of SI accumulator water and limit nitrogen injection into RCS	
ANSWER: D	
K/A: 000056 K3.02	Importance: 4.4
Cognitive Level: Knowledge	
References: 2OM-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: Modified from Q17 on 2LOT2A	Type: CLOSED BOOK
JTA: 3010060601	

37. The unit is at 100% power with all systems NSA. "A" Train SSPS testing is in progress. 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 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	

38. 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?

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 inserted and the reactor trip breakers open.

ANSWER: B	
K/A: 001 K6.08	Importance: 2.9
Cognitive Level: Comprehension	
References: 2OM-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 amps in the Intermediate Range. The operator 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.

Exhibiting a questioning attitude the Plant Operator states that the rod configuration seems improper and consults Plant Curve CB-15. Which of the following actions is required?

A. Manually trip the reactor and commence emergency boration.

B. Insert Control Banks A, B, C and D and re-calculate the Estimated Critical Position.

C. Request permission from General Manager Operations to enter Mode 1.

D. Request Nuclear Engineering validation of the current rod configuration.

ANSWER: A	
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:	Type: OPEN BOOK
JTA: 0010100101	Give CB-15

40. At low RCS pressures, and with procecedural restrictions, the RCP Seal Water Bypass Isolation Valve [2CHS*MOV307] may be 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 RCP Lower Radial Bearing.

D. Elevated cooling flow through RCP Thermal Barrier.

ANSWER: C	
K/A: 003 K1.03	Importance: 3.3
Cognitive Level: Comprehension	
References: 2OM-6.4.AAB, Issue 4, Rev. 1, Page 4 and 5, 2OM-6.1.C,Issue 4, Rev.0, page 20	
Lesson Plan #: 2LP-SQS-6.3	Obj. #: 4.c
History: NEW	
Source:	Type: Closed Book
JTA: 0030020101	

41. The RCS is at 240 degrees and 325 psig. The operator is reviewing 2OM-6.4.A, "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: 2OM-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

Closed Reference

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 resin 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	
ANSWER: A	
K/A: 004 A2.32	Importance: 3.4
Cognitive Level: Comprehension	
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: CLOSED BOOK
JTA: 0040100101	

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 Limitations require that the boron concentration of the pressurizer must be maintained within 50 ppm of the RCS. Which of the following is procedurally allowed to accomplish this task?

A. Throttle open one pressurizer spray valve.

B. Energize pressurizer heaters.

C. Cycle one pressurizer PORV.

D. Align excess letdown to the VCT.

ANSWER: B	
K/A: 004 A4.15 ***K/A CHANGE***	Importance: 3.6
Cognitive Level: Application	
References: 2OM-7.4.K, "Blender Boration Operations", Issue 4, Rev. 1, Page 2, Step 9	
Lesson Plan #: 2LP-SQS-7.1	Obj. #: 8
History: NEW	
Source:	Type: OPEN Book
JTA: 0040080101	Copy of procedure

44. The unit is operating in Mode 3 at normal temperature and pressure with Charging Flow Control valve [2CHS*FCV122] controlling at 60 gpm. Letdown Orifice 23 Isolation Valve [2CHS*AOV200B] is open and letdown 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?

A. Overcooling of the Regenerative Heat Exchanger [2CHS*E23].

B. Thermal shock to the reactor vessel in loop 21A.

C. Flashing of letdown flow downstream 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: 2OM-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	

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?

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.

D. "A" equipment actuates "B" Train slave relays remain energized.

ANSWER: A	
K/A: 013 K2.01	Importance:3.6
Cognitive Level: Comprehension	
References: 2OM-1.5 Issue 4, Rev. 3, Figure 1-41	
Lesson Plan #: 2LP-SQS-1.2	Obj. #: 7
History: NEW	
Source:	Type: Closed Book
JTA: 0130010101	

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 must be less than HI-3 setpoint.

ANSWER: D	
K/A: 013 A 3.02	Importance: 4.1
Cognitive Level: Application	
References: FSAR Figure 7.3-13,	
Lesson Plan #: 2LP-SQS-1.2	Obj. #: 10
History: NEW	
Source:	Type OPEN BOOK
JTA: 0130010101	Give FSAR Figure 7.3-13

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.

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	

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 the loss of voltage?

A. N-35 will indicate higher amps then N-36.

B. N-36 will indicate higher 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.

ANSWER: A	
K/A: 015 A 2.02	Importance: 3.1
Cognitive Level: Comprehension	
References: 2OM-2.4.AAC " NIS DETECTOR/COMPENSATOR TROUBLE", Issue 1, Rev. 3 Page 3 2OM-53C.4.2.2.18 " Intermediate Range Channel Malfunction" Issue 1A, Rev. 1, Step 4	
LP#: 2LP-SQS-2.1	OBJ: 2
History: NEW	
Source:	Type :CLOSED BOOK
JTA: 0000100401	

49. 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 B. P-8 C. P-9 D. P-10	
ANSWER: D	
K/A:: 015 K4.01	Importance: 3.1
Cognitive Level: Knowledge	
References: 2OM-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	

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 2-9 and running. Under this alignment which of the following signals will STOP the fan? 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
Cognitive Level: Knowledge	
References: 2OM-44C.1.D, Issue 4, Rev. 0, Pages 2 and 3	
Lesson Plan #: 2LP-SQS-44C.1	Obj. #: 7
History: NEW	
Source:	Type: Closed Book
JTA: 0880040101	

52. The 2nd 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 reduced to 95% prior to removal from service. B. Turbine load must be reduced to 40% load to remove the entire heater train from service. C. Turbine load must be reduced 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 than 50°F.	
ANSWER: B	
K/A:056 A2.12	Importance: 2.8
Cognitive Level: Application	
References: 2OM-23B.4.C, Issue 1, Rev. 6 pages 4 and 5, 2OM-23A.2.A Issue 4,Rev. 1	
Lesson Plan #: 2LP-SQS-23.1	Obj. #: 13
History: NEW	
Source:	Type: OPEN BOOK
JTA: 06EEE0101	

Seemed the direct Lookup.

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 2OM-24.2.A "Main Feedwater Precautions and Limitations" for maintaining steam generator levels on program?

A. One Main Feedwater Pump and One condensate Pump.

B. One Main Feedwater Pump and Two Condensate Pumps.

C. Two Main Feedwater Pumps and One Condensate Pump.

D. Two Main Feedwater Pumps 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 Precautions 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.

ANSWER: D	
K/A: 059 K3.02	Importance: 3.6
Cognitive Level: Knowledge	
References: 2OM-24.1.D, Issue 4, Rev. 2	
Lesson Plan #:: 2LP-SQS-24.1	Obj. #: 10
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0610030101	

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 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 the operator to the loss of suction to the operating pumps?

	Pump Amps	Discharge Pressure	Flow
A.	LOW	HIGH	LOW
B.	HIGH	LOW	HIGH
C.	ZERO	Equal to Suction	ZERO
D.	LOW	LOW	LOW

ANSWER: D

K/A: 061 A1.05	Importance: 3.6
Cognitive Level: Application	
References: Generic Fundamentals. Pump Performance with loss of suction	
Lesson Plan #: 2LP-SQS-24.1	Obj. #: 8
History: NEW	
Source:	Type: Closed Book
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 ***K/A CHANGE***	Importance: 2.7
Cognitive Level: Knowledge	
References: 2OM-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	

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 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.

ANSWER: C	
K/A: 071 A4.29	Importance: 3.0
Cognitive Level: Knowledge	
References: 2OM-19.1.B, Issue 4, Rev 5, Page 2, 2OM-19.2, Issue 4, Rev. 1, Precaution 9	
Lesson Plan #:2LP-SQS-19.1	Obj. #: 3
History: NEW	
Source:	Type Closed Book
JTA: 0710070101	

59. If Control Room Area Radition Monitor [2RMC*RQ201, 202] goes into ALERT what radiation concern would exist? A. Control room personnel exposure to gamma. B. Control room air intake of alpha particulate release. C. Control room air intake of beta particulate release. D. Control room personnel exposure 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 4	
Lesson Plan #: 2LP-SQS-43.1	Obj. #: 3
History: NEW	
Source:	Type: Closed Book
JTA: 0720030101	

Non Discriminatory

60. The Unit is in MODE 5:

- RHS is in service with the entire RCS at 130°F
- OPPS is NSA for MODE 5 and in service

How many Reactor Coolant Pumps may be started for heat up of the RCS under this condition?

A. NONE

B. ONE

C. TWO

D. THREE

ANSWER: B	
K/A: 002 K1.13	Importance: 4.1
Cognitive Level: Comprehension	
References: 2OM-6.4A."Reactor Coolant Pump Startup" Issue 4, Rev. 6, Page 1	
Lesson Plan #: 2LP-SQS-6.3	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 information is available to the operator from PSMS.

- Core Exit Thermocouples (PSMS)
  - Trisector 1= 495
  - Trisector 2 = 490
  - Trisector 3 = 488
- RCS Wide Range Pressure Indicator [2RCS*PT440] = 1185 psig
- RCS Wide Range Pressure Indicator [2RCS*PT441] = 1200 psig.
- RCS Wide Range 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?

more plausible distractors.

A. 41 degrees Superheat

B. Zero (0) degrees - saturated

C. 41 degrees subcooled

72°F

D. 92 degrees subcooled

ANSWER: D	
K/A: 006 A1.16	Importance: 4.1
Cognitive Level: Application	
References: Steam Tables 2OM-53.3B ES-0.2, Foldout page.	
Lesson Plan #: 2LP-SQS-6.7	Obj. #: 7
History: NEW	
Source:	Type: OPEN REFERNCE
JTA: 3010060601	Give steam tables

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 effective 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.

ANSWER: B	
K/A: 010 K1.03	Importance: 3.6
Cognitive Level: Comprehension	
References: 2OM-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	

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	
ANSWER: A	
K/A: 011 K4.01	Importance: 3.3
Cognitive Level: Knowledge	
References: 2OM-6.4.IF, Issue 4, Revision 5, Page 13	
Lesson Plan #: 2LP-SQS-6.4	Obj. #: 13
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0020090101	

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 Flux.

C. Overtemperature Delta-Temperature.

D. Overpower Delta-T.

ANSWER: C	
K/A: 012 K5.01	Importance: 3.3
Cognitive Level: Knowledge	
References: 2OM-1.1.B, Issue 4, Rev. 1 pages 5 and 6	
Lesson Plan #: 2LP-SQS-1.1	Obj. #: 5
History: NEW	
Source:	Type: Closed Book
JTA: 0120050101	

65. The annuciator A4-8G " ROD POSITION 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 between Data Cabinet A and Data Cabinet B.

D. Group demand signal is within 10 steps of the calculated Rod Insertion Limit.

ANSWER: A	
K/A: 014 A1.02	Importance: 3.2
Cognitive Level: Knowledge	
References: 2OM-1.1.B, Issue 4, Rev. 1 page 20, 2OM-1.4.ACF, Issue 4, Rev. 1	
Lesson Plan #:2LP-SQS-1.1	Obj. #: 8
History: NEW	
Source:	Type: Closed Book
JTA: 0140030101	

66. The unit is at 100% power with all systems NSA. Main Condenser Vacuum [2CNM-CND21A] Section A Condenser Vacuum Transmitter [2CNM-PT103A] is damaged. Section B Condenser Vacuum Transmitter [2CNM-PT103B] is intact. Annuciator A12-4C "CONDENSER UNAVAILABLE (C-9) is lit.

If the unit suffered a large load rejection at this point, which of the following steam release pathways would open first?

A. 1st and 2nd Bank Steam Bypass Valves.

B. 3rd and 4th Bank Steam Bypass Valves.

C. Residual Heat Release Valve [2SVS*HCV104].

D. Atmospheric Steam Dumps [2SVS*AOV101A, 101B, 101C].

ANSWER: D	
K/A: 016 K1.03	Importance: 3.2
Cognitive Level: Comprehension	
References: 2OM-22A.5, Issue 4, Rev. 0, Figure 22A-1, 2OM-21.5, Issue 4, Rev. 2, Figure 21-9B (12241-LSK-11-14B)	
Lesson Plan #: 2LP-SQS-21.1	Obj. #: 3
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0410030101	

67. Which of the following describes 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 ECA-1.1 "Loss of Emergency Coolant Recirculation" will be entered due to the lack of sump level.

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 delayed by 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
JTA:0060150101	By inspection. QSS flow is approx. 6000 gpm less and will slow rate of depletion of RWST. DBA so sump level will be present. RSS pump capability is above design basis pressure. CIB starts all RSS pumps after time delay.

68. 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 Ejector [2CVS-J22] in operation. B. Containment Vacuum Pumps [2CVS-P21A,P21B] selected to AUTO. C. Containment Vacuum Pump [2CVS-P21A,P21B] manually started as required. D. Containment Air Compressor [2IAC-C21A,C21B] aligned to take suction on Containment.	
ANSWER: C	
K/A: 029 K. 4.02	Importance: 2.9
Cognitive Level: Knowledge	
References: 2OM-12.1.C, Issue 4, Rev. 0, 2OM-12.4.E, Issue 4,Rev. 0	
Lesson Plan #: 2LP-SQS-12.1	Obj. #: 3
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0260060101	

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 pattern 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: 033--A0101	Tech Spec Reference for Student

70. The unit is stable at 8% power with the Main Turbine off-line. The Main Feedwater Regulating Bypass Valves are in automatic and controlling at program level. Inadvertently, loop 21A Main Steam Atmospheric Vent Valve [2SVS*PCV101A] fails full open. Which of the following ~~is~~ would be the result of the valve opening? ← Answered on Lk. term Gives 'C'

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.

ANSWER: C	
K/A: 035 K6.02	Importance: 3.1
Cognitive Level: Comprehension	
References: Generic Fundamentals, 2OM-21.1.D, Issue 4, Rev. 2, page 1	
Lesson Plan #: 2LP-SQS-24.1	Obj. #: 8
History: NEW	
Source:	Type: Closed Book
JTA: 0350060101	

71. The unit is in Mode 3 after shutdown from extended full power operations. Stm Dump Control Mode Selector is in STM PRESSURE mode. The operator adjusts the setpoint on the Main Stm Manifold Press Control [2MSS*PK422] from 8.8 turns to 8.5 turns. The operator observes Tavg _____and Loop Delta T_____?

A. Drop and drop.

B. Drop and remain the same.

C. Rise and rise.

D. Rise and drop.

close Valve? ↑ Lower PRESS

ANSWER: B	
K/A: 039 A1.05	Importance: 3.2
Cognitive Level: Comprehension	
References: See heat exchanger behavior GF. 2OM-21.1.C	
Lesson Plan #: 2LP-SQS-21	Obj. #: 3.
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0410050101	

72. Annuciator A6-5G "CONDENSER VACUUM LOW/LOW-LOW" alarm is lit. The operators are verifying criteria for proper 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.	
ANSWER: C	
K/A: 055 K3.01	Importance: 2.5
Cognitive Level: Comprehension	
References: 2OM-26.4.H, Issue 1, Rev. 10, Attachment 1	
Lesson Plan #: 2LP-SQS-26.2	Obj. #: 7
History: NEW	
Source:	Type: OPEN Book
JTA: 0550040101	Give copy of Attachment 1

73. The unit is in Mode 4 and heating up. 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?

74. Annuciator A8-10A "125 VDC BUS 2-1 GROUND" is lit. NO. 2-1 DC Bus Ground Detector indicates a -75 VDC ground. 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. D. 125 VDC Bus 2-1 Distribution Switchboard may trip on voltage differential.	
ANSWER: C	
K/A: 063 A2.01	Importance: 2.5
Cognitive Level: Comprehension	
References: 2OM--39.1.C, Issue 4, Rev. 0, 2OM-39.4.F, Issue 4, Rev. 1 Section II. (This reference is real shaky here. NOTHING IN OM actually says device will actuate.)	
Lesson Plan #: 2LP-SQS-39.1	Obj. #: 7. b
History: NEW	
Source:	Type CLOSED BOOK
JTA: 063AAA0101	

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 2AE 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 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:	Type: Closed Book
JTA: 0640040101	

76. The Unit is in MODE 5, Containment 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 Iodine 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: 2OM-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. The Unit is at 100% power. The operator is preparing to start Service Water pump [2SWS-P21A]. Which of the following ~~parameters~~ Conditions will prevent a pump start from the control board?

A. Service Water Pump [2SWS-P21B] in AFTER START.

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 Pump Discharge Valve [2SWS*MOV102A] OPEN.

ANSWER: D	
K/A: 076 A4.02	Importance:2.9
Cognitive Level: Knowledge	
References: 2OM-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	

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: 2OM-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_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.: 2OM-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, Injury and Casualty Control), Used on 2LOT2A Exam question 78	Type: CLOSED BOOK

Source: Based on SQS 1132,

JTA: 0860070101	

GET

80. The unit is in MODE 5 with the RCS operating at Reduced Inventory. Procedure 2OM-10.4.D RHS Operation With RCS At Reduced Inventory/Midloop Condition" is in progress. The RCS is drained to 3 feet 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, and 21B] running with total system flow limited to 4350 gpm including letdown flow and recirculation for the pumps.

ANSWER: C B	
K/A: 005 K3.01	Importance: 3.9
Cognitive Level: Comprehension	
References: 2OM-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

Ans is 'B' not C
DLB

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.: 2OM10.5"Residual Heat Removal Systems Figures and Tables" Figure10.1	
LP#: 2LP-SQS-10.1	OBJ: 8
History NEW	
Source:	
JTA: 0050080101	Type: CLOSED BOOK

82. Which of the following describes the function of the sparger installed in the Pressuizer Relief Tank [2RCS*TK22]?

A. Allows drainage of the Pressurizer Relief Tank via Primary Drains Transfer Pumps [2DGS*P21A, 21B].

B. Reduces pressure by spray from Pressurizer Relief Tank Spray Valve [2RCS-MOV516].

C. Directs steam discharge from Pressurizer PORV's [2RCS*455C,D, 2RCS*456] 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 ***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
JTA: 0070030101	

83. The Containment Iodine Filtration Charcoal adsorbers [2HVR-FLTA211A(B)] are designed for iodine removal from containment during which of the following scenerios? A. Normal subatmospheric and shutdown plant operations for normal containment access. B. Post Design Basis LOCA atmospheric clean up of containment prior to any release to the Uncontrolled Area. 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
Cognitive Level: Knowledge	
References: 2OM-44C.1.B	
Lesson Plan #: 2LP-SQS-44C.1	Obj. #: 1
History: NEW	
Source:	Type: CLOSED BOOK
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 startup of the Hydrogen Recombiners?

A. The hydrogen recombiner could ignite a hydrogen burn during on line operations.

B. Hydrogen concentration is above the design capacity of the recombiner.

C. Core damage is indicated and dose rates will be higher than projected while aligning containment penetrations.

D. Containment depressurization to subatmospheric conditions must be completed prior to recombiner startup.

ANSWER: A	
K/A: 028 A2.02	Importance: 3.5
Cognitive Level: Knowledge	
References: 2OM-53B.4.E-1 Background, Issue 1B, Rev. 6, step 29	
Lesson Plan #: 2LP-SQS-53.3	Obj. #: 3
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 a large load rejection occurs and A4-8A " ROD CONTROL SYSTEM URGENT ALARM" annunciates. Which of the following actions 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 step 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.	
ANSWER:D	
K/A: 041 K6.03	Importance: 2.7
Cognitive Level: Comprehension	
References: 2OM-1.1.C, Issue 4, Rev. 0	
Lesson Plan #: 2LP-SQS-21.1	Obj. #: 5.c
History: NEW	
Source:	Type: Closed Book
JTA: 0410030101	

86. 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 systems 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.	
ANSWER: B	
K/A: 103 A1.01	Importance: 3.7
Cognitive Level: Application	
References 2OM-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

operational but Very easy.
A + D Not plausible.

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 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].	
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	

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 " Daily Heat Balance" calculated Net Reactor Power is 2644 MWT. Which of the power range 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: 2.1.7	Importance: 3.7
Cognitive Level: Application	
References: 2OM-54.4.C1, Issue 1, Revision 11, page 2	
Lesson Plan #:2LP-SQS-RI	Obj. #: 5
History: NEW	
Source:	Type: OPEN BOOK
JTA: 0150050201	Give procedure to candidates.

OK

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 increments or less. D. Place the unit in HOT STANDBY with all rods inserted within 15 minutes.	
ANSWER: 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
History: NEW	
Source:	Type: CLOSED BOOK
JTA:	

91. 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 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°F.

D. At 0800 Keff must be less than or equal to 0.95 and at 1400 Tavg must be less than 350°F.

ANSWER: B	
K/A: 2.1.22	Importance: 2.8
Cognitive Level: Comprehension	
References: Unit 2 Technical Specifications, Table 1.1, page 1-8 and 3.5.1	
Lesson Plan #: 2LP-SQS-TS	Obj. #: 2
History: NEW	
Source:	Type: OPEN BOOK
JTA:	Give a copy of Table 1-1

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 at 3 SCFM. Which of the following actions must be completed?

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 are correct.

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	
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:	Type: OPEN BOOK
JTA: 0710060101	Give copy of procedure

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 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 the 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	
Lesson Plan #: 1/2LP-SQS-AP.2	Obj. #: 6.
History: NEW	
Source:	Type: OPEN BOOK
JTA: 119--A0301	Give NPDAP 3.4

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, which of the following is occuring? A. Margin to DNB is rising as Critical Heat Flux rises. B. Margin to DNB is falling as Critical Heat Flux falls. C. Margin to DNB is rising as Actual Heat Flux rises. D. Margin to DNB is falling as Actual Heat Flux falls.	
ANSWER: B	
K/A:2.2.22	Importance: 3.4
Cognitive Level: Comprehension	
References: Basis for Technical Specification 2.1.1,	
Lesson Plan #: 2LP-SQS-1.1	Obj. #: 7
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0020090101	

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.	
ANSWER: A	
K/A:2.3.1	Importance: 2.6
Cognitive Level: Knowledge	
References: GERT Student Handout, Rev. 19, May 1998, page 7-3 to 7-5	
Lesson Plan #: LP-RC-02	Obj. #:7-2
History: NEW	
Source:	Type: Closed Book
JTA:3410040302	

96. 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

Steam Generator Pressures are at 430 psig and stable

Pressurizer Heater Banks C and A are ON. The operator places the Pressurizer Master Pressure Controller in MANUAL. As RCS pressure rises, which of the following actuations should occur first?

A. Safety Injection Signal on low steam line pressure.

B. Safety Injection Signal on low RCS pressure.

C. AMSAC actuation on low steam generator pressure.

D. Reactor Trip signal generated on High RCS pressure.

ANSWER: A	
K/A: 2.4.2 ***K/A CHANGE***	Importance: 3.9
Cognitive Level: A: Comprehension	
Ref.: 2OM-1.2.B "Reactor Protection Setpoints", Issue 4, Rev. 3, pages 4 and 5	
LP#: 2LP-SQS-1.1	OBJ: 5. b
History LRT 1997 Module IV Written exam, Modified from Question 49, 2LOT 2A	
Source:	
JTA: 0120050101	CLOSED BOOK

97. 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 raising thermal power above 5%. C. Place the unit in Mode 3 with the 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: 2OM-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

Testing P6 Knowledge

98. The unit has undergone a Loss of Coolant Accident. Both trains of Safety Injection are in service and High Head SI Flow [2SIS*FI943] indicates 500 gpm. Coolant system pressure is only 50 psig above highest steam generator pressure. Tripping the Reactor Coolant Pumps is required at this time to accomplish which of the following strategies? A. Prevent damage to Reactor Coolant Pumps operating in a highly voided system. B. Prevent Reactor Coolant Pump overspeed and generation of missile fragments. 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 Level: Knowledge	
References: 2OM-53B.5.GI-6, Issue 1B, Rev. 1, page 9	
Lesson Plan #:2LP-SQS-53.2	Obj. #: 11
History: NEW	
Source:	Type: Closed Book
JTA:301AAA0601	

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 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?

A. 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: 2OM-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. 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: 2OM53.4.B, Issue 1, Rev. 10, page 7	
Lesson Plan #: Fire Brigade Training	Obj. #:
Objective:	
History: NEW	
Source:	Type: Closed Book
JTA:0860040101	Knowledge for Brigade Captain's

12/27/95

NOTE TO: NRC Document Control Desk
Mail Stop 0-5-D-24

FROM: Virgil Curley, Licensing Assistant
Operating Licensing Branch, R I

SUBJECT: OPERATOR LICENSING EXAMINATION ADMINISTERED ON
March 22, 23-25 95, AT Beaver Valley Unit 2
DOCKET #50-412

On March 22, 23-25, 1995 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. (Proposed)

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.

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.

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

A	B	C	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.

Facility: BVPS Unit 2		Date of Exam:										Exam Level: RO	
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	
1. Emergency & Abnormal Plant Evolutions	1	4	3	6				0	2			1	16
	2	5	4	3				1	3			1	17
	3	1	0	1				0	0			1	3
	Tier Totals	10	7	10				1	5			3	36
2. Plant Systems	1	3	1	3	3	3	1	2	3	1	2	1	23
	2	3	1	2	4	1	1	3	3	0	1	1	20
	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. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	13
	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 Examination Outline (Follows Form ES-401-4)

Emergency and Abnormal Plant Evolutions - Tier 1 /Group 1

E/APE # / Name / Safety Function	K 1	K 2	K 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				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						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 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 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				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					Relation of RCS activity to radiation monitors	2.6	1
K/A Category Totals:	4	3	6	0	2	1	Group Point Total:		16

PWR RO Examination Outline (Follows Form ES-401-4)

Emergency and Abnormal Plant Evolutions - Tier 1 /Group 2

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
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						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

PWR RO Examination Outline (Follows Form ES-401-4) Emergency and Abnormal Plant Evolutions - Tier 1 /Group 3									
E/APE # / Name / Safety Function	K 1	K 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				Actions in EOP for loss of Offsite Power	4.4	1
K/A Category Totals:	1		1			1	Group Point Total:		3

PWR RO Examination Outline Plant Systems - Tier 2 /Group 1												(Follows Form ES-401-4)		
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					**5.04**							**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								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										**4.15**		**Use of heater for uniform boron concentration**	**3.6**	**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								Design Feature; SR shutoff	3.1	1
017 In-core Temperature Monitor				4.01								ITM input to subcooling	3.4	1
022 Containment Cooling			**3.01**			**X**						**Signals to stop CAR fans**	**4.1**	**1**
056 Condensate					X	X	X	2.12				Impact of bypassing LP heaters	2.8	1
059 Main Feedwater		X			X	X	1.03					Power level restrictions	2.7	1
059 Main Feedwater		X	3.02		X	X						Effect of loss of MFW on AFW	3.6	1
061 Auxiliary/Emergency Feedwater	1.01											Relation of AFW to SG	4.1	1
061 Auxiliary/Emergency Feedwater							1.05					Changes in Flow/motor amps	3.6	1
068 Liquid Radwaste		**X**	**X**				**X**				**2.3.11**	**Control of release setpoints**	**2.7**	**1**
071 Waste Gas Disposal		X				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 Examination Outline Plant Systems - Tier 2 /Group 2												(Follows Form ES-401-4)		
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
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								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		X			Impact of DRPI switches on indication	3.2	1
016 Non-Nuclear Instrumentation	1.03						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										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		X			X			Termination of release on high activity	4.0	1
076Circulating Water						X	X	2.01	X			**Service Water Start-UP**	2.9	1
079 Station Air		X	X	4.01	X	X	X		X			Cross-connect with instrument air	2.9	1
086 Fire Protection										4.04		**CO2 Discharge Warning**	3.1	1
K/A Category Point Totals:	3	1	2	4	1	1	3	3	0	1	1	Group Point Total:		20

PWR RO Examination Outline Plant Systems - Tier 2 /Group 3												(Follows Form ES-401-4)		
System # / Name	K 1	K 2	K 3	K 4	K 5	K 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								**2.04**				**Effects of a loss of RHR on the RCS**	**2.9**	**1**
007 Pressurizer Relief/Quench Tank		**X**				**X**				**4.01**		**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			LOCA hydrogen concerns	3.5	1
~~**034 Fuel Handling Equipment**~~	~~**1.04**~~	~~**X**~~	~~**X**~~		~~**X**~~							~~**Relation with NIS**~~	~~**2.6**~~	~~**1**~~
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

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

Facility: BVPS2 Date of Examination: 3/22/99

Exam Level (circle one): **RO** / 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
3. 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)
5. 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
7. 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)
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (P)lant, (R)CA		

2/3/99 telecon

ES-301 Administrative Topics Outline Form ES-301-1

Facility: BVPS2 Date of Examination: 3/22/99

Examination Level (circle one): **RO** / SRO Operating Test Number: _____

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. on cat spec instrument
A.2	**2.2.22,** Knowledge of LCOs and Safety Limits	2. Determine pressures and temperatures at which safety limit curve would be violated. give traces — JPM 2. 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. meter qualified Valve lineup Purge Map look at Roof ask question about stay time
A.4	**2.4.6,** Symptom based EOP mitigation strategies.	1. New JPM, determine highest priority critical safety function from simulator control board indications.

SCENARIO OVERVIEW

Facility: Beaver Valley Power Station Unit 2 Scenario No.: 1 Op-Test No.: 2LOT2B

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm Response procedures to raise power and respond to a VCT problem, a steam flow problem, a stuck rod, a load rejection, a steam line break outside containment, coincident with one charging pump tripping and one charging pump failing to auto start.

Initial Conditions: IC-47, 75% power, BOL, steady state conditions. Rods are in auto. One Charging Pump and one Motor Driven AFW pump are out of service. One PZR PORV is isolated. Tornado watch in effect. AOP 6.4 in effect due to tube leak on SG "B".

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 2FWE-36 shut; 2FWE-102 open. 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
1	N/A	N RO/PO/ SRO	Raise power at 10%/hr
2	XMT LDS3 1,100,120,0 ,D	I RO/SRO	VCT level transmitter 2CHS*115 fails high diverting letdown and loss of auto makeup
3	XMT 2MSS22 1,2.8,0,0,D	I PO/SRO	SG "B" steam flow transmitter 2MSS*FT485 fails as is
4	MAL ACT EHC1B 0,30,0,D	R RO/SRO C PO	Load rejection, 15% (Governor valve #2 fails closed)
5	MAL ACT CRF8A H2,1,0,D	C RO N PO/SRO	Stuck rod, H2 (Preload)
6	MAL ACT MSS2B 1,5E^6 ,300,O,D	M RO/ PO/ SRO	Steam line break outside containment on SG "B"
7	PMP CHS1 2,0,C,PPLSI A	C RO/SRO	2CHS*P21A trips on SI initiation (Preload)
8	MAL PPL7B 2,0,D	C RO/SRO	2CHS*P21C fails to auto start (Preload)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (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: Beaver Valley Power Station Unit 2 Scenario No.: _2_ 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 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: IC-47, 75% power, BOL, steady state conditions. Rods are in Manual. 2CHS*P21B and 2FWE*P23B are OOS. 2RCS*PCV456 is isolated. Tornado Warning in effect. Tube leak on SG "B".

Turnover: The plant is at 75% power. BOL, 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. 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. Lower power to 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

Facility: Beaver Valley Power Station Unit 2 Scenario No.: _3_ 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 plugged boric acid filter, MFW pump trip, LOOP, one EDG trips, one EDG breaker fails to close (loss of all AC power), TD AFW pump trips on overspeed (able to reset), RCP "C" #1 seal leak (50 gpm).

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

Turnover: 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. 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 2OM-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 NOT 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: 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 controlling steam flow channel pressure compensation for SG "C", the flow totalizer does not terminate dilution flow at the setpoint, PZR pressure control problem, and a SGTR with loss of PZR pressure control

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

Turnover: The plant is at 48% power. RCS boron 318 PPM. Rods in auto with CBD at 171 steps. [2CHS*P21B] and [2FWE*P23B] are OOS. 2FWS-MOV152 de-energized shut. 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 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
1	N/A	R RO N PO/SRO	Raise power at 10%/hr
2	XMT MSS47 1,10,10,0,D	I PO/SRO	Steam flow pressure compensation failure 2MSS*PT486 fails low
3	OVR BAT8A 2,0,D	I RO/SRO	Total makeup flow totalizer fails to terminate dilution at setpoint (Preload)
4	MAL RCS4C 600,60,0,D	M ALL	Start as small leak that progressively worsens until SGTR SG "B" (600 GPM)
5	CNH PCS10 5,0,20,0,D	C RO/SRO	PZR Master Pressure Controller fails high
6	VLV RCS11 3,0,C	C RO/SRO	PORV Block valve 2RCS*MOV535 fails closed after manual close
7	VLV RCS13 3,0,C	C RO/SRO	PORV Block valve 2RCS*MOV537 breaker trips after manual close
8	MAL RCP4C 0,D	C RO/SRO	RCP "C" trips when reactor tripped

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

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.

- Prepare tear off sheets for all JPM's & questions JUST INITIAL Conditions & Cues No other info.

ES-301 Administrative Topics Outline Form ES-301-1

Facility: BVPS2 Date of Examination: 3/22/99

Examination Level (circle one): **RO** / SRO Operating Test Number: _____

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, determine highest priority critical safety function from list of parameters.*** Okay
	2.1.12, Ability to apply TS for a system	1. ***New JPM, Determine Tech Spec requirements for a failed PZR pressure transmitter.*** Okay
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*** Okay
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*** Beef up or replace CRT level
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. Beef up

BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

JPM Number: ADM-IF TS (2LOT2B NRC) Rev:0 System #:2.1
JPM Title: Determine TS Requirements for Failed PZR Pressure Xmitter
K/A Reference: 2.1.12 [2.9] Task ID #: 1190150301
JPM Application: ☐ Requal ☒ Initial Exam ☐ Training

Evaluation Method
☒ Perform
☐ Simulate

LOCATION
☐ Plant Site
☐ Simulator
☒ Classroom

TYPE
☐ Training
☐ Annual Requal. Exam
☐ OJT
☒ Initial Operator Exam
☐ Other: _____

Administered By:
☐ 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results 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: _____

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

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 BEAVER 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 pressure transmitters are operable.
INIT. CUE:	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:	

RTL #A5.635.J

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	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 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	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 NRC)	Determine TS Requirements for Failed PZR 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 Comments:

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
4.C Determine Tech Spec requirements.	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) Comments: _____
	EVALUATOR NOTE: SDP action is NOT applicable since the minimum channels operable is still met. Comments: _____ STOP TIME _____

BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

JPM Number: ADM-S TREES (2LOT2B NRC) Rev: 0 System #: 2.1
JPM Title: Determine FRPs to Enter and Priority

K/A Reference: 2.1.20 [4.3] Task ID #: 301AAA0601

JPM Application: ☐ Requal ☒ Initial Exam ☐ Training

Evaluation Method
- ☒ Perform
- ☐ Simulate

LOCATION
- ☐ Plant Site
- ☐ Simulator
- ☒ Classroom

TYPE
- ☐ Training
- ☐ Annual Requal. Exam
- ☐ OJT
- ☒ Initial Operator Exam
- ☐ Other: _____

Administered By:
- ☐ BV-T
- ☒ NRC
- ☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: _____

Results
- ☐ SAT
- ☐ UNSAT*

Time (minutes) 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	Results UNSAT*
Question #1	_____	N/A	_____	☐	☐
Employee No:	_____				
Question #1	_____	N/A	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation): _____

_____

Evaluator (Print): _____ Organization: _____
Evaluator Signature _____ Date: _____

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

CANDIDATE DIRECTION SHEET

* THIS SHEET TO BE GIVEN TO CANDIDATE *

☐ Read:

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%

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.

☐ 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-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:	

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:

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.

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.	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:
9. Report results	9. Candidate reports results to supervisor. _____ Comments: STOP TIME _____

BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

JPM Number: ADM-Safety Limit (2LOT2B NRC) Rev:0 System #:2.2
JPM Title: Determine If Tech Spec Safety Limit has been Violated.

K/A Reference: 2.2.22 [3.4] Task ID #: 1190150301

JPM Application: ☐ Requal ☒ Initial Exam ☐ Training

Evaluation Method
- ☒ Perform
- ☐ Simulate

LOCATION
- ☐ Plant Site
- ☐ Simulator
- ☒ Classroom

TYPE
- ☐ Training
- ☐ Annual Requal. Exam
- ☐ OJT
- ☒ Initial Operator Exam
- ☐ Other: _____

Administered By:
- ☐ BV-T
- ☒ NRC
- ☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: _____

Results
- ☐ SAT
- ☐ UNSAT*

Time (minutes) 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	Results UNSAT*
Question #1	_____	N/A	_____	☐	☐
Employee No:	_____				
Question #1	_____	N/A	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation): _____

Evaluator (Print): _____ Organization: _____
Evaluator Signature _____ Date: _____

RTL #A5.635.J 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 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.

☐ 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
HANDOUT:	

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.)
	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 ± 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:

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: STOP TIME _____

BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

JPM Number: ADM-RAD (2LOT2B NRC) Rev:0 System #:2.3
JPM Title: Determine Stay Time in High Rad Area

K/A Reference: 2.3.10 [2.9] 2.1.25 [2.8] Task ID #: 301AAA0601

JPM Application: ☐ Requal ☒ Initial Exam ☐ Training

Evaluation Method
☒ Perform
☐ Simulate

LOCATION
☐ Plant Site
☐ Simulator
☒ Classroom

TYPE
☐ Training
☐ Annual Requal. Exam
☐ OJT
☒ Initial Operator Exam
☐ Other: _____

Administered By:
☐ BV-T
☒ NRC
☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☐ SAT ☐ UNSAT*

Time (minutes) 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	Results UNSAT*
Question #1	_____	N/A	_____	☐	☐
Employee No:	_____				
Question #1	_____	N/A	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation): _____

Evaluator (Print): _____ Organization: _____
Evaluator Signature _____ Date: _____

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.

RIL #A5.635.J 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 STARTING LOCATION:	Control Room/Simulator
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:	

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.
1. Determine dose rate at the valve.	1. 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.** = x _____ 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: _____ DATE: _____
Director, Operations Training,
or Designee

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 No.	Brief Description	Revised by:	Approval Signature	Approval Date

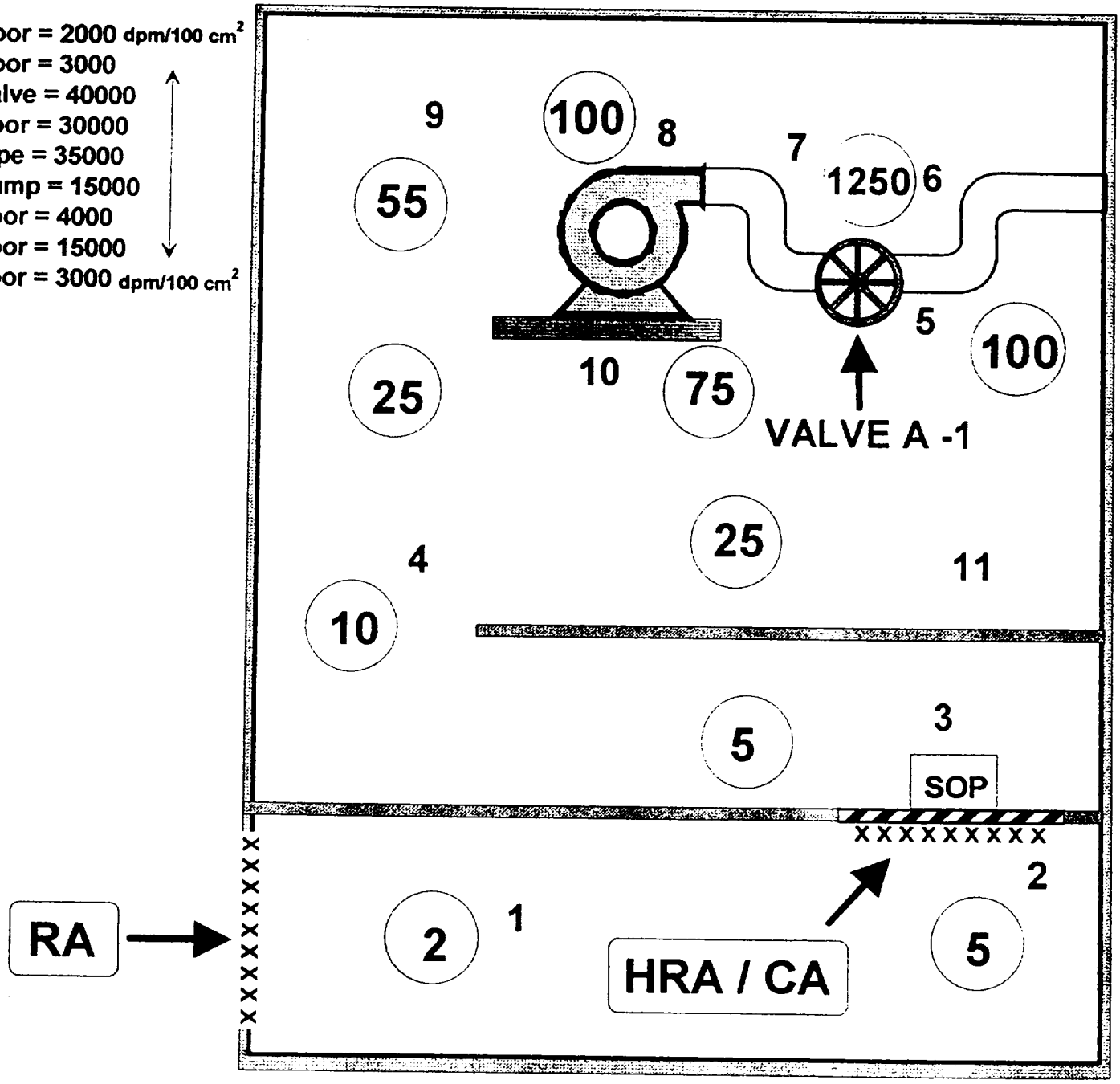
REACTOR POWER ___100%_____
SURVEY DATE _Current_____TIME _0800_____
SURVEYED BY __Randy Radtech_____
BADGE # ___7777_____
RWP # ___399-8000_____
INST. TYPE _RO2_____ SR # __1234_____
INST. TYPE _RM-14_____SR # __5678_____

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
▨ = Contaminated Area Boundry

* 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/100cm^2 EXCEPT:

3) floor = 2000 dpm/100 cm^2
4) floor = 3000
5) valve = 40000
6) floor = 30000
7) pipe = 35000
8) pump = 15000
9) floor = 4000
10) floor = 15000
11) floor = 3000 dpm/100 cm^2



Reviewed By: __H.P. Supervisor_____

(FOR TRAINING ONLY)

RTL #A5.635.J

* * 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?

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

KSA #:		
	2.4.39	3.3/3.1
	2.4.43	2.8/3.5

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

COMMENTS: _____

_____

_____

_____

RTL #A5.635.J

* * 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?.

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 ALLOTTED: 3 minutes

KSA #: 2.4.34 3.8/3.6

REF: EPP Vol 1 section 2 page 5-9 item 5.2.7.3 rev. 11

COMMENTS: _____

_____

_____

_____

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

Facility: BVPS2 Date of Examination: 3/22/99

Exam Level (circle one): **RO** / 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 - Explain affect of dropped rod on Shutdown Margin
		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
		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)
		b. ***011EA1.11, 4.2 - Priority of keeping core covered during LOCA***
4. 061/Reset Terry Turbine Trip and Throttle Valve/ D,P,R	4.	a. ***061K1.03, 3.5 - determine how to avoid steam binding of supply valves***
		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
		b. 003A2.01 - 3.5 - Predict effect of sudden Seal Injection on an overheated RCP seal
6. 076/ Startup Standby Service Water System (SWS) / D,S	4.	a. ***062AA1.02 - Contrast SWS heat load at BOL with that at EOL***
		b. 076K1.16 - 3.6 - Deduce affect of Containment Isolation Signal on the SWS and Liquid Discharge

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- Plant modified	**6.**	**a.** ***062A2.12 - 3.2 - Predict impact of reenergizing a faulted bus***
		b. ***064K1.02 - 3.1 - Develop plan to mitigate reduction of cooling water***
9. 015 / Perform a Quadrant Power Tilt Factor (QPTR) (unsatisfactory result) / N,S	**7.**	**a.** 001K5.07 - 3.3 - Evaluate effect of control rod drop on QPTR
		b. 015K5.12 - 3.2 - Relate excessive power peaking to power distribution Technical Specifications Detail
10. 078 / Start an Instrument Air (IA) Compressor / D,P Plant	**8.**	**a.** 078K3.02 - 3.4 -Predict affect of loss of IA on Safe Shutdown capability. Detail
		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)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (P)lant, (R)CA		

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.)

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.

RTL #A5.640U BEAVER VALLEY JOB PERFORMANCE MEASURE
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
☒ Perform
☐ Simulate

LOCATION
☐ Plant Site
☒ Simulator
☐ Classroom

TYPE
☐ Training
☐ Annual Requal. Exam
☐ OJT
☒ Initial Operator Exam
☐ Other: _____

Administered By:
☐ BV-T
☒ NRC
☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☐ SAT ☐ UNSAT*

Time (minutes) Allotted: 15 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
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-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 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 2OM-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 2OM-1.4.P, section IV.D. You are to perform steps D.1 through D.11.
REFERENCES:	2OM-1.4.P, " RCCA or RCCA Group Misalignment", Issue 4, Revision 2
TOOLS:	None
HANDOUT:	2OM-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

KSA #: 003 AK1.07 3.1/3.2

REF: 2OST-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.)

TIME ALLOTTED: 4 Minutes

KSA #: 003 AK 1.02 3.1/3.4

REF: 2OM-1.1

COMMENTS: _____

RTL #A5.635.J

* * 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).

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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.

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 #A5.635.J

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.	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 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:

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 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 Rod Step 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:

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:_____

NUMBER	TITLE
2CR-090	Recover a Dropped RCCA

STEP ("C" denotes critical 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.	10.	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: _____

NUMBER	TITLE
2CR-090	Recover a Dropped RCCA

STEP ("C" denotes critical step)		STANDARD (Indicate "S" for Sat. or "U" for Unsat.)	
11.C	Replace all disconnect switches to ROD CONNECT position.	11.C	Candidate places all switches for CBD to ROD CONNECT position. COMMENTS:
12.C	Clear urgent failure alarms on power cabinet.	12.1.C 12.2	Candidate clears urgent alarm using reset P/B on BB-B. Candidate verifies Ann. A4-8A clears. COMMENTS:

NUMBER	TITLE
2CR-090	Recover a Dropped RCCA

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.	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 Annunciator clear. Comments; Examiner Cue; Rx Engineering will perform a flux map at 75% power.

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 Control Selector 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:_____

RTL #A5.635.J

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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).

RTL #A5.635.J

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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.

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 **BEAVER VALLEY JOB PERFORMANCE MEASURE**
EVALUATOR COVER SHEET

JPM Number: 2CR-620 Rev:4 System #: 006
JPM Title: Respond to a Shutdown LOCA

K/A Reference: 009EA1.13 4.4/4.4 Task ID #:0000560401
JPM Application: ☒ Requal ☒ Initial Exam ☐ Training

Evaluation Method
- ☒ Perform
- ☐ Simulate

LOCATION
- ☐ Plant Site
- ☒ Simulator
- ☐ Classroom

TYPE
- ☐ Training
- ☐ Annual Requal. Exam
- ☐ OJT
- ☒ Initial Operator Exam
- ☐ Other: _____

Administered By:
- ☐ BV-T
- ☒ NRC
- ☐ Other: _____

What makes this JPM alternate path?

Evaluation Results

Performer: Name: _____ Employee No: _____ Candidate already placed in procedure

Results
- ☐ SAT
- ☐ UNSAT*

Time (minutes) Allotted: 15 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
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:	1. RCS isolated and 2. HHSI flow established.
RECOMMENDED STARTING LOCATION:	Simulator
DIRECTIONS:	You are to perform the 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.
REFERENCES:	2OM-53C.4.2.6.5 (ISSUE 1A Rev 8) "Shutdown LOCA"
TOOLS:	None
HANDOUT:	AOP 2.6.5

RTL #A5.635.J

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	Start time: _____
EXAMINER NOTE: Candidate may secure the RCP during this JPM due to seal leakoff, Vibration, ect., but this is not required by the AOP.	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:

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.	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
2CR-620	Respond to a Shutdown LOCA-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 level <4% and dropping. 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.

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

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

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	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-energize [2SIS*MOV867A-D]. COMMENTS: EXAMINER CUE: Other operators will reenergize the valves.. EXAMINER NOTE: Terminate the JPM at this point. STOP TIME: _____

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: _____

RTL #A5.635.J 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)

TIME ALLOTTED: 5 minutes

KSA #: 009 EA1.01 4.4/4.3

REF: AOP 2.6.5 Attachment 1

COMMENTS: _____

_____

_____

_____

RTL #A5.635.J

* * 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.

RTL #A5.635.J

* * 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.

BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

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: ☒ Requal ☒ Initial Exam ☐ Training

Evaluation Method

☒ Perform
☐ Simulate

LOCATION

☐ Plant Site
☒ Simulator
☐ Classroom

TYPE

☐ Training
☐ Annual Requal. Exam
☐ OJT
☒ Initial Operator Exam
☐ Other: _____

Administered By:

☐ BV-T
☒ NRC
☐ Other:

need replacement grp 2

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☐ SAT ☐ UNSAT*

Time (minutes) Allotted: 15 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
Question #1	_____	_____	_____	☐	☐
Employee No:	_____				
Question #2	_____	_____	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation):

_____

Evaluator (Print): _____ Organization: _____

Evaluator Signature _____ 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 2OM-7.4.O.
REFERENCES:	ECA 1.1 2OM-7.4.O
TOOLS:	NA
HANDOUT:	ECA 1.1 pgs. 1 through 5, 2OM 7.4.O

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 - but fairly low level discriminatory

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

REF: ECA 1.1, 2OM-7.4.O

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

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 2OM-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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	Start time: _____ EXAMINER NOTE: Initialize simulator in Mode 1, 100% power. Act Malf RCS 3B, DBA LOCA Act Malf CCS 7,8,9,&10, =3, RRS pumps fail Perform E-0, E-1, & ECA 1.1 to step 5. Write "7480ppm" on BB A for in-service BAT. Turn sound generator off Fail SR NIs to 1,000 cps (Malf. NIS 1A&B ~ 1000 cps) Write snap. (IC 52 for exam)
1.C Directs local valve lineup. EXAMINERS CUE: Aux. Bldg operator reports; 2FNC-35,-36,&-38 verified closed 2FNC-47 has been opened	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 ("C" denotes critical step)	STANDARD (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. EXAMINER NOTE: Emergency valves are not critical because they are initially closed and will not receive an open signal	4. 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 COMMENTS:

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
5.C Adjusts Boric Acid flow to the blender.	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: 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.

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

STEP ("C" denotes critical step)	STANDARD (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) COMMENTS: EXAMINER NOTE: If the flow is initially mis-set, but corrected in step 17, that constitutes satisfactory completion of this step. Acceptable settings are based on a concentration of 2000 to 2100 ppm with exactly 32.89gpm boric acid flow. Steps 5 and 6 are both satisfactory as long as makeup concentration is between 2000 and 2100 ppm.

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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
7.C Sets Boric acid totalizer	7.C Sets Boric acid totalizer to at least 267 gallons. 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 1000 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 ("C" denotes critical step)	STANDARD (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	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:

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

STEP ("C" denotes critical step)	STANDARD (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: EXAMINER NOTE: Terminate the JPM at this point. STOP TIME_____

RTL #A5.640U BEAVER VALLEY JOB PERFORMANCE MEASURE

EVALUATOR COVER SHEET

JPM Number: 2PL004 Rev: 8 System: 061

JPM Title: Reset the Terry Turbine Trip and Throttle Valve

K/A Reference: 061K4.07 3.1/3.3 Task ID #: 0610090101

JPM Application: ☒ Requal ☒ Initial Exam ☐ Training

Evaluation Method	LOCATION	TYPE
☐ Perform	☒ Plant Site	☐ Training
☒ Simulate	☐ Simulator	☐ Annual Requal. Exam
	☐ Classroom	☐ OJT
		☒ Initial Operator Exam
		☐ Other: _____

Administered By:

☐ BV-T ☒ NRC

☐ Other: _____ Need replacement qpmp to 1

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☐ SAT Time (minutes)

☐ UNSAT* Allotted: 10 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
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:	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:	2OM-24.4R Issue 1 Revision 13
TOOLS:	None
HANDOUT:	2OM-24.4R

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)

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.)
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.

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.	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:

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:

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.	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: _____

RTL #A5.635.J 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 2OM-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.

TIME ALLOTTED: 5 minutes

KSA #: 061K4.01 3.9/4.2

REF: 2OM-24.1
VOND 24-3
VOND 30-3
VOND 30-1

COMMENTS:

RTL #A5.635.J

* * 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.

RTL #A5.635.J

* * 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

NRC # 5

OJT CHECKLIST/JPM COVER PAGE

PROGRAM TITLE: Licensed Operator Training (Retraining)

SUBDIVISION: 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

PREPARED BY: _____ DATE: _____
W. Brickenstein

APPROVED FOR IMPLEMENTATION: _____ DATE: _____
Director, Operations Training,
or Designee

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

RTL #A5.640U BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

JPM Number: New #5 Rev: 0 System #: 003

JPM Title: Respond to RCP Oil Leak

K/A Reference: 003 A3.04 3.6/3.6 Task ID #:0030010101

JPM Application: ☒ Requal ☒ Initial Exam ☐ Training

Evaluation Method
- ☒ Perform
- ☐ Simulate

LOCATION
- ☐ Plant Site
- ☒ Simulator
- ☐ Classroom

TYPE
- ☐ Training
- ☐ Annual Requal. Exam
- ☐ OJT
- ☒ Initial Operator Exam
- ☐ Other: _____

Administered By:
- ☐ BV-T
- ☒ NRC
- ☐ Other:

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☐ SAT ☐ UNSAT*

Time (minutes) Allotted: 10 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
Question #1	_____	_____	_____	☐	☐
Employee No:	_____				
Question #2	_____	_____	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation):

_____

Evaluator (Print): _____ Organization: _____

Evaluator Signature _____ Date: _____

RTL#A5636J 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 LOCATION:	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 2OM-6.4.A for 2RCS*P21A.
REFERENCES:	2OM-6.4.A Issue 4, Rev. 7 2OM-6.4.AAC, Issue 4, Rev. 1
TOOLS:	Plant Computer, Stopwatch
HANDOUT:	2OM-6.4.A and 2OM-6.4.AAC

RTL #A5.635.J

NUMBER New # 5	TITLE: Respond to RCP Oil Leak

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	Start time: _____
BOOTH NOTE; monitor variables (MONV) TRCPUTB(1), XA40018R, JRCXRCS8, and JRCP417H.	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).
1. Candidate obtains a copy of OM-6, Procedure A, "Reactor Coolant System Startup".	1. Candidate locates OM-6, Procedure A. (Allow time to review the procedure.) COMMENTS: _____
2. C Place the 21A reactor coolant pump control switch to START (BB-A) Critical Step	2. Takes switch to the START position. COMMENTS: _____

NUMBER New # 5	TITLE: Respond to RCP Oil Leak

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)	3. 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.

NUMBER New # 5	TITLE: Respond to RCP Oil Leak

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: _____ BOOTH CUE: expert; RAMP TRCPUTB(1),300,500,0 after the Low Bearing Oil reservoir alarm is received.

NUMBER New # 5	TITLE: Respond to RCP Oil Leak

STEP ("C" denotes 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. COMMENTS: _____
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".

NUMBER New # 5	TITLE: Respond to RCP Oil Leak

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: _____ 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.

NUMBER New # 5	TITLE: Respond to RCP Oil Leak

STEP ("C" denotes critical step)	STANDARD (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. EXAMINER CUE: Computer alarm for High Temperature is received at 195°F; "A" bearing temperature is continuing to increase. RCP control switch White light illuminates when pump is stopped. COMMENTS: _____ EXAMINER CUE: Examiner terminates JPM at this point Stop Time: _____

RTL #A5.635.J

* * 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.)

RTL #A5.635.J

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: _____

RTL #A5.635.J

* * 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 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?")

(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: 2OM-15.1.d pg. 14 of 26

COMMENTS: _____

_____

_____

_____

RTL #A5.635.J 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.

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 PERFORMANCE MEASURE
EVALUATOR COVER SHEET

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 ☒ Initial Exam ☐ Training

Evaluation Method
- ☒ Perform
- ☐ Simulate

LOCATION
- ☐ Plant Site
- ☒ Simulator
- ☐ Classroom

TYPE
- ☐ Training
- ☐ Annual Requal. Exam
- ☐ OJT
- ☒ Initial Operator Exam
- ☐ Other: _____

Administered By:
- ☐ BV-T
- ☒ NRC
- ☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☒ SAT ☐ UNSAT*

Time (minutes) Allotted: 15 Actual: _____

Time Critical: ☐ Yes ☒ No

Administrative JPM ☐ Faulted JPM ☐

*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	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
Question #1				☐	☐
Employee No:					
Question #2				☐	☐
Employee No:					

*Comments (Required for UNSAT Evaluation):

_____

Evaluator (Print): _____ Organization: _____

Evaluator Signature _____ Date: _____

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 ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
2.C Opens CCP Pump Return Header Isolation	2.1 Opens 2CCP MOV 157-1. 2.2C Directs local opening of 2CCP MOV 156-1 COMMENTS:_____ 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.

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

STEP ("C" denotes critical step)	STANDARD (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

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
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 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: 2OM-15.1.d pg. 14 of 26

COMMENTS: _____

_____

_____

_____

RTL #A5.635.J 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: 2OM-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

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.

☐ 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: ☐ NO ☒ RO ☒ SRO

JPM Application: ☒ NRC ☒ Initial Exam ☒ Training

Evaluation Method
☒ Perform
☐ Simulate

LOCATION
☐ Plant Site
☒ Simulator
☐ Classroom

TYPE
☐ Training
☐ Annual Requal. Exam
☐ OJT
☒ Initial Operator Exam
☐ Other: _____

Administered By:
☐ BV-T
☒ NRC
☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: c_____

Results ☐ SAT ☐ UNSAT*

Time (minutes) 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
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-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 CONDITIONS:	The plant is at 100% power. The "A" Train 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, 2OM-30.4G. Assume all Initial Conditions are SAT.
REFERENCES:	2OM-30.4.G Issue 4 Rev. 2
TOOLS:	None
HANDOUT:	2OM-30.4.G

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.)
1. 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 2OM-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.	2.1 Places control switch for 2SWE*MOV116A to CLOSE. 2.2 Verifies green light illuminates. COMMENTS: EXAMINER CUE: Green light is lit.

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 than 5 psig below Service Water System pressure [2SWS-PI113A]. Then place discharge valve [2SWE*MOV116A] in AUTO, and verify that the valve opens.	4.1 Compares the two pressure indications. 4.2 Determines that pressure requirement is satisfied. EXAMINER CUE: [2SWE-PI114] indicates 140 psig. [2SWS-PI113A] indicates 50 psig.

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.
	COMMENTS:
	EXAMINER CUE: Act as NSS. Acknowledge Tech Spec report.

NUMBER	TITLE
2CR-126	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 2OM-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.
8. Verify [2SWS*MOV107A,C] are open.	8. Verifies valve open (Red) lights are lit. COMMENTS: EXAMINER CUE: 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:
10. Verify 2SWS*MOV102A is closed and log time SWS pump removed from service.	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.

NUMBER	TITLE
2CR-126	Startup the Standby Service Water System

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

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #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

KSA #: 062AA1.02 3.2/3.3

REF: AOP 2.30.1

NOT really operationally oriented. Or high safety significance but OK as

COMMENTS: _____

RTL #A5.635.J 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 actions if any should be taken?

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: 2OM-30.1.O

COMMENTS: _____

RTL #A5.635.J

* * 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

* * THIS SHEET TO BE GIVEN TO CANDIDATE * *

BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #1

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.

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" 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, 2OM-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 MEASURE
EVALUATOR COVER SHEET

#7

JPM Number: 2CR-046 Rev: 04 System #: 013

JPM Title: Perform ESF Checklist - CIA

K/A Reference: 013A4.01 4.5/4.8 Task 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	TYPE
☒ Perform	☐ Plant Site	☐ Training
☐ Simulate	☒ Simulator	☐ Annual Requal. Exam
	☐ Classroom	☐ OJT
		☒ Initial Operator Exam
		☐ Other: _____

Administered By:

☐ BV-T ☒ NRC

☐ Other: _____

Evaluation Results

Performer: Name: _____ Employee No: _____

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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
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-046
JPM TITLE:	Perform ESF Checklist - CIA
RECOMMENDED STARTING LOCATION:	Simulator
DIRECTIONS:	You are to perform the task "Perform ESF Checklist - CIA".
INITIATING 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.

RTL #A5.635.J

NUMBER	TITLE
2CR-046	Perform ESF Checklist - CIA

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	Start time: _____
	EXAMINER NOTE: Only provide cues if simulating performance of this task. Init. IC-13 CLF VLV SEA 15,1,D (Loss of Power to 378) CLF VLV SEA 16,2,D (Open). Activate Malf RCS2B=12,000 gpm. Allow components to actuate. Reset SI and CIA, both trains. Clear CLF VLV SEA 16,2,D (vlv 381). Depress Reheater Reset P.B. Start second CCP pump. Reduce CCP ΔP to <95 psig. Reopen RCP thermal barrier valves if needed. (IC-48 for exam)
1. Obtain copy of Attachment A-0.2.	1. Candidate locates attachment.
	EXAMINER NOTE: Refer to Attachment A-0.2 and check each valve as verified by the candidate.
	_____ COMMENTS

NUMBER	TITLE
2CR-046	Perform ESF Checklist - CIA

STEP ("C" denotes critical step)	STANDARD (Indicate "S" for Sat. or "U" for Unsat.)
	EXAMINER CUE: Prove indications for each component to support required position. All components are required in position, except "2CHS*MOV378 RCP Seal Water Cnmt Return Isol Vlv" which has neither green nor red light illuminated and 2CHS-MOV381 which has its red light lit.
2.C. Locate each component's indicated and check status vs required condition.	2.1 Candidate checks each valve on Attachment A-0.2 in the required condition. 2.2 Candidate initials each component on checklist. COMMENTS: (Cont. on next page)

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) EXAMINER NOTE: 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: EXAMINER CUE: Tell the candidate to stop after he verifies all components on BB-A. Stop Time: _____

RTL #A5.635.J 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?".)

TIME ALLOTTED: 5 minutes

KSA #: 103A2.03 3.5/3.8

REF: 2OM-53A.1.ECA-1.2

COMMENTS: ______________________

Low knowledge (i.e. Dosimetry i.e. one) - S Fail. Borderline - Chemistry explaining depends on question need in detail.

RTL #A5.635.J BVPS JOB PERFORMANCE MEASURE

ORAL QUESTION #2

Question: a 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.

ANSWER: a. 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.

TIME ALLOTTED: 4 minutes ~~what~~ ~~would~~ ~~until~~ ~~this~~ ~~valve~~

b. With actual CIA signal present when & only would the isolation signal be overridden to open the valve?

KSA #: 103K4.06 (3.1/3.7)
013K4.02 (3.9/4.2)

REF: 2OM-14A.1.D (I&C) page 9
Logic drawing 12241-LSK-14-15F
Electrical Schematic

COMMENTS: ______________________

RTL #A5.635.J

* * 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.

BVPS JOB PERFORMANCE MEASURE

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.

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.

☐ 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

8

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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
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:	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 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 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).

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

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.)
	Start time: _____ EXAMINER NOTE: All actions must be simulated. The Examiner should obtain key 138 for the Excitation cabinet.
1. Obtain a copy of OM-53A, Procedure ECA-0.0, Attachment A-1.5.	1. Candidate locates procedure and the attachment. COMMENTS: _____ EXAMINER CUE: If asked, 2SWS*P21A is in AUTO.
2. C Take local control of diesel generator No. 1	2. Candidate inserts key into switch and selects the LOCAL position, at the local control panel. COMMENTS: _____

Control ? Step ?

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: _____
4. C Depress the local start pushbutton until the engine starts and is self-sustaining; then release the pushbutton.	EXAMINER NOTE: Either pushbutton should be capable of starting the DG independently. 4. Candidate simulates depressing the local start pushbutton. COMMENTS: _____ EXAMINER CUE: Diesel generator does not start.

Critical

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.)
	EXAMINER NOTE: Provide key 138 to allow access to the Excitation Cabinet.
5.C Place key switch in AUTO and manually depress ES-1 or ES-2 emergency start relays.	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: _____

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.	6. Verifies DG engine speed is 515 rpm - 535 rpm. COMMENTS: _____ 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: _____

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.

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.)
9. 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: _____

* * 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).

1) 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.

seem to say #1) will not 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 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.

☐ 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
EVALUATOR COVER SHEET

9

JPM Number: 2CR-New #9 Rev: 0 System #:015

JPM Title: Perform a QPTR (Unsat)

K/A Reference:015A4.02 Difficulty; 3.9/3.9 Task ID #: 0150040201

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:		

New New Ops No. 2

Evaluation Results

Performer: Name: _____ Employee No: _____

Results ☐ SAT Time (minutes)

☐ UNSAT* Allotted: 15 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: _____

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
Question #1	_____	_____	_____	☐	☐
Employee No:	_____				
Question #2	_____	_____	_____	☐	☐
Employee No:	_____				

*Comments (Required for UNSAT Evaluation):

_____

Evaluator (Print): _____ Organization: _____

Evaluator Signature _____ Date: _____

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:	2OST-2.4A
TOOLS:	Calculator
HANDOUT:	2OST-2.4A

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

STEP ("C" denotes critical step)	STANDARD (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:_____ EXAMINER NOTE: 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.
1. Records uncorrected detector current values.	1. 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:
4. Determines average corrected currents.	4. Divides two current sums by four. COMMENTS:
5.C Checks results	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;_____

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: 2OM Figure 2-5

COMMENTS: _____

a dropped rod Q. but looking for effect on QPTR as opposed to effect on SDM. Probably OK.

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, $F_N^{\Delta H}$). (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 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.

BEAVER VALLEY JOB PERFORMANCE MEASURE
EVALUATOR COVER SHEET

JPM Number: 2PL-019   Rev: 3   System #: 078
JPM Title: Align Air Compressor for Operation

K/A Reference: 065AA1.04 3.5/3.4   Task ID #: 0000260401

JPM Designation: [X] NO [X] RO [X] SRO
JPM Application: [X] NRC [X] Initial Exam [ ] Training

Evaluation Method
[ ] Perform
[X] Simulate

LOCATION
[X] Plant Site
[ ] Simulator
[ ] Classroom

TYPE
[ ] Training
[ ] Annual Requal. Exam
[ ] OJT
[X] NRC Initial
[ ] Other: ________

Operator Exam
Administered By:
[ ] BV-T
[X] NRC
[ ] Other: ________

Need new [illegible] !

Evaluation Results
Performer: Name: ____________ Employee No: ________
Results [ ] SAT
[ ] UNSAT*

Time (minutes)
Allotted: 15 Actual: ______
Time Critical: [ ] Yes [X] No
Faulted: [ ]

*Comments (Required for UNSAT Evaluation): ____________

Evaluation Results [ ] Check here if same as above
Observer: Name: ____________ Employee No: ________

	Question ID	Time (minutes) Allotted	Actual	Results SAT	UNSAT*
Question #1	______	______	______	[ ]	[ ]
Question #2	______	______	______	[ ]	[ ]

*Comments (Required for UNSAT Evaluation): ____________

Evaluator (Print): ____________ Organization: ________
Evaluator Signature: ____________ Date: ________

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 CUE:	The NSS hands you a copy of OM-2.56C.4, Procedure 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 ycu 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

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

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.

Deleted

TIME 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

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 2OM 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 ALLOTTED: 5 minutes

KSA #: 000067EK3.04 3.3/4.1

REF: 2OM-28.1

COMMENTS: _____

_____

_____

_____

R/TL #A5.635.J

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.)
1.C Isolate all unnecessary loads on SAS.	Start time: _____ 1.C Candidate closes 2SAS-AOV105 by isolating and bleeding air pressure off of the valve. EXAMINER CUE: 2SAS-AOV105 is closed. Regulator shows zero pressure. COMMENTS: _____

R/TL #A5.635.J

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.	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:

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.	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: _____
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: _____

SCENARIO OVERVIEW

Facility: Beaver Valley Power Station Unit 2 Scenario No.: _2_ 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 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: IC-47, 75% power, BOL, steady state conditions. Rods are in Manual. 2CHS*P21B and 2FWE*P23B are OOS. 2RCS*PCV456 is isolated. Tornado Warning in effect. Tube leak on SG "B".

Turnover: The plant is at 75% power. BOL, 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. Lower power to remove 2FWS-P21A from service.

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 ACT,6,0,D	C PO/SRO	2FWE*P23A fails to auto start, will manually start (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

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. 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

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)

U2DRILL846(1)REV0

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

PZR PORV, 2RCS*PCV455C fails to 75% open
PORV Block 2RCS*MOV535 fails open

MAL PPL1A ACT,2,0,D
MAL PPL1B ACT,2,0,D

ATWS

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 _____
ANSS _____
RO _____
PO _____
STA _____

Simulator Frozen until after shift turnover unless it needs to be run momentarily for an alignment change.

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. Depress VCR PLAY/RECORD	Simulator running/VCR recording		ANSS assumes control and directs operators to commence lowering power IAW 2OM-52.4.B.
	Power lowering		RO develops reactivity plan, ANSS reviews and approves. Crew commences power reduction
<u>EVENT #1</u>			
After power is lowered $\geq$ 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

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
<u>EVENT #2</u> When PZR level stabilized, insert: XMT MSS42 1,0,20,D	Impulse pressure 2MSS*PT446 fails low Rods step in in Auto		

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 dI 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 2OM- 24.4.IF, Instrument Failure Procedure, Attachment 5
	SG levels lowering FRVs in Manual		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

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 2OM-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

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
<u>EVENTS #3, 4 & 5</u> XMT RCS30 1,2500,5,0,D	2RCS*PT444 fails high causing PZR spray valves and PORV 2RCS*PCV455C to open		
VLV RCS32 4,75,0,C,PRC:455C.GT.2250 (Preload)	2RCS*PCV455C fails 75% open		
VLV RCS11 2,0,D (Preload)	2RCS*MOV535, PORV Block fails open		
	PZR CONTROL PRESSURE HIGH/LOW alarm, A4-1D		RO notes alarm, informs ANSS and crew refers to ARPs as necessary.
	PZR CONTROL PRESSURE DEVIATION HIGH/LOW alarm. A4-1E, P0500D Various other PZR pressure and PRT alarms		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.
	Possible OTDT runback and rod stop. A4-4B, T0517D		PO places master pressure controller in manual, closes spray valves, and manually controls heaters.

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. CT -- 1
	Rods inserting.		RO uses auto or manual rod control to insert rods. Crew sounds standby alarm and announces Unit 2 reactor trip failure.

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.

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
EVENT #8 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 status, 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.

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.

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	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		ANSS directs RO to manually initiate SI, both trains
	EDGs running.		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

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.

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 ANSS directs performance of emergency safety function checklists when time permits
	Recirc spray pumps secured.		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.

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.

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: Beaver Valley Power Station Unit 2 Scenario No.: 1 Op-Test No.: 2LOT2B

Examiners: _____ Operators: _____

_____ _____

_____ _____

Objectives: To evaluate the applicants ability to use Normal, Abnormal, Emergency and Alarm Response procedures to raise power and respond to a VCT problem, a steam flow problem, a stuck rod, a load rejection, a steam line break outside containment, coincident with one charging pump tripping and one charging pump failing to auto start.

Initial Conditions: IC-47, 75% power, BOL, steady state conditions. Rods are in auto. One Charging Pump and one Motor Driven AFW pump are out of service. One PZR PORV is isolated. Tornado watch in effect. AOP 6.4 in effect due to tube leak on SG "B".

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 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,O,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

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 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. 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

1/2OM-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)

U2DRILL845(1)REV0

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 _____	 <u>Simulator Frozen</u> 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 2OM-52.4.B.

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE

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

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 AOP 2.35.2
	GV #2 closed		PO reports that GV #2 did not close in sequence and that it is full closed
	Turbine transfer from partial arc to full arc, power stable at approximately 60%		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

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	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
NOTE: Event #3 starts MAL CRF8A ACT,B8,1,0,D (Preload)			
	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 open B SG feed flow and level rising. A6-10F SG "B" FEED FLOW > STEAM FLOW in alarm		PO acknowledges alarms, reviews indications, informs ANSS that ANSS refers to ARPs and 2OM-24.4.IF, Instrument Failure Procedure, Attachment 3

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 III		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

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	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
<u>Event #5</u>			
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

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.

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
			RO verifies SI status.
EVENT #6 PMP CHS1 2,0,C,PPLSIA.EQ.1 (Preload)	2CHS*P21A trips on SI initiation		
EVENT #7 MAL PPL7B ACT,2,0,D (Preload)	2CHS*P21C HHSI pump fails to auto start		RO determines no HHSI pumps running, starts 2CHS*P21C and notifies ANSS
CT #1 - Crew manually actuates at least one train of SIS-actuated safeguards before transition to any ORP (E-0.D)	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.

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
	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.

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. One MDAFW pump running. TD AFW pump running		Crew verifies valves closed
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.		

INSTRUCTIONAL GUIDELINES	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.

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

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

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 ΔI 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. The plant is at 48% power, BOL. RCS boron 1061 ppm. Rods in manual with CBD at 166 steps. 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.

DUQUESNE LIGHT COMPANY
Nuclear Power Division
Training Administrative Manual

U2DRILL845(1)REV0

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Select DRILL 848, Initialize IC - 50, and establish initial plant conditions.	Reactor at approximately 48% power, BOL, steady state condition. Ready to raise power to 100%. RCS boron _1061_ ppm, CBD _166_ steps.		
Insert:			
VLV RCS33 3,0,C,PRC:444.LT.2230	2RCS*PCV455D fails open		
VLV RCS32 4,0,0,0,C,JPPLP4.EQ.1	2RCS*PCV455C fails closed		
VLV RCS13 3,0,C,JPPLP4.EQ.1	2RCS*MOV537 fails closed		
MAL RCP4C 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 File LRTM5IC			
Assign shift positions. NSS _____ ANSS _____ RO _____ PO _____ STA _____	<u>Simulator Frozen</u> until after shift turnover unless it needs to be run momentarily for an alignment change.		

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. Depress VCR PLAY/RECORD	Simulator running/VCR recording		ANSS assumes control and directs operators to commence raising power IAW 2OM-52.4.B.
<u>EVENT #1</u>			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

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
EVENT #2			
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		
			PO announces SG "B" alarms
	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		
			ANSS refers to ARPs
	SG "B" level returning to program		SG "B" MFRV 2FWS*FCV488 placed in manual and level controlled within ± 5% of program
			ANSS refers to 2OM-24.4.IF, Attachment 4
			PO identifies 2MSS*PT486 as the failed instrument

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 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 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
<u>EVENT #3</u>			
MAL RCS4B ACT,0.05,120,0,D	SG "B" tube leak (0.05 gpm, 72 gpd)		

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).
2OST-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

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. AOP-2.6.4 complete.			Crew requests Health Physics to perform water and air sampling and survey SG blowdown 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		

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		RO notes changing RCS parameters and informs ANSS.
If required, contact crew as U2 Operations Manager and direct a plant shutdown commence at 1%/min.			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 2OM-52.4.B Load Following.
			NSS evaluates EPP
Crew may have previously implemented AOP 2.51.1.			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
	Two PORVs in Auto with block valves open		RO ensures one PORV in auto with its associated block valve open.

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

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
EVENT #5	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.

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.

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.

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.

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).

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 and 2SDS-261.	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. 2SDS*AOV129A closed.		Crew isolates flow from the ruptured SG. CT #1
	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.

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.

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 EVENTS #6 & 7 VLV RCS13 3,0,C,JPPLP4.EQ.1 (Preload) VLV RCS32 4,0,0,0,C,JPPLP4.EQ.1 (Preload)	No spray valves available. RCP "C" tripped. 2RCS*PCV455A OOS No PZR PORVs are available 2RCS*PCV456 turned over OOS 2RCS*PCV455D block, 2RCS*MOV537 failed closed 2RCS*PCV455C failed closed		RO determines that no spray valves are available RO attempts to depressurize RCS using PZR PORV

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

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.			

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

Facility: Beaver Valley Power Station Unit 2 Scenario No.: _3_ 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 plugged boric acid filter, NI failure, MFW pump trip, LOOP, one EDG trips, one EDG breaker fails to close (loss of all AC power), TD AFW pump trips on overspeed (able to reset), RCP "C" #1 seal leak (50 gpm).

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

Turnover: 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.

Event No.	Malf. No.	Event Type*	Event Description
N/A	N/A	N	Continue plant shutdown IAW 2OM-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 VLV CFW27 1,0,D	I RO/SRO	2CNM-PS118B, MFW Pump suction pressure fails low causing trip of running MFW pump SU FW Pump recirc valve fails closed (Preload)
4	MAL SWD1 ACT,0,0,D	M ALL	LOOP
5	MAL DSG1A ACT,0,0,D BKR HIV13 2,0,D	C ALL	EDG 2-1 trips (Preload) EDG 2-2 output breaker trips (Preload) 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

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 ΔI 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

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	Trip of EDG 2-1		
BKR HIV13 2,0,D	Trip of EDG 2-2 Output Breaker		
MAL AFW3A ACT,5440,0,0,0,D	Trip of TD AFW Pump (can reset)		
MAL LDS3D ACT,95,0,0,0,D	F21, Boric Acid Filter to Blender plugs		
VLV CFW27 1,0,D	SU FW pump recirc valve fails closed		
File STUFFON File LRTM5IC			
Assign shift positions. NSS _____ ANSS _____ RO _____ PO _____ STA _____	<u>Simulator Frozen</u> 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.

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 2OM-52.4.C, step 20
	Turbine load and reactor power lowering		
<u>EVENT #1</u>			
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

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

RO announces alarm A4-4E

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

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

Power is greater than P10

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"

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 Computer point N0096D tripped Level Trip Switch caution tagged		Crew places "Level Trip Switch" to BYPASS on N35 drawer and to affix a Caution Tag to the switch Computer point status verified using CRT Inter Range screen
<u>EVENT #3</u> 2FWS-P21B Suction Pressure Switch 2FWS-PSL118B fails BST CFW24 1,0,D VLV CFW27 1,0,D	2FWS-P21B trips (loss of all main feedwater) Fail 2FWR*FCV155, SU Feed Pump Recirc shut (Preload)		2FWS-P21B Trips MD AFW pump 2FWE*P23A Auto start
	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		

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

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 STA monitors status trees
<u>EVENT #4</u>			
One minutes after completion of shift brief for ES-0.1 entry, Insert: MAL SWD1 ACT,0,0,D	LOOP		
<u>EVENT #5</u>			
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

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
			STA monitors CSF status trees for information only. S/U
	Annunciator A5-6D lit. Neutron 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)
	SLI manually actuated. MSIVs and bypass valves closed.		PO ensures steamlines isolated.
	Exciter and output breakers open.		PO verifies generator trip.
	PRZR PORVs closed, orifice isolation valves closed, Regen HX inlet valves closed.		RO checks if RCS is isolated

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; MAL RCP1B ACT,50,300,0,0,D	RCP 'C' #1 seal leak (50 gpm)		
CT #2 - Crew 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

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.

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.
			Crew requests Rad Con support to isolate RCP seals, dispatches plant operator to locally close valves.
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.			

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
	Blowdown isolation valves closed. Main and bypass feed regulating valves closed.		Crew checks SG isolation.
	All PORVs closed.		RO checks PRZR PORVs.
	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.
	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.

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	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
As System Operator report that power is available to Switchyard 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 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.

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

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
	One CCP pump running		Crew starts one CCP pump
	HHSI pumps all stopped		Crew checks HHSI pump status
	2CHS*LCV115C & E open (suction from VCT) VCT makeup in Auto at > RCS C_B 2CHS*MOV289 and 310 closed		Crew verifies charging system alignment
	Normal charging flow established		RO establishes normal charging flow
	One CCP pump running CRDM shroud fans running 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 correctly aligned		ANSS directs RO/PO to verify all indicating lights with orange CIA marks lit

INSTRUCTIONAL GUIDELINES	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; VLV CCP58 2,0,D VLV CCP60 2,0,D	CCP supply temperature is less than 105° 2CCP*MOV156-1,157-1 are open		Crew establishes seal cooling IAW Attachment A-1.5
	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; LOA SEA1 0.1,0,0,D LOA SEA2 0.1,0,0,D LOA SEA3 0.1,0,0,D	2CHS*MOV308A, B & C checked open 2CHS*HCV186 checked open 2CHS*178, 179, 180 opened until flow just indicated		
Collect and review logs after allowing crew time to complete.			Crew logs should be accurate, clear, and concise.

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.

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.		RO checks if letdown can be established, then establishes letdown.
	CCP supply/return valves open 2CCP*175-1 & 2 2CCP*176-1 & 2 2CCP*177-1 & 2 2CCP*178-1 & 2		
	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).			

INSTRUCTIONAL GUIDELINES	PLANT STATUS OR RESPONSE	OBJECTIVE	EXPECTED STUDENT RESPONSE
Collect and review logs after allowing operators to complete them.			Operator logs should be clear, accurate and concise.

Written

(As submitted preliminary)

1. The NCO is recovering a rod misaligned from its group in accordance with 2OM-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 of the following is a consequence of that action?

   A. Low Xenon concentration causes neutron flux peaks in the affected quadrant.

   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 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 reason for those actions?

A. Trip the Reactor Coolant pump and allow Doppler Power Coefficient to lower reactor power before tripping the reactor.
B. Trip the Reactor to prevent violation of DNB parameters before tripping the reactor coolant pump.
C. Trip the Reactor Coolant Pump to minimize flow oscillations in the core region from a pump coast down before tripping the Rx.
D. Trip the reactor to prevent 2/3 RCP bus Underfrequency Rx trip before tripping Reactor Coolant Pump

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	

3. A natural circulation cooldown has been in progress using ES-0.2 " Natural Circulation Cooldown". The RHS system is in service.

Why must the entire RCS be brought to less than 200 degrees prior to depressurization?

A. To augment heat removal from the head structure.

B. To bypass the requirement for soaking the head for 29 hours.

C. To maximize loop flow on continued natural circulation.

D. To prevent void formation in stagnant loops.

ANSWER:D	
K/A: W/E09/E10 K2.2:	Importance:3.6
Cognitive Level: Comprehension	
References: 2OM-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 Physics - OFE Lvnl.

4. The unit is conducting a natural circulation cooldown in accordance with ES-0.2 "Natural Circulation Cooldown". 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 less than 25°F/hr. C. Maintain RCS subcooling greater 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: 2OM-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	

5. The unit is at 100% with all systems NSA. The core age is MOL at 8000 MWD/MTU burnup. A malfuction requires turbine load to be runback at 5% per minute to 70% reactor power.

After reference to the Reactivity Plan, what is the total amount of boron injected into the RCS via the Emergency Boration 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.

ANSWER: C	
K/A: 000024 K1.02	Importance: 3.6
Cognitive Level: Application	
References: Reactivity Plan for Routine Operations Activities - Valid for burnups of 7000 - 9000 MWD/MTU.	
Lesson Plan #: 2LP-SQS-7.1	Obj. #: 8
History: NEW	
Source:	Type: OPEN BOOK
JTA: 004EEE0101	Give copy of Reactivity Plan

Direct lookup

6. 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 Exchanger [2CHS*E24]

C. Degassifier Vent Chillers [2BRS*E22A,22B]

D. Seal Water Heat Exchanger [2CHS*E21]

ANSWER: C	
K/A:000026 AK2.03	Importance:3.6
Cognitive Level: Knowledge	
References 2OM-15.5, Figure 15-1, 2OM-15.3.B, Iss. 4, Rev. 10	
Lesson Plan #:: 2LP-SQS-15.1	Obj. #: 6
History: NEW	
Source:	Type: CLOSED BOOK
JTA:: 0000060121	

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, Pressurizer 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
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 ANSS 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 AFW flow is designed to acomplish which of the following functions?

A. Provide minimum flow through the operating Auxiliary Feedwater pumps.

B. Prevent exceeding pump runout on the operating Auxiliary Feedwater pumps.

C. Provide thermal stress relief by maintaining wetted surfaces on the interior of the steam generators.

D. Prevent overflow of the steam generators during restoration of narrow range level.

ANSWER: C .	
K/A:000040 (W/E12) K3.2	Importance:3.3
Cognitive Level: Knowledge	
References: 2OM-53.B.4.ECA-2.1, Iss. 1B, Rev. 6, Background for CAUTION before step 6	
Lesson Plan #: 2LP-SQS-53.3	Obj. #: 3
.	
History: NEW	
Source:	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 RCS is saturated at 400 psig. SI can NOT be terminated.

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 water and SI flow to limit ~~temperature stress on the vessel wall.~~

C. Use forced flow to collapse voids in the core outlet plenum and vessel head.

D. To equalize RCS pressures, allowing uniform SI flow to the vessel.

ANSWER:B	
K/A:W/EO8 K3.2	Importance:3.6
Cognitive Level: Knowledge	
References: 2OM-53B.4.FR-P.1, Background for Step 6, Issue 1B, Rev. 1, page 21	
Lesson Plan #:2LP-SQS-53.3	Obj. #: 3
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 3110140601	

10. The unit is operating at 100% power with all systems NSA when the Section A1 Main Condenser Water Box Outlet Valve [2CWS*MOV100A] malfunctions and closes. Unit power remains constant.

As a result, the temperature of CWS to the cooling tower will___(1)___ and condenser absolute pressure will___(2)___.

A. **(1)** rise, **(2)** rise

B. **(1)** fall, **(2)** fall

C. **(1)** rise, **(2)** fall

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% power coincident with a complete loss of the switchyard.

- All RCP pumps are off.
- RVLIS is available.
- RCS temperature and pressure are trending toward no-load values.
- 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: 2OM-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	

12. Due to performing a maintainence 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
- Turbine First Stage Pressure 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.

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 fails low.

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	
Lesson Plan #: 2SQS-24.1	Obj. #: 5
History: NEW	
Source:	Type: OPEN Book
JTA: 059BBB0401	Give UFSAR Figure 7-3.18

13. A fire has started in the Cable Spreading 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 2OM-56C "Alternate Safe Shutdown From Outside Control Room".

Which of the methods is to be used to bring the unit to Cold Shutdown?

A. Conduct a natural circulation cooldown using only the Train B (Purple) 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 Panel and conduct a natural circulation cooldown.

D. Transfer all Train A (Orange) equipment to the Alternate Shutdown Panel and conduct a natural circulation cooldown.

ANSWER: D	
K/A: 000067 K3.02	Importance: 2.5
Cognitive Level: Knowledge	
References: 2OM-53B.4. 2OM-56C.4.B, Issue 1, Rev. 14	
Lesson Plan #: 2LP-SQS-56C.1	Obj. #: 2
History: NEW	
Source:	Type: Closed Book
JTA: 0000020401	

14. The control room was evacuated due to a fire. Procedure 2OM-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].

ANSWER: D	
K/A: ,000068 K3.06	Importance: 3.9
Cognitive Level: Knowledge	
References: 2OM-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: 0000020401	

15. Unit 2 Containment operates at sub-atmospheric pressure. Maintenance of sub-atmospheric pressure is required to meet which one of the following criteria?

A. Maintain minimum flow to Containment Radiation Monitors 2RQ-303A and 303B for leakage detection.

B. Ensure containment pressure can be restored to sub-atmospheric pressure within 1 hour after a Design Basis Accident.

C. Maintain leakage for all at power operational modes up to Technical Specification limits.

D. Ensure containment temperature 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 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	

Distractors - Do they go with question?

16. 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: 2OM-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 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.

NP → C. Dilute until Control Bank D reads zero steps and Bank D rod bottom lights are lit.

D. Perform 2OST-49.1 "Shutdown Margin Calculation (Plant Critical) within 1 hour.

ANSWER:B	
K/A:000003 K3.04	Importance:3.8
Cognitive Level: Memory	
References: 2OM-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 Reponse." The following conditions exist:

- All steam generators are below the narrow range
- All reactor coolant pumps are operating
- Steam Dumps are open to the condenser and Tave is trending to 547°F
- Auxiliary Feedwater is 200 gpm 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 feedwater flow is greater than 365 gpm.

C. No, all steam generator levels 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: 2OM-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	

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 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 stabilize at or near ~~2235~~ psig. What's shut off head?

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	
Lesson Plan #: 2LP-SQS-11.1	Obj. #: 5
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: 000011 K2.02	Importance: 2.6
Cognitive Level: Comprehension	
References 2OM-11.1.C, Issue 4, Rev. 0 page 3, 2OM-11.1.D, Iss. 4, Rev. 0, page 3, 2OM-11.2.B, Issue 4, Rev. 2 Page 3.	
Lesson Plan #: 2LP-SQS-11.1	Obj. #: 5
History: NEW	
Source:	Type: Closed Book
JTA: 3010020601	

21. Following a Safety Injection signal, Letdown Orifice Isolation [2CHS-AOV200B] failed to close. If the letdown line were subsequently 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: 2OM-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	

Have SI then get LD line break?

22. 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 Pumps [2SIS*P21A, P21B]

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: 2OM-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	

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.

ANSWER: D	
K/A: W/E02 K2.1	Importance: 3.4
Cognitive Level: Application	
References: 2OM-53B.4.ES-1.1, Issue 1B Rev 6 Background for step 2 Note 1	
Lesson Plan #: 2LP-SQS-53.3	Obj. #: 6
History: NEW	
Source:	Type: OPEN BOOK
JTA: 3010010601	Copy of ES 1.1

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
- All RHS system components are NSA
- B RHS train is available for service

According to the VOND, if RCS Pressure Transmitter [2RCS*PT440] fails high, which of the following describes what will happen to the RHS system?

A. 2RHS*MOV701A and 2RHS*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.

ANSWER: A	
K/A: 000025 K3.02	Importance: 3.3
Cognitive Level: Application	
References: 2OM-10.5, Issue 4, Rev. 0 Figure 10-1, 2OM-10.1.D, Issue 4, Rev. 0, page 3 to 6	
Lesson Plan #: 2LP-SQS-10.1	Obj. #: 9
History: NEW	
Source:	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 actuations?

A. Both First Stage Impulse Pressure Transmitters [2MSS*PT446, 2MSS*PT447] still indicate greater 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.

ANSWER: B	
K/A: 000029 A2.09	Importance:4.4
Cognitive Level: Comprehension	
References: FSAR Figure 7.3-20	
Lesson Plan #: 2LP-SQS-26.3	Obj. #: 4
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0450070101	

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 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 Turbine go to E-0 "Reactor Trip and Safety Injection" Step 1. D. Continue to monitor the affected Steam Generator and prepare for a normal plant shutdown.	
ANSWER: A	
K/A: 000037 K3.02	Importance: 3.2
Cognitive Level: Application	
References: 2OM-53C.4.2.6.4, Issue 1A, Rev. 9, Step 3	
Lesson Plan #: 2LP-SQS-53C.1	Obj. #: 8
History: NEW	
Source:	Type OPEN BOOK.
JTA: 0000110401	Give student AOP 4.6.4

27. A steam generator tube has ruptured in the 21C Steam Generator. The crew is performing the actions required by E-3" Steam Generator Tube Rupture". The cooldown of the RCS has been completed and RCS pressure matches steam generator pressure. Leakage into the affected steam generator will continue until the operators complete which of the following task? To prevent restart

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 in the narrow range.

C. Spray the pressurizer as needed to minimize subcooling and hold the RCS pressure equals steam pressure in the affected steam generator.

D. Restore normal charging and letdown and balance RCS pressure to match 21C steam generator pressure.

ANSWER: D	
K/A: 000038 K1.02	Importance: 3.2
Cognitive Level: Knowledge	
References: 2OM-53B.E-3 Background Issue 1B, Rev. 7, page	
Lesson Plan #: 2LP-SQS-53.3	Obj. #: 3
History: NEW	
Source:	Type: Closed Book
JTA: 3010040601	

28. Unit 2 has tripped from 100% power due 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.

B. Tcold falls rapidly as SI flows fills the cold leg and RCP casing.

C. Tcold remains at or near saturation temperature for Steam Generator 21C steam pressure.

D. Tcold rises as Loop 21C stagnates during cooldown of loops 21A and 21B

ANSWER: B	
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: 3010040601	

29. 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 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 mismatch on 2FWS*FT476 for 25 seconds.

ANSWER: C	
K/A: 000054 A2.03	Importance: 4.1
Cognitive Level: Knowledge	
References: 2OM-24.1.D, Issue 4, Rev. 2 and 2OM-24.1.E, Issue 4, Rev. 1	
Lesson Plan #: 2LP-SQS-24.1	Obj. #: 10
History: NEW	
Source:	Type: CLOSED BOOK
JTA:0130010101	

Stem focus.

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, Rev 6, Step 5	
Lesson Plan #:2LP-SQS-53.3	Obj. #: 3
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 3110060601	

Just putting in Stm Press Mode would not do this. - Q really asks why a large stm demand would result in low press on Nat. Recirc.

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" alarm annuciates on DRMS Console. The sample pump for 2SGC-RQI100 is 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: 00059 AK2.01	Importance: 2.7
Cognitive Level: Comprehension	
References: 2OM-25.4.L, Issue 4, Rev. 9, Page 14, CAUTION before step 13.g	
Lesson Plan #: 2LP-SQS-25.1	Obj. #: 5
History: NEW	
Source:	Type: OPEN Book
JTA: 072BBB0221	Copy of 2OM-25.L

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: 2OM-43.1.C, Issue 4, Rev. 3, page 22 and 23	
Lesson Plan #: 2LP-SQS-43.1	Obj. #: 1
History: NEW	
Source:	Type: Closed Book
JTA: 072BBB0221	

33. A LOCA has occurred that resulted in damage to fuel. Radiation levels in the containment reached 200,000 Rem/hr and now , 24 hours later, are 5,000 Rem/hr. Containment pressure peaked at 15 psig and now has returned to 0.5 psig.

Which of the following describes the correct use of "Adverse Containment" values.

A. Discontinue use of "adverse containment" values due to containment pressure dropping below 5 psig.

B. Discontinue use of "adverse containment" values due to containment radiation levels below 10^5 Rads/hr.

C. Continue use of "adverse containment" values until integrated radiation dose is confirmed to be below 10^6 Rads.

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: 2OM53B.5.GI-2, Issue 1B, Revision 1, page 13	
Lesson Plan #: 2LP-SQS-53.3	Obj. #:6
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 301AAA0601	

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. ?

ANSWER: A	
K/A:: 000028 G 2.4.4	Importance: 4.0
Cognitive Level: Knowledge	
References: 2OM-6.4.IF, Issue 4, Revision 5, page 13	
Lesson Plan #: 2LP-SQS-6.4	Obj. #: 13
History: NEW	
Source:	Type: CLOSED BOOK
JTA:0110030101	

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 Iodine release from a damaged fuel assembly.

C. Overheating damage to a fuel assembly from a loss of cooling.

D. Damage to fuel handling equipment 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 Isolation 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 greater than 50°F and PRZR level on scale.

D. Maximize injection of SI accumulator water and limit nitrogen injection into RCS

ANSWER: D	
K/A: 000056 K3.02	Importance: 4.4
Cognitive Level: Knowledge	
References: 2OM-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: Modified from Q17 on 2LOT2A	Type: CLOSED BOOK
JTA: 3010060601	

37. The unit is at 100% power with all systems NSA. "A" Train SSPS testing is in progress. 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 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	

38. 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?

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 inserted and the reactor trip breakers open.

ANSWER: B	
K/A: 001 K6.08	Importance: 2.9
Cognitive Level: Comprehension	
References: 2OM-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 amps in the Intermediate Range. The operator 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.

Exhibiting a questioning attitude the Plant Operator states that the rod configuration seems improper and consults Plant Curve CB-15. Which of the following actions is required?

A. Manually trip the reactor and commence emergency boration.

B. Insert Control Banks A, B, C and D and re-calculate the Estimated Critical Position.

C. Request permission from General Manager Operations to enter Mode 1.

D. Request Nuclear Engineering validation of the current rod configuration.

ANSWER: A	
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:	Type: OPEN BOOK
JTA: 0010100101	Give CB-15

40. At low RCS pressures, and with procecedural restrictions, the RCP Seal Water Bypass Isolation Valve [2CHS*MOV307] may be 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 RCP Lower Radial Bearing. D. Elevated cooling flow through RCP Thermal Barrier.	
ANSWER: C	
K/A: 003 K1.03	Importance: 3.3
Cognitive Level: Comprehension	
References: 2OM-6.4.AAB, Issue 4, Rev. 1, Page 4 and 5, 2OM-6.1.C,Issue 4, Rev.0, page 20	
Lesson Plan #: 2LP-SQS-6.3	Obj. #: 4.c
History: NEW	
Source:	Type: Closed Book
JTA: 0030020101	

41. The RCS is at 240 degrees and 325 psig. The operator is reviewing 2OM-6.4.A, "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: 2OM-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

Closed reference.

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 resin 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	
ANSWER: A	
K/A: 004 A2.32	Importance: 3.4
Cognitive Level: Comprehension	
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: CLOSED BOOK
JTA: 0040100101	

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 Limitations require that the boron concentration of the pressurizer must be maintained within 50 ppm of the RCS. Which of the following is procedurally allowed to accomplish this task?

A. Throttle open one pressurizer spray valve.

B. Energize pressurizer heaters.

C. Cycle one pressurizer PORV.

D. Align excess letdown to the VCT.

ANSWER: B	
K/A: 004 A4.15 ***K/A CHANGE***	Importance: 3.6
Cognitive Level: Application	
References: 2OM-7.4.K, "Blender Boration Operations", Issue 4, Rev. 1, Page 2, Step 9	
Lesson Plan #: 2LP-SQS-7.1	Obj. #: 8
History: NEW	
Source:	Type: OPEN Book
JTA: 0040080101	Copy of procedure

44. The unit is operating in Mode 3 at normal temperature and pressure with Charging Flow Control valve [2CHS*FCV122] controlling at 60 gpm. Letdown Orifice 23 Isolation Valve [2CHS*AOV200B] is open and letdown 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?

A. Overcooling of the Regenerative Heat Exchanger [2CHS*E23].

B. Thermal shock to the reactor vessel in loop 21A.

C. Flashing of letdown flow downstream 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: 2OM-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	

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?

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.

D. "A" equipment actuates "B" Train slave relays remain energized.

ANSWER: A	
K/A: 013 K2.01	Importance:3.6
Cognitive Level: Comprehension	
References: 2OM-1.5 Issue 4, Rev. 3, Figure 1-41	
Lesson Plan #: 2LP-SQS-1.2	Obj. #: 7
History: NEW	
Source:	Type: Closed Book
JTA: 0130010101	

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 must be less than HI-3 setpoint.

ANSWER: D	
K/A: 013 A 3.02	Importance: 4.1
Cognitive Level: Application	
References: FSAR Figure 7.3-13,	
Lesson Plan #: 2LP-SQS-1.2	Obj. #: 10
History: NEW	
Source:	Type OPEN BOOK
JTA: 0130010101	Give FSAR Figure 7.3-13

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.

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	

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 the loss of voltage?

A. N-35 will indicate higher amps then N-36.

B. N-36 will indicate higher 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.

ANSWER: A	
K/A: 015 A 2.02	Importance: 3.1
Cognitive Level: Comprehension	
References: 2OM-2.4.AAC " NIS DETECTOR/COMPENSATOR TROUBLE", Issue 1, Rev. 3 Page 3 2OM-53C.4.2.2.18 " Intermediate Range Channel Malfunction" Issue 1A, Rev. 1, Step 4	
LP#: 2LP-SQS-2.1	OBJ: 2
History: NEW	
Source:	Type :CLOSED BOOK
JTA: 0000100401	

49. 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

B. P-8

C. P-9

D. P-10

ANSWER: D	
K/A:: 015 K4.01	Importance: 3.1
Cognitive Level: Knowledge	
References: 2OM-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	

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 2-9 and running. Under this alignment which of the following signals will STOP the fan? 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
Cognitive Level: Knowledge	
References: 2OM-44C.1.D, Issue 4, Rev. 0, Pages 2 and 3	
Lesson Plan #: 2LP-SQS-44C.1	Obj. #: 7
History: NEW	
Source:	Type: Closed Book
JTA: 0880040101	

52. The 2nd 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 reduced to 95% prior to removal from service.

B. Turbine load must be reduced to 40% load to remove the entire heater train from service.

C. Turbine load must be reduced 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 than 50°F.

ANSWER: B	
K/A:056 A2.12	Importance: 2.8
Cognitive Level: Application	
References: 2OM-23B.4.C, Issue 1, Rev. 6 pages 4 and 5, 2OM-23A.2.A Issue 4,Rev. 1	
Lesson Plan #: 2LP-SQS-23.1	Obj. #: 13
History: NEW	
Source:	Type: OPEN BOOK
JTA: 06EEE0101	

Seems to be direct lookup.

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 2OM-24.2.A "Main Feedwater Precautions and Limitations" for maintaining steam generator levels on program?

A. One Main Feedwater Pump and One condensate Pump.

B. One Main Feedwater Pump and Two Condensate Pumps.

C. Two Main Feedwater Pumps and One Condensate Pump.

D. Two Main Feedwater Pumps 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 Precautions 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.

ANSWER: D	
K/A: 059 K3.02	Importance: 3.6
Cognitive Level: Knowledge	
References: 2OM-24.1.D, Issue 4, Rev. 2	
Lesson Plan #:: 2LP-SQS-24.1	Obj. #: 10
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0610030101	

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 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 the operator to the loss of suction to the operating pumps?

	Pump Amps	Discharge Pressure	Flow
A.	LOW	HIGH	LOW
B.	HIGH	LOW	HIGH
C.	ZERO	Equal to Suction	ZERO
D.	LOW	LOW	LOW

ANSWER: D

K/A: 061 A1.05	Importance: 3.6

Cognitive Level: Application

References: Generic Fundamentals. Pump Performance with loss of suction

Lesson Plan #: 2LP-SQS-24.1	Obj. #: 8

History: NEW

Source:	Type: Closed Book
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 ***K/A CHANGE***	Importance: 2.7
Cognitive Level: Knowledge	
References: 2OM-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	

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 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.

ANSWER: C	
K/A: 071 A4.29	Importance: 3.0
Cognitive Level: Knowledge	
References: 2OM-19.1.B, Issue 4, Rev 5, Page 2, 2OM-19.2, Issue 4, Rev. 1, Precaution 9	
Lesson Plan #:2LP-SQS-19.1	Obj. #: 3
History: NEW	
Source:	Type Closed Book
JTA: 0710070101	

59. If Control Room Area Radition Monitor [2RMC*RQ201, 202] goes into ALERT what radiation concern would exist? A. Control room personnel exposure to gamma. B. Control room air intake of alpha particulate release. C. Control room air intake of beta particulate release. D. Control room personnel exposure 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 4	
Lesson Plan #: 2LP-SQS-43.1	Obj. #: 3
History: NEW	
Source:	Type: Closed Book
JTA: 0720030101	

Non Discriminatory

60. The Unit is in MODE 5:

- RHS is in service with the entire RCS at 130°F
- OPPS is NSA for MODE 5 and in service

How many Reactor Coolant Pumps may be started for heat up of the RCS under this condition?

A. NONE

B. ONE

C. TWO

D. THREE

ANSWER: B	
K/A: 002 K1.13	Importance: 4.1
Cognitive Level: Comprehension	
References: 2OM-6.4A."Reactor Coolant Pump Startup" Issue 4, Rev. 6, Page 1	
Lesson Plan #: 2LP-SQS-6.3	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 information is available to the operator from PSMS.

- Core Exit Thermocouples (PSMS)
  - Trisector 1= 495
  - Trisector 2 = 490
  - Trisector 3 = 488
- RCS Wide Range Pressure Indicator [2RCS*PT440] = 1185 psig
- RCS Wide Range Pressure Indicator [2RCS*PT441] = 1200 psig.
- RCS Wide Range 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?

more plausible distractors.

A. 41 degrees Superheat

B. Zero (0) degrees - saturated

C. 41 degrees subcooled

72°F

D. 92 degrees subcooled

ANSWER: D	
K/A: 006 A1.16	Importance: 4.1
Cognitive Level: Application	
References: Steam Tables 2OM-53.3B ES-0.2, Foldout page.	
Lesson Plan #: 2LP-SQS-6.7	Obj. #: 7
History: NEW	
Source:	Type: OPEN REFERNCE
JTA: 3010060601	Give steam tables

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 effective 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.

ANSWER: B	
K/A: 010 K1.03	Importance: 3.6
Cognitive Level: Comprehension	
References: 2OM-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	

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

ANSWER: A	
K/A: 011 K4.01	Importance: 3.3
Cognitive Level: Knowledge	
References: 2OM-6.4.IF, Issue 4, Revision 5, Page 13	
Lesson Plan #: 2LP-SQS-6.4	Obj. #: 13
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0020090101	

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 Flux.

C. Overtemperature Delta-Temperature.

D. Overpower Delta-T.

ANSWER: C	
K/A: 012 K5.01	Importance: 3.3
Cognitive Level: Knowledge	
References: 2OM-1.1.B, Issue 4, Rev. 1 pages 5 and 6	
Lesson Plan #: 2LP-SQS-1.1	Obj. #: 5
History: NEW	
Source:	Type: Closed Book
JTA: 0120050101	

65. The annuciator A4-8G " ROD POSITION 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 between Data Cabinet A and Data Cabinet B.

D. Group demand signal is within 10 steps of the calculated Rod Insertion Limit.

ANSWER: A	
K/A: 014 A1.02	Importance: 3.2
Cognitive Level: Knowledge	
References: 2OM-1.1.B, Issue 4, Rev. 1 page 20, 2OM-1.4.ACF, Issue 4, Rev. 1	
Lesson Plan #:2LP-SQS-1.1	Obj. #: 8
History: NEW	
Source:	Type: Closed Book
JTA: 0140030101	

66. The unit is at 100% power with all systems NSA. Main Condenser Vacuum [2CNM-CND21A] Section A Condenser Vacuum Transmitter [2CNM-PT103A] is damaged. Section B Condenser Vacuum Transmitter [2CNM-PT103B] is intact. Annuciator A12-4C "CONDENSER UNAVAILABLE (C-9) is lit.

If the unit suffered a large load rejection at this point, which of the following steam release pathways would open first?

A. 1st and 2nd Bank Steam Bypass Valves.

B. 3rd and 4th Bank Steam Bypass Valves.

C. Residual Heat Release Valve [2SVS*HCV104].

D. Atmospheric Steam Dumps [2SVS*AOV101A, 101B, 101C].

ANSWER: D	
K/A: 016 K1.03	Importance: 3.2
Cognitive Level: Comprehension	
References: 2OM-22A.5, Issue 4, Rev. 0, Figure 22A-1, 2OM-21.5, Issue 4, Rev. 2, Figure 21-9B (12241-LSK-11-14B)	
Lesson Plan #: 2LP-SQS-21.1	Obj. #: 3
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0410030101	

67. Which of the following describes 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 ECA-1.1 "Loss of Emergency Coolant Recirculation" will be entered due to the lack of sump level.

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 delayed by 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
JTA:0060150101	By inspection. QSS flow is approx. 6000 gpm less and will slow rate of depletion of RWST. DBA so sump level will be present. RSS pump capability is above design basis pressure. CIB starts all RSS pumps after time delay.

68. 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 Ejector [2CVS-J22] in operation.

B. Containment Vacuum Pumps [2CVS-P21A,P21B] selected to AUTO.

C. Containment Vacuum Pump [2CVS-P21A,P21B] manually started as required.

D. Containment Air Compressor [2IAC-C21A,C21B] aligned to take suction on Containment.

ANSWER: C	
K/A: 029 K. 4.02	Importance: 2.9
Cognitive Level: Knowledge	
References: 2OM-12.1.C, Issue 4, Rev. 0, 2OM-12.4.E, Issue 4,Rev. 0	
Lesson Plan #: 2LP-SQS-12.1	Obj. #: 3
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0260060101	

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 pattern 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: 033--A0101	Tech Spec Reference for Student

70. The unit is stable at 8% power with the Main Turbine off-line. The Main Feedwater Regulating Bypass Valves are in automatic and controlling at program level.

Inadvertently, loop 21A Main Steam Atmospheric Vent Valve [2SVS*PCV101A] fails full open. Which of the following ~~is~~ would be the result of the valve opening? ← Ammend or L. term Gains C's

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.

ANSWER: C	
K/A: 035 K6.02	Importance: 3.1
Cognitive Level: Comprehension	
References: Generic Fundamentals, 2OM-21.1.D, Issue 4, Rev. 2, page 1	
Lesson Plan #: 2LP-SQS-24.1	Obj. #: 8
History: NEW	
Source:	Type: Closed Book
JTA: 0350060101	

71. The unit is in Mode 3 after shutdown from extended full power operations. Stm Dump Control Mode Selector is in STM PRESSURE mode. The operator adjusts the setpoint on the Main Stm Manifold Press Control [2MSS*PK422] from 8.8 turns to 8.5 turns. The operator observes Tavg _____and Loop Delta T_____?

↑ close Valve? Lower PRESS

A. Drop and drop.

B. Drop and remain the same.

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. 2OM-21.1.C	
Lesson Plan #: 2LP-SQS-21	Obj. #: 3.
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0410050101	

72. Annuciator A6-5G "CONDENSER VACUUM LOW/LOW-LOW" alarm is lit. The operators are verifying criteria for proper 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.

ANSWER: C	
K/A: 055 K3.01	Importance: 2.5
Cognitive Level: Comprehension	
References: 2OM-26.4.H, Issue 1, Rev. 10, Attachment 1	
Lesson Plan #: 2LP-SQS-26.2	Obj. #: 7
History: NEW	
Source:	Type: OPEN Book
JTA: 0550040101	Give copy of Attachment 1

73. The unit is in Mode 4 and heating up. 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?

74. Annuciator A8-10A "125 VDC BUS 2-1 GROUND" is lit. NO. 2-1 DC Bus Ground Detector indicates a -75 VDC ground. 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.

D. 125 VDC Bus 2-1 Distribution Switchboard may trip on voltage differential.

ANSWER: C	
K/A: 063 A2.01	Importance: 2.5
Cognitive Level: Comprehension	
References: 2OM--39.1.C, Issue 4, Rev. 0, 2OM-39.4.F, Issue 4, Rev. 1 Section II. (This reference is real shaky here. NOTHING IN OM actually says device will actuate.)	
Lesson Plan #: 2LP-SQS-39.1	Obj. #: 7. b
History: NEW	
Source:	Type CLOSED BOOK
JTA: 063AAA0101	

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 2AE 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 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:	Type: Closed Book
JTA: 0640040101	

76. The Unit is in MODE 5, Containment 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 Iodine 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: 2OM-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. The Unit is at 100% power. The operator is preparing to start Service Water pump [2SWS-P21A]. Which of the following ~~parameters~~ CONDITIONS will prevent a pump start from the control board?

A. Service Water Pump [2SWS-P21B] in AFTER START.

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 Pump Discharge Valve [2SWS*MOV102A] OPEN.

ANSWER: D	
K/A: 076 A4.02	Importance:2.9
Cognitive Level: Knowledge	
References: 2OM-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	

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: 2OM-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_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.: 2OM-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, Injury and Casualty Control), Used on 2LOT2A Exam question 78	Type: CLOSED BOOK

Source: Based on SQS 1132,

JTA: 0860070101	

GET

80. The unit is in MODE 5 with the RCS operating at Reduced Inventory. Procedure 2OM-10.4.D RHS Operation With RCS At Reduced Inventory/Midloop Condition" is in progress. The RCS is drained to 3 feet 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, and 21B] running with total system flow limited to 4350 gpm including letdown flow and recirculation for the pumps.

ANSWER: C B	
K/A: 005 K3.01	Importance: 3.9
Cognitive Level: Comprehension	
References: 2OM-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

Answer 'B' not C
DLB

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.: 2OM10.5"Residual Heat Removal Systems Figures and Tables" Figure10.1	
LP#: 2LP-SQS-10.1	OBJ: 8
History NEW	
Source:	
JTA: 0050080101	Type: CLOSED BOOK

82. Which of the following describes the function of the sparger installed in the Pressuizer Relief Tank [2RCS*TK22]?

A. Allows drainage of the Pressurizer Relief Tank via Primary Drains Transfer Pumps [2DGS*P21A, 21B].

B. Reduces pressure by spray from Pressurizer Relief Tank Spray Valve [2RCS-MOV516].

C. Directs steam discharge from Pressurizer PORV's [2RCS*455C,D, 2RCS*456] 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 ***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
JTA: 0070030101	

83. The Containment Iodine Filtration Charcoal adsorbers [2HVR-FLTA211A(B)] are designed for iodine removal from containment during which of the following scenerios?

A. Normal subatmospheric and shutdown plant operations for normal containment access.

B. Post Design Basis LOCA atmospheric clean up of containment prior to any release to the Uncontrolled Area.

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
Cognitive Level: Knowledge	
References: 2OM-44C.1.B	
Lesson Plan #: 2LP-SQS-44C.1	Obj. #: 1
History: NEW	
Source:	Type: CLOSED BOOK
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 startup of the Hydrogen Recombiners?

A. The hydrogen recombiner could ignite a hydrogen burn during on line operations.

B. Hydrogen concentration is above the design capacity of the recombiner.

C. Core damage is indicated and dose rates will be higher than projected while aligning containment penetrations.

D. Containment depressurization to subatmospheric conditions must be completed prior to recombiner startup.

ANSWER: A	
K/A: 028 A2.02	Importance: 3.5
Cognitive Level: Knowledge	
References: 2OM-53B.4.E-1 Background, Issue 1B, Rev. 6, step 29	
Lesson Plan #: 2LP-SQS-53.3	Obj. #: 3
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 a large load rejection occurs and A4-8A " ROD CONTROL SYSTEM URGENT ALARM" annunciates. Which of the following actions 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 step 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.

ANSWER:D	
K/A: 041 K6.03	Importance: 2.7
Cognitive Level: Comprehension	
References: 2OM-1.1.C, Issue 4, Rev. 0	
Lesson Plan #: 2LP-SQS-21.1	Obj. #: 5.c
History: NEW	
Source:	Type: Closed Book
JTA: 0410030101	

86. 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 systems 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.

ANSWER: B	
K/A: 103 A1.01	Importance: 3.7
Cognitive Level: Application	
References 2OM-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

operational but Very easy.
A + D Not plausible.

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 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].

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	

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 " Daily Heat Balance" calculated Net Reactor Power is 2644 MWT. Which of the power range 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: 2.1.7	Importance: 3.7
Cognitive Level: Application	
References: 2OM-54.4.C1, Issue 1, Revision 11, page 2	
Lesson Plan #:2LP-SQS-RI	Obj. #: 5
History: NEW	
Source:	Type: OPEN BOOK
JTA: 0150050201	Give procedure to candidates.

OK

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 increments or less.

D. Place the unit in HOT STANDBY with all rods inserted within 15 minutes.

ANSWER: 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
History: NEW	
Source:	Type: CLOSED BOOK
JTA:	

91. 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 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°F.

D. At 0800 Keff must be less than or equal to 0.95 and at 1400 Tavg must be less than 350°F.

ANSWER: B	
K/A: 2.1.22	Importance: 2.8
Cognitive Level: Comprehension	
References: Unit 2 Technical Specifications, Table 1.1, page 1-8 and 3.5.1	
Lesson Plan #: 2LP-SQS-TS	Obj. #: 2
History: NEW	
Source:	Type: OPEN BOOK
JTA:	Give a copy of Table 1-1

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~~ verifies the release rate ~~being~~ at 3 SCFM. Which of the following actions must be completed?

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 are correct.

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	
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:	Type: OPEN BOOK
JTA: 0710060101	Give copy of procedure

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 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 the 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	
Lesson Plan #: 1/2LP-SQS-AP.2	Obj. #: 6.
History: NEW	
Source:	Type: OPEN BOOK
JTA: 119--A0301	Give NPDAP 3.4

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, which of the following is occuring?

A. Margin to DNB is rising as Critical Heat Flux rises.

B. Margin to DNB is falling as Critical Heat Flux falls.

C. Margin to DNB is rising as Actual Heat Flux rises.

D. Margin to DNB is falling as Actual Heat Flux falls.

ANSWER: B	
K/A:2.2.22	Importance: 3.4
Cognitive Level: Comprehension	
References: Basis for Technical Specification 2.1.1,	
Lesson Plan #: 2LP-SQS-1.1	Obj. #: 7
History: NEW	
Source:	Type: CLOSED BOOK
JTA: 0020090101	

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.	
ANSWER: A	
K/A:2.3.1	Importance: 2.6
Cognitive Level: Knowledge	
References: GERT Student Handout, Rev. 19, May 1998, page 7-3 to 7-5	
Lesson Plan #: LP-RC-02	Obj. #:7-2
History: NEW	
Source:	Type: Closed Book
JTA:3410040302	

96. 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

Steam Generator Pressures are at 430 psig and stable

Pressurizer Heater Banks C and A are ON. The operator places the Pressurizer Master Pressure Controller in MANUAL. As RCS pressure rises, which of the following actuations should occur first?

A. Safety Injection Signal on low steam line pressure.

B. Safety Injection Signal on low RCS pressure.

C. AMSAC actuation on low steam generator pressure.

D. Reactor Trip signal generated on High RCS pressure.

ANSWER: A	
K/A: 2.4.2 ***K/A CHANGE***	Importance: 3.9
Cognitive Level: A: Comprehension	
Ref.: 2OM-1.2.B "Reactor Protection Setpoints", Issue 4, Rev. 3, pages 4 and 5	
LP#: 2LP-SQS-1.1	OBJ: 5. b
History LRT 1997 Module IV Written exam, Modified from Question 49, 2LOT 2A	
Source:	
JTA: 0120050101	CLOSED BOOK

97. 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 raising thermal power above 5%.

C. Place the unit in Mode 3 with the 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: 2OM-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

Testing P6 Knowledge

98. The unit has undergone a Loss of Coolant Accident. Both trains of Safety Injection are in service and High Head SI Flow [2SIS*FI943] indicates 500 gpm. Coolant system pressure is only 50 psig above highest steam generator pressure.

Tripping the Reactor Coolant Pumps is required at this time to accomplish which of the following strategies?

A. Prevent damage to Reactor Coolant Pumps operating in a highly voided system.

B. Prevent Reactor Coolant Pump overspeed and generation of missile fragments.

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 Level: Knowledge	
References: 2OM-53B.5.GI-6, Issue 1B, Rev. 1, page 9	
Lesson Plan #:2LP-SQS-53.2	Obj. #: 11
History: NEW	
Source:	Type: Closed Book
JTA:301AAA0601	

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 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?

A. 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: 2OM-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. 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: 2OM53.4.B, Issue 1, Rev. 10, page 7	
Lesson Plan #: Fire Brigade Training	Obj. #:
Objective:	
History: NEW	
Source:	Type: Closed Book
JTA:0860040101	Knowledge for Brigade Captain's