Date - 12-27-99

NOTE TO: NRC DOCUMENT CONTROL DESK
MAIL STOP 0-5-D-24

FROM: Virgil Curley, LICENSING ASSISTANT
OPERATING LICENSING BRANCH _ REGION I

SUBJECT: OPERATOR LICENSING EXAMINATION ADMINISTERED ON
1/22-28/99, AT Vermont Yankee
DOCKET NO. 50-271

ON Jan. 22-28, 99 OPERATOR LICENSING EXAMINATIONS WERE ADMINISTERED AT THE REFERENCED FACILITY. ATTACHED YOU WILL FIND THE FOLLOWING INFORMATION FOR PROCESSING THROUGH NUDOCS AND DISTRIBUTION TO THE NRC STAFF, INCLUDING THE NRC PDR.

Item #1 a) FACILITY SUBMITTED OUTLINE AND INITIAL EXAM SUBMITTAL DESIGNATED FOR DISTRIBUTION UNDER RIDS CODE A070.

b) AS GIVEN OPERATING EXAMINATION, DESIGNATED FOR DISTRIBUTION UNDER RIDS CODE A070.

Item #2 EXAMINATION REPORT WITH THE AS GIVEN WRITTEN EXAMINATION ATTACHED, DESIGNATED FOR DISTRIBUTION UNDER RIDS CODE IE42.

A070

Facility:	Vermont Yanke	Date of Exam: 01/25/99								Exam Level: SRO		
Tier	Group	K/A Category Points										Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	3	4	3				4	5			7	26
	2	2	3	3				3	3			3	17
	Tier Totals	5	7	6				7	8			10	43
2. Plant Systems	1	1	2	2	2	2	1	3	2	2	4	2	23
	2	1		1	2	1	2	1	1	1	2	1	13
	3	1					1					2	4
	Tier Totals	3	2	3	4	3	4	4	3	3	6	5	40
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		
					5		5		3		4		17

Note:
- Attempt to distribute topics among all K/A Categories: select at least one topic from every K/A category within each tier.
- Actual point totals must match those specified in the table.
- Select topics from many systems: avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
- Systems/evolutions within each group are identified on the associated outline.
- The shaded areas are not applicable to the category/tier.

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A070

A5

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
295003	Partial or Complete Loss of A.C. Power		X					AK2.04 A.C. electrical loads	3.5	1
295003	Partial or Complete Loss of A.C. Power					X		AA2.02 Reactor power, pressure, and level	4.3	1
295003	Partial or Complete Loss of A.C. Power				X			AA1.03 Systems necessary to assure safe plant shutdown	4.4	1
295006	SCRAM			X				AK3.02 Reactor power response	4.2	1
295007	High Reactor Pressure			X				AK3.04 Safety/relief valve operation: Plant-Specific	4.1	1
295007	High Reactor Pressure				X			AA1.05 Reactor/turbine pressure regulating system	3.8	1
295009	Low Reactor Water Level		X					AK2.03 Recirculation system	3.2	1
295009	Low Reactor Water Level				X			AA1.02 Reactor water level control	4.0	1
295010	High Drywell Pressure									
295013	High Suppression Pool Temperature									
295014	Inadvertent Reactivity Addition									
295015	Incomplete SCRAM		X					AK2.04 RPS	4.1	1
295016	Control Room Abandonment					X		AA2.02 Reactor water level	4.3	1
295016	Control Room Abandonment						X	2.4.41 Knowledge of the emergency action level thresholds and classifications.	4.1	1
295016	Control Room Abandonment			X				AK3.03 Disabling control room controls	3.7	1
295017	High Off-Site Release Rate						X	2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions including:□ 1.Reactivity control□ 2.Core cooling and heat removal□ 3.Reactor coolant system integrity□ 4.Containment conditions□ 5.Radioactivity release control.	4.3	1
295023	Refueling Accidents	X						AK1.03 Inadvertent criticality	4.0	1
295024	High Drywell Pressure						X	2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes.	4.0	1
295025	High Reactor Pressure	X						EK1.03 Safety/relief valve tailpipe temperature/pressure relationships	3.8	1
295026	Suppression Pool High Water Temperature					X		EA2.01 Suppression pool water temperature	4.2	1
295026	Suppression Pool High Water Temperature						X	2.1.12 Ability to apply technical specifications for a system.	4.0	1
295027	High Containment Temperature (Mark III Containment Only)									
295030	Low Suppression Pool Water Level						X	2.4.18 Knowledge of the specific bases for EOPs.	3.6	1
295030	Low Suppression Pool Water Level		X					EK2.07 Downcomer/ horizontal vent submergence	3.8	1
295031	Reactor Low Water Level					X		EA2.04 Adequate core cooling	4.8	1
295031	Reactor Low Water Level				X			EA1.08 Alternate injection systems: Plant-specific	3.9	1

ES-401		BWR SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1									ES-401-1
Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.	
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown	X						EK1.06 Cooldown effects on reactor power	4.2	1	
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown						X	2.4.48 Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and directives affect plant and system conditions.	3.8	1	
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown					X		EA2.01 Reactor power	4.3	1	
295038	High Off-Site Release Rate										
500000	High Containment Hydrogen Concentration						X	2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions including:□ 1.Reactivity control□ 2.Core cooling and heat removal□ 3.Reactor coolant system integrity□ 4.Containment conditions□ 5.Radioactivity release control.	4.3	1	
	K/A Category Point Totals:	3	4	3	4	5	7	Group Point Total:		26	

ES-401	BWR SRO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2									ES-401-1
Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
295001	Partial or Complete Loss of Forced Core Flow Circulation		X					AK2.01 Recirculation system	3.7	1
295001	Partial or Complete Loss of Forced Core Flow Circulation	X						AK1.02 Power/flow distribution	3.5	1
295002	Loss of Main Condenser Vacuum			X				AK3.09 Reactor power reduction	3.2	1
295004	Partial or Complete Loss of D.C. Power		X					AK2.03 D.C. bus loads	3.3	1
295004	Partial or Complete Loss of D.C. Power						X	2.4.48 Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and directives affect plant and system conditions.	3.8	1
295005	Main Turbine Generator Trip			X				AK3.03 Feedwater temperature decrease	3.0	1
295008	High Reactor Water Level						X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
295011	High Containment Temperature (Mark III Containment Only)									
295012	High Drywell Temperature	X						AK1.01 Pressure/temperature relationship	3.5	1
295018	Partial or Complete Loss of Component Cooling Water						X	2.4.24 Knowledge of loss of cooling water procedures.	3.7	1
295019	Partial or Complete Loss of Instrument Air					X		AA2.02 Status of safety-related instrument air system loads (see AK2.1 - AK2.19)	3.7	1
295019	Partial or Complete Loss of Instrument Air		X					AK2.03 Reactor feedwater	3.3	1
295020	Inadvertent Containment Isolation									
295021	Loss of Shutdown Cooling				X			AA1.02 RHR/shutdown cooling	3.5	1
295021	Loss of Shutdown Cooling					X		AA2.04 Reactor water temperature	3.5	1
295022	Loss of CRD Pumps									
295028	High Drywell Temperature				X			EA1.04 Drywell pressure	4.0	1
295029	High Suppression Pool Water Level									
295032	High Secondary Containment Area Temperature			X				EK3.03 Isolating affected systems	3.9	1
295033	High Secondary Containment Area Radiation Levels				X			EA1.03 Secondary containment ventilation	3.8	1
295034	Secondary Containment Ventilation High Radiation									
295035	Secondary Containment High Differential Pressure									
295036	Secondary Containment High Sump/Area Water Level					X		EA2.02 Water level in the affected area	3.1	1
600000	Plant Fire On Site									
	K/A Category Point Totals:	2	3	3	3	3	3	Group Point Total:		17

Plant Systems - Tier 2/Group 1

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
201005	Rod Control and Information System (RCIS)														
202002	Recirculation Flow Control System								X				A2.05 Scoop tube lockup: BWR-2, 3, 4	3.1	1
203000	RHR/LPCI: Injection Mode (Plant Specific)									X			A3.08 System initiation sequence	4.1	1
203000	RHR/LPCI: Injection Mode (Plant Specific)			X									K3.03 Automatic depressurization logic	4.3	1
206000	High Pressure Coolant Injection System										X		A4.12 Turbine trip controls: BWR-2, 3, 4	3.9	1
206000	High Pressure Coolant Injection System							X					A1.08 System lineup: BWR-2, 3, 4	4.0	1
207000	Isolation (Emergency) Condenser														
209001	Low Pressure Core Spray System				X								K4.04 Line break detection	3.2	1
209002	High Pressure Core Spray System (HPCS)														
211000	Standby Liquid Control System		X										K2.02 Explosive valves	3.2	1
211000	Standby Liquid Control System											X	2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
212000	Reactor Protection System					X							K5.02 Specific logic arrangements	3.4	1
212000	Reactor Protection System										X		A4.07 System status lights and alarms	3.9	1
215004	Source Range Monitor (SRM) System										X		A4.07 Verification of proper functioning/ operability	3.6	1
215005	Average Power Range Monitor/Local Power Range Monitor System										X		A4.06 Verification of proper functioning/ operability	3.8	1
216000	Nuclear Boiler Instrumentation								X				A2.11 Heatup or cooldown of the reactor vessel	3.3	1
217000	Reactor Core Isolation Cooling System (RCIC)							X					A1.03 Reactor water level	4.0	1
217000	Reactor Core Isolation Cooling System (RCIC)		X										K2.01 Motor operated valves	2.8	1
218000	Automatic Depressurization System					X							K5.01 ADS logic operation	3.8	1
223001	Primary Containment System and Auxiliaries														
223002	Primary Containment Isolation System/Nuclear Steam Supply Shut-Off	X											K1.01 Main steam system	3.9	1
226001	RHR/LPCI: Containment Spray System Mode														
239002	Relief/Safety Valves						X						K6.05 Discharge line vacuum breaker	3.2	1

ES-401	BWR SRO Examination Outline Plant Systems - Tier 2/Group 1	ES-401-1

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
241000	Reactor/Turbine Pressure Regulating System			X									K3.11 RPS	3.8	1
259002	Reactor Water Level Control System														
261000	Standby Gas Treatment System							X					A1.01 System flow	3.1	1
262001	A.C. Electrical Distribution									X			A3.03 Load shedding	3.5	1
264000	Emergency Generators (Diesel/Jet)											X	2.1.31 Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.	3.9	1
264000	Emergency Generators (Diesel/Jet)				X								K4.01 Emergency generator trips (normal)	3.7	1
290001	Secondary Containment														
	K/A Category Point Totals:	1	2	2	2	2	1	3	2	2	4	2	Group Point Total:		23

Plant Systems - Tier 2/Group 2

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
201001	Control Rod Drive Hydraulic System								X				A2.11 Valve openings	2.7	1
201002	Reactor Manual Control System										X		A4.02 Emergency in/notch override switch	3.5	1
201004	Rod Sequence Control System (Plant Specific)														
201006	Rod Worth Minimizer System (RWM) (Plant Specific)														
202001	Recirculation System														
204000	Reactor Water Cleanup System														
205000	Shutdown Cooling System (RHR Shutdown Cooling Mode)					X							K5.02 Valve operation	2.9	1
214000	Rod Position Information System														
215002	Rod Block Monitor System						X						K6.05 LPRM detectors: BWR-3, 4, 5	3.1	1
215003	Intermediate Range Monitor (IRM) System														
219000	RHR/LPCI: Torus/Suppression Pool Cooling Mode										X		A4.14 The overrides for suppression pool cooling valve logic: Plant-Specific	3.5	1
230000	RHR/LPCI: Torus/Suppression Pool Spray Mode														
234000	Fuel Handling Equipment				X								K4.02 Prevention of control rod movement during core alterations	4.1	1
239003	MSIV Leakage Control System														
245000	Main Turbine Generator and Auxiliary Systems							X					A1.02 Turbine speed	2.5	1
259001	Reactor Feedwater System						X						K6.02 Condensate system	3.4	1
262002	Uninterruptable Power Supply (A.C./D.C.)				X								K4.01 Transfer from preferred power to alternate power supplies	3.4	1
263000	D.C. Electrical Distribution			X									K3.03 Systems with D.C. components (i.e. valves, motors, solenoids, etc.)	3.8	1
271000	Offgas System	X											K1.06 Main steam system	2.9	1
272000	Radiation Monitoring System														
286000	Fire Protection System									X			A3.01 Fire water pump start	3.4	1
290003	Control Room HVAC														
300000	Instrument Air System (IAS)														
400000	Component Cooling Water System (CCWS)											X	2.4.11 Knowledge of abnormal condition procedures.	3.6	1
	K/A Category Point Totals:	1	0	1	2	1	2	1	1	1	2	1	Group Point Total:		13

Plant Systems - Tier 2/Group 3

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
201003	Control Rod and Drive Mechanism											X	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
215001	Traversing In-Core Probe														
233000	Fuel Pool Cooling and Clean-up														
239001	Main and Reheat Steam System														
256000	Reactor Condensate System														
268000	Radwaste														
288000	Plant Ventilation Systems						X						K6.03 Plant air systems	2.7	1
290002	Reactor Vessel Internals											X	2.1.12 Ability to apply technical specifications for a system.	4.0	1
290002	Reactor Vessel Internals	X											K1.02 Recirculation system	3.2	1
	K/A Category Point Totals:	1	0	0	0	0	1	0	0	0	0	2	Group Point Total:		4

Facility Vermont Yankee	Date: January 25, 1999		Exam Level:	SRO
Category	KA #	KA Topic	Imp.	Points
Conduct of Operations	2.1.1	Knowledge of conduct of operations requirements.	3.8	1
	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	4.0	1
	2.1.12	Ability to apply technical specifications for a system.	4.0	1
	2.1.21	Ability to obtain and verify controlled procedure copy.	3.2	1
	2.1.22	Ability to determine Mode of Operation.	3.3	1
	Total			5
Equipment Control	2.2.11	Knowledge of the process for controlling temporary changes.	3.4	1
	2.2.13	Knowledge of tagging and clearance procedures.	3.8	1
	2.2.13	Knowledge of tagging and clearance procedures.	3.8	1
	2.2.22	Knowledge of limiting conditions for operations and safety limits.	4.1	1
	2.2.26	Knowledge of refueling administrative requirements.	3.7	1
	Total			5
Radiation Control	2.3.1	Knowledge of 10 CFR 20 and related facility radiation control requirements.	3.0	1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	3.1	1
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	3.3	1
	Total			3
Emergency Procedures and Plan	2.4.12	Knowledge of general operating crew responsibilities during emergency operations.	3.9	1
	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions including: 1.Reactivity control 2.Core cooling and heat removal 3.Reactor coolant system integrity 4.Containment conditions 5.Radioactivity release control.	4.3	1
	2.4.38	Ability to take actions called for in the facility emergency plan, including (if required)supporting or acting as emergency coordinator.	4.0	1
	2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
	Total			4
Tier 3 Target Point Total (RO/SRO)				17

Facility	Vermont Yanke	Date of Exam:		01/25/99					Exam Level: RO			
Tier	Group	K/A Category Points										Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	2	2	3				2	1			3	13
	2	2	4	2				4	4			3	19
	3			1				1	2				4
	Tier Totals	4	6	6				7	7			6	36
2. Plant Systems	1	2	2	3	2	2	2	4	3	2	4	2	28
	2	2		1	3	2	2	2	2	2	1	2	19
	3	1			1		1		1				4
	Tier Totals	5	2	4	6	4	5	6	6	4	5	4	51
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		
					4		3		3		3		13

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.

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
295005	Main Turbine Generator Trip			X				AK3.03 Feedwater temperature decrease	2.8	1
295006	SCRAM			X				AK3.02 Reactor power response	4.1	1
295007	High Reactor Pressure			X				AK3.04 Safety/relief valve operation: Plant-Specific	4.0	1
295009	Low Reactor Water Level				X			AA1.02 Reactor water level control	4.0	1
295009	Low Reactor Water Level		X					AK2.03 Recirculation system	3.1	1
295010	High Drywell Pressure									
295014	Inadvertent Reactivity Addition									
295015	Incomplete SCRAM	X						AK1.03 Reactivity effects	3.8	1
295015	Incomplete SCRAM						X	2.4.48 Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and directives affect plant and system conditions.	3.5	1
295024	High Drywell Pressure						X	2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes.	3.3	1
295024	High Drywell Pressure		X					EK2.18 Ventilation	3.3	1
295025	High Reactor Pressure				X			EA1.07 ARI/RPT/ATWS: Plant-Specific	4.1	1
295031	Reactor Low Water Level					X		EA2.04 Adequate core cooling	4.6	1
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown						X	2.4.48 Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and directives affect plant and system conditions.	3.5	1
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown	X						EK1.06 Cooldown effects on reactor power	4.0	1
500000	High Containment Hydrogen Concentration									
	K/A Category Point Totals:	2	2	3	2	1	3	Group Point Total:		13

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
295001	Partial or Complete Loss of Forced Core Flow Circulation		X					AK2.01 Recirculation system	3.6	1
295001	Partial or Complete Loss of Forced Core Flow Circulation	X						AK1.02 Power/flow distribution	3.3	1
295001	Partial or Complete Loss of Forced Core Flow Circulation					X		AA2.03 Actual core flow	3.3	1
295002	Loss of Main Condenser Vacuum			X				AK3.09 Reactor power reduction	3.2	1
295003	Partial or Complete Loss of A.C. Power				X			AA1.03 Systems necessary to assure safe plant shutdown	4.4	1
295003	Partial or Complete Loss of A.C. Power		X					AK2.04 A.C. electrical loads	3.4	1
295004	Partial or Complete Loss of D.C. Power		X					AK2.03 D.C. bus loads	3.3	1
295008	High Reactor Water Level						X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	3.7	1
295008	High Reactor Water Level				X			AA1.04 HPCI: Plant-Specific	3.5	1
295011	High Containment Temperature (Mark III Containment Only)									
295012	High Drywell Temperature	X						AK1.01 Pressure/temperature relationship	3.3	1
295013	High Suppression Pool Temperature									
295016	Control Room Abandonment			X				AK3.03 Disabling control room controls	3.5	1
295016	Control Room Abandonment					X		AA2.02 Reactor water level	4.2	1
295017	High Off-Site Release Rate									
295018	Partial or Complete Loss of Component Cooling Water						X	2.4.24 Knowledge of loss of cooling water procedures.	3.3	1
295019	Partial or Complete Loss of Instrument Air					X		AA2.02 Status of safety-related instrument air system loads (see AK2.1 - AK2.19)	3.6	1
295019	Partial or Complete Loss of Instrument Air		X					AK2.03 Reactor feedwater	3.2	1
295020	Inadvertent Containment Isolation									
295022	Loss of CRD Pumps					X		AA2.01 Accumulator pressure	3.5	1
295026	Suppression Pool High Water Temperature						X	2.4.6 Knowledge symptom based EOP mitigation strategies.	3.1	1
295027	High Containment Temperature (Mark III Containment Only)									
295028	High Drywell Temperature				X			EA1.04 Drywell pressure	3.9	1
295029	High Suppression Pool Water Level									
295030	Low Suppression Pool Water Level									
295033	High Secondary Containment Area Radiation Levels				X			EA1.03 Secondary containment ventilation	3.8	1
295034	Secondary Containment Ventilation High Radiation									
295038	High Off-Site Release Rate									

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
600000	Plant Fire On Site									
	K/A Category Point Totals:	2	4	2	4	4	3	Group Point Total:		19

Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
295021	Loss of Shutdown Cooling				X			AA1.02 RHR/shutdown cooling	3.5	1
295021	Loss of Shutdown Cooling					X		AA2.04 Reactor water temperature	3.6	1
295023	Refueling Accidents									
295032	High Secondary Containment Area Temperature			X				EK3.03 Isolating affected systems	3.8	1
295035	Secondary Containment High Differential Pressure									
295036	Secondary Containment High Sump/Area Water Level					X		EA2.02 Water level in the affected area	3.1	1
	K/A Category Point Totals:	0	0	1	1	2	0	Group Point Total:		4

Plant Systems - Tier 2/Group 1

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
201001	Control Rod Drive Hydraulic System								X				A2.11 Valve openings	2.6	1
201002	Reactor Manual Control System							X					A1.02 Control rod position	3.4	1
201002	Reactor Manual Control System											X	2.1.32 Ability to explain and apply system limits and precautions.	3.4	1
201005	Rod Control and Information System (RCIS)														
202002	Recirculation Flow Control System								X				A2.05 Scoop tube lockup: BWR-2, 3, 4	3.1	1
203000	RHR/LPCI: Injection Mode (Plant Specific)			X									K3.03 Automatic depressurization logic	4.2	1
203000	RHR/LPCI: Injection Mode (Plant Specific)									X			A3.08 System initiation sequence	4.1	1
206000	High Pressure Coolant Injection System							X					A1.08 System lineup: BWR-2, 3, 4	4.1	1
206000	High Pressure Coolant Injection System										X		A4.12 Turbine trip controls: BWR-2, 3, 4	4.0	1
207000	Isolation (Emergency) Condenser														
209001	Low Pressure Core Spray System											X	2.1.32 Ability to explain and apply system limits and precautions.	3.4	1
209001	Low Pressure Core Spray System				X								K4.04 Line break detection	3.0	1
209002	High Pressure Core Spray System (HPCS)														
211000	Standby Liquid Control System		X										K2.02 Explosive valves	3.1	1
212000	Reactor Protection System					X							K5.02 Specific logic arrangements	3.3	1
212000	Reactor Protection System										X		A4.07 System status lights and alarms	4.0	1
215003	Intermediate Range Monitor (IRM) System			X									K3.01 RPS	3.9	1
215004	Source Range Monitor (SRM) System							X					A1.05 SCRAM, rod block, and period alarm trip setpoints	3.6	1
215004	Source Range Monitor (SRM) System										X		A4.07 Verification of proper functioning/ operability	3.4	1
215005	Average Power Range Monitor/Local Power Range Monitor System	X											K1.16 Flow converter/comparator network: Plant-Specific	3.3	1
215005	Average Power Range Monitor/Local Power Range Monitor System										X		A4.06 Verification of proper functioning/ operability	3.6	1
216000	Nuclear Boiler Instrumentation								X				A2.11 Heatup or cooldown of the reactor vessel	3.2	1
217000	Reactor Core Isolation Cooling System (RCIC)		X										K2.01 Motor operated valves	2.8	1
218000	Automatic Depressurization System					X							K5.01 ADS logic operation	3.8	1

ES-401 BWR RO Examination Outline ES-401-2

Plant Systems - Tier 2/Group 1

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
223001	Primary Containment System and Auxiliaries														
223002	Primary Containment Isolation System/Nuclear Steam Supply Shut-Off	X											K1.01 Main steam system	3.8	1
239002	Relief/Safety Valves						X						K6.05 Discharge line vacuum breaker	3.0	1
241000	Reactor/Turbine Pressure Regulating System			X									K3.11 RPS	3.8	1
259001	Reactor Feedwater System									X			A3.01 RFP auto start: Plant-Specific	3.3	1
259001	Reactor Feedwater System						X						K6.02 Condensate system	3.3	1
259002	Reactor Water Level Control System														
261000	Standby Gas Treatment System							X					A1.01 System flow	2.9	1
264000	Emergency Generators (Diesel/Jet)				X								K4.01 Emergency generator trips (normal)	3.5	1
	K/A Category Point Totals:	2	2	3	2	2	2	4	3	2	4	2	Group Point Total:		28

Plant Systems - Tier 2/Group 2

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
201003	Control Rod and Drive Mechanism	X											K1.01 Control rod drive hydraulic system	3.2	1
201003	Control Rod and Drive Mechanism											X	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
201004	Rod Sequence Control System (Plant Specific)														
201006	Rod Worth Minimizer System (RWM) (Plant Specific)					X							K5.01 Minimize clad damage if a control rod drop accident (CRDA) occurs: P-Spec(Not-BWR6)	3.3	1
202001	Recirculation System								X				A2.06 Inadvertent recirculation flow decrease	3.6	1
204000	Reactor Water Cleanup System								X				A2.07 Loss of plant air systems	2.5	1
205000	Shutdown Cooling System (RHR Shutdown Cooling Mode)					X							K5.02 Valve operation	2.8	1
214000	Rod Position Information System														
215002	Rod Block Monitor System						X						K6.05 LPRM detectors: BWR-3, 4, 5	2.8	1
219000	RHR/LPCI: Torus/Suppression Pool Cooling Mode										X		A4.14 The overrides for suppression pool cooling valve logic: Plant-Specific	3.7	1
226001	RHR/LPCI: Containment Spray System Mode														
230000	RHR/LPCI: Torus/Suppression Pool Spray Mode														
239001	Main and Reheat Steam System														
245000	Main Turbine Generator and Auxiliary Systems							X					A1.02 Turbine speed	2.6	1
256000	Reactor Condensate System														
262001	A.C. Electrical Distribution									X			A3.03 Load shedding	3.4	1
262002	Uninterruptable Power Supply (A.C./D.C.)				X								K4.01 Transfer from preferred power to alternate power supplies	3.1	1
263000	D.C. Electrical Distribution				X								K4.01 Manual/ automatic transfers of control: Plant- Specific	3.1	1
263000	D.C. Electrical Distribution			X									K3.03 Systems with D.C. components (i.e. valves, motors, solenoids, etc.)	3.4	1
271000	Offgas System	X											K1.06 Main steam system	2.8	1
272000	Radiation Monitoring System						X						K6.01 Reactor protection system	3.0	1

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
272000	Radiation Monitoring System							X					A1.01 Lights, alarms, and indications associated with normal operations	3.2	1
286000	Fire Protection System									X			A3.01 Fire water pump start	3.4	1
290001	Secondary Containment														
290003	Control Room HVAC														
300000	Instrument Air System (IAS)				X								K4.01 Manual/automatic transfers of control	2.8	1
400000	Component Cooling Water System (CCWS)											X	2.4.11 Knowledge of abnormal condition procedures.	3.4	1
	K/A Category Point Totals:	2	0	1	3	2	2	2	2	2	1	2	Group Point Total:		19

Plant Systems - Tier 2/Group 3

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
215001	Traversing In-Core Probe														
233000	Fuel Pool Cooling and Clean-up								X				A2.02 Low pool level	3.1	1
234000	Fuel Handling Equipment				X								K4.02 Prevention of control rod movement during core alterations	3.3	1
239003	MSIV Leakage Control System														
268000	Radwaste														
288000	Plant Ventilation Systems						X						K6.03 Plant air systems	2.7	1
290002	Reactor Vessel Internals	X											K1.02 Recirculation system	3.2	1
	K/A Category Point Totals:	1	0	0	1	0	1	0	1	0	0	0	Group Point Total:		4

Facility Vermont Yankee	Date: January 25, 1999		Exam Level:	RO
Category	KA #	KA Topic	Imp.	Points
Conduct of Operations	2.1.1	Knowledge of conduct of operations requirements.	3.7	1
	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	3.0	1
	2.1.21	Ability to obtain and verify controlled procedure copy.	3.1	1
	2.1.22	Ability to determine Mode of Operation.	2.8	1
	Total			4
Equipment Control	2.2.13	Knowledge of tagging and clearance procedures.	3.6	1
	2.2.13	Knowledge of tagging and clearance procedures.	3.6	1
	2.2.22	Knowledge of limiting conditions for operations and safety limits.	3.4	1
	Total			3
Radiation Control	2.3.1	Knowledge of 10 CFR 20 and related facility radiation control requirements.	2.6	1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9	1
	Total			3
Emergency Procedures and Plan	2.4.12	Knowledge of general operating crew responsibilities during emergency operations.	3.4	1
	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions including: 1.Reactivity control 2.Core cooling and heat removal 3.Reactor coolant system integrity 4.Containment conditions 5.Radioactivity release control.	3.7	1
	2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
	Total			3
Tier 3 Target Point Total (RO/SRO)				13

Facility: Vermont Yankee	Date of Examination: 01/25/99
Examination Level: RO	Operating Test No: #1

System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description
1. SDC/Restart SDC Following Short Term Shutdown/N,S,L	4	a. 205000K402 - 3.7/3.8 - SDC Isolation Switch operation
		b. 205000G2.4.48 - 3.5/3.8 - SDC flowpaths with idle recirc loop
2. Open MSIV's After a Group I Isolation /D, ,S	5	a. 223002K406 - 3.4/3.5 - PCIS vs other isolations, reset requirements
		b. 223002K607 - 3.2/3.3 - Reset MSIVs after loss of power to one solenoid
3. DG/Secure "A" DG From Op Readiness Demonstration - Monthly/D,S	6	a. 264000A201 - 3.5/3.6 - Logic print use to describe stopping DG from CR while loaded
		b. 264000G2.4.35 - 3.3/3.5 - Local actions for DG failure to start on a LNP
4. Exiting the Power-to-Flow Exclusion Region W/ Oscillations /N, A, S	1	a. 201001G2.1.25 - 2.8/3.1 - Overcharging HCU accumulator effects
		b. 201001A308 - 3.0/2.9 - Rod insertions with failed stabilizing valve
5. Condensate/Emergency Fill The Main Condenser With Service Water/D,S	2	a. 256000G2.1.24 - 2.8/3.1 - SW Alternate Cooling vs condenser emergency fill
		b. 256000K604 - 2.8/2.8 - Loss of 4KV voltage protection affect on Condensate Pumps
6. RPS/Immediate Actions For Control Room Evacuation/N,S	7	a. 212000A212 - 4.0/4.1 - TSV input to RPS Logic
		b. 212000A412 - 3.9/3.9 - Half scrams vs SDV isolations
7. EHC/Perform Emergency Governor Test From CRP 9-7/D,S	3	a. 241000K413 - 2.9/3.0 - Prevention of turbine trip during testing
		b. 241000A107 - 3.8/3.7 - Bypass Jack operation while at power
8. SLC/Boron Injection Using CRD System From SLC Tank/N,P,R	1	a. 211000A10 - 4.0/4.1 - Flowpath SLC storage tank to reactor vessel for this lineup
		b. 211000G2.1.24 - 2.8/3.1 - How this lineup impacts CRD operation.
9. PCIS/Bypass PCIS Group I Isolation Signals/D,P	5	a. 223002K408 - 3.3/3.7 - One jumper not installed affect on isolation logic.
		b. 223001A302 - 3.5/3.5 - Separated MSIV disc, plant, PCIS, RPS response
10. RCIC/Operate RCIC From Alternate Shutdown Panel/M,P, R	2	a. 217000A301 - 3.5/3.5 - RCIC Min Flow Valve response at Alt Shutdown Panel
		b. 217000A207 - 3.1/3.1 - RCIC response to loss of oil pressure and why.

* 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

Facility: Vermont Yankee
Date of Examination: 01/25/99
Examination Level: SRO(I)
Operating Test No: #2

System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description
1. Feedwater/Transfer Level Control Aux To Main Feed Reg Valve/D,S,L	2	a. 259002K410 - 3.4/3.4 - Power changes while in single element control
		b. 259001K301 - 3.9/3.9 - Loss of FRV control signal plant response
2. SBGT/Manually Initiate SBGT Train "A" /D, S	9	a. 261000K302 - 3.6/3.9 - Inop SBGT vs Secondary Containment Integrity
		b. 261000A304 - 3.0/3.1 - SBGT heater indications during an accident
3. AC Dist/Energize Bus 8 From Bus 9/ D,S	6	a. 215005K601 - 3.7/3.8 - Bus loss with inop APRMs
		b. 212000A412 - 3.9/3.9 - Reset SDV scram with loss of RPS bus
4. MHC/Swap From EPR To MPR/ N,S	3	a. 241000K607 - 3.4/3.4 - Effects of failed steam pressure signal on MPR
		b. 241000A409 - 3.2/3.1 - TCV/IV operations on slow and fast overspeed
5. Exiting the Power-to-Flow Exclusion Region W/ Oscillations /N, A, S	1	a. 201001G2.1.25 - 2.8/3.1 - Overcharging HCU accumulator effects
		b. 201001A308 - 3.0/2.9 - Rod insertions with failed stabilizing valve
6. PCIS/Reset A Group III Isolation/ D,S	5	a. 223002A403 - 3.6/3.5 - Attempted reset with failed valve switch contacts
		b. 223002K408 - 3.3/3.7 - RHR/SDC isolations from Alternate Shutdown Panels
7. HPCI/RPV Venting Via HPCI/ D,S	4	a. 295024K104 - 3.6/3.9 - Minimum RPV Flooding Pressure during Emergency Depress
		b. 295024G2.4.21 - 3.7/4.3 - Post ED SRV actions with lowering torus water level
8. RPS/Startup The "A" RPS MG Set/ D,P	7	a. 212000K602 - 3.7/3.9 - APRM vs RPS Tech Spec actions
		b. 212000G2.2.26 - 2.5/3.7 - RPS operable trips during refueling interlock checks
9. CTMT/Manually Open Containment Spray Valve/N,P,R	5	a. 223001G2.2.22 - 3.4/4.1 - Operability of manually operated MOV
		b. 223001A210 - 3.6/3.8 - Drywell leak location determination
10. SDC/Placing SDC Isolation Valve On Alternate Power/N,P	4	a. 295021A205 - 3.4/3.4 - Thermal stratification indications
		b. 295021G2.1.22 - 2.8/3.3 - Time to mode change on loss of SDC

* 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

Facility: Vermont Yankee	**Date of Examination: 01/25/99**
Examination Level: SRO(U)	**Operating Test No: #3**

System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description
1. Feedwater/Transfer Level Control Aux To Main Feed Reg Valve/D,S,L	2	a. 259002K410 - 3.4/3.4 - Power changes while in single element control
		b. 259001K301 - 3.9/3.9 - Loss of FRV control signal plant response
2. Exiting the Power-to-Flow Exclusion Region W/ Oscillations /N, A, S	1	a. 201001G2.1.25 - 2.8/3.1 - Overcharging HCU accumulator effects
		b. 201001A308 - 3.0/2.9 - Rod insertions with failed stabilizing valve
3. N/A		a.
		b.
4. MHC/Swap From EPR To MPR/ N,S	3	a. 241000K607 - 3.4/3.4 - Effects of failed steam pressure signal on MPR
		b. 241000A409 - 3.2/3.1 - TCV/IV operations on slow and fast overspeed
5. N/A		a.
		b.
6. N/A		a.
		b.
7. N/A		a.
		b.
8. N/A		a.
		b.
9. CTMT/Manually Open Containment Spray Valve/N,P,R	5	a. 223001G2.2.22 - 3.4/4.1 - Operability of manually operated MOV
		b. 223001A210 - 3.6/3.8 - Drywell leak location determination
10. SDC/Placing SDC Isolation Valve On Alternate Power/N,P	4	a. 295021A205 - 3.4/3.4 - Thermal stratification indications
		b. 295021G2.1.22 - 2.8/3.3 - Time to mode change on loss of SDC

* 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

Simulation Facility: Vermont Yankee	**Scenario No.:** #1		
Examiners: ________	**Operators:** ________	SCRO	
________	________	CRO	
________	________	ACRO	

Objectives: Evaluate the crew's ability to operate plant equipment to support a normal power ascension, respond to and evaluate (TS) a level instrument failure and the resultant reactivity addition transient, recognize and take action for a Recirc Pump seal failure, recognize and limit the positive reactivity from a runaway Recirc Pump, determine the affect of a loss of a 480 VAC ECCS bus on plant operation, and to implement the EOPs to monitor and control plant parameters for a major primary containment steam leak resulting in emergency depressurization as well as recognizing the inability to spray the drywell.

Initial Conditions: IC-87, 40% power, ready for second Feedwater Pump Start

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malf. No.	Event Type*	Event Description
1		R CRO SCRO	Continue power ascension IAW OP-0105
2		N ACRO SCRO	Start the second Feedwater Pump
3	RR18A HP03	I ACRO SCRO	ECCS level instrument failure, Inadvertent HPCI initiation (TS)
4	RR07B RR08B	C CRO SCRO	"B" Recirc Pump lower and upper seal failure
5	RR10	I CRO SCRO	"A" Recirc Pump speed controller failure, pump speed increasing
6	ED05C	C CRO ACRO SCRO	480 VAC ECCS Bus 8 fails
7	MS06	M CRO ACRO SCRO	Steam line leak in the drywell - emergency depressurization
8	RH03A	C ACRO SCRO	Drywell Spray Valves do not open.

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

Event Description: Power ascension IAW OP-0105

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct continued power ascension IAW OP 0105 Phase 4 A.23
	CRO	Continue control rod withdrawals per the sequence and limits VYOPF 2404.01 For each control rod withdrawal: – Desired control rod selected – Rod Movement Control Switch on CRP 9-5 positioned to "Notch Out" – Observes normal drive pressure, flow and RMCS indications – Monitors nuclear instrumentation for proper response
	ACRO	Monitor plant parameters/assist as necessary Make preparations for second Feedwater Pump start

Op Test No.: **Scenario No.: #1** **Event No.: 2** **Page 2 of 10**

Event Description: "C" Feedwater Pump start

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct startup of "C" Feedwater Pump per Phase 4 section B of OP 0105
	ACRO	Start the second feedwater pump per OP 0105 Phase 4.B – Review Phase 2 & 4 Precautions and Administrative Limits – Verify both heater strings are in service – Verify Standby Lube Oil pump in service – Close feed pump discharge valve (FDW-4C) – Position "C" pump control switch to "Start" – Verify pump breaker closes, discharge valve opens and auxiliary lube oil pump stops – Check seal water temp. – Monitor lube oil and bearing temps until stabilized – Monitor running current (max. 666 amps) – Check bus 3 / 4 undervoltage relay targets
	CRO	Observe system flow and reactor level stabilizes
	ACRO	Report "C" Feedwater Pump placed in service. Place "B" Feedwater Pump in Standby – Control switch placed in "Auto" – Open Feedwater Pump Discharge Valve (FDW-4B)

Op Test No.: **Scenario No.: #1** **Event No.: 3** **Page 3 of 10**

Event Description: ECCS level instrument (LT-72A) failure low, Inadvertent HPCI initiation (TS)

Cause: Electrical short in low level sensing circuit (K1 & K2 energize)

Initial Automatic Actions: HPCI initiation and injection, alarms 9-3 R-1 & R-5 for SBGT start

Effects (General Sequence): Power and level increase (positive reactivity addition)

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	Recognize/report ECCS level instrument LT-72A on CRP 9-5 downscale, inform SCRO
		Recognize/report HPCI initiation and injection beginning, inform SCRO
	SCRO	Enter/direct actions IAW OT 3110, Positive Reactivity Insertion"
		May refer to OT 3114, "Reactor High Level", may direct securing one SBGT train
	ACRO	Verifies by two or more independent indications that HPCI initiation is spurious, informs SCRO
		Secure HPCI – Press/hold the HPCI Turbine Trip/Inhibit pushbutton selector switch then rotate to "Inhibit" – Verify HPCI Stop & Control Valves close & Aux Oil Pump auto starts
		Verify both Standby Gas Treatment Trains running – Open SGT-1A and 1B – Secure one train when/if directed
	CRO	Verify reactor power and level return to normal.
	SCRO	Refer to Tech. Spec. 3.5.E and Table 3.2.1, determine HPCI is Inoperable but available if needed to inject, 24 hour shutdown with RCIC Inoperable
		Direct I&C investigate cause of failure.

Op Test No.: **Scenario No.: #1** **Event No.: 4**

Event Description: "B" Recirc Pump upper and lower seal failure

Cause: Worn seals

Initial Automatic Actions: Initially receive alarms 9-4 G-1 & G-2

Effects (General Sequence): Both seals on the "B" Recirc pump fail requiring pump removal and isolation, increasing drywell temperature/pressure until isolated

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	Recognize/take action IAW 9-4 G-2 & G-1, inform SCRO – Monitor "B" Recirc Pump parameters – Determine failure of both pump seals, inform SCRO – Monitor Drywell equipment drain sump, temperature and pressure
	SCRO	Enter/direct actions IAW ON 3142, "Recirc Pump Seal Failure" – Direct "B" Recirc Pump shutdown and isolation Enter/direct actions IAW OT 3117, "Reactor Instability", and OT 3118, "Recirc Pump Trip" – May direct monitoring for reactor instabilities Refer to Tech Spec 3.6.G and direct actions for single loop operation, inform RE
	CRO	Secure and isolate the "B" recirc pump IAW ON 3142 – Open "B" Recirc Pump MG Set Motor Breaker – Close suction valve RV-43B – When suction indicates closed, close discharge bypass valve RV-54B and discharge valve RV-53B – Direct Aux Operator to secure seal purge IAW OP 2111 – Place controller in "Manual" and run down to "minimum"
	CRO	Determine operating point on COLR Figure 2.4-1 Monitor LRPM readings by selecting STBLTY on ERFIS – May initiate stability monitoring

Op Test No.: **Scenario No.: #1** **Event No.: 5** **Page 5 of 10**

Event Description: "A" Recirc Pump speed controller failure, pump speed increasing

Cause: Master Controller output failure high

Initial Automatic Actions: Reactor power rise, alarms 9-5 D-2 & D-3

Effects (General Sequence): Pump speed increasing, power rise

Time	Position	Applicant's Actions Or Behavior
	CRO	Recognize/report rising reactor power, inform SCRO Recognize/report "A" Recirc Pump speed rising, inform SCRO Recognize/take actions IAW 9-5 D-2 & D-3 – Monitor flow and power to confirm control rod blocks
	SCRO	Enter/direct actions IAW 0T 3110, "Positive Reactivity Insertion" – Direct the manual control of "A" Pump controller (may already be in manual)
	CRO	When directed raise speed of "A" Recirc Pump to 50-70% – Place pump controller in "Manual" (or use Master) and raise pump speed – Do not exceed 1% CTP/min power change
	SCRO	Contact I&C and inform them of the recirc flow controller failure.
	ACRO	Monitor RPV level pressure and power for return to normal Assist as necessary

Op Test No.: **Scenario No.: #1** **Event No.: 6** **Page 6 of 10**

Event Description: 480 VAC ECCS Bus 8 fails

Cause: Bus fault due to ground on 8

Initial Automatic Actions: Half scram, PCIS Group 3 isolation, multiple alarms

Effects (General Sequence):

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	Recognize/take actions IAW 9-5 K-1, inform SC RO – Recognize half scram and PCIS GP 3 isolation – Recognize loss of 480 VAC Bus 8
	SCRO	Take actions for loss of Bus 8 – Direct identification of lost loads – Direct backup of PCIS GP 3 Refer to Tech Spec 3.5.B. – Determine 30 day shutdown LCO required – Other LCOs reviewed Direct troubleshooting/repair
	CRO/ ACRO	Determine the following loads lost on Bus 8, inform SCRO – A RPS half scram – PCIS GP 3 isolation – B CRD pump loss – B RBCCW pump – A TBCCW pump – B RHR – B CS – B SBGT

Event Description: 480 VAC ECCS Bus 8 fails (Con't)

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	– B SBLC pump – Stack Gas I,II,III indication loss – Loss of RWCU (CU-15 loss of power) – Vital MG Set swap to DC drive – Loss of RCIC (RCIC-15 loss of power)
	ACRO	Backup Group 3 isolations IAW posted Operator Aid

Op Test No.: **Scenario No.: #1** **Event No.: 7** **Page 8 of 10**

Event Description: Steam line leak in the drywell

Cause: "A" MSL 18 inch pipe rupture between reactor vessel and flow restrictor

Initial Automatic Actions: High drywell pressure scram

Effects (General Sequence): Slowly rising drywell pressure to scram setpoint then rapid increase MSIV high flow closure setpoint

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	Recognize rising drywell pressure, inform SCRO – Check backpanel indications
		Recognize/take actions IAW 9-5 G-1 & F-1 – Check for leaks – Maximize drywell cooling
	SCRO	Enter/direct actions IAW OT 3111, "High Drywell Pressure" – Direct power reduction/ transfer house loads/manual scram
	.	Direct manual scram per OT-3100 and enter/direct actions IAW EOP-1 and 3
	CRO	Insert manual scram when directed/recognize automatic scram on high drywell pressure, inform SCRO – Press manual scram pushbuttons, concurrently execute OT-3100.
		Recognize/report EOP-1 and 3 entries on high drywell pressure.
		May recognize high steam flow in "A" MSL, inform SCRO
	ACRO	Monitor and report RHR, CS, EDG and SBGT initiations and PCIS GROUP 2, 3 and 4 isolations. Noting failures from previous power failure.
		Recognize/report MSIV closure on low pressure/high flow

Op Test No.:	Scenario No.: #1	Event No.: 7	Page 9 of 10

Event Description: Steam line leak in the drywell (Con't)

Time	Position	Applicant's Actions Or Behavior
	CRO	Maintain level in 127 - 177 inches using preferred systems (Feedwater and HPCI.)
	ACRO	Close MSIVs to control cooldown rate if necessary due to steam flow from auxiliaries Attempt reactor pressure control below 1055 psig, report pressure lowering with MSIVs closed Report drywell/torus pressure trending up to 10 psig
CT	SCRO	Direct Torus Sprays on "A" RHR loop before torus pressure reaches 10 psig
	ACRO	Place "A" RHR in torus spray per OP 2124, Appendix D: – Place CRP 9-3 RHRSW PP LPCI A/C AUTOSTOP OVERRIDE SWITCH to MANUAL OVERRD – Start one RHRSW pump – Adjust RHR-89A to maintain RHRSW pressure at >20 psig above RHR pressure and to achieve RHRSW HX flow 2950-3050 gpm – Start appropriate RHR pump – Turn RHR LOGIC CTMT SPRAY VLV LPCI SIG BYPASS to MANUAL – Open RHR-39A – Open RHR-38A – Close RHR-65A if desired – Report torus sprays initiated
CT	SCRO	Direct drywell sprays with "A" RHR loop before reaching "Unsafe" region of DWSIL graph – Verify torus level < 22.8 ft and in "Safe" region of DWSIL graph

Op Test No.: **Scenario No.: #1** **Event No.: 8**

Event Description: Drywell Spray Valve (RHR-26A) motor overload failure

Cause: Containment spray valve mechanically binds in the closed position.

Initial Automatic Actions: N/A

Effects (General Sequence): Valve will not open from Control Room

Time	Position	Applicant's Actions Or Behavior
	ACRO	Place "A" RHR loop in Drywell spray per OP-2124, Appendix E: – Check closed RHR-34A – Open RHR31A – Open RHR-26A – Report inability to open RHR-26A – Recognize loss of valve position indication when drywell spray valve opened
	SCRO	Direct ACRO to coordinate with Aux Operator to locally open RHR-26A loop spray valve – Recognize RHR-26B not available due to bus loss
CT		Recognize torus level/pressure cannot be maintained in the "Safe" region of PSP graph or drywell temperature cannot be maintained below 280 deg. F, Exits EOP-1, RPV pressure leg , enter/direct actions IAW EOP-5 – Direct rapid depressurization with bypass valves/may go direct to Emergency Depressurization
	ACRO	Perform an Emergency Depressurization when directed – Prevent injection from CS and RHR Pumps – Open all SRVs Report Aux Operator is able to manually open "A" RHR Drywell Spray valve – Recognize/report lowering drywell pressure once valve is open
	SCRO	Classify event IAW AP 3125 – Alert per A-3-b/A-3-a

Simulation Facility: Vermont Yankee **Scenario No.:** #2 **Op Test No.:**

Examiners: ____________ **Operators:** ____________ SCRO

____________ ____________ CRO

____________ ____________ ACRO

Objectives: Evaluate the crew's ability to operate plant equipment to support a normal power ascension, to perform and recognize a failure of safety related equipment and implement the required TS, recognize an instrumentation failure and resulting single control rod scram, recognize increasing turbine vibrations, to insert a manual scram after recognizing two control rods scram, and to implement the EOPs to monitor and control plant parameters for a full core ATWS with an inability to inject boron and with inadequate pressure control capability including a determination that lowering reactor water level is required to control power.

Initial Conditions: IC- 89, 85% power

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malf. No.	Event Type*		Event Description
1		R	CRO SCRO	Continue power ascension IAW OP-0105
2	Override	N	ACRO SCRO	Core Spray surveillance. Pump trips.
3	TU03A	C	ACRO SCRO	Main turbine bearing number 1, high vibration, slowly increasing
4	NM05C RD06	I C	CRO SCRO	APRM "C" failure upscale, control rod 22-15 scram, blown pilot valve fuse
5	Override RD06	I C	CRO SCRO	Half scram from Event 3 will not reset, two control rods scram: 38-15, 06-27
6	RD12A & B	M	CRO ACRO SCRO	SDV hydraulic lock - ATWS
7	SL01A & B	C	CRO ACRO SCRO	"A" SLC Pump trips, "B" SLC Pump trips
8	TC03	C	ACRO SCRO	7 of 10 Turbine Bypass Valves do not open

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

Op Test No.: **Scenario No.:** **#2** **Event No.:** **1** **Page 1 of 9**

Event Description: Continue with the reactor startup in accordance with OP 0105

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct CRO to continue power ascension to 90% using recirc flow with a 1% power change per 3 minutes limit
	CRO	Raises power to 90% IAW OP 0105 Using the Recirc Master Manual Controller, raises recirc flow 1% power change per 3 minutes Monitors recirc flow and nuclear instrumentation
	ACRO	Monitors plant parameters/assists as necessary Makes preparations for Core Spray surveillance

Op Test No.: **Scenario No.: #2** **Event No.: 2** **Page 2 of 9**

Event Description: Core Spray System "B" Surveillance Test/Pump Trip

Cause: Under Investigation

Initial Automatic Actions: N/A

Effects (General Sequence): Upon starting pump and opening CS-26B, pump will trip.

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct ACRO to commence full flow surveillance test OP 4123 for the "B" Core Spray Pump.
	ACRO	Reviews OP 4123 Admin limits and Precautions Starts the "B" Core Spray pump Verifies Min Flow Valve (CS-5B) remains open, ADS Permissive RHR/CS Running alarm received and RRU-8 starts Opens CS-26B to achieve 3100 gpm
CT		Recognize Pump trips
	SCRO	Refer to Tech Spec 3.5.A Declare "B" Core Spray inoperable 7 days to restore, 24 hours to complete surveillances on other CS loop
		Direct ACRO to secure "B" Core Spray/return the system to "Standby"
	ACRO	Secure "B" Core Spray Verify ADS Permissive RHR/CS Running alarm clears and RRU-8 stops
	CRO	Monitor plant parameters/assist as necessary

Op Test No.: **Scenario No.: #2** **Event No.: 4** **Page 4 of 9**

Event Description: APRM "C" Fails Upscale and Control Rod 22-15 scrams

Cause: The APRM fails due to a failure in the Averaging Amplifier, and the rod scrams due to a Blown fuse.

Initial Automatic Actions: Alarms 9-5 K-1, L-2 , M-1, M-3, B-8, D-3 & D-5

Effects (General Sequence): APRM upscale alarm with half scram. Concurrent single rod scram

Time	Position	Applicant's Actions Or Behavior
	CRO	Recognize/take action IAW 9-5 K-1, L-2, M-2 & M-3, inform SCRO Recognize APRM "C" upscale and half scram Recognize rod drift alarm
		Recognize control rod 22-15 has scrammed, inform SCRO - Verifies only one rod scrammed - Monitors power, pressure, level
	ACRO	Checks APRM "C" upscale on the back panel
	SCRO	Refers to Tech Specs 1.1 and 3.1
		Enter/direct actions IAW OT 3167 and 3166 - Inform Reactor Engineer - Initiate Event Report per AP 0009.
	CRO	Select scrammed control rod and verify fully inserted
		Reduce core flow to 27.5 - 29 Mlbm/hr

Op Test No.: **Scenario No.: #2** **Event No.: 3** **Page 3 of 9**

Event Description: Main turbine bearing vibration slowly rises.

Cause: Rotor Unbalance

Initial Automatic Actions: Alarm 9-7 F-2

Effects (General Sequence): Turbine vibration slowly rising

Time	Position	Applicant's Actions Or Behavior
	ACRO	Recognize/take action IAW 9-7 F-2, inform SCRO Monitors Vibration Recorder R-110-1 and confirm a rising vibration condition Continues to monitor turbine vibration trend
	SCRO	Direct Turbine load reduced not to exceed 1%/minute reactor power
	ACRO	Reduces VARs on the Main Generator if directed. Reduce turbine load with speed/load changer Recognize vibration rising rate is slowing, inform SCRO
	CRO	Reduces load using Recirc flow as directed, if not at minimum Inserts control rods to reduce load

Op Test No.: **Scenario No.: #2** **Event No.: 5** **Page 5 of 9**

Event Description: Event 3 Half Scram Fails to Reset, Causes Two Control Rods to Scram: 38-15,06-27

Cause: Blown Fuse

Initial Automatic Actions: N/A

Effects (General Sequence): Half scram will not reset, when attempted, two control rods scram

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct Event 3 APRM "C" bypassed, half scram reset
	CRO	Bypasses APRM "C"
		Attempts to reset half scram, recognize will not reset, inform SCRO
CT		Recognize two control rods (38-15, 06-27) scram, inform SCRO Inform SCRO inserting manual scram
	SCRO	Acknowledge manual scram per OT 3167, "Control Rod Drift" (2 rods scrammed)
		Enter/directs actions IAW OT 3100 Directs manual scram inserted
	ACRO	Continue monitoring/reporting rising turbine vibrations

Op Test No.: **Scenario No.: #2** **Event No.: 6** **Page 6 of 9**

Event Description: SDV Hydraulic Lock - ATWS

Cause: SDV blockage

Initial Automatic Actions: Normal RPS scram indications, no rod motion

Effects (General Sequence): No rod motion, manual scram and ARI do not work

Time	Position	Applicant's Actions Or Behavior
CT	CRO	Insert manual reactor scram, recognize failure to scram, inform SCRO - Initiate ARI/RPT - Inform SCRO rods have not inserted
	SCRO	Enter/direct actions IAW EOP-2 concurrently with OT 3100/EOP-1 - Direct initiation of ARI/RPT
CT		Direct SLC initiation before 110 degrees F in Torus
		Determines hydraulic ATWS exists - Direct EOP-2 Appendix E-H actions as necessary
	ACRO	Inhibits ADS
		Bypass MSIV low level interlock per Appendix P when directed
		Verify turbine trips on scram

Op Test No.:	Scenario No.: #2	Event No.: 7	Page 7 of 9

Event Description: "A" SLC Pump trips, "B" Pump Fails to Start

Cause: Overcurrent trip, relay failure, high vibration

Initial Automatic Actions: Alarms 9-5 K-4 & L-4

Effects (General Sequence): Either SLC Pump started trips after 10 seconds, Main turbine trip places pressure control on the bypass valves

Time	Position	Applicant's Actions Or Behavior
	CRO	Starts the "A" SLC Pump - Monitors normal start indications and indications of injection - Verify RWCU isolates Recognize "A" SLC Pump trips, informs SCRO Starts the "B" SLC pump Recognizes the pump trips, informs SCRO Direct troubleshooting "A" and "B" SLC Pump
	ACRO	Recognize/take actions IAW 9-5 K-4/L-4, inform SCRO of main turbine trip - Verify MSIVs open and turbine bypass valves opening to control pressure, recognize not all bypass valves responding
	CRO	Performs Appendix F & G actions for rod insertion as time allows

Event Description: 7 of 10 Bypass Valves Fail to Open/Lowering Reactor water Level

Cause: Valve servo failures

Initial Automatic Actions: N/A

Effects (General Sequence): Only 1 valve opens, pressure rises, SRVs may open if operators do not open them

Time	Position	Applicant's Actions Or Behavior
	ACRO	Recognize that more than 3 bypass valves should be open and that reactor pressure is rising, inform SCRO - Open SRVs as necessary to augment Bypass Valves to maintain pressure less than 1055 psig (800-1000 psig)
	SCRO	Direct terminate and prevent injection and lower level to 90 inches - When power <2% or TAF or SRVs closed with <2.5 psig drywell pressure, direct injection to maintain -22 inches and level to which it was lowered
		Enter/direct actions IAW EOP-3 for high torus temperature Direct implementation of Appendix P
	ACRO	Terminates and prevents Feed and Condensate Feed Pumps in "pull-to-lock" Close HP Heater Outlet Valves (FDW-7A & B) Monitors power and level
		Terminates and prevents HPCI, CS and RHR CS and RHR Pumps in "pull-to-lock" HPCI in "Inhibit" Monitors power and level
		Place available RHR in torus cooling

Op Test No.: **Scenario No.: #2** **Event No.: 8** **Page 9 of 9**

Event Description: 7 of 10 Bypass Valves Fail to Open/Lowering Reactor water Level (Con't)

Time	Position	Applicant's Actions Or Behavior
	CRO	When directed, injects with Condensate/Feedwater to maintain level –22 inches and the level it was lowered to
	SCRO	Monitors plant parameters Exit EOP-2 and Enter EOP-1 when reactor shutdown Classify event IAW AP 3125 Site Area Emergency IAW S-7-c

Simulation Facility: Vermont Yankee	Scenario No.: #3	Op Test No.:
Examiners: ____	Operators: ____ SCRO	
____	____ CRO	
____	____ ACRO	

Objectives: Evaluate the crew's ability to remove plant equipment from service, recover from CRD pump trip, evaluate the TS for failure of plant equipment, evaluate TS for failed jet pump and commence plant shutdown, recognize a Recirc Pump failure to respond during the power reduction, take actions for a fuel failure including a manual scram, recognize RCU leak with failure to isolate, and to implement the EOPs to monitor and control plant parameters for a leak with fuel failure outside the primary containment while recognizing and taking actions for plant equipment failures.

Initial Conditions: IC-83, 100% power, "C" RHR Pump in Torus cooling

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malf. No.	Event Type*	Event Description
1		N ACRO SCRO	Secure Torus Cooling
2	CD01	C CRO SCRO	CRD Pump Trip
3		R CRO SCRO	Power reduction for jet pump failure
4	RR10 RR11A	I CRO SCRO	Master flow controller failure (lowering Recirc Pump Speed)/"A" Recirc Pump does not respond
5	RX01	M CRO ACRO SCRO	Fuel failure slowly increasing
6	CU03	M CRO ACRO SCRO	Reactor Water Cleanup leak with failure to isolate/reactor leak to secondary containment
7	ED12B	C ACRO SCRO	4 KV Bus fails to auto transfer
8	DG05A	C ACRO SCRO	"A" Diesel Generator fails to auto start

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

Op Test No.:	Scenario No.: #3	Event No.: 1	Page 1 of 8

Event Description: Remove the "C" RHR pump from service, secure Torus cooling

Initial Automatic Actions: N/A

Effects (General Sequence): Secure valve lineup and secure the RHR and RHRSW pumps.

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct ACRO to secure torus cooling, return RHR to Standby
	ACRO	Secures torus cooling IAW OP 2124, Section E – Close RHR-34A, Torus cooling – Secure the "C" RHR Pump
	ACRO	Complete securing torus cooling – Close RHR-39A – Secure running RHRSW Pump – Open/check open RHR-65A – Open/check open RHR-16A
	CRO	Monitor plant parameters/assist as necessary

Op Test No.: **Scenario No.: #3** **Event No.: 2** **Page 2 of 8**

Event Description: CRD Pump Trip

Initial Automatic Actions: N/A

Effects (General Sequence): CRD Pump Trip annunciator, CRD pressures go to zero.

Time	Position	Applicant's Actions Or Behavior
	CRO	Recognize CRD Pump Trip - consult ARS for pump trip annunciator
	SCRO	Enter and direct actions IAW ON 3145, Loss of CRD Regulation Function
	CRO	Start the Standby CRD pump – Place Flow Control Valve in Manual and Close – Start the Alternate CRD pump – Reestablish 48-52 gpm (+/- 3 GPM for each RR seal) - Place CRD controller in Auto - Verify charging header pressure at 1400- 1500 psig
	SCRO	- Consult Tech Spec 3.3. No requirements.

Op Test No.:	Scenario No.: #3	Event No.: 3	Page 3 of 8

Event Description: Jet Pump Failure/Tech Spec Shutdown Required

Cause: Jet pump riser is failed on Jet Pump 11 & 12 (L & M)

Initial Automatic Actions: N/A

Effects (General Sequence): Reduced core flow, power reduction

Time	Position	Applicant's Actions Or Behavior
	SCRO	Enter/direct actions IAW ON 3141
		Inform Duty and Call Officer, and Ops Manager
		Refer to Tech Spec 3.6.F – Declare Jet Pump "L" & "M" inoperable – Required to be in cold shutdown in 24 hours
		Direct immediate power reductions IAW OP 0105
		Notify Load Dispatcher
	CRO	Commence power reduction when directed, IAW OP 0105 - Using the Rx Recirc Master Manual Controller, lowers recirc flow - Reduction rate < 10%/min - Monitors recirc flow and nuclear instrumentation
	ACRO	Monitor plant conditions/assist as necessary

Op Test No.: **Scenario No.: #3** **Event No.: 4** **Page 4 of 8**

Event Description: Master Recirc Flow Controller Fails Lowering Pump Speeds/"A" Recirc Pump Does Not Respond

Cause: Master controller output failure, "A" Controller failure

Initial Automatic Actions: N/A

Effects (General Sequence): Master controller is failed attempting to lower speeds on both pumps but the "A" Pump speed is not changing

Time	Position	Applicant's Actions Or Behavior
	CRO	Continue power reduction IAW OP 0105
		Recognize lowering speed on the "B" Recirc Pump and no response on the "A" Pump, inform SCRO – Place both Recirc Pumps in "Manual" and attempt to control speed
		Recognize "B" Recirc Pump speed can be controlled in "Manual" but still no response from "A" – Monitor and report current loop flow values and magnitude of mismatch
	SCRO	May enter/direct actions IAW OT 3118, "Recirc Pump Trip", and/or OT 3117, "Reactor Instability"
		May refer to Tech Spec 3.6.G and H – No actions required
	ACRO	Monitor plant parameters/assist as necessary

Op Test No.: **Scenario No.: #3** **Event No.: 5** **Page 5 of 8**

Event Description: Slowly Increasing Fuel Failure

Cause: Mismatched Recirc flows on power reduction

Initial Automatic Actions: Various Off-Gas and Main Steam Line radiation alarms

Effects (General Sequence): Slowly rising rad levels progressing to automatic MSIV/scram setpoints if no operator actions taken

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	Recognize/take action IAW 9-3 F-1 & G-2, inform SCRO – Monitor off-gas and steam line radiation levels for trends, report rising levels – Monitor plant parameters
	SCRO	Enter/direct actions IAW OT 3112, "Main Steam Line High Rad", and ON 3152, "Off Gas High Rad" – Direct power reduction – Direct preparations for scram and MSIV closure Direct Manual Scram BEFORE MSL Rad reaches 3 X Normal
	CRO	Continue power reduction – Trips the "A" Recirculation Pump – Closes the "A" Recirculation Pump Discharge Valve – Using the "B" Recirc Pump Manual Controller, lowers recirc flow to 27.5 to 29 Mlbm/hour – Inserts control rods IAW Rapid Shutdown Sequence – Monitors recirc flow and nuclear instrumentation
	ACRO	Monitor plant parameters/radiation levels - Recognize radiation levels are not lowering, inform SCRO - Start both Standby Gas Treatment trains

Op Test No.: **Scenario No.:** **#3** **Event No.:** **6**

Event Description: Reactor Water Cleanup leak/failure to isolate/reactor leak to secondary containment

Cause: Piping failure upstream Regen HX, isolation logic failure

Initial Automatic Actions: Alarms for system high flow

Effects (General Sequence): RCU leak (reactor coolant) to Rx Building (secondary containment) with fuel failure present. Rising Rx Building rad levels

Time	Position	Applicant's Actions Or Behavior
	SCRO	Enter/direct actions IAW OT 3100 – Direct manual scram – May direct MSIV closure Enter/direct actions IAW EOP-1 & ON 3153, "Excessive Rad Levels" May enter/direct actions IAW EOP-4 once RCU leak/isolation failure reported
	CRO	Manually scram the reactor – Place the Reactor Mode Switch in "Shutdown" when steam flow < 0.5 Mlbm/hr per line – Verify all control rods fully inserted, inform SCRO – Verify power lowering to IRM range
	ACRO	Recognize/take actions IAW 9-5 H-6, J-6 & K-6, inform SCRO – Close/verify Group 1 valves – Close Off-gas Outlet Valve (OG-FCV-11) – Verify SJAE and AOG isolated Manually open SRVs to control pressure 800-1000 psig – Place RHR in torus cooling
CT		Recognize/take action for RCU system leak indications, inform SCRO – Recognize RCU did not auto isolate, inform SCRO – Attempt to manually isolate, recognize RCU cannot be isolated, inform SCRO

Op Test No.:	Scenario No.: #3	Event No.: 7	Page 7 of 8

Event Description: 4 KV Bus 2 Failure to Transfer

Cause: Relay failure

Initial Automatic Actions: N/A

Effects (General Sequence): Bus de-energized on the transfer but did not re-energize. Operator action will be able to re-energize the bus from the Startup Transformer

Time	Position	Applicant's Actions Or Behavior
	ACRO	Recognize Bus 2 did not transfer to the Startup Transformer, inform SCRO – Energize Bus 2 from the Startup Transformer When directed, begin cooldown at less than 100 deg F/hour with SRVs and/or HPCI Monitor secondary containment parameters – Recognize increasing Reactor Building radiation levels, 9-3 E-3
	CRO	Maintain water level 127 - 177 inches with feedwater
	SCRO	Enter/direct actions IAW EOP-4 – Monitor increasing RB rad levels – Recognize primary system (RCU) is discharging into secondary Containment
CT		When rad levels in two RB areas are greater than Max Safe Operating Limit, enter/direct actions IAW EOP-5 – Direct Emergency Depressurization
	ACRO	Perform an Emergency Depressurization – Prevent injection from CS and RHR Pumps – Open all SRVs

Op Test No.: **Scenario No.: #3** **Event No.: 8** **Page 8 of 8**

Event Description: "A" Diesel Generator fails to auto start

Cause: Relay failure

Initial Automatic Actions: N/A

Effects (General Sequence): DG will not auto start. Operator action will be able to start the DG and re-energize the bus if desired/directed

Time	Position	Applicant's Actions Or Behavior
	ACRO	Recognize the Diesel Generator did not start, inform SCRO – Start the "A" DG and re-energize Bus 2 or via the Vernon Tie or the Startup Transformer
	SCRO	May direct "A" DG to be started and bus re-energized
	SCRO	Classify event IAW AP 3125 – Site Area Emergency per S-3-a

Facility: Vermont Yankee Examination Level: RO		Date of Examination: 01/25/99 Operating Test Number: #1
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Short Term Info/ SO #98-02 Actions	JPM - Evaluate CRO logs for Torus water level/volume and determine required actions. K/A 2.1.33 (3.4/4.0)
	Reactor Startup Requirements	Given a starting SRM count rate, when is criticality expected? K/A 2.4.47 (3.4/3.7)
		Specific temperature limits for criticality and SDM determination. K/A 2.2.25 (2.5/3.7)
A.2	Piping and Instrument Drawings	Trace the flowpath from the Conn. River to the reactor vessel. K/A 2.1.24 (2.8/3.1)
		SLC operation vs RWCU isolation and Squib Valve firing. K/A 2.1.24 (2.8/3.1)
A.3	RWP/High Rad Area Entry Actions	JPM - Locate & determine radiological requirements for inspection of valve CU-19A (in locked high rad area). K/A 2.3.4 (2.5/3.1)
A.4	Emergency Plan Actions	Evacuation actions while dressed out in a Contaminated Area (OP 3524). K/A 2.3.1 (2.6/3.0)
		Control Room actions for medical emergency. K/A 2.4.11 (3.4/3.6)

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Evaluate CRO Logs for Torus Water Level / Volume Out of Specifications and Determine Required Actions.
Failure Mode: N/A
Reference: AP-0150, "Conduct of Operations and Operator Rounds", Rev.31
Task Number:
Facility JPM #: N/A

Task Performance: AO/RO/SRO ___ RO/SRO _X_ SRO Only ___

Sequence Critical: Yes ___ No _X_

Time Critical: Yes ___ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation _X_ Performance ___ Discuss ___

Setting: Classroom ___ Simulator ___ Plant _X_

Performance Expected Completion Time: 8 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____________

Prepared by: ____________________ Operations Training Instructor ________ Date

Reviewed by: ____________________ SRO Licensed/Certified Reviewer ________ Date

Approved by: ____________________ Operations Training Supervisor ________ Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: You have just completed the CRO rounds for Day Shift but have not completed a review of the last 4 sheets of this rounds sheet (Shts 10–13)

Initiating Cues: Complete the review the last sheets and submit for SCRO review

Task Standards: CRP 9-23 panel compensated Torus Water volume identified as out of spec. and circled and identified with a capital letter at the item and in the remarks. And the SS notified.

Required Materials: AP-0150, "Conduct of Operations and Operator Rounds", Rev.31

Simulator Setup: N/A

JPM Modification: N/A

'aluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	Step 1:	Obtain ProcedureAP-0150, Operator Rounds and review Procedure.
	Standard:	AP-0150 obtained and reviewed.
Interim Cue:	Provide completed log sheets 10, 11, 12, 13 and 13a.	
SAT/UNSAT	Step 2:	Review log sheet data for sheets provided.
	Standard:	Identifies requirement to reference OP 2115
Interim Cue:	none	
SAT/UNSAT	*Step 3:	Obtain OP 2115, Figure 1.
	Standard:	Locate and plot recorded Torus diff. Pressure and allowable torus indicated level.
Interim Cue:	none	
SAT/UNSAT	*Step 4:	Identify Torus volume in unacceptable region of Fig 1
	Standard:	Plot point on unacceptable region of figure.
Interim Cue:	none.	
SAT/UNSAT	*Step 5:	Refer to NOTE #5 requirement for out of spec. conditions.
	Standard:	Notify SCRO of notification requirement and T.S. LCO 3.7.A.8 entry requirement.
Interim Cue:	Acknowledge report as SCRO	

.T/UNSAT **Step 6:** **Refer to AP-0150 Procedure section for instructions for out of spec recording requirements.**

Standard: Circle the Compensated Torus Water Volume reading and assign a capitol letter next to the entry then denote this letter in the Remarks sections

Interim Cue: Reading circled and denoted per AP-0150

TIME FINISH: ____________

Terminating Cue: CRP 9-23 panel compensated Torus Water volume identified as out of spec, circled and identified with a capital letter at the item and in the remarks. And the SS notified.

Evaluators Comments:

RO

ADMIN QUESTIONS

NDIDATE: ____________________ DOCKET: ______________ DATE: ______________

QUESTION: A.1.Q#2.a.

Prior to control rod withdrawal initial SRM power is130 cps. At what indicated count rate is the CRO withdrawing control rods required to stop and allow power to stabilize per station startup requirements?

ANSWER:

Per OP-0105 when count rate reaches two doublings or 520 cps.

RESPONSE:

SAT _____ UNSAT _____ K/A NUMBER: 2.4.47 3.4/3.7

FERENCES: OP-0105, Reactor Operation, Rev. 4, Phase 1A, Step 20, Page 14

QUESTION: A.1.Q#2.b.

Following a refuel outage the Reactor Engineer states that a Shutdown Margin Calculation will be performed on the startup. What minimum and maximum RPV temperature limits apply for this test during startup?

ANSWER:

RPV coolant temp. must be below 180 deg. F and above 80 deg. F per the startup procedure and T.S..

RESPONSE:

SAT _____ UNSAT _____ K/A NUMBER: 2.2.22 3.4/4.1

REFERENCES: OP-0105, Reactor Operation, Rev. 4, Phase 1A, Step 7, Page 11
Tech Spec 3.6.A.1 and Figure 3.6.1

UESTION: A.2.Q#1.a.

Plant conditions require use of Alternate Injection Systems to restore reactor water level in an emergency. Using plant piping and instrumentation drawings trace the procedural flow path to inject water from the Connecticut River into the reactor with the RHR "A" loop injection valve stuck closed

ANSWER:

Using OE-3107 Appendix M, trace Fire Water through SW-8 crosstie through Emer.Fill valves RHR-184/183 to the RHR-20 valve to the "B" loop injection valves to the reactor.

RESPONSE:

SAT _____ UNSAT _____ K/A NUMBER: 2.1.24 2.8/3.1

REFERENCES: Print G191159, Service Water
Print G191172, RHR
OE-3107, OE Appendices, Appendix M, Rev. 10

QUESTION: A.2.Q#1.b.

During a failure to scram event the Standby Liquid Control System initiation switch is positioned to the SYS 1 position. The associated squib valve fires but the pump immediately trips on overload. Using system logic prints identify the expected status of the Reactor Water Cleanup System isolation with this pump start fault condition.

ANSWER:

Identify with prints that the RCU isolation comes directly off the system initiation switch and would not be effected by the pump failure.

RESPONSE:

SAT _____ UNSAT _____ K/A NUMBER: 2.1.24 2.8/3.10

EFERENCES: Print (CWD) B-191301, Sh 1201, 912, 909

UESTION: A.4.Q#1.a.

What actions should be taken if a station Site Area Emergency is announced while you are working, dressed out, in a contaminated area?

ANSWER:

Immediately report to RP control point to receive instructions for monitoring.
Then report to the Plant Admin Building and report as required to the TSC, or OSC and EOF

RESPONSE:

SAT ______ UNSAT ______ K/A NUMBER: 2.3.1 2.6/3.0

REFERENCES: OP-3524, Emergency Actions To Ensure Initial Accountability and Security Response, Rev. 15, Sections I.A & IV.A, Pages 2 & 9

UESTION: A.4.Q#1.b.

While on night shift you receive a report from the Aux Operator in the Turbine Building that another AO has smashed his thumb while working on a valve. He reports that the injured operator's thumb is bleeding badly and an RP Technician is assisting by applying pressure to the wound. What actions must you take from the Control Room under this condition?

ANSWER:

Obtain location and acknowledge report
Turn page volume increase switch to "alert"
Make "Medical Emergency" announcement
Provide known radiological conditions to the Medical Response Technician
Record info provided by the MRT on VYOPF 3508.01, Medical Status Record Sheet.
Notify "Rescue, Inc" and Hospital if transportation offsite is required.

RESPONSE:

SAT ______ UNSAT ______ K/A NUMBER: 2.4.11 3.4/3.6

EFERENCES: OP-3508, Onsite Medical Emergency Procedure, Rev. 21, Sections A & B.6, Pages 3 & 7

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Locate and Determine Radiological Requirements for Inspection of RCU Valve V12-19A (CU-19A).

Failure Mode: N/A

Reference: AP 0541, "Access to High and Very High Radiation Areas", Rev.4

Task Number:

Facility JPM #: N/A

Task Performance: AO/RO/SRO __ RO/SRO X SRO Only __

Sequence Critical: Yes __ No X

Time Critical: Yes __ No X

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation X Performance __ Discuss __

Setting: Classroom __ Simulator __ Plant X

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____________

Prepared by: ____________________ Operations Training Instructor ________ Date

Reviewed by: ____________________ SRO Licensed/Certified Reviewer ________ Date

Approved by: ____________________ Operations Training Supervisor ________ Date

irections: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the Plant and you are to simulate the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- The previous shift prepared the "A" RCU pump for startup to swap operating pumps per OP-2112 Section B
- When you attempted startup of the pump abnormal indications were observed
- You request an Aux operator to verify the CU-19A, Pump "A" suction valve, is in the correct position.

Initiating Cues: Locate this valve using plant reference material and identify any radiological requirements the Aux Operator must comply with to perform the desired task.

Task Standards: Valve identified in High Radiation Area and AP-0541 requirements identified..

Required Materials:
- OP-2112, "Reactor Water Cleanup System", Rev. 28
- AP-0503, "Establishing and Posting Restricted Areas", Rev. 23(VYAPF 0503.01)
- AP-0541, "Access to High and Very High Radiation Areas", Rev. 4

Simulator Setup: N/A

JPM Modification: N/A

aluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	Step 1:	Obtain Procedure OP2112, RCU and review Admin Limits, Precautions, and Prerequisites.
	Standard:	OP 2112 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	Step 2:	Review Procedure section for positioning of suction valve.
	Standard:	Section B Step 3.b. identified.
Interim Cue:	none	
SAT/UNSAT	*Step 3:	Using Appendix A identify location of CU-19A.
	Standard:	App. A, Reactor Water Cleanup Valve Lineup, pg. 1 of 4 located identifying valve in RCU A Pump room.
Interim Cue:	none	
SAT/UNSAT	*Step 4:	Refer to AP-0503, Attachment 1 High and Very High Radiation Area Logsheet
	Standard:	Identifies RCU A Pump Room as a High Radiation Area.
Interim Cue:	none.	
SAT/UNSAT	*Step 5:	Refer to AP-0541, to determine access requirements.
	Standard:	Identifies requirement for an RWP covering the scope of the work, RP notification prior to entry, continuous dose rate monitoring, or integrated dose rate device with alarm or continuous RP technician coverage
Interim Cue:	none	

TIME FINISH: ____________

Terminating Cue: Valve identified in HRA and AP-0541 requirements identified.

Evaluators Comments:

Facility: Vermont Yankee Examination Level: SRO		Date of Examination: 01/25/99 Operating Test Number: #2
Administrative Topic/Subject Description		**Describe method of evaluation:** **1. ONE Administrative JPM, OR** **2. TWO Administrative Questions**
A.1	Parameter Verification/	Determination of RPV flooding condition to restore Adequate Core Cooling K/A 2.4.6 (3.1/4.0)
	Adequate Core Cooling	Determination of the Maximum Core Uncovery Time Limit K/A 2.4.47 (3.4/3.7)
	Reportability	Time limits and personnel requirements for notifications. K/A 2.4.30 (2.2/3.6)
	Requirements	Notification requirements for incorrect reports. K/A 2.1.18 (2.9/3.0)
A.2	Surv. Testing/Failed Surveillance Actions	JPM - Review completed surveillance/take actions for OOS data. K/A 2.1.33 (3.4/4.0)
A.3	Radiation Work	Specific Shift Supervisor responsibilities for RWP authorization. K/A 2.3.7 (2.0/3.3)
	Permits	Requirements for TIP Room entry. K/A 2.3.10 (2.9/3.3)
A.4	EP/Protective Action Recommendation	JPM - Perform off-site protective action recommendations using rad dose Information from the nomograms (JPM-20037 modified). K/A 2.4.44 (2.1/4.0)

SRO

ADMIN QUESTIONS

NDIDATE: ____________ DOCKET: ____________ DATE: ____________

QUESTION: A.1.Q#1.a.

Assuming the following conditions during execution of EOP-6, "RPV Flooding", what conditions are required to reestablish Adequate Core Cooling with reactor water level unknown:

- All rods are fully inserted except 6 at position 02.
- RPV pressure is 110 psig and stable with 3 SRVs open.
- RHR "A" is injecting at rated flow.
- Torus level is 14 ft.
- Torus pressure is 15 psig and lowering slowly.

ANSWER:

Maintain the current conditions for at least 62 minutes to ensure the reactor is flooded to at least TAF.

RESPONSE:

T ______ UNSAT ______ K/A NUMBER: 2.4.6 3.1/4.0

REFERENCES: EOP-6, RPV Flooding

QUESTION: A.1.Q#1.b.

How long can injection into the RPV be stopped during execution of EOP-6, "RPV Flooding", once the Minimum RPV Flooding Interval is met assuming only three SRVs were opened to emergency depressurize? Assume it has been 5 hours since all rods were fully inserted.

ANSWER:

Approximately 6 (six) minutes after the Flooding Interval of 62 minutes is met.

RESPONSE:

SAT ______ UNSAT ______ K/A NUMBER: 2.4.47 3.4/3.7

EFERENCES: EOP-6, RPV Flooding

'JESTION: A.1.Q#2.a.

Ten minutes ago, while operating at rated conditions, an initiation and injection of HPCI occurred. The CRO secured the system after verifying reactor water level and Drywell pressure normal by two independent indications. What notifications (if any) must be made?

ANSWER:

This requires a 4 hour notification.

RESPONSE:

SAT _____ UNSAT _____ K/A NUMBER: 2.4.30 2.2/3.6

REFERENCES: AP-0156, "Notification of Significant Events", 50.72(b)(2)(ii)

QUESTION: A.1.Q#2.b.

During an outage the crew has made a 1 hour non-emergency notification to the NRC per 10 CFR 50.72 (b) 1 (ii) due to a loss of shutdown cooling capability. During your review of the event you determine that the event should have been reported under 10 CFR 50.72 (b) 2 (iii) B as a 4 hour non-emergency report. What actions should be taken?

ANSWER:

The NRC should be notified of a downgrade of the initial notification.

RESPONSE:

SAT _____ UNSAT _____ K/A NUMBER: 2.1.18 2.9/3.0

.EFERENCES: AP-0156, "Notification of Significant Events", discussion section

ʼJESTION: A.3.Q#1.a.

During a refueling outage an RWP for inspection of the upper bioshield wall in the drywell is brought to the control room for your (Shift Supervisor) review and approval. What conditions and/or actions must you address to approve this work and the RWP?

ANSWER:

SS review of evolutions that may effect the radiological conditions is required by AP-0502. Additionally AP-0518 requires suspension of all fuel movement activities in the RV cavity if work is approved.

RESPONSE:

SAT _____ UNSAT _____ K/A NUMBER: K/A 2.3.7 (2.0/3.3)

REFERENCES: AP-0502, "Radiation Work Permits", Rev. 32, Section 2.a
AP-0518, "Radiation Protection Requirements For The Drywell When The Reactor Is Shutdown", Rev.8, Section 5.b.1)b)

QUESTION: A.3.Q#1.b.

Following LRPM calibration using the TIP machines on the previous shift, the Maintenance Department requests permission to go into the TIP room to inspect the TIP tube connections on one of the machines that hung up momentarily during its last withdraw. What requirements must be established for access control to the room at this time? Why?

ANSWER:

Plant Manager and Radiation Protection Manager must provide permission for entry since TIPs have been in the core within the last 24 hours.

RESPONSE:

ʼAT _____ UNSAT _____ K/A NUMBER: K/A 2.3.10 (2.9/3.3)

REFERENCES: AP 0508, "Traversing In-Core Probe (TIP) Room Entry", Rev. 9, Admin Limit 2.b.

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Review Completed Surveillance And Take Action For Out Of Specification Data.
Failure Mode: N/A
Reference: OP-4124, "Residual Heat Removal System Surveillance Procedure", Rev.47
Task Number:
Facility JPM #: N/A

Task Performance: AO/RO/SRO ___ RO/SRO ___ SRO Only _X_

Sequence Critical: Yes ___ No _X_

Time Critical: Yes ___ No _X_

Operator Performing Task: ______________________

Examiner: ______________________

Date of Evaluation: ______________

Method of Testing: Simulation _X_ Performance ___ Discuss ___

Setting: Classroom ___ Simulator ___ Plant _X_

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ______________

Prepared by: ______________________ ______________
Operations Training Instructor Date

Reviewed by: ______________________ ______________
SRO Licensed/Certified Reviewer Date

Approved by: ______________________ ______________
Operations Training Supervisor Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to simulate the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: The RHR system surveillance for RHR "A" Loop has been submitted to you for review and signature.

Initiating Cues: Review the provided surveillance data and sign as the Shift Supervisor.

Task Standards: OOS closure time for RHR-65A valve noted on surveillance and T.S. 3.5.A.4.b identified.

Required Materials:
- OP-4124, "Residual Heat Removal System Surveillance Procedure", Rev. 47
- VYOPF-4124.01, "RHR Valve Operability Test", Rev. 47
- VY Technical Specifications , LCO 3.5.A.4.b.

Simulator Setup: N/A

JPM Modification: N/A

aluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	Step 1:	Obtain Procedure OP-4124, Residual Heat Removal System Surveillance Procedure and review Procedure.
	Standard:	OP-4124 obtained and reviewed.
Interim Cue:	Provide completed VYOPF 4124.01 for RHR loop A.	
SAT/UNSAT	*Step 2:	Review log sheet data for sheets provided.
	Standard:	Identifies RHR-65A closure time OOS.
Interim Cue:	none	
SAT/UNSAT	*Step 3:	Reviews acceptance criteria 1. And 2. On log sheet.
	Standard:	Slow closure time fails acceptance criteria 2..
Interim Cue:	none	
SAT/UNSAT	*Step 4:	Declares RHR – 65A inoperable.
	Standard:	Identifies OP-4124 criteria for operability.
Interim Cue:	none.	
SAT/UNSAT	*Step 5:	Refer to Tech. Spec. section 3.5.
	Standard:	Locates action 3.5.A.4.b. as applicable T.S.
Interim Cue:	none	

.T/UNSAT *Step 6: Identify LCO as seven day spec.

Standard: Seven day LCO 3.5.A.4.b. identified

Interim Cue: none

TIME FINISH: ____________

Terminating Cue: Valve closure time identified as OOS and correct LCO entered.

Evaluators Comments:

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Off-Site Protective Action Recommendations.
Failure Mode: N/A
Reference: OP-3511 Off-Site Protective Action Recommendations
Task Number:
Facility JPM #: JPM-20037 (Modified)

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes __ No _X_

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator __ Plant _X_

Performance Expected Completion Time: 15 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____________

Prepared by: ____________________ Operations Training Instructor ________ Date

Reviewed by: ____________________ SRO Licensed/Certified Reviewer ________ Date

Approved by: ____________________ Operations Training Supervisor ________ Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the PLANT and you are to simulate the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: A failure to scram transient has occurred resulting in fuel damage. Reactor power has been below 2% for two hours. A release through the stack has been occurring for almost two hours and Chemistry Stack silver zeolite samples have been taken however the results of this sample and field monitoring data is not yet available. ODPS is not available and the TSC is not yet fully staffed. A General Emergency has been declared and initial PARs have been issued.

Initiating Cues: As the PED make off-site PARs based on radiological dose information from the Nomogram given the attached data sheet.

Task Standards: PARs made for towns downwind 5 miles and remaining initial shelter recommendations retransmitted per initial PAR sheet.

Required Materials:
- OP-3511,VYOPF 3511.01 for initial PARs from GE classification(identifying shelter for Brattleboro, Guiford, Vernon, and Bernardston) ,
- OP-3513 including App.B, and Figure II (Vermont Yankee Emergency Dose Rate Nomogram)

Simulator Setup: N/A

JPM Modification: Modified initial plant conditions and provided data to complete rad assessment for a new wind direction. Also required re-transmittal of existing PARs from initial classification.

aluation | Performance Steps

TIME START: ____________

SAT/UNSAT

Step 1: **Obtain Procedure OP-3511 section II and review the precautions.**

Standard: OP-3511 obtained and precautions reviewed.

Interim Cue: none.

SAT/UNSAT

Step 2: **Implement OP-3513 Section I.**

Standard: Obtain OP-3513 section I, review precautions and obtain VYOPF 3513.01.

Interim Cue: Provide operator with VYOPF 3513.01 from initial PARs and blank for new data.

SAT/UNSAT

Step 3:Obtain OP 3513 Appendix B.

Standard: OP 3513 App. B located.

Interim Cue: Provide operator a blank copy of App. B for data.

SAT/UNSAT

Step 4: **Record required data in App B per OP 3513**

Standard: Record:

- Date and time
- 2 Hour time since shutdown
- 2 mph upper wind speed
- 100 deg. Upper wind direction
- Maintain assumed stab. Class
- 2 E 4 mR/hr Stack High Range monitor reading
- 100,000 scfm Stack flow

Interim Cue: Provide data to candidate as each requested/needed.

SAT/UNSAT *Step 5: **Use OP 3513 App. B Full Scale Nomogram to determine Site Boundary Dose Rate..**

Standard: Identifies 1.5 E 3 mR/hr Stack Site Boundary Dose Rate using Nomogram and record on App.B.

Interim Cue: none

SAT/UNSAT *Step 6: **Calculate the Stack Site Boundary Dose using App. B.**

Standard: Calculates 3 R Stack Site Boundary Dose using Step 3 calculation and records on App. B.

Interim Cue: none

SAT/UNSAT *Step 7: **Implement OP 3511 Section II Step A.2. to formulate PARs.**

Standard: Compares dose at site boundary with OP-3511 EPA guidelines and determines they are exceeded.

Interim Cue: none

SAT/UNSAT *Step 8: **Choose the town affected by the PAR per OP 3511 step 2.b. and Table 5.**

Standard: Evacuate Guilford, Vernon and Hinsdale identified in sector E and recorded on VYOPF 3511.01 sheet in Section II.

Interim Cue: none

SAT/UNSAT Step 9: **Record PAR information from previous VYOPF 3511.01 in section I.**

Standard: Shelter Brattleboro and Bernardston identified and recorded on VYOPF 3511.01 Section I.

Interim Cue: none

SAT/UNSAT **Step 10: Review the PARs with the Site Recovery Manager and obtain approval on VYOPF 3511.01**

Standard: Send copy of VYOPF 3511.01 to SRM.

Interim Cue: Inform operator that copy is sent and SRM reviewed and approved PARs.

SAT/UNSAT ***Step 11: Transmit VYOPF 3511.01 data to State Authorities per OP 3503.**

Standard: Send copies to the State Authorities..

Interim Cue: Inform operator that the State Authorities have been informed

SAT/UNSAT **Step 12: Distribute the completed VYOPF 3511.01.**

Standard: Send to EOF Coordinator

terim Cue: Inform operator that distribution has taken place and that no further actions are required for this task.

TIME FINISH: ____________

Terminating Cue: Operator completes VYOPF 3511.01 with PARs completed..

Evaluators Comments:

Facility: Vermont Yankee **Examination Level: RO**		**Date of Examination: 01/25/99** **Operating Test No: #1**
System / JPM Title / Type Codes*	**Safety Function**	**Planned Follow-up Questions: K/A/G - Importance - Description**
1. SDC/Restart SDC Following Short Term Shutdown/N,S,L	4	a. 205000K402 - 3.7/3.8 - SDC Isolation Switch operation b. 205000G2.4.48 - 3.5/3.8 - SDC flowpaths with idle recirc loop
2. Open MSIV's After a Group I Isolation /D, ,S	5	a. 223002K406 - 3.4/3.5 - PCIS vs other isolations, reset requirements b. 223002K607 - 3.2/3.3 - Reset MSIVs after loss of power to one solenoid
3. DG/Secure "A" DG From Op Readiness Demonstration - Monthly/D,S	6	a. 264000A201 - 3.5/3.6 - Logic print use to describe stopping DG from CR while loaded b. 264000G2.4.35 - 3.3/3.5 - Local actions for DG failure to start on a LNP
4. Exiting the Power-to-Flow Exclusion Region W/ Oscillations /N, A, S	1	a. 201001G2.1.25 - 2.8/3.1 - Overcharging HCU accumulator effects b. 201001A308 - 3.0/2.9 - Rod insertions with failed stabilizing valve
5. Condensate/Emergency Fill The Main Condenser With Service Water/D,S	2	a. 256000G2.1.24 - 2.8/3.1 - SW Alternate Cooling vs condenser emergency fill b. 256000K604 - 2.8/2.8 - Loss of 4KV voltage protection affect on Condensate Pumps
6. RPS/Immediate Actions For Control Room Evacuation/N,S	7	a. 212000A212 - 4.0/4.1 - TSV input to RPS Logic b. 212000A412 - 3.9/3.9 - Half scrams vs SDV isolations
7. EHC/Perform Emergency Governor Test From CRP 9-7/D,S	3	a. 241000K413 - 2.9/3.0 - Prevention of turbine trip during testing b. 241000A107 - 3.8/3.7 - Bypass Jack operation while at power
8. SLC/Boron Injection Using CRD System From SLC Tank/N,P,R	1	a. 211000A10 - 4.0/4.1 - Flowpath SLC storage tank to reactor vessel for this lineup b. 211000G2.1.24 - 2.8/3.1 - How this lineup impacts CRD operation.
9. PCIS/Bypass PCIS Group I Isolation Signals/D,P	5	a. 223002K408 - 3.3/3.7 - One jumper not installed affect on isolation logic. b. 223001A302 - 3.5/3.5 - Separated MSIV disc, plant, PCIS, RPS response
10. RCIC/Operate RCIC From Alternate Shutdown Panel/M,P, R	2	a. 217000A301 - 3.5/3.5 - RCIC Min Flow Valve response at Alt Shutdown Panel b. 217000A207 - 3.1/3.1 - RCIC response to loss of oil pressure and why.

* 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

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Restart SDC following Short Term Shutdown
Failure Mode: N/A
Reference: OP 2124, "Residual Heat Removal System", Rev. 46
Task Number:
Facility JPM #: N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ______________________

Examiner: ______________________

Date of Evaluation: ______________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS __ FAIL __ Time Required: ____

Prepared by: TB Jeffries — Operations Training Instructor — 1-22-99 Date

Reviewed by: [signature] — SRO Licensed/Certified Reviewer — 1-22-99 Date

Approved by: [signature] — Operations Training Supervisor — 1/22/99 Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- A Refuel Outage is in progress.
- A Core Offload has just been completed.
- The Reactor Water Cleanup is shutdown for outage work.
- Spent Fuel Pool temperature is 103 deg. F.
- The 'A' RHR Pump was secured from the Shutdown Cooling 15 minutes ago due to a scheduled evolution in the outage schedule.

Initiating Cues: The SCRO directs you to restart the 'A' RHR Pump in Shutdown Cooling IAW OP 2124, (Section N) and establish a flow of 6500 gpm.

Task Standards: The SDC Pump is restarted in accordance with procedure OP 2124, Section N.

Required Materials: OP 2124, "Residual Heat Removal", Rev. 46

Simulator Setup:
- Reactor Pressure below the Shutdown Cooling Isolation interlock.
- Reactor level >185 inches (or state a value in the initial conditions).
- Reactor temperature <190 deg. F (or state a value in the initial conditions).
- 'A' RHR Pump lined up in SDC and then secured per section N.1.

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	Step 1:	Obtain Procedure OP 2124 and review Admin Limits, Precautions, and Prerequisites.
	Standard:	OP 2124 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	Inform operator Prerequisites are SAT.	
SAT/UNSAT	Step 2:	Confirm RHR Outboard Injection Valve closed.
	Standard:	On CRP 9-3, observe RHR-27A closed, green light on, red light off
SAT/UNSAT	Step 3:	Open the RHR Heat Exchanger Bypass Valve.
	Standard:	On CRP 9-3, open RHR-65A by placing the control switch to the Open position, observes red light on, green light off
SAT/UNSAT	Step 4:	Control cooldown rate.
	Standard:	Upon RHR Pump start, adjusts the following valves as necessary to control cooldown rate: – Hx Bypass RHR-65A(B) – RHRSW Discharge RHR-87A(B) – RHR Hx Inlet RHR-23A(B)
SAT/UNSAT	Step 5:	Open the RHR Outboard Injection Valve.
	Standard:	On CRP 9-3, place the Control Switch for RHR-27A in the open Position for approximately one second and visually observe Red and Green light dual indication.
SAT/UNSAT	*Step 6:	Start the 'A' RHR Pump.
	Standard:	On CRP 9-3, place the Control Switch for the 'A' RHR pump to the Start position, observes red light on, green light off

SAT/UNSAT — *Step 7: **Establish SDC system flow rate.**

Standard: On CRP 9-3, throttle open the Outboard Injection Valve RHR-27A by taking the control switch to the Open position until a flow rate of >4100gpm is established

SAT/UNSAT — Step 8: **Adjust RHR Service Water (RHRSW) discharge pressure.**

Standard: On CRP 9-3, throttle RHR-89A until RHRSW pressure is 20 psid above RHR pressure and RHRSW flow is less than or equal to 3050 gpm.

Interim Cue: Inform operator that another operator will monitor cooldown from this point on.

TIME FINISH: ____________

Terminating Cue: The 'A' RHR Pump has been restarted in the SDC mode in accordance with procedure OP 2124, Section N.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

The RHR S/D Cooling Valves (RHR-17 & 18) Keylock Isolation Switch in the Radwaste Corridor has two positions, "Lockout" and "Open Permissive".

When is this switch is REQUIRED to be in "Lockout"? What is effect on the operation of Shutdown Cooling when it is in "Lockout"?

EXPECTED ANSWER:

-- When reactor pressure is greater than 100 psig
-- Prevents operation of the RHR Shutdown Cooling Isolation Valves (RHR-17 & 18) from the Main Control Room when at power (protects low pressure RHR piping), inadvertent operation during a fire (circuit failure), ensures that don't rely on SDC interlocks to keep valves closed if operated while at power

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 205000K402 3.7/3.8

REFERENCES: OP 2124, "Residual Heat Removal", Rev. 44, Section L.1, Page 29

JPM QUESTIONS

QUESTION NO: 2

Given that the "A" loop of RHR is in Shutdown Cooling with the suction from, and return to, the "A" Recirc Loop. The "B" Recirc loop is idle. Describe the Shutdown Cooling flowpath for this lineup? (A simple sketch may be useful.) While operating in this lineup, what prevents reverse flow through the "B" Recirc Loop Jet Pumps?

EXPECTED ANSWER:

-- Flowpath per P&ID G-191172 - From Recirc Pump suction through RHR Pump, RHR heat exchanger, back to discharge side of Recirc Pump, into jet pump rams to jet pump discharge, to lower vessel head region, up through the core and moisture separators to the core shroud annulus region into the Recirc Pump suction line (Candidate describes, preferably sketches this lineup, or traces flow path on P&IDs)

-- Reverse flow through idle Recirc loop jet pumps is prevented due to the high head loss presented by those pumps (easier for flow to go up through the core instead of the idle jet pumps)

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER:	205000G2.4.48	3.5/3.8
REFERENCES:	P&ID G-191172	
	LOT-00-205, "Residual Heat Removal", Rev. 18, Section II.B.6.b.7), Page 17	

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Open the MSIVs After a Group I Isolation
Reference: OP 2113, Main and Auxiliary Steam

Task Number: 2000030501

Task Performance: AO/RO/SRO ___ RO/SRO _X_ SRO Only ___

Sequence Critical: Yes _X_ No ___

Time Critical: Yes ___ No _X_

Operator Performing Task: ______________________

Examiner: ______________________________

Date of Evaluation: __________

Method of Testing: Simulation ___ Performance _X_ Discuss ___

Setting: Classroom ___ Simulator _X_ Plant ___

Performance Expected Completion Time: 15 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ______

Prepared by: TB Jeffries 1-22-99
Operations Training Instructor Date

Reviewed by: [signature] 1-22-99
SRO Licensed Certified Reviewer Date

Approved by: [signature] 1/22/99
Operations/Training Supervisor Date

ıctions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the Simulator and you are to perform the actions.

You are requested to "talk through" the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: Following a Reactor Scram a Group I isolation has occurred due to low steam pressure in Run. The isolation was backed up and the isolation signal has cleared.

Initiating Cues: The SS directs you to reopen the MSIVS.

Task Standards: MSIVs re-opened in accordance with OP 2113, Main and Auxiliary Steam

Required Materials: OP 2113, Main and Auxiliary Steam

Simulator Set-up: Any IC. MSIV switches in Shut position and mode switch in Refuel or Startup. The simulator operator should ensure that vacuum remains satisfactory if other JPMs are ongoing before this one is started.

'luation | Performance Steps

TIME START: _____

SAT/UNSAT

Step 1: Obtain Procedure Review Prerequisites

Standard: OP 2113, section 5, obtained, prerequisites reviewed
Comment: During an emergency condition, some operators may perform this from memory

---

Interim Cue: If asked, inform operator that prerequisites are met.

NOTE: Operator should begin at step 5.f.

SAT/UNSAT

Step 2: Verify PCIS Sys 1 and Sys 2 Reset Permissive Lights are Energized

Standard: Containment Isolation Reset Permissive Lights CRP 9-5 14A and 16A are lit. Located on the lower right portion of the vertical panel.

SAT/UNSAT

***Step 3: Reset the Group I Isolation**

Standard: Group I Isolation Reset Switch to INBD and OUTBD positions. Switch located on the upper right portion of the horizontal CRP 9-5 panel. Third switch from the right of panel.

SAT/UNSAT

Step 4: Monitor Radiation Monitors

Standard: Operator identifies which rad monitor readings are normal or abnormal
AOG - CRP 9-50
Primary Containment CRP 9-2
Reactor Bldg CRP 9-2, 9-11

luation		Performance Steps
SAT/UNSAT	+	***Step 5:** **Open the Outboard Isolation Valves MS-86A, B, C, and D**
		Standard: At CRP 9-3, operator places the following control switches to auto-open:
		______ MS-86A
		______ MS-86B
		______ MS-86C
		______ MS-86D
SAT/UNSAT		**Step 6:** **Verify MSIV-86A-D OPEN**
		Standard: Operator observes MSIV-86A-D red light ON, green light OFF
		______ MS-86A
		______ MS-86B
		______ MS-86C
		______ MS-86D
SAT/UNSAT	+	***Step 7:** **Open MS-74**
		Standard: Operator takes control switch for MS-74 to OPEN
SAT/UNSAT		**Step 8:** **Verify MS-74 OPEN**
		Standard: Operator observes MS-74 red light ON, green light OFF
SAT/UNSAT	+	***Step 9:** **Open MS-77**
		Standard: Operator takes control switch for MS-77 to OPEN
SAT/UNSAT		**Step 10:** **Verify MS-77 OPEN**
		Standard: Operator observes MS-77 red light ON, green light OFF

luation	Performance Steps
SAT/UNSAT	**Step 11: Open MS-78**
	Standard: Operator takes control switch for MS-78 to OPEN
SAT/UNSAT	**Step 12: Verify MS-78 to OPEN**
	Standard: Operator observes MS-78 red light ON, green light OFF
SAT/UNSAT	**Step 13: Observe Main Steam pressure on CRP 9-7 starts to increase**
	Standard: Operator observes pressure starts to increase on meter located on CRP 9-7 above Turbine Expansion recorder left hand meter of group of three
T/UNSAT	**Step 14: Check Bypass valves SHUT or Raise EPR or MPR Setpoint to Close the Bypass Valves**
	Standard: Verify Bypass valves BV1 - BV10 indicated CLOSED, Green lights ON and Red lights OFF on CRP 9-7. EPR and MPR control switches are located on CRP 9-7 horizontal panel. The white light ON above the control switch indicates which pressure regulator is controlling pressure.
SAT/UNSAT	**Step 15: If the MSIV's have been closed for 30 min or more open MS-79 for 10 min.**
	Standard: MS-79 indicates OPEN on CRP 9-3 by red light ON green light OFF
	Comment: This step unnecessary due to Interim Cue after Step 13. Step left in for procedural adherence and JPM flexibility.

Interim Cue: The MSIVs have been shut for only 10 min.

luation		Performance Steps
SAT/UNSAT		**Step 16: Verify Upstream and Downstream Steam Pressures are Within 50 psig**
		Standard: At CRP 9-7, using PI-101-2 main steam pressure and at CRP 9-5 using PI-2-3-56A or B verify steam pressure indications are within 50 psid
SAT/UNSAT	+	***Step 17: Open the Inboard Main Steam Isolation Values MS-80A, B, C and D**
		Standard: At CRP 9-3, operator places the following control switches to AUTO-OPEN: _____ MS-80A _____ MS-80B _____ MS-80C _____ MS-80D
T/UNSAT		**Step 18: Verify MSIV-80A-D OPEN**
		Standard: Operator observes red light ON, green light OFF for MSIV-80A-D on CRP 9-3 ____ MS-80A ____ MS-80B ____ MS-80C ____ MS-80D

+ Steps 5, 7, 9, & 15 are sequence critical steps

TIME FINISH: _____

Terminating Cue: MSIVs reopened in accordance with OP 2113 Main and Auxiliary Steam

Evaluators Comments: ______________________________
____
____

stem: 200100 K/A's:	K1.01 K1.03 K1.06 K1.13 K1.17 K1.25 K1.27 K2.01 K2.02 K3.01 K3.07 K3.09 K3.16 K4.01 K4.02 K4.07 K4.09 K4.10 K5.06 K5.08 K5.09 K6.03 K6.04 K6.05 K6.06 K6.08
	A1.01 A1.02 A1.08 A1.09 A1.10 A2.03 A2.04 A2.10 A2.12 A3.01 A4.01 A4.02 A4.03 A4.04 A4.07 A4.09 A4.10
System Generic K/A's:	1, 4, 5, 7, 9, 10, 12, 13, 14, 15

JPM QUESTIONS

QUESTION NO: 1

Assuming the cause of this isolation signal was a high temperature on the outlet of the non-regenerative heat exchanger (a non-PCIS isolation signal), how would the procedure to reset the isolation differ had it been caused by a PCIS isolation signal? What steps are necessary to reset the isolation? Assume the system isolated as designed.

EXPECTED ANSWER:

-- No difference in the effect on Reactor Water Cleanup and in the procedures to reset the isolation
-- Verify the initiating signal is clear, position the System Isolation Reset Switch to INBD then OUTBD.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 223002K406 3.4/3.5

REFERENCES: LOT-00-204, "Reactor Water Cleanup", Rev. 14, Section IV.B.1.f., Page 16

OP 2112, "Reactor Water Cleanup System", Rev. 28, Page 8

JPM QUESTIONS

QUESTION NO: 2

The plant was operating at 100% power when a reactor scram occurred. Electrical loads transferred to the Startup Transformer as required. During the transfer a voltage dip caused the Inboard Main Steam Isolation Valve (MSIV) AC solenoids to deenergize. What actions must be taken to reenergize these solenoids?

EXPECTED ANSWER:

Place the Group 1 Isolation Reset Switch to "INBD" and release.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 223002K607 3.2/3.3

REFERENCES: LOT-01-223, "Primary Containment Isolation System", Rev. 10, TP-10

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Secure From "A" Diesel Generator Operational Readiness Demonstration - Monthly
Failure Mode:	N/A
Reference:	OP 4126, "Diesel Generator Surveillance", Rev. 43
Task Number:	
Facility JPM #:	JPM-26402, Rev. 9, Updated to latest procedure Rev

Task Performance: AO/RO/SRO ___ RO/SRO _X_ SRO Only ___

Sequence Critical: Yes ___ No _X_

Time Critical: Yes ___ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation ___ Performance _X_ Discuss ___

Setting: Classroom ___ Simulator _X_ Plant ___

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____________

Prepared by:	TB Jeffries — Operations Training Instructor	1-22-99 Date
Reviewed by:	[signature] — SRO Licensed/Certified Reviewer	1-22-99 Date
Approved by:	[signature] — Operations Training Supervisor	1/22/99 Date

irections: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the Simulator and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: The "A" DG has been running for performance of the monthly operational readiness demo, paralleled to the Bus, for over eight hours; all surveillances are complete; "A" DG is ready be to secured.

Initiating Cues: The SCRO directs you to secure from Diesel Operational Readiness Demonstration Monthly Surveillance on the "A" DG per OP 4126.

Task Standards: "A" DG secured in accordance with OP 4126.

Required Materials: OP 4126, "Diesel Generator Surveillance", Rev. 43
VYOPF 4126.03 partially completed

Simulator Setup: Any IC. "A" DG running and loaded to 2500-2750 KW. Ensure droop set to 50 (IDA DGR02).

JPM Modification: N/A

aluation **Performance Steps**

TIME START: ____________

SAT/UNSAT **Step 1:** **Obtain Procedure OP 4126, Section C.1 Step 36 and review Admin Limits, Precautions, and Prerequisites.**

Standard: OP 4126, Section C.1 Step 36 obtained, admin limits, precautions and prerequisites reviewed.

Interim Cue: If asked, all prerequisites have been met.

SAT/UNSAT **Step 2:** **Reduce generator load gradually to approximately 1200 - 1375 KV and Hold for 5 minutes**

Standard: On CRP 9-8 horizontal panel, place the "A" diesel generator speed governor control switch to the lower position, on CRP 9-8 vertical panel, observe the "A" diesel generator KW meter lower to approximately 1200 - 1375 KW and held for 5 minutes.

'erim Cue: If operator waits 5 minutes, inform operator that 5 minutes have elapsed (time compression).

SAT/UNSAT ***Step 3:** **Unload Generator to < 200 KW**

Standard: On CRP 9-8 horizontal panel, lowers generator load to less than 200 KW by placing the diesel generator speed governor control switch to lower, on CRP 9-8 vertical panel observes "A" DG KW meter indication for less than 200 KW

SAT/UNSAT ***Step 4:** **Open Generator Output Breaker**

Standard: On CRP 9-8 horizontal panel, places the "A" diesel generator output breaker control switch to the OPEN position.

SAT/UNSAT **Step 5:** **Verify the "A" Diesel Generator Output Breaker is Open**

Standard: On CRP 9-8 horizontal panel, verifies the "A" DG output breaker is OPEN, green light on, red light off

.T/UNSAT **Step 6:** **Run the DG unloaded for approximately one minute**

Standard: Monitors DG operation and runs unloaded for approximately one minute.

SAT/UNSAT **Step 7:** **Direct Aux Operator to locally reset the governor speed droop to "Zero"**

Standard: Directs Aux Operator to perform Step C.1.37.d of OP 4126

Interim Cue: When directed, inform operator Step C.1.37.d of OP 4126 is complete

SAT/UNSAT **Step 8:** **Check Voltage and Frequency**

Standard: On CRP 9-8 vertical panel, verifies the voltage regulator maintaining the "A" DG voltage approximately 4160V and the governor maintaining frequency approximately 60 Hz

SAT/UNSAT **Step 9:** **Verify both Auto and Manual Voltage Regulators within Normal Range**

Standard: On CRP 9-8 horizontal panel, verifies the "A" DG auto and manual regulators are maintaining normal range (4000 - 4200V) as indicated by both white lights being ON for each regulator.

SAT/UNSAT **Step 10:** **Stop the "A" DG with Start/Stop Switch on CRP 9-8**

Standard: On CRP 9-8 horizontal panel, places the "A" DG start/stop switch to the STOP position.

SAT/UNSAT **Step 11:** **Verifies the "A" DG is stopped**

Standard: On CRP 9-8 horizontal panel, verifies the "A" DG is stopped by observing the start/stop control switch indicating lights, green light on, red light off

Interim Cue: When/if requested, report as Aux Operator that the "A" DG has stopped

SAT/UNSAT

Step 12: **Direct Aux Operator to complete "A" DG shutdown**

Standard: Directs Aux Operator to complete "A" DG shutdown starting with Step C.1.41.

Interim Cue:	When/if contacted, inform operator the Aux Operator will complete the shutdown procedure.

TIME FINISH: ____________

Terminating Cue: The "A" DG is secured IAW OP 4126

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

What would have happened if the "A" DG Start/Stop Switch on CRP 9-8 had been placed in "Stop" with load at 200 KW? Using appropriate logic drawings, show that this is an expected response.

EXPECTED ANSWER:

- The Diesel Generator will continue to run loaded to 200 KW.
- Per logic prints.

ACTUAL ANSWER:

SAT ________ UNSAT ________

K/A NUMBER: 264000A201 3.5/3.6

REFERENCES: LOT-00-264, "Emergency Diesel Generator", Rev. 16, Section I.B.1.f., Page 51

JPM QUESTIONS

QUESTION NO: 2

The "B" Emergency Diesel Generator failed to start on a valid Loss of Normal Power (LNP) signal. Assuming the cause of the failure to start is found and corrected, what are the MINIMUM actions required to allow the "B" DG to automatically start? Explain each step required.

EXPECTED ANSWER:

- Place the Remote/At Engine control switch in "At Engine" to remove auto start capabilities, reset any lockout to clear trips, press the local Reset pushbutton on the engine instrument panel to reset the Shutdown Relay, wait 100 seconds for stopping relay to time out, place the Remote/At Engine control switch in "Remote" to enable auto start capabilities

ACTUAL ANSWER:

SAT ______ UNSAT ______

K/A NUMBER: 264000G2.4.35 3.3/3.5

REFERENCES: OP 4126, "Diesel Generator Surveillance", Rev. 43, Precaution 9, Page 6

LOT-00-264, "Emergency Diesel Generator", Rev. 16, Section I.B.7, Pages 59 & 60

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Exiting the Power-to-Flow Exclusion Region
Failure Mode: APRM 10% Peak-to-Peak Oscillations requires manual scram
Reference: OT 3117, "Reactor Instability", Rev 8
Task Number:
Facility JPM #: N/A

Task Performance: AO/RO/SRO __ RO/SRO X SRO Only __

Sequence Critical: Yes X No __

Time Critical: Yes __ No X

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance X Discuss __

Setting: Classroom __ Simulator X Plant __

Performance Expected Completion Time: 15 minutes

Evaluation Results:

Performance: PASS __ FAIL __ Time Required: ____

Prepared by: ____________________ 1/26/99
Operations Training Instructor Date

Reviewed by: ____________________ 1-26-99
SRO Licensed/Certified Reviewer Date

Approved by: ____________________ 1/26/99
Operations Training Supervisor Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the Simulator and you are to perform the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- The plant is operating at power
- Both Recirc Pumps have tripped
- The plant is operating in the Exclusion Region of the Power-to-Flow Map

Initiating Cues: The plant was operating at 100% power when both recirc pumps tripped. The actions of OT 3118, Recirc Pump Trip, are being carried out. The SCRO directs you to carry out the actions of OT 3117, Reactor Instability, to exit the Exclusion Region. The Solomon stability monitor is available and has been initiated.

Task Standards: A manual scram is inserted in response to indications of reactor instability

Required Materials: OT 3117, "Reactor Instability", Rev 8

Simulator Setup:
- IC-92

Verify:
- Insert RR05A and RR05B to trip both Recirc Pumps or turn the pumps off
- Reactor Power will be about 50% and Core Flow will be about 12 Mlbs/Hr, causing operation in the Exclusion Region
- Allow the plant to stabilize
- Advance the APRM, Level, and Pressure recorders on 9-5
- Start power oscillations using the Remote Key pad when the second rod is inserted to about notch 12, going in.
- See following sheet for APRM and LPRM malfunctions to be inserted
- To cause oscillations: Red Key+Key 1 to insert
  Red Key+M/D Key, then Red Key+Key 1 to remove
  Repeat

ᐧRM Malfunctions: Upscale

NMO5A @ 22
NMO5B @ 24
NMO5C @ 19
NMO5D @ 19
NMO5E @ 21
NMO5F @ 19

LPRM Malfunctions: Downscale

NM3 0809A
NM3 0817A
NM3 1607A
NM3 1625A
NM3 1633D
NM3 2409A
NM3 2417B
NM3 2425C
NM3 3209A
NM31617D

aluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OT 3117 and review.**
	Standard:	OT 3117 obtained and reviewed.
Interim Cue:	Inform operator Prerequisites are SAT.	
SAT/UNSAT	**Step 2:**	**Monitor LPRM readings**
	Standard:	Select the STBLTY key on ERFIS
SAT/UNSAT	**Step 3:Insert the first control rod (30-23)**	
	Standard:	Obtain the Rapid Shutdown Sequence and insert the first rod in accordance with the designated sequence using "Continuous Insert."
SAT/UNSAT	**Step 4:**	**Insert the second control rod (14-23)**
	Standard:	Insert the second rod in accordance with the designated sequence using "Continuous Insert."
Interim Cue:	Insert Oscillations when rod 14-23 is at notch 12 on ERFIS RWM screen, equivalent to notch 10 on the Full Core Display.	
SAT/UNSAT	**Step 5:**	**Recognize the onset of reactor instability.**
	Standard:	Note any or all of the following: oscillating period, APRM Power recorders, LPRM cycling Low Power Lights on Full Core Display.
SAT/UNSAT	**Step 6:**	**Insert manual scram due to core wide instability.**
	Standard:	Recognize that APRM's are oscillating 10%, Peak-to-Peak, and LPRM's have cycling Low Power lights, and insert manual scram

TIME FINISH: ____________

Terminating Cue: Manual Scram inserted in accordance with OT 3117, "Reactor Instability."

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

The plant is making preparations for a reactor startup from a refueling outage. Reactor Building ambient temperature is 65 degrees F. The hydraulic control unit accumulators have been charged with nitrogen to a pressure of 620 psig. Several days later, with the plant at power, Reactor Building temperatures have stabilized at 91 degrees F

Which of the following describes the expected impact on the Control Rod Drive Hydraulic system operations for these conditions? Why is this true?

EXPECTED ANSWER:

-- Control rod scram speeds will be faster and may result in mechanism damage.

-- As RB heats up, accumulator operating pressure will be higher due to the higher (above limits allowed) starting pre-charge pressure. This results in a higher differential pressure across the operating piston on a reactor scram. Higher d/p gives faster scram speeds. Potential for mechanism damage.

CTUAL ANSWER:

SAT ________ UNSAT ________

K/A NUMBER:	201001G2.1.25	2.8/3.1
REFERENCES:	OP 2111, "Control Rod Drive System", Rev. 33, Section B and Tables 1 & 2, Pages 9 - 11	

JPM QUESTIONS

QUESTION NO: 2

During a reactor shutdown, the CRO notes that control rod speeds seem slower than normal and the Aux Operator reports the CRD Flow Control Valve is stroking slightly closed while the rod is in motion. The FCV reopens when the rod stops. What is the cause of the slower rod speeds? Explain your answer.

EXPECTED ANSWER:

-- The in-service CRD Insert Stabilizing Valve has failed open.
-- If the Insert Stabilizing Valve has failed open, the 4 gpm flow required to insert control rods will not be diverted from cooling water. Instead, total demand from the CRD system will go up by 4 gpm and the FCV will attempt to momentarily reduce flow back to its setpoint. This will result in a small close, then reopen cycle of the FCV every time a rod is inserted.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 201001A308 3.0/2.9

REFERENCES: LOT-01-201, "Control Rod Drive Hydraulics", Rev. 15, II.C & TP-1, Page 11

SRO –5 and RO -4

Initial Conditions:

- The plant is operating at power
- Both Recirc Pumps have tripped
- The plant is operating in the Exclusion Region of the Power-to-Flow Map

Initiating Cues:

The plant was operating at 100% power when both recirc pumps tripped. The actions of OT 3118, Recirc Pump Trip, are being carried out. The SCRO directs you to carry out the actions of OT 3117, Reactor Instability, to exit the Exclusion Region. The Solomon stability monitor is available and has been initiated.

SRO –5 and R0 -4

JPM QUESTIONS

QUESTION NO: 1

The plant is making preparations for a reactor startup from a refueling outage. Reactor Building ambient temperature is 65 degrees F. The hydraulic control unit accumulators have been charged with nitrogen to a pressure of 620 psig. Several days later, with the plant at power, Reactor Building temperatures have stabilized at 91 degrees F

Which of the following describes the expected impact on the Control Rod Drive Hydraulic system operations for these conditions? Why is this true?

SRO –5 RO-4

JPM QUESTIONS

QUESTION NO: 2

During a reactor shutdown, the CRO notes that control rod speeds seem slower than normal and the Aux Operator reports the CRD Flow Control Valve is stroking slightly closed while the rod is in motion. The FCV reopens when the rod stops. What is the cause of the slower rod speeds? Explain your answer.

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Lineup And Perform Emergency Fill Of The Main Condenser With Service Water
Failure Mode: N/A
Reference: RP 2170, "Condensate System", Rev. 19
Task Number:
Facility JPM #: JPM-20006, Rev. 5, Updated to latest procedure Rev

Task Performance: AO/RO/SRO __ RO/SRO X SRO Only __

Sequence Critical: Yes __ No X

Time Critical: Yes __ No X

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance X Discuss __

Setting: Classroom __ Simulator X Plant __

Performance Expected Completion Time: 5 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: __________

Prepared by: ____________________ 1-22-99
Operations Training Instructor Date

Reviewed by: ____________________ 1-22-99
SRO Licensed/Certified Reviewer Date

Approved by: ____________________ 1/22/99
Operations Training Supervisor Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

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This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: A loss of coolant accident has occurred with RCIC and HPCI not available.

Initiating Cues: The SCRO directs you to emergency fill the main condenser with Service Water.

Task Standards: Main condenser filling from Service Water.

Required Materials: RP 2170, "Condensate System", Section H, Rev. 19.

Simulator Setup: Any IC

JPM Modification: N/A

aluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure RP 2170, and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	RP 2170 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	**Step 2:**	**Close the Drain, SW-56, between SW-55A and SW-55B**
	Standard:	Contacts Auxiliary Operator and directs performance of Step H.1 of RP 2170.
Interim Cue:	When contacted, inform operator that SW-56 has been closed	
	NOTE:	This step not required to be performed.
AT/UNSAT	**Step 3:**	**Place a 4KV switchgear sync check handle in the control socket of SW-55B.**
	Standard:	4 KV switchgear Sync Check Handle from CRP 9-8 inserted into socket of SW-55B located on CRP 9-23.
SAT/UNSAT	***Step 4:**	**Open SW-55B.**
	Standard:	SW-55B opened by turning sync check handle to the right and releasing.
SAT/UNSAT	**Step 5:**	**Verify SW-55B Open.**
	Standard:	Verifies SW-55B Open, red light ON and green light OFF
SAT/UNSAT	**Step 6:**	**Place a 4KV switchgear sync check handle in the control socket of SW-55A.**
	Standard:	4 KV switchgear Sync Check Handle from CRP 9-8 inserted into socket of SW-55A located on CRP 9-23.

SAT/UNSAT	***Step 7:**	**Open SW-55A.**
	Standard:	SW-55A opened by turning sync check handle to the right and releasing.
SAT/UNSAT	**Step 8:**	**Verify SW-55A Open.**
	Standard:	Verifies SW-55A Open, red light ON and green light OFF
SAT/UNSAT	**Step 9:**	**Monitor hotwell level**
	Standard:	Verifies hotwell level rising.

Interim Cue:	When SW-55A and B open, inform operator that hotwell rising, and that another operator will continue monitoring level

TIME FINISH: ____________

Terminating Cue: Hotwell level increasing

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

Using the appropriate P&IDs, explain why this lineup cannot be accomplished with Service Water in the Alternate Cooling Mode of operation and the SW-20 valve closed.

EXPECTED ANSWER:

-- In the Alternate Cooling Mode of operation, a portion of the Service Water system needed to support selected heat loaded for long term cooling and shutdown following the loss of the Vernon Dam and Pond is provided cooling by the West Cooling Tower and basin. The remaining SW loads are manually isolated with SW-20. This includes the lines supplying the SW-55A and SW-55B valves.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 256000G2.1.24 2.8/3.1

REFERENCES: LOT-00-276, "Service Water", Rev. 14, Section IV.G.2 and TP-1, Pages 28 & 29

P&ID G-191159 Sheets 1 & 2

JPM QUESTIONS

QUESTION NO: 2

What will be the response of the "A" Condensate Pump if Bus 1 Feeder Breakers (Breaker 12 &13) are both open while operating at power? What is the purpose of this feature?

EXPECTED ANSWER:

- The Condensate Pump will continue to run with lowering voltage but will not trip until bus voltage is less than 1000 VAC (or less than 70% voltage) and then a 2 minute time delay has expired at which time the breaker will open.
- This helps bus voltage to rapidly decay before the breakers try to open under a load

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 256000K604 2.8/2.8

REFERENCES: LOT-01-262, "4 KV Electrical Distribution System", Rev. 15, Section II.E, Pages 17 & 18

LOT-00-256, "Condensate System", Rev. 17, Section IV.A.8.b, Page 23

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Immediate Actions for a Control Room Evacuation
Failure Mode: N/A
Reference: OP 3126, "Shutdown Using Alternate Shutdown Methods", Rev. 15
Task Number:
Facility JPM #: N/A

Task Performance: AO/RO/SRO ___ RO/SRO _X_ SRO Only ___

Sequence Critical: Yes ___ No _X_

Time Critical: Yes ___ No _X_

Operator Performing Task: ______________________

Examiner: ______________________

Date of Evaluation: ______________

Method of Testing: Simulation ___ Performance _X_ Discuss ___

Setting: Classroom ___ Simulator _X_ Plant ___

Performance Expected Completion Time: 5 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ___

Prepared by: ______________________ 1-22-99
Operations Training Instructor Date

Reviewed by: ______________________ 1-22-99
SRO Licensed/Certified Reviewer Date

Approved by: ______________________ 1/22/99
Operations Training Supervisor Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to perform the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- The SCRO has determined that a Control Room evacuation is required.
- A Site Area Emergency has been declared and announced on the GAI-Tronics.
- Chemistry has been notified to make the Emergency Notifications.
- You are the only Control Room Operator available in the Control Room.

Initiating Cues: The SCRO directs you expedite taking the Immediate Actions for a Control Room evacuation and then leave immediately.

Task Standards: The Control Room is evacuated in accordance with procedure OP 3126, Section 3.

Required Materials: OP 3126, "Shutdown Using Alternate Shutdown Methods", Rev. 15

Simulator Setup: Any "at-power" IC

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	Step 1:	Obtain Procedure OP 3126 and review.
	Standard:	OP 3126 obtained.

NOTE: Immediate actions should normally be performed from memory.

SAT/UNSAT	*Step 2:	Manually scram the Reactor.
	Standard:	Press both RPS Scram Pushbuttons.
SAT/UNSAT	*Step 3:	Trip the 'A' and 'B' Recirc Pumps.
	Standard:	Place both Recirc Pump Drive Motor control switches to the Trip position.
SAT/UNSAT	*Step 4:	Close the MSIVs.
	Standard:	Rotate each MSIV control switch (8) to the Closed position.
SAT/UNSAT	*Step 5:	Bypass ADS.
	Standard:	Place the ADS Bypass control switch to the BYPASS Position.
SAT/UNSAT	*Step 6:	Place RHR "A" in Pull-to-Lock.
	Standard:	Rotate the "A" RHR Pump control switch to the Pull to Lock Position.

SAT/UNSAT *Step 7: Place the HPCI Oil Pump in Pull-to-Lock.

Standard: Rotate the "A" HPCI Oil Pump control switch to the Pull to Lock Position.

SAT/UNSAT *Step 8: Place the Reactor Feed Pumps in Pull-to-lock.

Standard: Rotate each Reactor Feed Pump control switch to the Pull to Lock Position.

SAT/UNSAT Step 9: Take the portable radios and exit the Control Room.

Standard: Operator obtains the portable radios and exits the Control Room.

Interim Cue: Inform operator that the portable radios have been obtained.

TIME FINISH: __________

Terminating Cue: The Control Room evacuation immediate actions have been completed in accordance with procedure OP 3126, Section 3.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: _1_

The plant is operating at 35% power with a trip inserted on RPS Subchannel "A1" due to a failed reactor pressure instrument. The #2 and #3 Turbine Stop Valves fail closed simultaneously. The plant continues operation at 35% power. Is EOP-2 entry required? Explain your answer.

EXPECTED ANSWER:

-- EOP-2 entry not required. No ATWS conditions exist.
-- TSV-2 and 3 closing do not cause a half scram on the "B" RPS Trip System.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 212000A212 4.0/4.1

REFERENCES: LOT-00-212, "Reactor Protection System", Rev. 17, TP-8

JPM QUESTIONS

QUESTION NO: 2

With the plant operating at 100% power, APRM Channel "B" fails full upscale. All expected automatic actions occur. What is the status of the Scram Discharge Volume Vent & Drain Valves for this failure? What is the difference if a manual half scram were inserted with the "B" Manual Scram pushbutton with the plant operating at 100% power. Explain your answer.

EXPECTED ANSWER:

- -- The SDV Vent and Drain Valves remain open
- -- SDV Vent and Drain Valves do not close on either an automatic or manual half scram.
- -- The Scram Discharge Volume Vent & Drain Pilot Valve (31A & B) controls the air to all Vent & Drain Valves. Two solenoids in one body. Takes both de-energizing to position the pilot valve to vent the air.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 212000A412 3.9/3.9

REFERENCES: LOT-01-201, "Control Rod Drive Hydraulics", Rev. 15, Section III.J and TP-3, Page 29

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Perform The Emergency Governor Test From CRP 9-7
Failure Mode: N/A
Reference: OP 4160, "Turbine Generator Surveillance", Rev. 29
Task Number:
Facility JPM #: JPM-24501, Rev. 1, Updated to latest procedure Rev

Task Performance: AO/RO/SRO ___ RO/SRO _X_ SRO Only ___

Sequence Critical: Yes _X_ No ___

Time Critical: Yes ___ No _X_

Operator Performing Task: ______________________

Examiner: ______________________

Date of Evaluation: ______________

Method of Testing: Simulation ___ Performance _X_ Discuss ___

Setting: Classroom ___ Simulator _X_ Plant ___

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ______________

Prepared by: ______________________ 1-22-99
Operations Training Instructor Date

Reviewed by: ______________________ 1-22-99
SRO Licensed/Certified Reviewer Date

Approved by: ______________________ 1/22/99
Operations Training Supervisor Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: Plant is operating at power, normal turbine surveillances are being conducted.

Initiating Cues: The SCRO directs you perform the Emergency Governor Test from Control Room per OP 4160. (Provide VYOPF 4160.0~~2~~7 at this time). An Aux Operator is standing by at the turbine front standard in communication with the Control Room.

Task Standards: Emergency Governor tripped and reset per OP 4160.

Required Materials: OP 4160, "Turbine Generator Surveillance", Rev. 29

Simulator Setup: Any "at power" IC

JPM Modification: N/A

aluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OP 4160, Section IV.D.1 and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	OP 4160 Section IV.D.1 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	***Step 2:**	**Pull EMERG GOVERNOR TRIP/TEST switch handle out.**
	Standard:	EMERG GOVERNOR TRIP/TEST handle on CRP 9-7 is pulled directly toward the operator.
SAT/UNSAT	**Step 3:**	**Verify Emergency Governor Lockout Indication Light comes on and stays on.**
	Standard:	Observes Red light to the left and above switch illuminates and stays on.
SAT/UNSAT	**Step 4:**	**Verify operator at the front standard has lockout indication.**
	Standard:	Contacts front standard operator for lockout condition at front standard.
Interim Cue:	When operator at CRP 9-7 has proper lockout indication, inform the operator that the front standard operator has lockout indication.	
SAT/UNSAT	***Step 5:**	**Turn switch to the TRIP position and hold.**
	Standard:	Switch is turned clockwise through RESET to TRIP and held.
SAT/UNSAT	**Step 6:**	**Verify Green trip light comes on and stays on while switch is held in TRIP position.**
	Standard:	Verifies green light directly above switch comes on and stays on.

SAT/UNSAT **Step 7:** **Verify RESET light goes out and stays out while switch is held in TRIP position.**

Standard: Verifies Red light above and to the right of switch goes out and stays out.

SAT/UNSAT **Step 8:** **Verify computer alarm typer prints, TURBINE TRIP - EMERG TRIP VALVE.**

Standard: Verify computer printout.

Interim Cue: Since operator cannot leave panel to check alarm typer, if alarm typer prints EMERG TRIP VALVE TRIP inform operator as such.

SAT/UNSAT ***Step 9:** **Turn switch to RESET and hold.**

Standard: Switch is turned counter-clockwise to RESET position and held.

AT/UNSAT **Step 10:** **Verify Green TRIP light goes out and stays out.**

Standard: Verifies that Green trip light goes out and remains out.

SAT/UNSAT **Step 11:** **Verify Red RESET light comes on and stays on.**

Standard: Operator verifies Red reset light comes on and remains on.

SAT/UNSAT **Step 12:** **Verify alarm typer prints TURBINE EMERG TRIP VALVE NORM.**

Standard: Verify computer printout.

Interim Cue: Since operator cannot leave panel to verify computer printout if alarm typer prints TURBINE TRIP VALVE NORM, inform operator as such

SAT/UNSAT ***Step 13:** **Turn switch to vertical position.**

Standard: Switch turned counter-clockwise to the vertical position and not pushed in

SAT/UNSAT **Step 14: Verify Green TRIP light stays out.**

Standard: Verifies Green light remains off.

SAT/UNSAT **Step 15: Verify Red RESET light stays on.**

Standard: Operator verifies Red light remains on

SAT/UNSAT **Step 16: Verify alarm typer still indicates TURBINE EMERG TRIP VALVE NORM.**

Standard: Confirms alarm typer still indicates TURBINE EMERG TRIP VALVE NORM.

Interim Cue:	Since operator cannot leave the panel inform the operator that the typer still indicates TURBINE EMERG TRIP VALVE NORM

\T/UNSAT **Step 17: Verify operator at the front standard has reset indication.**

Standard: Contacts front standard operator for status of reset indication at front standard.

Interim Cue:	If operator properly positions switch for reset light indication, inform the operator that the front standard operator has reset light indication

SAT/UNSAT ***Step 18: Push EMERG GOVERNOR TRIP/TEST switch to the normal position.**

Standard: Switch is pushed straight in.

SAT/UNSAT **Step 19: Verify Red LOCKOUT light goes out and stays out.**

Standard: Verifies Red light goes out and stays out.

SAT/UNSAT

Step 20: **Verify operator at front standard observes the lockout is reset.**

Standard: Contacts front standard operator.

Interim Cue: When contacted, inform operator that the front standard operator has lockout reset.

SAT/UNSAT

Step 21: **Record required data.**

Standard: Data recorded on VYOPF 4160.0~~2~~9

TIME FINISH: ____________

Terminating Cue: Emergency Governor tripped and reset per OP 4160.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

During the performance of this test, what physically is preventing the turbine from tripping?

EXPECTED ANSWER:

The oil drain path from the Emergency Governor (Emergency Governor Trip/Test switch in Lockout) is blocked preventing a trip condition from draining the oil from the EG trip piston thus preventing the piston from lifting and tripping the trip lever,

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 241000K413 2.9/3.0

REFERENCES: LOT-00-249, "Mechanical Hydraulic Control System", Rev. 12, Section III.E.5.d.2).c), Page 23

JPM QUESTIONS

QUESTION NO: 2

With the plant operating at 100% power and 1000 psig, the Bypass Opening Jack switch shorts out to the "Raise" position resulting in the Bypass Valves opening. With no operator action, what is the expected MHC system response and the reason for that response?

EXPECTED ANSWER:

- The control valves will open to the speed/load changer setting, then the bypass valves will open
- The BPV Opening Jack going to raise initially sends the opening signal to the Control Valves until limited by the Control Valve Relay then the rising pressure signal will open the bypass valves. (The speed control signal and pressure signal are compared until the speed signal is limited by the Control Valve Relay at which time the pressure signal becomes controlling and opens the bypass valves.)

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 241000A107 3.8/3.7

REFERENCES: LOT-00-249, "Mechanical Hydraulic Control System", Rev. 12, Section III.E.4. and TP-2, Page 20

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Boron Injection Using the CRD System from the SLC Tank
Failure Mode: N/A
Reference: OE 3107, Appendix K, "Boron Injection Using CRD System from SLC Tank", Rev. 12
Task Number:
Facility JPM #: N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation _X_ Performance __ Discuss __

Setting: Classroom __ Simulator __ Plant _X_

Performance Expected Completion Time: 20 minutes

Evaluation Results:

Performance: PASS __ FAIL __ Time Required: ____

Prepared by: TB [signature] 1-22-99
Operations Training Instructor — Date

Reviewed by: [signature] 1-22-99
SRO Licensed/Certified Reviewer — Date

Approved by: [signature] 1/22/99
Operations Training Supervisor — Date

S

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- An ATWS has occurred.
- The EOPs have been entered.
- The SLC Tank is available.
- CRD Pump "A" is in service and CRD Pump "B" is in standby.

Initiating Cues: The SCRO directs you to line up the CRD system for boron injection from the SLC Tank (IAW OE 3107, Appendix K) to the "A" CRD Pump. Inform the Control Room when the CRD Pumps can be started.

Task Standards: The SLC tank and CRD System are lined up to inject into the reactor vessel using "A" CRD Pump in accordance with procedure OP 3107, Appendix K.

Required Materials: OP 3107, Appendix K, "Boron Injection Using CRD System from SLC Tank", Rev. 12

Simulator Setup: N/A

Evaluation **Performance Steps**

TIME START: ____________

SAT/UNSAT **Step 1:** **Obtain Procedure OP 3107 Appendix K and review Prerequisites.**

Standard: OP 3107 obtained, prerequisites reviewed.

Interim Cue: Inform operator Prerequisites are SAT.

SAT/UNSAT ***Step 2:** **Establish a flow path from the SLC Tank to the CRD Pumps.**

Standard: Route a hose from the SLC tank down the EOP SLC Pipe Chase On 318' elevation West, down through the EOP Pipe Chase on Elevations 303' and 280' and down through the equipment hatch on elevation 252' to the CRD Pumps.

note: - Prob in 318 BOT

Interim Cue: As each step of hose routing is simulated, inform operator, hose has been routed.

SAT/UNSAT ***Step 3:** **Verify SLC Tank Drain Valve Closed.**

Standard: At the SLC Tank, verify SLC-23 closed.

Interim Cue: When valve simulated checked, inform operator valve is fully clockwise

SAT/UNSAT ***Step 4:** **Remove Drain Valve Pipe Cap.**

Standard: At the SLC Tank, remove the pipe cap from the 1.5 inch tank drain.

Interim Cue: As cap is simulated being removed, inform operator at each step of removal that step is completed.

SAT/UNSAT ***Step 5: Connect a Drain Hose Adaptor.**

Standard: At the SLC Tank, connect a hose adaptor to the tank drain.

Interim Cue: As hose adapter is simulated being installed, inform operator at each step of installation that step is completed.

SAT/UNSAT ***Step 6: Connect the Suction Hose.**

Standard: At the SLC Tank, connect the CRD Pump suction hose to the SLC Tank drain line.

Interim Cue: As hose is simulated being installed, inform operator at each step of installation that step is completed.

SAT/UNSAT **Step 7: Place the SLC Tank Heater in service.**

Standard: On side of junction box, Rack 25-19 (RB 318'), place the SLC tank heater in service by rotating the control switch to the 'ON' position.

Interim Cue: When heaters simulated energized, inform operator heaters are on.

SAT/UNSAT ***Step 8: Verify DW Isolation to the CST Header Valve Closed.**

Standard: In the CRD pump room, verify DW-66 in the closed position.

Interim Cue: When valve simulated checked, inform operator valve is fully clockwise

SAT/UNSAT ***Step 9: Verify DW Isolation to the CST Header Valve Closed.**

Standard: In the CRD pump room, verify DW-65 in the closed position.

Interim Cue: When valve simulated checked, inform operator valve is fully clockwise

SAT/UNSAT	***Step 10:**	**Remove the Check Valve Flange**
	Standard:	In the CRD pump (between DW-65 and 66), remove the top flange from check valve DW-67.
Interim Cue:	As flange is simulated being removed, inform operator at each step of removal that step is completed.	
SAT/UNSAT	***Step 11:**	**Install a Mechanical Bypass Flange.**
	Standard:	In the CRD pump, install a mechanical bypass flange with a hose connection.
Interim Cue:	As cap is simulated being installed, inform operator at each step of installation that step is completed.	
SAT/UNSAT	***Step 12:**	**Connect SLC Tank Hose.**
	Standard:	In the CRD pump, connect the SLC suction hose to the mechanical bypass Flange.
Interim Cue:	As hose is simulated being installed, inform operator at each step of installation that step is completed.	
SAT/UNSAT	***Step 13:**	**Secure both CRD Pumps.**
	Standard:	Contact the Control Room and request both CRD Pumps be secured.
Interim Cue:	When requested, inform operator that both CRD Pumps are secured.	
SAT/UNSAT	**Step 14:**	**Verify both CRD Pumps secured.**
	Standard:	In the CRD pump, observe both CRD Pumps secured.
Interim Cue:	When checked, inform operator that both pump are secured.	
SAT/UNSAT	***Step 15:**	**Close CST Suction Supply to the CRD Pumps.**
	Standard:	In the CRD pump, close valve CST-63C.
Interim Cue:	When valve simulated closed, inform operator valve has been positioned fully clockwise	

SAT/UNSAT — *Step 16: **Open DW Isolation to CST Header Valve.**

Standard: In the CRD pump, open valve DW-66.

Interim Cue: When valve simulated opened, inform operator valve has been positioned fully counter-clockwise

SAT/UNSAT — *Step 17: **Bypass the CRD Suction Filter.**

Standard: In the CRD pump, open CRD suction filter bypass valve CRD-158A ~~or CRD-158B.~~

Interim Cue: When valve simulated opened, inform operator valve has been positioned fully counter-clockwise

NOTE: Either valve may be closed

SAT/UNSAT — *Step 18: **Close the CRD Suction Filter Inlet Valve.**

Standard: In the CRD pump, close valve CRD-35A.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT — *Step 19: **Close the CRD Suction Filter Inlet Valve.**

Standard: In the CRD pump, close valve CRD-35B.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT — *Step 20: **Close CRD Pump Min Flow Valve.**

Standard: In the CRD pump, close valve CRD-37A.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT ~~*Step 21: Close CRD Pump Min Flow Valve.~~ NA using "A"

~~Standard: In the CRD pump, close valve CRD-37B.~~

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT *Step 22: **Open the SLC Tank Drain Valve.**

Standard: AT the SLC Tank, open valve SLC-23.

Interim Cue: When valve simulated opened, inform operator valve has been positioned fully counter-clockwise

SAT/UNSAT *Step 23: **Vent the SLC to CRD Pump Suction Hose.**

Standard: In the CRD pump, open CRD Pump suction strainer drain valve CRD-151A(B) until no entrapped air is visible.

Interim Cue: When valve simulated opened, inform operator valve has been positioned counter-clockwise and that a steady stream of water has been obtained.

SAT/UNSAT *Step 24: **Close the Vent flow path**

Standard: In the CRD pump, close valve CRD-151A(~~B~~).

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT *Step 25: **Open CRD Pump Test Bypass Valve.**

Standard: At the CRD Flow Control Station, open valve CRD-40

Interim Cue: When valve simulated opened, inform operator valve has been positioned fully counter-clockwise

SAT/UNSAT *Step 26: **Open CRD Pump Test Bypass Valve.**

Standard: At the CRD Flow Control Station, open valve CRD-40A.

Interim Cue: When valve simulated opened, inform operator valve has been positioned fully counter-clockwise

SAT/UNSAT — ***Step 27:** **Close the CRD Drive Filter Inlet valve.**

Standard: At the CRD Flow Control Station, close valve CRD-42A.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT — ***Step 28:** **Close the CRD Drive Filter Inlet valve.**

Standard: At the CRD Flow Control Station, close valve CRD-42B.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT — ***Step 29:** **Close the CRD Cooling Water Pressure Control Station Discharge Valve.**

Standard: At the CRD Flow Control Station, close valve CRD-94.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT — **Step 30:** **Start the CRD Pump(s).**

Standard: Contact the Control Room and report that the SLC Tank is lined up to the CRD System and the CRD Pumps may be started.

Interim Cue: Acknowledge report as the CRO, inform operator the "A" CRD Pump is being started.

TIME FINISH: ____________

Terminating Cue: The SLC Tank is lined up to the CRD System and ready for injection in accordance with procedure OP 3107, Appendix K.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

A hydraulic ATWS has occurred. RPS is currently reset and the Scram Discharge Volume is draining awaiting another manual scram attempt. With OE 3107, Appendix K completed, describe the injection flow path for SLC into the reactor vessel.

EXPECTED ANSWER:

From the discharge of the CRD pumps, SLC will bypass the entire CRD system and enter the reactor vessel via the Reactor Water Cleanup system return line.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 211000A109 4.0/4.1

REFERENCES: P&ID G-191170 and G-191171

JPM QUESTIONS

QUESTION NO: 2

Considering the multiple purposes of the Control Rod Drive Hydraulic system, how does this Appendix K lineup impact the ability of CRD to carry out its intended functions?

EXPECTED ANSWER:

With the CRD Pump Test Bypass Valves (CRD-40 and 40A) open and the Drive Water Filter Inlet Valves (CRD-42A and 42B) closed and CRD-94, normal CRD flow will be diverted resulting in a loss of Recirc Pump Seal purge, Reference Leg Keepfill, CRD cooling water, CRD drive water and CRD accumulator charging flow. (None of the CRD system operations associated with these flowpaths will be available.)

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 211000G2.1.24 2.8/3.1

REFERENCES: P&ID G-191170

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Bypassing Of PCIS Group I Isolation Signals
Failure Mode: N/A
Reference: OE 3107, Appendix P, "Bypassing Of PCIS Group I Isolation Signals", Rev. 12
Task Number:
Facility JPM #: JPM-20032, Rev. 8, Updated to latest procedure Rev

Task Performance: AO/RO/SRO ___ RO/SRO _X_ SRO Only ___

Sequence Critical: Yes ___ No _X_

Time Critical: Yes ___ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation _X_ Performance ___ Discuss ___

Setting: Classroom ___ Simulator ___ Plant _X_

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____________

Prepared by: ____________________ 1-22-99
Operations Training Instructor Date

Reviewed by: ____________________ 1-22-99
SRO Licensed/Certified Reviewer Date

Approved by: ____________________ 1/22/99
Operations Training Supervisor Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: A failure to scram has occurred. The SCRO has entered EOP-2, "ATWS-RPV Control". SLC is injecting and the main condenser is available with no indication of a steam leak or fuel failure. The MSIVs are open and EOP-2 directs performance of Appendix P of OE 3107. I&C assistance is NOT available.

Initiating Cues: The SCRO directs you to bypass Group I isolation signals per OE 3107 Appendix P.
NOTE:

DIRECT THE OPERATOR TO UTILIZE A FLASHLIGHT AS A POINTER WHEN INSIDE THE PANELS.

Task Standards: Group I isolation signals bypassed IAW OE 3107 Appendix P

Required Materials: EOP-2, "ATWS-RPV Control", Rev. Draft
OE 3107, Appendix P, Rev. 12
Flashlight or laser pointer
Banana to banana jumper wire

Simulator Setup: N/A

JPM Modification: Modified initial conditions to reflect EOP-2

aluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OE 3107, Appendix P and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	OP 3107 Appendix P obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	**Step 2:**	**Obtain the EOP toolbox or jumpers from the tool box**
	Standard:	Obtains the banana plug jumpers from the EOP tool box
Interim Cue:	When toolbox and appropriate jumpers located, inform operator they have jumpers in hand. DO NOT allow the operator to remove any items from the tool box.	
\T/UNSAT	***Step 3:**	**In CRP 9-15 install a jumper from DD-20 to DD-19**
	Standard:	In the back of CRP 9-15, simulates installing a jumper from DD-20 to DD-19, located upper left side, from right-hand door. (Upper 1/4 of terminal strip)
Interim Cue:	When proper contacts located and proper installation technique simulated, inform operator the jumper is installed.	
SAT/UNSAT	***Step 4:**	**In CRP 9-15 install a jumper from BB-32 to BB-33**
	Standard:	In the back of CRP 9-15, simulates installing a jumper from BB-32 to BB-33, located upper right side, far left-hand door. (Upper 1/3 of terminal strip)
Interim Cue:	When proper contacts located and proper installation technique simulated, inform operator the jumper is installed.	

SAT/UNSAT ***Step 5: In CRP 9-17 install a jumper from DD-20 to DD-19**

Standard: In the back of CRP 9-17, simulates installing a jumper from DD-20 to DD-19, located upper left side, far right-hand door. (Upper 1/4 of terminal strip)

Interim Cue: When proper contacts located and proper installation technique simulated, inform operator the jumper is installed.

SAT/UNSAT ***Step 6: In CRP 9-17 install a jumper from BB-20 to BB-19**

Standard: In the back of CRP 9-17, simulates installing a jumper from BB-20 to BB-19, located upper right side, far left-hand door. (Upper 1/4 of terminal strip)

Interim Cue: When proper contacts located and proper installation technique simulated, inform operator the jumper is installed.

SAT/UNSAT **Step 7: Verify that the following isolation valves are OPEN, MS-80A, B, C, and D**

Standard: At CRP 9-3, operator verifies the Inboard MSIVs are OPEN:

____ MS-80A
____ MS-80B
____ MS-80C
____ MS-80D

Interim Cue: When proper valves located, inform operator MS-80 A, B, C, D red lights on, green lights are off

SAT/UNSAT

Step 8: **Verify that the following isolation valves are OPEN, MS-86A, B, C, and D**

Standard: At CRP 9-3, operator verifies the Outboard MSIVs are OPEN:

____ MS-86A
____ MS-86B
____ MS-86C
____ MS-86D

Interim Cue: When proper valves located, inform operator MS-86 A, B, C, D red lights on, green lights are off

TIME FINISH: ____________

Terminating Cue: PCIS Group I isolation signals bypassed (jumpers installed)

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: _1_

If the jumper between terminal strip locations BB-32 and BB-33 in CRP 9-15 had NOT been installed (Step 1.a.2)) and reactor water level subsequently lowered to 75 inches, what would be the response of the MSIVs? Confirm your answer utilizing logic prints. Assume the other 3 jumpers were correctly installed.

EXPECTED ANSWER:

The MSIVs should remain open. Installing three jumpers should still defeat the needed "one-out-of-two-taken-twice" logic for an isolation.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 223002K408 3.3/3.7

REFERENCES: PCIS Group 1 Isolation logic print, CWD 1100, 1101, 1102, 1103, 1108

JPM QUESTIONS

QUESTION NO: _2_

With the plant operating at 50% power a MSIV disk separates from the stem. The disk closes but the stem remains in position. What will be the expected plant response? Include plant parameters and the expected RPS and/or PCIS alarms and actions. What actions should be take upon diagnosis of this failure?

EXPECTED ANSWER:

-- Reactor pressure rise, reactor power rises, 3 steam line flows rise and failed MSIV line flow goes to "zero"
-- Should be no PCIS or RPS setpoints exceeded on a transient at this power level
-- Close both MSIVs in that line. (Primary Containment Integrity and RPS input)

Note: This is not clearly discussed in these technical specifications but the applicant should review these sections.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 223001A302 3.5/3.5

REFERENCES: OT 3116, "High Reactor Pressure", Rev. 6, Section FOA 3.

Tech Spec 3.1.A, 3.2.G & 3.7.D

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Operate RCIC From The Alternate Shutdown Panel
Failure Mode:	N/A
Reference:	OP 3126, Shutdown Using Alternate Shutdown Methods, Rev. 15.
Task Number:	
Facility JPM #:	JPM-21701, Rev. 8, Modified

Task Performance: AO/RO/SRO __ RO/SRO X SRO Only __

Sequence Critical: Yes X No __

Time Critical: Yes __ No X

Operator Performing Task: ________________

Examiner: ________________

Date of Evaluation: ____________

Method of Testing: Simulation X Performance __ Discuss __

Setting: Classroom __ Simulator __ Plant X

Performance Expected Completion Time: 20 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: __________

Prepared by: [signature] Operations Training Instructor — Date: 1-22-99

Reviewed by: [signature] SRO Licensed/Certified Reviewer — Date: 1-22-99

Approved by: [signature] Operations Training Supervisor — Date: 1/22/99

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: The Control Room is inaccessible. All OP 3126 Immediate Actions have been completed prior to evacuating the Control Room. HPCI-24 is open. The reactor has been scrammed.

Initiating Cues: The SCRO has appointed you as Operator #3 and directs you to inject RCIC to raise reactor water level from the Alternate Shutdown Panel IAW OP 3126 (Appendix C). Inform the SCRO when you are injecting.

Task Standards: Reactor water level rising with RCIC injecting IAW OP 3126.

Required Materials: OP 3126, Shutdown Using Alternate Methods, Rev. 15

Simulator Setup: N/A

JPM Modification: Converted from simulator to in-plant JPM, condensed several steps, stopped JPM when operator reports injecting

aluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	Step 1:	Obtain Procedure OP 3126, Appendix C and review Admin Limits, Precautions, and Prerequisites.
	Standard:	OP 3126 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	Step 2:	Place MTS-13-2 to EMERGENCY
	Standard:	Simulates rotating MTS-13-2 switch counter-clockwise to EMERGENCY position
Interim Cue:	When simulated in EMERGENCY, inform operator switch is positioned counter-clockwise to EMERGENCY	
\T/UNSAT	*Step 3:	Place both transfer switches on CP-82-3 to EMERGENCY
	Standard:	Simulates placing CP-82-3 transfer switches in EMERGENCY
Interim Cue:	When simulated in EMERGENCY, inform operator both transfer switches are positioned to EMERGENCY	
SAT/UNSAT	Step 4:	Open RCIC-15 & 16
	Standard:	Simulates opening RCIC-15 & 16
Interim Cue:	When simulated open, inform operator that both valves indicate open.	
SAT/UNSAT	Step 5:	In the HPCI Room, open the HPCI Aux Oil Pump ACB on DC-1B.
	Standard:	Simulates opening the HPCI Aux Oil Pump breaker
Interim Cue:	When simulated open, inform operator the breaker is open, down	

When operator asks or heads toward HPCI Room
inform him that HPCI AOP BKR is open

T/UNSAT

Step 6: **At RCIC Room SRV control panel (213' level), check SRV-71A & 71B control switches are in the close position**

Standard: Checks SRV switch positions

Interim Cue: When checked, inform operator switches are both in closed position.

SAT/UNSAT

Step 7: **At RCIC corner room (232' level), places the alternate shutdown transfer switch for SRV-71A and 71B to OPEN.**

Standard: Simulates placing the transfer switch for SRV-71A and 71B to EMERGENCY.

Interim Cue: When simulated in EMERGENCY, inform operator the switch is in EMERGENCY

SAT/UNSAT

Step 8: **Place MTS-13-1 to EMERGENCY**

Standard: Simulates rotating MTS-13-1 switch counter-clockwise to EMERGENCY position

.erim Cue: When simulated in EMERGENCY, inform operator switch is positioned counter-clockwise to EMERGENCY

SAT/UNSAT

+***Step 9:** **Place 3 transfer switches on RCIC shutdown panel (CP-82-1) to EMERGENCY in the following sequence: SS1178A, SS1178B, SS1178C.**

Standard: Simulates placing the three RCIC transfer switches in EMERGENCY in the proper sequence.

Interim Cue: When simulated in EMERGENCY, inform operator the three switches are in EMERGENCY

SAT/UNSAT

Step 10: **Close SRV control power knifeswitch in panel 1300BS11.**

Standard: Simulates closing the SRV control power knifeswitch.

Interim Cue: When simulated closed, inform operator knifeswitch is closed.

ˬAT/UNSAT	**Step 11:**	**Replace RCIC shutdown panel fuses if necessary**
	Standard:	Checks RCIC indications on CP-82-1. Determines no fuse replacement necessary.
Interim Cue:	When/if checked, inform operator all indications on panel are normal.	
SAT/UNSAT	***Step 12:**	**Open RCIC-132, Cooling Water Valve**
	Standard:	Simulates placing RCIC-132 control switch to OPEN
Interim Cue:	When simulated open, inform operator valve is open, red light on, green light off	
SAT/UNSAT	**Step 13:**	**Open RCIC-18**
	Standard:	Simulates placing RCIC-18 control switch to OPEN
'erim Cue:	When simulated open, inform operator valve is open, red light on, green light off	
SAT/UNSAT	**Step 14:**	**Open RCIC-20**
	Standard:	Simulates placing RCIC-20 control switch to OPEN
Interim Cue:	When simulated open, inform operator valve is open, red light on, green light off	
SAT/UNSAT	**Step 15:**	**Open RCIC-21, Pump Discharge**
	Standard:	Simulates placing RCIC-21 control switch to OPEN
Interim Cue:	When simulated open, inform operator valve is open, red light on, green light off	
SAT/UNSAT	**Step 16:**	**Start the RCIC gland seal vacuum pump**
	Standard:	Simulates placing the RCIC gland seal vacuum pump switch to START
Interim Cue:	When simulated started, inform operator pump is running, red light on, green light off	

SAT/UNSAT **Step 17:** **Operate RCIC gland seal condensate pump as necessary to maintain level within the sightglass**

Standard: Monitors gland seal sightglass level and simulates operating the gland seal pump as required

Interim Cue: When/if checked, inform operator level is just below mid-level in the sightglass

SAT/UNSAT ***Step 18:** **Set the RCIC potentiometer to zero by turning potentiometer counter-clockwise to the zero setting.**

Standard: Simulates rotating the RCIC potentiometer counter-clockwise to the zero setting.

Interim Cue: When operation simulated , inform operator the potentiometer is at zero setting

SAT/UNSAT **Step 19:** **Open RCIC-27, minimum flow and monitor CST and torus level**

Standard: Simulates placing RCIC-27 switch to OPEN, checks CST and torus levels

Interim Cue: When simulated open, inform operator valve is open, red light on, green light off. When/if checked, inform operator CST and Torus levels are not noticeably changing

SAT/UNSAT ***Step 20:** **Start RCIC turbine by opening RCIC-131 and raising the RCIC potentiometer setting so turbine is accelerated to greater than 2000 rpm immediately**

Standard: Simulates placing RCIC-131 switch to OPEN and immediately rotates RCIC potentiometer clockwise to raise turbine speed, monitors turbine speed on CP-82-1

Interim Cue: When simulated open, inform operator RCIC-131 is opening, red light on, green light off When potentiometer simulated raised, inform operator turbine speed rising, now at 2250 rpm.

SAT/UNSAT **Step 21: Adjust RCIC potentiometer to obtain 400 gpm at less than 4500 rpm**

Standard: Simulates operating potentiometer clockwise to achieve 400 gpm at less than 4500 rpm. Flow is on DPIS-13-61 next to RCIC Alternate Shutdown Panel

Interim Cue: When potentiometer simulated operated, inform operator turbine speed and flow rising, now at 400 gpm and 4300 rpm. NOTE: If > 4300 rpm flow is > 400 gpm, if <4300 rpm flow is <400 gpm

SAT/UNSAT ***Step 22: Close RCIC -27 when flow is above 80 gpm**

Standard: Simulates placing RCIC-27 control switch in CLOSE when flow >80 gpm on DPIS-13-61

NOTE: Procedure assumes RCIC-27 auto closure. This will occur only with initiation signal present. So with no signal valve must be closed by the operator.

Interim Cue: When simulated closed, inform operator valve is closed, green light on, red light off

SAT/UNSAT **Step 23: Control water level between 137" and 167" by adjusting RCIC flow with the potentiometer, inform SCRO that RCIC is injecting**

Standard: Simulates adjusting flowrate with RCIC potentiometer. Informs SCRO that RCIC is injecting. Monitors LI-2-3-72C.

Interim Cue: When simulated injecting, inform operator that another operator will control level with RCIC.

TIME FINISH: ____________

Terminating Cue: Another operator will control level with RCIC.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

Would the expected response and/or operator action regarding the RCIC Minimum Flow Valve (RCIC-27) have been any different if reactor water level was 55 inches during this task? Using appropriate logic drawings, show that this is an expected response.

EXPECTED ANSWER:

-- If an initiation signal had been present, the RCIC-27 valve would have closed automatically at a flow of 80 gpm, no operator action required.
-- Per logic prints.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 217000A301 3.5/3.5

REFERENCES: CWD 193

JPM QUESTIONS

QUESTION NO: 2

RCIC is running and injecting at 400 gpm with speed control by the potentiometer at the Alternate Shutdown Panel. A failure of the RCIC shaft driven lube oil pump results in a total loss of oil pressure (reading 0 psig). What will be the expected response of RCIC to this failure? Explain your answer.

EXPECTED ANSWER:

- -- The RCIC turbine will accelerate until it trips on mechanical overspeed.
- -- The RCIC turbine governor is spring open, oil closed valve. A loss of oil pressure will result in the valve going full open resulting in an overspeed condition until stopped by the Turbine Trip/Throttle Valve closing on a mechanical overspeed condition.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER:	217000A207	3.1/3.1
REFERENCES:	LOT-00-217, "Reactor Core Isolation Cooling", Rev. 16, Section III.C.2. & 3 and Section V.C.1, Pages 20 & 35	

Facility: Vermont Yankee	Date of Examination: 01/25/99
Examination Level: SRO(I)	Operating Test No: #2

System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description
1. Feedwater/Transfer Level Control Aux To Main Feed Reg Valve/D,S,L	2	a. 259002K410 - 3.4/3.4 - Power changes while in single element control
		b. 259001K301 - 3.9/3.9 - Loss of FRV control signal plant response
2. SBGT/Manually Initiate SBGT Train "A" /D, S	9	a. 261000K302 - 3.6/3.9 - Inop SBGT vs Secondary Containment Integrity
		b. 261000A304 - 3.0/3.1 - SBGT heater indications during an accident
3. AC Dist/Energize Bus 8 From Bus 9/ D,S	6	a. 215005K601 - 3.7/3.8 - Bus loss with inop APRMs
		b. 212000A412 - 3.9/3.9 - Reset SDV scram with loss of RPS bus
4. MHC/Swap From EPR To MPR/ N,S	3	a. 241000K607 - 3.4/3.4 - Effects of failed steam pressure signal on MPR
		b. 241000A409 - 3.2/3.1 - TCV/IV operations on slow and fast overspeed
5. Exiting the Power-to-Flow Exclusion Region W/ Oscillations /N, A, S	1	a. 201001G2.1.25 - 2.8/3.1 - Overcharging HCU accumulator effects
		b. 201001A308 - 3.0/2.9 - Rod insertions with failed stabilizing valve
6. PCIS/Reset A Group III Isolation/ D,S	5	a. 223002A403 - 3.6/3.5 - Attempted reset with failed valve switch contacts
		b. 223002K408 - 3.3/3.7 - RHR/SDC isolations from Alternate Shutdown Panels
7. HPCI/RPV Venting Via HPCI/ D,S	4	a. 295024K104 - 3.6/3.9 - Minimum RPV Flooding Pressure during Emergency Depress
		b. 295024G2.4.21 - 3.7/4.3 - Post ED SRV actions with lowering torus water level
8. RPS/Startup The "A" RPS MG Set/ D,P	7	a. 212000K602 - 3.7/3.9 - APRM vs RPS Tech Spec actions
		b. 212000G2.2.26 - 2.5/3.7 - RPS operable trips during refueling interlock checks
9. CTMT/Manually Open Containment Spray Valve/N,P,R	5	a. 223001G2.2.22 - 3.4/4.1 - Operability of manually operated MOV
		b. 223001A210 - 3.6/3.8 - Drywell leak location determination
10. SDC/Placing SDC Isolation Valve On Alternate Power/N,P	4	a. 295021A205 - 3.4/3.4 - Thermal stratification indications
		b. 295021G2.1.22 - 2.8/3.3 - Time to mode change on loss of SDC

* 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

Facility: Vermont Yankee	Date of Examination: 01/25/99
Examination Level: SRO(U)	Operating Test No: #3

System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description
1. Feedwater/Transfer Level Control Aux To Main Feed Reg Valve/D,S,L	2	a. 259002K410 - 3.4/3.4 - Power changes while in single element control
		b. 259001K301 - 3.9/3.9 - Loss of FRV control signal plant response
2. N/A		a.
		b.
3. N/A		a.
		b.
4. MHC/Swap From EPR To MPR/ N,S	3	a. 241000K607 - 3.4/3.4 - Effects of failed steam pressure signal on MPR
		b. 241000A409 - 3.2/3.1 - TCV/IV operations on slow and fast overspeed
5. Exiting the Power-to-Flow Exclusion Region W/ Oscillations /N, A, S	1	a. 201001G2.1.25 - 2.8/3.1 - Overcharging HCU accumulator effects
		b. 201001A308 - 3.0/2.9 - Rod insertions with failed stabilizing valve
6. N/A		a.
		b.
7. N/A		a.
		b.
8. N/A		a.
		b.
9. CTMT/Manually Open Containment Spray Valve/N,P,R	5	a. 223001G2.2.22 - 3.4/4.1 - Operability of manually operated MOV
		b. 223001A210 - 3.6/3.8 - Drywell leak location determination
10. SDC/Placing SDC Isolation Valve On Alternate Power/N,P	4	a. 295021A205 - 3.4/3.4 - Thermal stratification indications
		b. 295021G2.1.22 - 2.8/3.3 - Time to mode change on loss of SDC

* 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

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Transfer Vessel Level Control From Auxiliary To Main Feedwater Regulator Valve
Failure Mode:	N/A
Reference:	OP 0105, "Reactor Operations", Rev. 4
Task Number:	
Facility JPM #:	JPM-25902, Rev. 4, Updated to latest procedure Rev

Task Performance: AO/RO/SRO __ RO/SRO X SRO Only __

Sequence Critical: Yes __ No X

Time Critical: Yes __ No X

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance X Discuss __

Setting: Classroom __ Simulator X Plant __

Performance Expected Completion Time: 9 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____________

Prepared by: TB Jeffrie 1-22-99
Operations Training Instructor — Date

Reviewed by: [signature] 1-22-99
SRO Licensed/Certified Reviewer — Date

Approved by: [signature] 1/22/99
Operations Training Supervisor — Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: A plant startup is in progress

Initiating Cues: The SCRO directs you to transfer level control from the Auxiliary FRV to the "A" Main Feed Regulating Valve. The Aux FRV is approximately 80% open.

Task Standards: Reactor level control switched from Auxiliary to Main Feedwater Reg. Valve in accordance with OP 0105.

Required Materials: OP 0105, "Reactor Operations", Rev. 4

Simulator Setup: Low power IC. One feedwater pump running with the Auxiliary Feedwater Regulating Valve about 80% open

JPM Modification: N/A

aluation	Performance Steps
	TIME START: ____________
SAT/UNSAT	Step 1: Obtain Procedure OP 0105, Phase 2, Section D.13, and review Admin Limits, Precautions, and Prerequisites.
	Standard: OP 0105 obtained, admin limits, precautions and prerequisites reviewed.

Interim Cue: If asked, all prerequisites have been met.

SAT/UNSAT	Step 2: Check Vessel Level Control Mode Switch in 1 ELEMENT
	Standard: Single element/3 element switch in 1 ELEMENT on CRP 9-5 vertical board
SAT/UNSAT	*Step 3: Check Rx Vessel Level Master Controller in MAN and Adjust Manual Pot to Zero (Full Closed)
	Standard: Controller verified in MAN and manual pot turned fully counter-clockwise on CRP 9-5 horizontal board
SAT/UNSAT	*Step 4: Place "A" Feedwater Reg Valve FDW-12A Controller in BAL
	Standard: "A" FRV M/A station placed in BAL on CRP 9-5 horizontal panel
SAT/UNSAT	Step 5: Check Feedwater Reg Valve FDW-12B Controller in Manual and Pot at Zero
	Standard: "B" FRV M/A station checked in MAN and pot checked to zero (full counter-clockwise) position on CRP 9-5 horizontal panel
SAT/UNSAT	*Step 6: Open FDW-11A Blocking Valve
	Standard: FDW-11A control switch placed in OPEN on CRP 9-5
SAT/UNSAT	Step 7: Verify FDW-11A OPEN
	Standard: Observes FDW-11A red light on, green light off on CRP 9-5

SAT/UNSAT **<u>Step 8: Check the reactor level stable and the Auxiliary Feed Reg Valve compensates for leakage through the Main Feed Reg Valve</u>**

Standard: Observes level indicators on CRP 9-5 are stable and Auxiliary Reg valve controlling level

SAT/UNSAT ***<u>Step 9: Slowly Open the "A" Main Feed Reg Valve with the Rx Vessel Level Master Control Manual Pot</u>**

Standard: Master control station manual pot turned slowly clockwise.

SAT/UNSAT **<u>Step 10: Observe Auxiliary FRV FDW-13 Slowly Closing</u>**

Standard: Observes valve position on Auxiliary FRV controller on CRP 9-5

SAT/UNSAT **<u>Step 11: When Auxiliary Feed Reg Valve is Less than 20% Open Balance the Manual Pot</u>**

Standard: Auxiliary FRV controller balanced on CRP 9-5

SAT/UNSAT **<u>Step 12: Transfer Auxiliary FRV to MANUAL</u>**

Standard: Auxiliary FRV controller placed in MANUAL

SAT/UNSAT ***<u>Step 13: Fully Close the Auxiliary FRV</u>**

Standard: Auxiliary FRV controller manual pot turned fully counter-clockwise

SAT/UNSAT **<u>Step 14: Verify Auxiliary Reg Valve fully shut</u>**

Standard: Observe FDW-13 valve indication green light ON, red light OFF on CRP 9-5

SAT/UNSAT **<u>Step 15: Adjust Rx Vessel Level Master Controller to maintain level</u>**

Standard: Level being adjusted by master controller pot on CRP 9-5

SAT/UNSAT **Step 16: Adjust the Setpoint Tape on the Rx Vessel Level Master Controller to Zero Deviation**

Standard: Setpoint tape adjusted to null indication

SAT/UNSAT ***Step 17: Switch Rx Vessel Level Master Controller to BAL**

Standard: Master FRV controller switched to BAL

TIME FINISH: ____________

Terminating Cue: Reactor level control switched from Auxiliary to Main Feedwater Reg. Valve in accordance with OP 0105.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

Due to a malfunction, the Feedwater Level Control system had to be placed in "Single Element" at 95% power and then a 20% rapid power reduction was made. How would the feed system and reactor water level respond?

EXPECTED ANSWER:

Level would rise as power is reduced then would slowly catch up to the demanded level but won't reach it until the power reduction is completed. (The feed system and reactor water level response would be very sluggish. A level dominant system.)

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 259002K410 3.4/3.4

REFERENCES: OP 2172, "Feedwater System", Rev. 20,

JPM QUESTIONS

QUESTION NO: 2

With the plant operating at 100% power, a loss of control signal to the "A" Feedwater Regulating Valve occurs. Assuming no operator actions taken, what would be the expected response of reactor water level and the Feedwater System over the next 20 minutes?

EXPECTED ANSWER:

Initially, the "A" FRV would lockup (fail as-is) and there would be no noticeable level or feedwater system changes. As time goes on, the "A" FRV would begin to drift open. The resulting reactor water level rise would be compensated for by the "B" FRV closing down with a net "zero" change in level. Eventually the "A" FRV would be fully open and the "B" FRV would be throttled in the "closed" direction with normal reactor water level.

ACTUAL ANSWER:

SAT ______ **UNSAT** ______

K/A NUMBER: 259001K301 3.9/3.9

REFERENCES: LOT-00-259, "Feedwater System", Rev. 12, Section III.E.1.d, Page 10

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Manually Initiate SBGT Train "A"
Reference: OP 2117, Standby Gas Treatment, Rev. 16
Task Number: 2610030101
Facility JPM#: JPM-26101, Rev. 9

Task Performance: AO/RO/SRO ___ RO/SRO _X_ SRO Only ___

Sequence Critical: Yes ___ No _X_

Time Critical: Yes ___ No _X_

Operator Performing Task: ______________________

Examiner: ______________________

Date of Evaluation: ______________

Method of Testing: Simulation ___ Performance _X_ Discuss ___

Setting: Classroom ___ Simulator _X_ Plant _

Performance Expected Completion Time: 5 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: _____

Prepared by: ______________________ 1-22-99
Operations Training Instructor Date

Reviewed by: ______________________ 1-22-99
SRO Licensed/Certified Reviewer Date

Approved by: ______________________ 1/22/99
Operations Training Supervisor Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the Simulator and you are to perform the actions.

You are requested to "talk through" the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: Reactor at power, normal plant operation

Initiating Cues: The SS directs you to start SBGT A and take a suction on the Reactor Building.

Task Standards: SBGT Train "A" manually started and taking a suction on the Reactor Building.

Required Materials: OP 2117, Standby Gas Treatment
Figures I and II of OP 4117
OP 2115, Primary Containment - Drywell/Torus D.P. limitations

Simulator Set-Up: Any At-Power IC.
SBGT "B" lined up to vent the torus

Evaluation **Performance Steps**

TIME START: _____

SAT/UNSAT Step 1: Obtain Procedure review precautions, administrative limits, and prerequisites

Standard: OP 2117 Section B obtained, administrative limits, precautions and prerequisites are reviewed.

Interim Cue: If asked, all prerequisites of OP 2117 are met.

SAT/UNSAT Step 2: Check for open Chemical or Fire Permits for location and existing status of work.

Standard: Operator checks on open Chemical or Fire permits.

Interim Cue: When asked, there are no open Chemical or Fire permits.

SAT/UNSAT *Step 3: Place REF-2A Fan Switch to the START Position on CRP 9-26

Standard: SBGT Fan "A" Switch taken to START on CRP 9-26

SAT/UNSAT Step 4: Verify SBGT A start

Standard: Operator observes SBGT Fan "A" red light ON, green light OFF on CRP 9-26

SAT/UNSAT Step 5: Verify air flow

Standard: Operator observes flow meter on CRP 9-26 to indicate about 250 scfm

SAT/UNSAT Step 6: Verify SGT-2A OPEN

Standard: Observes SGT-2A OPEN on CRP 9-26 red light ON, green light OFF

Evaluation | Performance Steps

SAT/UNSAT Step 7: Verify SGT-3A OPEN

Standard: Observes SGT-3A OPEN on CRP 9-26, red light ON, green light OFF.

SAT/UNSAT *Step 8: Open SGT-1A

Standard: SGT-1A handswitch on CRP 9-26 taken to OPEN

SAT/UNSAT Step 9: Verify SGT-1A OPENS

Standard: Operator observes A SBGT air flow increase to about 1200 scfm on CRP 9-26 and SGT-1A red light ON, green light OFF on CRP 9-26

SAT/UNSAT Step 10: Check that SGT-4A CLOSED

Standard: Observes SGT-4A CLOSED on CRP 9-26, green light ON, red light OFF

SAT/UNSAT Step 11: Close/check closed the idle SBGT Train inlet and outlet valves SGT-2B, SGT-3B

Standard: Observes SGT-2B/3B CLOSED on CRP 9-26, red light OFF and green light ON.

SAT/UNSAT Step 12: Verify Actual Flow is Between 1425 - 1500 CFM

Standard: Obtains indicated flow reading on CRP 9-26 and verifies actual flow as shown on Figure I of OP 4117

Note: An indicated flow between 1263 and 1332 corresponds to an actual flow of 1425-1500. An indicated flow of 1300 is an actual flow of 1465.

SAT/UNSAT Step 13: Check that 9KW Duct Heater is Energized for the Operating Train

Standard: Observes 9KW heater EUH-2 indicates "ON" at CRP 9-26, red light ON, green light OFF

Evaluation	Performance Steps
SAT/UNSAT	Step 14: Monitor Drywell/Torus dP. Refer to OP 2115 For Limits

Standard: Operator observes PR/ΔPR-1-156-3 on CRP 9-25 to check Drywell/Torus dP between 1.8 and 2.0 psid.

TIME FINISH: ___________

Terminating Cue: SBGT Train "A" manually started and taking a suction on the Reactor Building.

Evaluators Comments:____

System: 261000 K/As:

K1.01 (3.4/3.6)	K1.09 (3.2/3.4)
K1.12 (3.1/3.2)	K3.01 (3.3/3.6)
K4.01 (3.7/3.8)	K4.03 (2.5/2.7)
K5.02 (2.3/2.5)	A1.01 (2.9/3.1)
A1.04 (3.0/3.3)	A2.01 (2.9/3.1)
A2.02 (2.9/3.1)	A3.01 (3.2/3.3)
A3.02 (3.2/3.1)	A3.03 (3.0/2.9)
A4.03 (3.0/3.0)	A4.06 (3.3/3.6)
A4.07 (3.1/3.2)	

Generic K/As:

2.1.2	(3.0/4.0)	2.1.10	(2.7/3.9)
2.1.20	(4.3/4.2)	2.1.23	(3.9/4.0)
2.1.27	(2.8/2.9)	2.1.28	(3.2/3.3)
2.1.30	(3.9/3.4)	2.1.32	(3.5/3.8)
2.4.10	(3.0/3.1)	2.4.50	(3.3/3.3)

JPM QUESTIONS

QUESTION NO: 1

With the plant operating at power, both trains of Standby Gas Treatment have been declared "Inoperable". What are the restrictions on continued plant operation for these conditions?

EXPECTED ANSWER:

With both SBGT "Inoperable", must immediately initiate procedures to ensure Secondary Containment Integrity is maintained to be completed within 24 hours (3.7.B.4) With both trains "Inop", cannot maintain Secondary Containment Integrity (3.7.C.1.a). Have an additional 4 hours to restore Secondary Containment Integrity (3.7.C.2). Then must be in Hot Shutdown within 12 hours and Cold Shutdown within following 24 hours (3.7.C.3).

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 261000K302 3.6/3.9

REFERENCES: Tech Specs 3.7.B and 3.7.C, Amendments 143 & 147, Pages 152 - 155a

JPM QUESTIONS

QUESTION NO: 2

On a loss of coolant accident with fuel failure, both trains of Standby Gas Treatment have started and are operating normally. The "B" SBGT train is shutdown 30 minutes into the accident. 90 minutes into the accident the CRO checking indications on CRP 9-26 notes that BOTH the Heater Green Light and Red Light on the "A" SBGT train are illuminated. Is this an expected indication? Justify your answer.

EXPECTED ANSWER:

- Yes, expected indication
- Once the charcoal bed has reached operating temperature, the heaters will cycle off. With both lights on, the fan is running and a high temperature (150 degrees F) condition exists and the heater has cycled off.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 261000A304 3.0/3.1

REFERENCES: LOT-00-261, "Standby Gas Treatment", Rev. 19, Section IV.E.6, Pages 18 & 19

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Energize Bus 8 From Bus 9
Failure Mode: N/A
Reference: OP 2143, "480 And Lower Voltage AC System", Rev. 39
Task Number:
Facility JPM #: JPM-26208, Rev. 4, Updated to latest procedure Rev

Task Performance: AO/RO/SRO ___ RO/SRO _X_ SRO Only ___

Sequence Critical: Yes _X_ No ___

Time Critical: Yes ___ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation ___ Performance _X_ Discuss ___

Setting: Classroom ___ Simulator _X_ Plant ___

Performance Expected Completion Time: 5 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____________

Prepared by: ____________________ 1-22-99
Operations Training Instructor — Date

Reviewed by: ____________________ 1-22-99
SRO Licensed/Certified Reviewer — Date

Approved by: ____________________ 1/22/99
Operations Training Supervisor — Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: The plant has experienced a fault that has caused a loss of 4KV Bus 3 while operating at power. All other power sources are operable. "A" FPC Pump, "A" RBCCW Pump and "B" TBCCW Pump are operating. The Vital MG is on DC drive and Switchyard control power is on ALT. Chemistry has been notified.

Initiating Cues: The SCRO directs you to energize 480 VAC Bus 8 from Bus 9.

Task Standards: Bus 8 is re-energized from Bus 9.

Required Materials: OP 2143, "480 And Lower Voltage AC System", Rev. 39

Simulator Setup: Any IC. Insert malfunction EDO4A (Bus 3 ground) and IDA EDR47 to ALT (Switchyard control power)

JPM Modification: N/A

aluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	Step 1:	Obtain Procedure OP 2143, Section O and review Admin Limits, Precautions, and Prerequisites.
	Standard:	OP 2143 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	Step 2:	Notify Chemistry that Stack Gas I, II and Stack Flow indicator FT-108-22 will be deenergized/inoperable. Inform SCRO of Tech Spec applicability
	Standard:	Notifies Chemistry of power transfer and informs SCRO of Tech Spec concerns, given in initial conditions.
Interim Cue:	Acknowledge report as Chemistry. Inform operator that Tech Specs have been reviewed and applicable actions taken	
SAT/UNSAT	Step 3:	Shift redundant equipment to Bus 9 to minimize Bus 8 loads
	Standard:	Per initial conditions, verifies "A" FPC Pump, "A" RBCCW Pump and "B" TBCCW Pump running, the Vital MG Set on DC drive and Switchyard control power on ALT
Interim Cue:	If Auxiliary Operator called, inform operator that switchyard control power in on ALT	
SAT/UNSAT	Step 4:	Secure Shutdown Cooling per OP 2124
	Standard:	Per initial conditions verifies SDC secured
SAT/UNSAT	Step 5:	Ensure that Bus 9 is energized
	Standard:	Checks Bus 9 energized using voltage indication on CRP 9-8 or via appropriate breaker line-up
SAT/UNSAT	+*Step 6:	Open Breaker 88
	Standard:	Places control switch for Breaker 88 to OPEN

SAT/UNSAT	**Step 7:**	**Verify Breaker 88 open and Bus 8 voltage zero**
	Standard:	Observes green light on, red light off, checks Bus 8 voltage on all three phases reading zero on CRP 9-8
SAT/UNSAT	**Step 8:**	**Enter the LCOs for the "A" DG, Bus 8 Inop and admin 24 hour Cold Shutdown while Bus 8 powered from Bus 9**
	Standard:	Informs SCRO of LCO requirements for these conditions
Interim Cue:	Acknowledge report as SCRO. Inform operator that Tech Specs have been reviewed and applicable actions taken.	
SAT/UNSAT	**+*Step 9:**	**Close Breaker 8T9 from CRP 9-8**
	Standard:	Places switch for 8T9 to CLOSE and releases, observes red light on, green light off
SAT/UNSAT	**+*Step 10:**	**Close Breaker 9T8 from CRP 9-8**
	Standard:	Places switch for 9T8 to CLOSE and releases, observes red light on, green light off
SAT/UNSAT	**Step 11:**	**Observe Bus 8 voltage approximately 480 VAC**
	Standard:	Checks Bus 8 voltage on all three phases reading 480 on CRP 9-8 by moving the Bus 8 Voltmeter Selector Switch from AB to BC and CA
SAT/UNSAT	**Step 12:**	**Return the "A" RPS MG Set to service**
	Standard:	Directs Aux Operator to place the "A" RPS MG Set in service.
Interim Cue:	When called, acknowledge order to place MG Set in service. Inform operator that another operator will complete the procedure.	

+ Step 6 must be done before Steps 9 & 10 but Steps 9 & 10 may be reversed

TIME FINISH: ____________

Terminating Cue: **Bus 8 is reenergized from Bus 9**

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

The Caution associated with Step O.5 of OP 2143 states that: "If the number of operable LPRMs is less than 9 on APRM "D" or APRM "F", opening Breaker 88 will result in a full reactor scram." Why is this true? Why isn't APRM "C" included in this Caution?

EXPECTED ANSWER:

- This transfer causes a loss of the "A" RPS MG Set and a half scram on "A" RPS. Less than 9 LPRMs on APRM "D" or "F" result in an Inop Trip (the other side's companion LPRMs have already been lost) and a half scram on "B" RPS giving a full scram.
- APRM "C" doesn't lose any companion LPRMs thus no Inop trip.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 215005K601 3.7/3.8

REFERENCES: LOT-05-215, "Average Power Range Monitor", Rev. 13, Section VI.F.2, Page 30

JPM QUESTIONS

QUESTION NO: 2

Why must both RPS buses be energized in order to successfully reset the Scram Discharge Volume High Level Scram? Prove your answer?

EXPECTED ANSWER:

Both solenoids must be reenergized to reset the scram. The contacts are in series.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 212000A412 3.9/3.9

REFERENCES: LOT-00-212, "Reactor Protection System", Rev. 17, Section I.B. Page 37

CWD 830

DWG 5920-2119

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Swap Pressure Regulators (EPR to MPR)
Failure Mode:	N/A
Reference:	OP 2160, "Turbine Generator Support Systems Operation", Rev. 23
Task Number:	
Facility JPM #:	N/A

Task Performance: AO/RO/SRO ___ RO/SRO _X_ SRO Only ___

Sequence Critical: Yes _X_ No ___

Time Critical: Yes ___ No _X_

Operator Performing Task: ______________________

Examiner: ______________________

Date of Evaluation: ______________

Method of Testing: Simulation ___ Performance _X_ Discuss ___

Setting: Classroom ___ Simulator _X_ Plant ___

Performance Expected Completion Time: 8 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ___

Prepared by: ______________________ Operations Training Instructor — 1-22-99 Date

Reviewed by: ______________________ SRO Licensed/Certified Reviewer — 1-22-99 Date

Approved by: ______________________ Operations Training Supervisor — 1/22/99 Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: - The plant is operating at power
- The White light for the EPR Regulator is lit.

Initiating Cues: The SCRO directs you to swap from the EPR Pressure Regulator to the MPR Pressure Regulator.

Task Standards: The MPR Pressure Regulator is placed in service in accordance with procedure OP 2160, Section B.1.

Required Materials: OP 2160, "Turbine Generator Support Systems Operation", Rev. 23

Simulator Setup: - 100% power
- EPR Regulator in service

aluation	Performance Steps	
	TIME START: _____________	
SAT/UNSAT	Step 1:	Obtain Procedure OP 2160 and review Admin Limits, Precautions, and Prerequisites.
	Standard:	OP 2160 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	Inform operator Prerequisites are SAT.	
SAT/UNSAT	Step 2:	Verify MPR output stroke.
	Standard:	Verify the MPR Output Stroke is approximately 10% below the EPR Output Stroke setting.
SAT/UNSAT	Step 3:	Verify MPR bulb.
	Standard:	Verifies the white light bulb for the MPR is good. (removes bulb and checks it/swaps bulb with one currently illuminated)
SAT/UNSAT	*Step 4:	Lower MPR Setpoint.
	Standard:	Rotates the MPR Output Switch to the Lower Position and observes the MPR Output Stroke moves in the direction of the EPR Output Stroke setting, and continues to hold the switch until the MPR takes control.
SAT/UNSAT	Step 5:	Verify the MPR has Pressure Control.
	Standard:	Observes the white light on above the MPR Setpoint Switch, white light off above the EPR Setpoint switch, and Reactor Pressure stable on CRP 9-5.
SAT/UNSAT	Step 6:	Adjust the EPR Setpoint.
	Standard:	Rotates the EPR Setpoint control to the raise position until the EPR Output Stroke slowly decreases to zero.

SAT/UNSAT

Step 7: Report Pressure Regulators swapped.

Standard: Notifies the SCRO that the MPR is in control.

Interim Cue: Acknowledge report as SCRO, if asked, placing the EPR in "Cutout" is not required.

TIME FINISH: ____________

Terminating Cue: The MPR Pressure Regulator is in service and controlling Reactor Pressure in accordance with procedure OP 2160, Section B.1.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

Assume the EPR is controlling pressure with the MPR acting as backup. Concerning the main steam pressure signal FROM the main steam line averaging manifold TO the Mechanical Pressure Regulator (MPR), explain why this signal to the MPR failing HIGH results in a reactor scram while this signal to the MPR failing LOW does not.

EXPECTED ANSWER:

-- The MPR is set at a higher pressure setpoint than the EPR. A high pressure input signal will cause the MPR to raise its output signal until it is greater than the normally controlling EPR. When its signal is greater than the EPR it will cause the Turbine Control Valves to open in an attempt to lower pressure. Low main steam line pressure with RMS in "Run" results in MSIV closure and reactor scram.

-- If a failed low main steam pressure input is sent to the MPR it will lower MPR output. Since the MPR is deliberately set to be at a lower setpoint than the EPR lowering the signal further will not affect the Turbine Control Valves because the EPR is in control. No large pressure change or reactor scram.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 241000K607 3.4/3.4

REFERENCES: LOT-00-249, "Mechanical Hydraulic Control System", Rev. 12, Section III.E.3.a & b. Pages 16 - 18

JPM QUESTIONS

QUESTION NO: 2

Why are "overspeed control valves" (Intercept Valves) placed between the High Pressure turbine and the two Low Pressure Turbines for steam control? Describe the expected response of the Turbine Control Valves and Intercept Valves on a turbine "slow" overspeed condition as opposed to a "fast" overspeed condition?

EXPECTED ANSWER:

-- Specifically designed to control steam admission to the low pressure turbines on "overspeed" transients when the Turbine Control Valves (supplying steam to the High Pressure Turbine) are already closed. Control of the large amount of high energy steam in the cross-around headers and moisture separators (between HP and LP turbines) is needed to prevent overspeeding an unloaded turbine.
-- On "slow" overspeed the TCV ramp closed from 100% to 105% speed, the IV then ramp closed from 105% to 107% speed
-- On a "fast" overspeed, the TCV will close at 100%, the IV will ramp closed from 100% to 103% speed.

CTUAL ANSWER:

SAT ________ UNSAT ________

K/A NUMBER: 241000A409 3.2/3.1

REFERENCES: LOT-00-245, "Main Turbine", Rev. 11, Section III.C.3, Page 31

LOT-00-249, "Mechanical Hydraulic Control System", Rev. 12, TP- 8

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Exiting the Power-to-Flow Exclusion Region
Failure Mode: APRM 10% Peak-to-Peak Oscillations requires manual scram
Reference: OT 3117, "Reactor Instability", Rev 8
Task Number:
Facility JPM #: N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 15 minutes

Evaluation Results:

Performance: PASS __ FAIL __ Time Required: ___

Prepared by: ____________________ Operations Training Instructor — 1/26/99 Date

Reviewed by: ____________________ SRO Licensed/Certified Reviewer — 1-26-99 Date

Approved by: ____________________ Operations Training Supervisor — 1/26/99 Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the Simulator and you are to perform the actions.

You are requested to "talk through" the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- The plant is operating at power
- Both Recirc Pumps have tripped
- The plant is operating in the Exclusion Region of the Power-to-Flow Map

Initiating Cues: The plant was operating at 100% power when both recirc pumps tripped. The actions of OT 3118, Recirc Pump Trip, are being carried out. The SCRO directs you to carry out the actions of OT 3117, Reactor Instability, to exit the Exclusion Region. The Solomon stability monitor is available and has been initiated.

Task Standards: A manual scram is inserted in response to indications of reactor instability

Required Materials: OT 3117, "Reactor Instability", Rev 8

Simulator Setup:
- IC-92

Verify:
- Insert RR05A and RR05B to trip both Recirc Pumps or turn the pumps off
- Reactor Power will be about 50% and Core Flow will be about 12 Mlbs/Hr, causing operation in the Exclusion Region
- Allow the plant to stabilize
- Advance the APRM, Level, and Pressure recorders on 9-5
- Start power oscillations using the Remote Key pad when the second rod is inserted to about notch 12, going in.
- See following sheet for APRM and LPRM malfunctions to be inserted
- To cause oscillations: Red Key+Key 1 to insert
  Red Key+M/D Key, then Red Key+Key 1 to remove
  Repeat

ᵓRM Malfunctions: Upscale

NMO5A @ 22
NMO5B @ 24
NMO5C @ 19
NMO5D @ 19
NMO5E @ 21
NMO5F @ 19

LPRM Malfunctions: Downscale

NM3 0809A
NM3 0817A
NM3 1607A
NM3 1625A
NM3 1633D
NM3 2409A
NM3 2417B
NM3 2425C
NM3 3209A
NM31617D

aluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	Step 1:	Obtain Procedure OT 3117 and review .
	Standard:	OT 3117 obtained and reviewed.
Interim Cue:	Inform operator Prerequisites are SAT.	
SAT/UNSAT	Step 2:	Monitor LPRM readings
	Standard:	Select the STBLTY key on ERFIS
SAT/UNSAT	Step 3:Insert the first control rod (30-23)	
	Standard:	Obtain the Rapid Shutdown Sequence and insert the first rod in accordance with the designated sequence using "Continuous Insert."
SAT/UNSAT	Step 4:	Insert the second control rod (14-23)
	Standard:	Insert the second rod in accordance with the designated sequence using "Continuous Insert."
Interim Cue:	Insert Oscillations when rod 14-23 is at notch 12 on ERFIS RWM screen, equivalent to notch 10 on the Full Core Display.	
SAT/UNSAT	Step 5:	Recognize the onset of reactor instability.
	Standard:	Note any or all of the following: oscillating period, APRM Power recorders, LPRM cycling Low Power Lights on Full Core Display.
SAT/UNSAT	Step 6:	Insert manual scram due to core wide instability.
	Standard:	Recognize that APRM's are oscillating 10%, Peak-to-Peak, and LPRM's have cycling Low Power lights, and insert manual scram

TIME FINISH: ____________

Terminating Cue: Manual Scram inserted in accordance with OT 3117, "Reactor Instability."

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

The plant is making preparations for a reactor startup from a refueling outage. Reactor Building ambient temperature is 65 degrees F. The hydraulic control unit accumulators have been charged with nitrogen to a pressure of 620 psig. Several days later, with the plant at power, Reactor Building temperatures have stabilized at 91 degrees F

Which of the following describes the expected impact on the Control Rod Drive Hydraulic system operations for these conditions? Why is this true?

EXPECTED ANSWER:

-- Control rod scram speeds will be faster and may result in mechanism damage.
-- As RB heats up, accumulator operating pressure will be higher due to the higher (above limits allowed) starting pre-charge pressure. This results in a higher differential pressure across the operating piston on a reactor scram. Higher d/p gives faster scram speeds. Potential for mechanism damage.

.CTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 201001G2.1.25 2.8/3.1

REFERENCES: OP 2111, "Control Rod Drive System", Rev. 33, Section B and Tables 1 & 2, Pages 9 - 11

JPM QUESTIONS

QUESTION NO: 2

During a reactor shutdown, the CRO notes that control rod speeds seem slower than normal and the Aux Operator reports the CRD Flow Control Valve is stroking slightly closed while the rod is in motion. The FCV reopens when the rod stops. What is the cause of the slower rod speeds? Explain your answer.

EXPECTED ANSWER:

- The in-service CRD Insert Stabilizing Valve has failed open.
- If the Insert Stabilizing Valve has failed open, the 4 gpm flow required to insert control rods will not be diverted from cooling water. Instead, total demand from the CRD system will go up by 4 gpm and the FCV will attempt to momentarily reduce flow back to its setpoint. This will result in a small close, then reopen cycle of the FCV every time a rod is inserted.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 201001A308 3.0/2.9

REFERENCES: LOT-01-201, "Control Rod Drive Hydraulics", Rev. 15, II.C & TP-1, Page 11

SRO –5 and RO -4

Initial Conditions:

- The plant is operating at power
- Both Recirc Pumps have tripped
- The plant is operating in the Exclusion Region of the Power-to-Flow Map

Initiating Cues:

The plant was operating at 100% power when both recirc pumps tripped. The actions of OT 3118, Recirc Pump Trip, are being carried out. The SCRO directs you to carry out the actions of OT 3117, Reactor Instability, to exit the Exclusion Region. The Solomon stability monitor is available and has been initiated.

JPM QUESTIONS

QUESTION NO: 1

The plant is making preparations for a reactor startup from a refueling outage. Reactor Building ambient temperature is 65 degrees F. The hydraulic control unit accumulators have been charged with nitrogen to a pressure of 620 psig. Several days later, with the plant at power, Reactor Building temperatures have stabilized at 91 degrees F

Which of the following describes the expected impact on the Control Rod Drive Hydraulic system operations for these conditions? Why is this true?

JPM QUESTIONS

QUESTION NO: 2

During a reactor shutdown, the CRO notes that control rod speeds seem slower than normal and the Aux Operator reports the CRD Flow Control Valve is stroking slightly closed while the rod is in motion. The FCV reopens when the rod stops. What is the cause of the slower rod speeds? Explain your answer.

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Reset Group III Isolation
Failure Mode:	N/A
Reference:	OP 2115, "Primary Containment", Rev. 40
Task Number:	
Facility JPM #:	JPM- 22303, Rev. 10, Updated to latest procedure Rev

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 12 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: __________

Prepared by: ____________________ Operations Training Instructor 1-22-99 Date

Reviewed by: ____________________ SRO Licensed/Certified Reviewer 1-22-99 Date

Approved by: ____________________ Operations Training Supervisor 1/22/99 Date

irections: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: A Group III isolation has occurred on high drywell pressure
Drywell pressure has been restored to less than 2.5 psig

nitiating Cues: The SCRO directs you to reset the Group III isolation logic (IAW OP 2115).

Task Standards: Group III isolation reset

Required Materials: OP 2115, "Primary Containment", Rev. 40

Simulator Setup: Any IC
Insert then delete malfunction RP05

JPM Modification: N/A

aluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	Step 1:	Obtain Procedure OP 2115, Section G and review Admin Limits, Precautions, and Prerequisites.
	Standard:	OP 2115 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	*Step 2:	Place the control switch for CA-38A to the CLOSED position per Appendix D
	Standard:	Control switch for CA-38A on CRP 9-3 in CLOSED
SAT/UNSAT	*Step 3:	Place the control switch for CA-38B to the CLOSED position per Appendix D
	Standard:	Control switch for CA-38B on CRP 9-3 in CLOSED
SAT/UNSAT	*Step 4:	Place the control switch for SGT-6 to the CLOSED position per Appendix D
	Standard:	Control switch for SGT-6 on CRP 9-3 in CLOSED
SAT/UNSAT	*Step 5:	Place the control switch for AC-7 to the CLOSED position per Appendix D
	Standard:	Control switch for AC-7 on CRP 9-3 in CLOSED
SAT/UNSAT	*Step 6:	Place the control switch for AC-8 to the CLOSED position per Appendix D
	Standard:	Control switch for AC-8 on CRP 9-3 in CLOSED

.T/UNSAT

<u>*Step 7: Place the control switch for AC-9 to the CLOSED position per Appendix D</u>

Standard: Control switch for AC-9 on CRP 9-3 in CLOSED

SAT/UNSAT

<u>*Step 8: Place the control switch for AC-10 to the CLOSED position per Appendix D</u>

Standard: Control switch for AC-10 on CRP 9-3 in CLOSED

SAT/UNSAT

<u>*Step 9: Place the control switch for AC-6A to the CLOSED position per Appendix D</u>

Standard: Control switch for AC-6A on CRP 9-3 in CLOSED

SAT/UNSAT

<u>*Step 10: Place the control switch for AC-6B to the CLOSED position per Appendix D</u>

Standard: Control switch for AC-6B on CRP 9-3 in CLOSED

SAT/UNSAT

<u>*Step 11: Place the control switch for AC-7A to the CLOSED position per Appendix D</u>

Standard: Control switch for AC-7A on CRP 9-3 in CLOSED

SAT/UNSAT

<u>*Step 12: Place the control switch for AC-7B to the CLOSED position per Appendix D</u>

Standard: Control switch for AC-7B on CRP 9-3 in CLOSED

SAT/UNSAT

<u>*Step 13: Place the control switch for AC-20 to the CLOSED position per Appendix D</u>

Standard: Control switch for AC-20 on CRP 9-3 in CLOSED

.T/UNSAT

<u>*Step 14: Place the control switch for AC-22A to the CLOSED position per Appendix D</u>

Standard: Control switch for AC-22A on CRP 9-3 in CLOSED

SAT/UNSAT

<u>*Step 15: Place the control switch for AC-22B to the CLOSED position per Appendix D</u>

Standard: Control switch for AC-22B on CRP 9-3 in CLOSED

SAT/UNSAT

<u>*Step 16: Place the control switch for AC-23 to the CLOSED position per Appendix D</u>

Standard: Control switch for AC-23 on CRP 9-3 in CLOSED

SAT/UNSAT

<u>*Step 17: Place the control switch for HVAC-9 to the CLOSED position per Appendix D</u>

Standard: Control switch for HVAC-9 on CRP 9-26 in CLOSED

SAT/UNSAT

<u>*Step 18: Place the control switch for HVAC-10 to the CLOSED position per Appendix D</u>

Standard: Control switch for HVAC-10 on CRP 9-26 in CLOSED

SAT/UNSAT

<u>*Step 19: Place the control switch for HVAC-11 to the CLOSED position per Appendix D</u>

Standard: Control switch for HVAC-11on CRP 9-26 in CLOSED

SAT/UNSAT

<u>*Step 20: Place the control switch for HVAC-12 to the CLOSED position per Appendix D</u>

Standard: Control switch for HVAC-12 on CRP 9-26 in CLOSED

SAT/UNSAT

***Step 21: Place the control switches for VG-26, VG-23, VG-76A & VG-76B to the CLOSED position per Appendix D**

Standard: Control switches for VG-26, VG-23, VG-76A & VG-76B on CRP 9-26 in CLOSED

SAT/UNSAT

Step 22: Ensure the Reset Permissive Lights are lit

Standard: Checks Reset Permissive Lights on CRP 9-5 are on, Group III red lights (Sys 1 and Sys 2) on lower right section of panel

SAT/UNSAT

***Step 23: Reset the PCIS Logic when the signal has cleared**

Standard: Resets PCIS Logic by positioning the Reset Switch on CRP 9-5 to INBD then OUTBD or OUTBD then INBD

SAT/UNSAT

Step 24: Reset Containment Air Monitor isolation using PB 5 & 6

Standard: Presses PB 5 & 6 (labeled VG-76A & VG-26 isolate reset/BG-76B & VG-23 isolation reset) on CRP 9-47.

TIME FINISH: ____________

Terminating Cue: Group III logic reset as indicated by isolation reset red light energized on CRP 9-3 mimic

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

During the reset of a PCIS Group 3 isolation, the "close" contacts on the switch did not make up for the AC-7A valve. How would this affect resetting the inboard isolation? What would be the indication of this failure? Is there any way to bypass this failure to allow resetting the inboard isolation? Explain your answers utilizing the actual contacts, relays, etc.

EXPECTED ANSWER:

-- The inboard isolation could not be reset. All inboard Group 3 valve switches must be in "Close" to satisfy the IOPC Logic. (The valve contacts are in series.) Inboard isolation will not reset.
-- The PCIS SYS 1 Reset Permissive red light on CRP 9-5 would not be received.
-- This failure cannot be bypassed other than by jumpering out the contacts for the valve switch.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 223002A403 3.6/3.5

REFERENCES: LOT-01-223, "Primary Containment Isolation System", Rev. 11, Section I.C.5 & TP-18, Page 36

JPM QUESTIONS

QUESTION NO: 2

Following a toxic gas problem the Control Room has been evacuated. Shutdown cooling has been established at the Alternate Shutdown Panels and RHR-18 has been placed on its alternate power supply (MCC-9B). A fouled RHR heat exchanger is resulting in rising reactor temperature and pressure. Assuming the pressure rise does not stop, what will be the response of the RHR system? Explain your answer.

EXPECTED ANSWER:

-- The normal RHR-17 isolation will not occur at 135 psig. RHR-18 will close and the RHR Pump will trip.
-- With the RHR Alternate Shutdown Transfer Switches in "Emergency" the RHR-17 isolations are bypassed and the RHR-18 isolations, except for high pressure, are bypassed. RHR-18 on MCC-9B does not affect this isolation.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 223002K408 3.3/3.7

REFERENCES: LOT-01-223, "Primary Containment Isolation System", Rev. 11, Section I.D.3 & TP-22, Pages 38 & 39

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: RPV Venting Via HPCI
Failure Mode: N/A
Reference: OE 3107, Appendix EE, "RPV Venting Via HPCI", Rev. 12
Task Number:
Facility JPM #: JPM-20045, Rev. 1, Updated to latest procedure Rev

Task Performance: AO/RO/SRO ___ RO/SRO X SRO Only ___

Sequence Critical: Yes ___ No X

Time Critical: Yes ___ No X

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________________

Method of Testing: Simulation ___ Performance X Discuss ___

Setting: Classroom ___ Simulator X Plant ___

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____________________

Prepared by: ____________________ Operations Training Instructor — Date: 1-22-99

Reviewed by: ____________________ SRO Licensed/Certified Reviewer — Date: 1-22-99

Approved by: ____________________ Operations Training Supervisor — Date: 1/22/99

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to perform the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: A plant transient has occurred and the SCRO has entered EOP-5, "RPV-ED", and is performing Emergency Depressurization. Only 2 SRVs can be opened. HPCI has been terminated per Appendix GG of OE 3107. Torus pressure is 18 psig.

Initiating Cues: The SCRO directs you to emergency depressurize via HPCI to the main condenser defeating interlocks as necessary per OE 3107, Appendix EE. The TSC concurs with this action and I&C is available for assistance.

Task Standards: The reactor vented via HPCI to the main condenser per Appendix EE

Required Materials: OE 3107, Appendix EE, "RPV Venting Via HPCI", Rev. 12

Simulator Setup: Any IC. Place remote function RPR24 to BYPASS. No HPCI initiation signals present.

JPM Modification: Provided some amplifying initial conditions.

aluation | Performance Steps

TIME START: ____________

SAT/UNSAT

Step 1: **Obtain Procedure OE 3107, Appendix EE and review Admin Limits, Precautions, and Prerequisites.**

Standard: OE 3107, Appendix EE obtained, admin limits, precautions and prerequisites reviewed.

Interim Cue: If asked, all prerequisites have been met.

SAT/UNSAT

***Step 2:** **Place HPCI Aux Oil Pump in Pull-To-Lock**

Standard: Places HPCI Aux Oil Pump P-85-1A control switch on CRP 9-3 in Pull-To-Lock

SAT/UNSAT

Step 3: **Defeat Steam Supply HPCI-14 opening signal due to initiation logic**

Standard: Directs I&C to perform Step 2.a. of Appendix EE

NOTE: May not be performed based upon initial conditions and indications in the simulator

---

Interim Cue: If directed, as I&C inform operator Step 2.a of Appendix EE is complete

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SAT/UNSAT

Step 4: **Close or check closed Steam Supply HPCI-14**

Standard: Checks green light on, red light off for HPCI-14 on CRP 9-3

SAT/UNSAT

***Step 5:** **Close or check closed Steam Line Drain HPCI-42**

Standard: Places HPCI-42 control switch to CLOSE, observes green light on, red light off on CRP 9-3

SAT/UNSAT

***Step 6:** **Close or check closed Steam Line Drain HPCI-43**

Standard: Places HPCI-43 control switch to CLOSE, observes green light on, red light off on CRP 9-3

SAT/UNSAT *Step 7: **Defeat PCIS Group VI isolation interlocks for Steam Isolation HPCI - 15**

Standard: Directs I&C to perform Step 6 of Appendix EE

Interim Cue: When directed, as I&C inform operator Step 6 of Appendix EE is complete

SAT/UNSAT *Step 8: **Defeat PCIS Group VI isolation interlocks for Steam Isolation HPCI - 16**

Standard: Directs I&C to perform Step 7 of Appendix EE

Interim Cue: When directed, as I&C inform operator Step 7 of Appendix EE is complete

SAT/UNSAT Step 9: **Open or check open Steam Isolation HPCI-15**

Standard: Observes red light on, green light off for HPCI-15 on CRP 9-3

SAT/UNSAT Step 10: **Open or check open Steam Isolation HPCI-16**

Standard: Observes red light on, green light off for HPCI-16 on CRP 9-3

SAT/UNSAT *Step 11: **Open or check open Steam Trap Bypass HPCI-53**

Standard: Places HPCI-53 switch to OPEN on CRP 9-3, observes red light on, green light off

SAT/UNSAT *Step 12: **Open or check open Steam Line Drain HPCI-42**

Standard: Places HPCI-42 switch to OPEN on CRP 9-3, observes red light on, green light off

SAT/UNSAT *Step 13: **Open or check open Steam Line Drain HPCI-43**

Standard: Places HPCI-43 switch to OPEN on CRP 9-3, observes red light on, green light off

TIME FINISH: ____________

Terminating Cue: The reactor is vented through HPCI to the main condenser per Appendix EE.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

During the performance of RPV - Emergency Depressurization with only two (2) Safety Relief Valves open, what is the MAXIMUM allowed reactor pressure? Why shouldn't reactor pressure be allowed to rise above this limit?

EXPECTED ANSWER:

- 68 psig (50 psig above torus pressure)
- This value is the maximum pressure allowed to ensure the vessel is depressurized such that low pressure systems can inject for RPV flooding and there still will be sufficient steam flow for decay heat removal

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 295024A204 3.9/3.9

REFERENCES: EOP-5, "RPV-ED" Flowchart, Rev. Draft

BWROG EPGs/SAGs, Appendix B, Section 11, Step C2-1.3, Pages B-11-15 - B11-19

BWROG EPGs/SAGs, Appendix B, Section 17.23, Pages B-17-58 - B-17-60

JPM QUESTIONS

QUESTION NO: 2

Following an Emergency Depressurization in which all Safety Relief Valves were successfully opened, reactor pressure is 35 psig with a torus pressure of 9 psig. Torus water level subsequently lowers to less than 5.5 feet. What actions should be taken with the SRVs? Explain your answer?

EXPECTED ANSWER:

-- With the SRVs open and the reactor depressurized, the SRVs should be left open (even with level below their discharges)
-- Any additional energy going to the containment (with the discharges uncovered) is within the capacity of the containment vent. (Maintaining the reactor depressurized takes priority, any containment pressure problems can be controlled by venting.)

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 295024G2.4.21 3.7/4.3

REFERENCES: BWROG EPGs/SAGs, Appendix B, Section 11, Step C2-1.3, Pages B-11-16

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Startup The "A" RPS MG Set
Failure Mode: N/A
Reference: OP 2134, Reactor Protection System, Rev. 15
Task Number:
Facility JPM #: JPM-21202, Rev. 7, Updated to latest procedure Rev

Task Performance: AO/RO/SRO ___ RO/SRO _X_ SRO Only ___

Sequence Critical: Yes ___ No _X_

Time Critical: Yes ___ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________________

Method of Testing: Simulation _X_ Performance ___ Discuss ___

Setting: Classroom ___ Simulator ___ Plant _X_

Performance Expected Completion Time: 15 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: ____________________

Prepared by: ____________________ 1-22-99
Operations Training Instructor — Date

Reviewed by: ____________________ 1-22-99
SRO Licensed/Certified Reviewer — Date

Approved by: ____________________ 1/22/99
Operations Training Supervisor — Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: The "A" RPS MG Set is being returned to service after brush replacement. There is an operator available in the Control Room to assist you

Initiating Cues: The SCRO directs you to startup the "A" RPS MG set per OP 2134 Section1. Inform the SCRO when the MG set is ready to be placed in service.

Task Standards:
"A" RPS MG Set running producing 118 +/- 1 volts
"A" RPS MG Set output beaker shut
Power Panels A-1 and A-2 breakers shut

Required Materials: OP 2134, Reactor Protection System, Rev. 15

Simulator Setup: N/A

JPM Modification: N/A

aluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	Step 1:	Obtain Procedure OP 2134, Section 1 and review Admin Limits, Precautions, and Prerequisites.
	Standard:	OP 2134 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	Step 2:	Check at CRP 9-15:
	a.	RPS Bus "A" Normal/Alternate selector switch in either ALT or Off
	b.	"A" system power supply circuit breaker 5A-CB1A is ON
	c.	Both scram test switches are positioned to NORMAL
	Standard:	Contacts Control Room and requests verification that all switches and breakers are properly positioned
'erim Cue:	When requested, inform operator that OP 2134 Section 1, Step a. has been verified	
SAT/UNSAT	*Step 3:	Check power available to the MG Set from MCC 8A
	Standard:	Contacts Control Room and requests verification that power available to MG Set from MCC 8A
Interim Cue:	When requested, inform operator that power is available to the "A" RPS MG Set	
SAT/UNSAT	Step 4:	Check MG 3-1A Output Breaker on local panel is OFF
	Standard:	Checks position of MG Set Output Breaker, observes breaker is OFF, DOWN position
Interim Cue:	When checked, inform operator that breaker is in the OFF, DOWN position.	

SAT/UNSAT **Step 5: Check circuit breakers on RPS Power Protection Panels A1 and A2 are OFF**

Standard: Checks position of the RPS Power Protection Panel breakers, observes breakers are OFF, DOWN

Interim Cue: When checked, inform operator the breakers are OFF, DOWN

SAT/UNSAT ***Step 6: Press the Motor ON pushbutton on local control panel**

Standard: Simulates starting the "A" RPS MG Set, checks "Motor ON" red light ON

Interim Cue: When simulated, inform operator the pushbutton has been pushed, MG Set starting and coming to speed, Motor ON red light is on

SAT/UNSAT **Step 7: Check output voltage**

Standard: Checks MG Set output voltage on local panel "A-C Volts" meter after reaching operating speed

→ Maint

Interim Cue: When checked, inform operator voltage rising, now reading 119 volts

SAT/UNSAT ***Step 8: Close the MG Set Output Breaker**

Standard: Simulates operating the output breaker in the UP, CLOSED position

Interim Cue: When simulated closed, inform operator breaker is in the UP, CLOSED position

SAT/UNSAT **Step 9: Check Panel A-1 Power In lamp is ON**

Standard: Checks "Power In, Motor Gen" red light ON on Panel A-1

Interim Cue: When checked, inform operator Power In, Motor Gen red light on

SAT/UNSAT ***Step 10: Position Panel A-1 Output Breaker to OFF to reset it**

Standard: Simulates placing breaker in OFF

Interim Cue: When simulated OFF, inform operator breaker is OFF, DOWN.

SAT/UNSAT *Step 11: Position Panel A-1 Output Breaker to ON

Standard: Simulates placing breaker in ON

Interim Cue: When simulated, inform operator breaker is ON, UP and that the "Power Out" light on Panel A-1 is on

SAT/UNSAT Step 12: Check Panel A-2, "Power In PPP A-1" light is ON

Standard: Checks "Power In" light on A-2 is ON

Interim Cue: When checked, inform operator "Power In" light is on.

SAT/UNSAT Step 13: Position Panel A-2 Output Breaker to OFF to reset it

Standard: Simulates placing breaker in OFF

Interim Cue: When simulated OFF, inform operator breaker is OFF, DOWN.

SAT/UNSAT *Step 14: Position Panel A-2 Output Breaker to ON

Standard: Simulates placing breaker in ON

Interim Cue: When simulated, inform operator breaker is ON, UP and that the "Power Out" light on Panel A-2 is on

SAT/UNSAT Step 15: Inform SCRO "A" RPS MG Set ready to be placed in service

Standard: Makes report to SCRO

Interim Cue: Acknowledge report as SCRO, inform operator another operator will place the MG Set in service

TIME FINISH: ____________

Terminating Cue: Another operator will place the "A" RPS MG Set in service.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

The plant is operating at 100%. The "B" RPS Bus is deenergized due to a fault on the bus. APRM "A" is bypassed due to an "upscale" failure. I&C has just reported that the "C" ARPM High Flux Flow Biased scram setpoint is set non-conservatively high. What actions are required?

EXPECTED ANSWER:

-- Initiate insertion of operable control rods and complete insertion of all operable rods within 4 hours.

-- Place one RPS Trip system in "Trip" ("B" system already tripped), reduce power and place the Reactor Mode Switch in "Startup/Hot Standby" within 8 hours.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 212000K602 3.7/3.9

REFERENCES: Tech Spec 3.1 and Table 3.1.1., Amendment 61 & 94, Pages 21 - 24

JPM QUESTIONS

QUESTION NO: 2

The plant is shutdown for a refueling outage. The Refuel Interlock checks are in progress requiring the Reactor Mode Switch be placed in "Startup/Hot Standby". APRM power supply problems have resulted in the unavailability of the APRM High Flux Scram. What conditions must be met to complete the Refuel Interlock checks?

EXPECTED ANSWER:

-- The following trips must be "Operable": Reactor Mode Switch in "Shutdown", Manual Scram, High flux IRM scram, High Flux SRM scram in noncoincidence, SDV high water level scram and no more than two control rods can be withdrawn (rods that are withdrawn cannot be face adjacent or diagonally adjacent).

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 212000G2.2.26 2.5/3.7

REFERENCES: Tech Spec 3.1 and Table 3.1.1., Amendment 61 & 94, Pages 21 - 24

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Manually Open Containment Spray Valve
Failure Mode:	N/A
Reference:	OP 2124, "Residual Heat Removal System", Rev. 46
Task Number:	
Facility JPM #:	N/A

Task Performance: AO/RO/SRO ___ RO/SRO _X_ SRO Only ___

Sequence Critical: Yes _X_ No ___

Time Critical: Yes ___ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation _X_ Performance ___ Discuss ___

Setting: Classroom ___ Simulator ___ Plant _X_

Performance Expected Completion Time: 8 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____

Prepared by: ____________________ 1-22-99
Operations Training Instructor — Date

Reviewed by: ____________________ 1-22-99
SRO Licensed/Certified Reviewer — Date

Approved by: ____________________ 1/22/99
Operations Training Supervisor — Date

irections:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the Plant and you are to simulate the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- A small break LOCA is in progress inside the Drywell.
- Torus Pressure is 9.5 psig.
- Drywell Pressure is 12 psig.
- EOP-3, "Primary Containment Control", has been entered for drywell pressure and temperature.
- RHR Pump "B" is being lined up for Drywell spray.
- The Outboard Drywell Spray valve, RHR-31B, has failed to open from the Control Room.

Initiating Cues: The SCRO directs you to open the Outboard Drywell Spray Valve, RHR-31B, inform the Control Room when the valve is open.

Task Standards: Drywell Spray Valve RHR-31B is opened in accordance with procedure OP 2124, Appendix E.

Required Materials: OP 2124, "Residual Heat Removal", Rev. 46, Appendix E

Simulator Setup: N/A

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	Step 1:	Obtain Procedure OP 2124 and review Admin Limits, Precautions, and Prerequisites.
	Standard:	OP 2124 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	Inform operator Prerequisites are SAT.	
SAT/UNSAT	*Step 2:	Locate Outboard Drywell Spray Valve RHR-31B.
	Standard:	Transits to Reactor Building 280' elevation and locates valve RHR-31B.
SAT/UNSAT	*Step 3:	Declutch the valve.
	Standard:	Operator depresses the declutch lever on valve RHR-31B.
Interim Cue:	When valve operation simulated, inform operator declutch lever is depressed.	
SAT/UNSAT	*Step 4:	Open Drywell Spray Valve.
	Standard:	Operator rotates the handwheel for RHR-31B in the counter clockwise direction.
Interim Cue:	When valve operation simulated, inform operator the valve is opening freely; only moderate force is required to operate the valve.	
Interim Cue:	Inform operator the valve is fully open.	
SAT/UNSAT	Step 5:	Notify the Control Room.
	Standard:	Operator notifies the Control Room that RHR-31B is full open.
Interim Cue:	Acknowledge report as Control Room Operator.	

TIME FINISH: ____________

Terminating Cue: RHR-31B has been manually opened in accordance with procedure OP 2124, Appendix E, and the Control Room has been notified.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

What is the "operability" status of this valve after being opened? What must be done to make it "operable" once again? Include the documentation that must be completed for this valve?

EXPECTED ANSWER:

FACILITY CHECK CORRECT ANSWER

-- Valve shall be declared "Inoperable"
-- LCO would be "tracked" in the turnover logs (Per VYAPF 0152.02, Tech Spec Systems/Components Inoperable)
-- Valve shall be electrically stroked at least one complete close/cycle and returned to the desired position
-- Valve shall be declared "Operable"

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 223001G2.2.22 3.4/4.1

REFERENCES: NEED FACILITY REFERENCE

OT 3111, "High Drywell Pressure", Rev. 10, Section 6. Note, Page 2

VYAPF 0152.02, "Shift Turnover Logs – Tech Spec Systems/Components Inoperable", Rev. 21

JPM QUESTIONS

QUESTION NO: 2

Due to a small leak, drywell pressures/temperatures are slowly rising while at power. How would the location of the leak be determined? What drywell temperature and elevation is the operator cautioned regarding possible reactor water level indication errors?

EXPECTED ANSWER:

- Performance of Drywell Temperature Profile Test, OP 4115, "Primary Containment Surveillance"
- Temperatures above 215 degrees F below the 320 foot elevation.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 223001A210 3.6/3.8

REFERENCES: OT 3111, "High Drywell Pressure", Rev. 10, Section 5, Page 2

OP 4115, "Primary Containment Surveillance", Rev. 41, Section D & VYOPF 4115.05, Page 11

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Placing SDC Isolation Valve on Alternate Power
Failure Mode: N/A
Reference: OP 3126, "Shutdown Using Alternate Shutdown Methods", Rev. 15, Appendix F, "Instructions for RHR-18 Alternate Power Connection"
Task Number:
Facility JPM #: N/A

Task Performance: AO/RO/SRO ___ RO/SRO X SRO Only ___

Sequence Critical: Yes X No ___

Time Critical: Yes ___ No X

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation X Performance ___ Discuss ___

Setting: Classroom ___ Simulator ___ Plant X

Performance Expected Completion Time: 15 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ___

Prepared by: ____________________ 1-22-99
Operations Training Instructor — Date

Reviewed by: ____________________ 1-22-99
SRO Licensed/Certified Reviewer — Date

Approved by: ____________________ 1/22/99
Operations Training Supervisor — Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the Plant and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- The Main Control Room has just been evacuated.
- Power has been lost to MCC-8B due to a fire
- Alternate Shutdown Cooling is being lined up.

Initiating Cues: The SCRO directs you to lineup the alternate power supply for Shutdown Cooling Isolation Valve (V10-18) and supply power to the valve.

Task Standards: Power has been lined up to V10-18 from MCC-9B, in accordance with procedure OP 3126, Appendix F.

Required Materials: OP 3126, "Shutdown Using Alternate Shutdown Methods", Rev. 15, Appendix F, "Instructions for RHR-18 Alternate Power Connection"

Simulator Setup: N/A

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	Step 1:	Obtain Procedure OP 3126, Appendix F, and review Admin Limits, Precautions, and Prerequisites.
	Standard:	OP 3126 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	Inform operator Prerequisites are SAT.	
SAT/UNSAT	Step 2:	Verify the Standby Feeder Breaker is open.
	Standard:	At MCC-9B, cubicle 11KR, verifies the standby feeder breaker is open.
Interim Cue:	When breaker checked open, inform operator breaker is in Off, Down position	
\T/UNSAT	*Step 3:	Open the breaker for V10-18.
	Standard:	At MCC-8B, cubicle 7F, opens breaker for V10-18.
Interim Cue:	When breaker simulated open, inform operator that the cub. 7F bkr. is in Off, Down position.	
SAT/UNSAT	Step 4:	Locate the Feeder Cable from MCC-9B.
	Standard:	At MCC-8B, locates the feeder cable from MCC-9B in the junction box above MCC-8B.
Interim Cue:	When cable located, inform operator that the cable is in the junction box but is not installed. If checked, the other end of the cable is hooked to a spare breaker (Cubicle 11KR) in MCC-9B	

SAT/UNSAT *Step 5: Connect the Feeder Cable from MCC-9B.

Standard: At MCC-8B, Cubicle 7F, connects the feeder cable from MCC-9B to the Load Side of the breaker.

Interim Cue: After connection simulated, inform the operator that the cable is connected to the load side (bottom) of breaker cubicle 7F.

SAT/UNSAT Step 6: Verify Position of Appendix R Transfer Switches.

Standard: Contacts SCRO RHR Alternate S/D panel, verifies the Appendix R Transfer Switches are in the Emergency Position.

Interim Cue: When contacted, inform operator all Appendix R Transfer Switches are in "Emergency"

SAT/UNSAT *Step 7: Supply power to V10-18.

Standard: At MCC-9B, cubicle 11KR, closes the standby feeder breaker to V10-18.

Interim Cue: When breaker simulated closed, inform the operator that the cubicle 11KR breaker is in the Up, On position

SAT/UNSAT Step 8: Inform SCRO at RHR Alternate Shutdown Panel that V10-18 is powered and can be operated.

Standard: Contacts SCRO, reports Appendix F is completed.

Interim Cue: Acknowledge report as SCRO

TIME FINISH: ____________

Terminating Cue: Power has been lined up to V10-18 from MCC-9B, in accordance with procedure OP 3126, Appendix F.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

The plant had been in Hot Shutdown with Shutdown Cooling in service. Following a trip of the running RHR Pump, forced circulation cannot be re-established. How can the operator determine if temperature stratification is occurring? Demonstrate how this is done. What would be the indications that stratification is occurring?

EXPECTED ANSWER:

- Temperature stratification may be detected by monitoring reactor vessel skin temperatures.
- Done by using TR 2-3-89 and TR 2-3-90.
- Wide variance in reactor vessel skin temperatures, location to location, top to bottom and around vessel circumference.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 295021A205 3.4/3.4

REFERENCES: ON 3156, "Loss Of Shutdown Cooling", Rev. 4, Section B.6, Page 4

JPM QUESTIONS

QUESTION NO: 2

The plant has had a loss of all means of Shutdown Cooling while in Cold Shutdown with the following conditions:

- Temperature readings indicate a 1.5 degree F rise in reactor water temperature every 8 minutes
- Current reactor temperature is 114 degrees F
- The reactor vessel head is installed

Assuming no means of core cooling becomes available, when will the plant change modes?

EXPECTED ANSWER:

8 hours 42 minutes (+/- 5 minutes)

212 deg - 114 deg = 98 deg / 1.5 deg/8 min = 522.6 minutes / 60 min/hr = 8.71 hours = 8 hours 43 min

.CTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 295021G2.1.22 2.8/3.3

REFERENCES: ON 3156, "Loss Of Shutdown Cooling", Rev. 4, Section B.7, Page 4

Tech Spec 1.0.V.1, Amendment 84, Page 3

Proposed Exam,

VERMONT YANKEE
NUCLEAR POWER CORPORATION

185 Old Ferry Road, Brattleboro, VT 05301-7002
(802) 257-5271

November 23, 1998
TDL 98-021

Regional Administrator, Region I
Attn: Mr. Todd Fish
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pa. 19406-1415

Subject: Vermont Yankee January 1999 exam outline

The attached outline is being sent in accordance with the accepted examination schedule. The enclosed materials shall be withheld from public disclosure until after the examinations are complete (IAW NUREG 1021, ES 201).

If you have any questions, please contact Mike Romeo, in our Brattleboro office at (802) 258-4197.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Michael A. Romeo Sr.

Michael A. Romeo Sr.
Acting Operations Training Supervisor

Enclosures

~~A040~~
A070

Folder

Enclosure List

1.	Examination Outline Quality Assurance Checklist (ES-201-2)	1 page
2.	Reactor Operator Written Exam Outline (ES-401-2) (ES-401-5)	11 pages
3.	Senior Reactor Operator Written Exam Outline (ES-401-1) (ES-401-5)	9 pages
4.	Simulator Scenario Outlines (ES-D-1)	5 pages
5.	Individual Walk-through Test Outline (ES-301-2)	3 pages
6.	Administrative Topics Outline (ES-301-1)	2 pages

Facility: Vermont Yankee **Examination Level: RO**		**Date of Examination: 01/25/99** **Operating Test Number: #1**
Administrative Topic/Subject Description		**Describe method of evaluation:** **1. ONE Administrative JPM, OR** **2. TWO Administrative Questions**
A.1	Short Term Info/ SO #98-02 Actions	JPM - Evaluate CRO logs for Torus water level/volume and determine required actions. K/A 2.1.33 (3.4/4.0)
	Reactor Startup Requirements	Given a starting SRM count rate, when is criticality expected? K/A 2.4.47 (3.4/3.7)
		Specific temperature limits for criticality and SDM determination. K/A 2.2.25 (2.5/3.7)
A.2	Piping and Instrument Drawings	Trace the flowpath from the Conn. River to the reactor vessel. K/A 2.1.24 (2.8/3.1)
		SLC operation vs RWCU isolation and Squib Valve firing. K/A 2.1.24 (2.8/3.1)
A.3	RWP/High Rad Area Entry Actions	JPM - Locate & determine radiological requirements for inspection of valve CU-19A (in locked high rad area). K/A 2.3.4 (2.5/3.1)
A.4	Emergency Plan Actions	Evacuation actions while dressed out in a Contaminated Area (OP 3524). K/A 2.3.1 (2.6/3.0)
		Control Room actions for medial emergency. K/A 2.4.11 (3.4/3.6)

Facility: Vermont Yankee **Examination Level:** SRO		**Date of Examination:** 01/25/99 **Operating Test Number:** #2
Administrative Topic/Subject Description		**Describe method of evaluation:** **1. ONE Administrative JPM, OR** **2. TWO Administrative Questions**
A.1	Parameter Verification/	Determination of RPV flooding condition to restore Adequate Core Cooling K/A 2.4.6 (3.1/4.0)
	Adequate Core Cooling	Determination of the Maximum Core Uncovery Time Limit K/A 2.4.47 (3.4/3.7)
	Reportability	Time limits and personnel requirements for notifications. K/A 2.4.30 (2.2/3.6)
	Requirements	Notification requirements for incorrect reports. K/A 2.1.18 (2.9/3.0)
A.2	Surv. Testing/Failed Surveillance Actions	JPM - Review completed surveillance/take actions for OOS data. K/A 2.1.33 (3.4/4.0)
A.3	Radiation Work	Specific Shift Supervisor responsibilities for RWP authorization. K/A 2.3.7 (2.0/3.3)
	Permits	Requirements for TIP Room entry. K/A 2.3.10 (2.9/3.3)
A.4	EP/Protective Action Recommendation	JPM - Perform off-site protective action recommendations using rad dose information from the nomograms (JPM-20037 modified). K/A 2.4.44 (2.1/4.0)

Facility: Vermont Yankee	**Date of Examination: 01/25/99**
Examination Level: RO	**Operating Test No: #1**

System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description
1. SDC/Restart SDC Following Short Term Shutdown/N,S,L	4	a. 205000K402 - 3.7/3.8 - SDC Isolation Switch operation
		b. 205000G2.4.48 - 3.5/3.8 - SDC flowpaths with idle recirc loop
2. PCIS/Group 5 Isolation Signal With Failure To Isolate/N, A,S	5	a. 223002K406 - 3.4/3.5 - PCIS vs other isolations, reset requirements
		b. 223002K607 - 3.2/3.3 - Reset MSIVs after loss of power to one solenoid
3. DG/Secure "A" DG From Op Readiness Demonstration - Monthly/D,S	6	a. 264000A201 - 3.5/3.6 - Logic print use to describe stopping DG from CR while loaded
		b. 264000G2.4.35 - 3.3/3.5 - Local actions for DG failure to start on a LNP
4. SBGT/Respond To Loss Of RB Vent W/ SGBT Failure/M,A,S	9	a. 261000A203 - 2.9/3.2 - Response to a high charcoal bed temperature
		b. 261000A401 - 3.2/4.0 - Purging via SBGT or RB Ventilation exhaust
5. Condensate/Emergency Fill The Main Condenser With Service Water/D,S	2	a. 256000G2.1.24 - 2.8/3.1 - SW Alternate Cooling vs condenser emergency fill
		b. 256000K604 - 2.8/2.8 - Loss of 4KV voltage protection affect on Condensate Pumps
6. RPS/Immediate Actions For Control Room Evacuation/N,S	7	a. 212000A212 - 4.0/4.1 - TSV input to RPS Logic
		b. 212000A412 - 3.9/3.9 - Half scrams vs SDV isolations
7. EHC/Perform Emergency Governor Test From CRP 9-7/D,S	3	a. 241000K413 - 2.9/3.0 - Prevention of turbine trip during testing
		b. 241000A107 - 3.8/3.7 - Bypass Jack operation while at power
8. SLC/Boron Injection Using CRD System From SLC Tank/N,P,R	1	a. 211000A10 - 4.0/4.1 - Flowpath SLC storage tank to reactor vessel for this lineup
		b. 211000G2.1.24 - 2.8/3.1 - How this lineup impacts CRD operation.
9. PCIS/Bypass PCIS Group I Isolation Signals/D,P	5	a. 223002K408 - 3.3/3.7 - One jumper not installed affect on isolation logic.
		b. 223001A302 - 3.5/3.5 - Separated MSIV disc, plant, PCIS, RPS response
10. RCIC/Operate RCIC From Alternate Shutdown Panel/M,P, R	2	a. 217000A301 - 3.5/3.5 - RCIC Min Flow Valve response at Alt Shutdown Panel
		b. 217000A207 - 3.1/3.1 - RCIC response to loss of oil pressure and why.

* 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

Facility: Vermont Yankee		Date of Examination: 01/25/99
Examination Level: SRO(I)		Operating Test No: #2
System / JPM Title / Type Codes*	**Safety Function**	**Planned Follow-up Questions: K/A/G - Importance - Description**
1. Feedwater/Transfer Level Control Aux To Main Feed Reg Valve/D,S,L	2	a. 259002K410 - 3.4/3.4 - Power changes while in single element control
		b. 259001K301 - 3.9/3.9 - Loss of FRV control signal plant response
2. SBGT/Manually Initiate SBGT Train "A", does not reach rated flow/M,A,S	9	a. 261000K302 - 3.6/3.9 - Inop SBGT vs Secondary Containment Integrity
		b. 261000A304 - 3.0/3.1 - SBGT heater indications during an accident
3. AC Dist/Energize Bus 8 From Bus 9/ D,S	6	a. 215005K601 - 3.7/3.8 - Bus loss with inop APRMs
		b. 212000A412 - 3.9/3.9 - Reset SDV scram with loss of RPS bus
4. MHC/Swap From EPR To MPR/ N,S	3	a. 241000K607 - 3.4/3.4 - Effects of failed steam pressure signal on MPR
		b. 241000A409 - 3.2/3.1 - TCV/IV operations on slow and fast overspeed
5. CRD/Actions For Stuck Control Rod W/ PCV Failure/N,A,S	1	a. 201001G2.1.25 - 2.8/3.1 - Overcharging HCU accumulator effects
		b. 201001A308 - 3.0/2.9 - Rod insertions with failed stabilizing valve
6. PCIS/Reset A Group III Isolation/ D,S	5	a. 223002A403 - 3.6/3.5 - Attempted reset with failed valve switch contacts
		b. 223002K408 - 3.3/3.7 - RHR/SDC isolations from Alternate Shutdown Panels
7. HPCI/RPV Venting Via HPCI/ D,S	4	a. 295024K104 - 3.6/3.9 - Minimum RPV Flooding Pressure during Emergency Depress
		b. 295024G2.4.21 - 3.7/4.3 - Post ED SRV actions with lowering torus water level
8. RPS/Startup The "A" RPS MG Set/ D,P	7	a. 212000K602 - 3.7/3.9 - APRM vs RPS Tech Spec actions
		b. 212000G2.2.26 - 2.5/3.7 - RPS operable trips during refueling interlock checks
9. CTMT/Manually Open Containment Spray Valve/N,P,R	5	a. 223001G2.2.22 - 3.4/4.1 - Operability of manually operated MOV
		b. 223001A210 - 3.6/3.8 - Drywell leak location determination
10. SDC/Placing SDC Isolation Valve On Alternate Power/N,P	4	a. 295021A205 - 3.4/3.4 - Thermal stratification indications
		b. 295021G2.1.22 - 2.8/3.3 - Time to mode change on loss of SDC

* 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

Facility: Vermont Yankee		**Date of Examination: 01/25/99**
Examination Level: SRO(U)		**Operating Test No: #3**
System / JPM Title / Type Codes*	**Safety Function**	**Planned Follow-up Questions: K/A/G - Importance - Description**
1. Feedwater/Transfer Level Control Aux To Main Feed Reg Valve/D,S,L	2	a. 259002K410 - 3.4/3.4 - Power changes while in single element control
		b. 259001K301 - 3.9/3.9 - Loss of FRV control signal plant response
2. SBGT/Manually Initiate SBGT Train "A", does not reach rated flow/M,A,S	9	a. 261000K302 - 3.6/3.9 - Inop SBGT vs Secondary Containment Integrity
		b. 261000A304 - 3.0/3.1 - SBGT heater indications during an accident
3. N/A		a.
		b.
4. MHC/Swap From EPR To MPR/ N,S	3	a. 241000K607 - 3.4/3.4 - Effects of failed steam pressure signal on MPR
		b. 241000A409 - 3.2/3.1 - TCV/IV operations on slow and fast overspeed
5. N/A		a.
		b.
6. N/A		a.
		b.
7. N/A		a.
		b.
8. N/A		a.
		b.
9. CTMT/Manually Open Containment Spray Valve/N,P,R	5	a. 223001G2.2.22 - 3.4/4.1 - Operability of manually operated MOV
		b. 223001A210 - 3.6/3.8 - Drywell leak location determination
10. SDC/Placing SDC Isolation Valve On Alternate Power/N,P	4	a. 295021A205 - 3.4/3.4 - Thermal stratification indications
		b. 295021G2.1.22 - 2.8/3.3 - Time to mode change on loss of SDC

* 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

Facility	Vermont Yanke Date of Exam: 01/25/99												Exam Level: RO
Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	2	2	3				2	1			3	13
	2	2	4	2				4	4			3	19
	3			1				1	2				4
	Tier Totals	4	6	6				7	7			6	36
2. Plant Systems	1	2	2	3	2	2	2	4	3	2	4	2	28
	2	2		1	3	2	2	2	2	2	1	2	19
	3	1			1		1		1				4
	Tier Totals	5	2	4	6	4	5	6	6	4	5	4	51
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		
					4		3		3		3		13

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.

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
295005	Main Turbine Generator Trip			X				AK3.03 Feedwater temperature decrease	2.8	1
295006	SCRAM			X				AK3.02 Reactor power response	4.1	1
295007	High Reactor Pressure			X				AK3.04 Safety/relief valve operation: Plant-Specific	4.0	1
295009	Low Reactor Water Level				X			AA1.02 Reactor water level control	4.0	1
295009	Low Reactor Water Level		X					AK2.03 Recirculation system	3.1	1
295010	High Drywell Pressure									
295014	Inadvertent Reactivity Addition									
295015	Incomplete SCRAM	X						AK1.03 Reactivity effects	3.8	1
295015	Incomplete SCRAM						X	2.4.48 Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and directives affect plant and system conditions.	3.5	1
295024	High Drywell Pressure						X	2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes.	3.3	1
295024	High Drywell Pressure		X					EK2.18 Ventilation	3.3	1
295025	High Reactor Pressure				X			EA1.07 ARI/RPT/ATWS: Plant-Specific	4.1	1
295031	Reactor Low Water Level					X		EA2.04 Adequate core cooling	4.6	1
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown						X	2.4.48 Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and directives affect plant and system conditions.	3.5	1
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown	X						EK1.06 Cooldown effects on reactor power	4.0	1
500000	High Containment Hydrogen Concentration									
	K/A Category Point Totals:	2	2	3	2	1	3	Group Point Total:		13

Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
295001	Partial or Complete Loss of Forced Core Flow Circulation		X					AK2.01 Recirculation system	3.6	1
295001	Partial or Complete Loss of Forced Core Flow Circulation	X						AK1.02 Power/flow distribution	3.3	1
295001	Partial or Complete Loss of Forced Core Flow Circulation					X		AA2.03 Actual core flow	3.3	1
295002	Loss of Main Condenser Vacuum			X				AK3.09 Reactor power reduction	3.2	1
295003	Partial or Complete Loss of A.C. Power				X			AA1.03 Systems necessary to assure safe plant shutdown	4.4	1
295003	Partial or Complete Loss of A.C. Power		X					AK2.04 A.C. electrical loads	3.4	1
295004	Partial or Complete Loss of D.C. Power		X					AK2.03 D.C. bus loads	3.3	1
295008	High Reactor Water Level						X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	3.7	1
295008	High Reactor Water Level				X			AA1.04 HPCI: Plant-Specific	3.5	1
295011	High Containment Temperature (Mark III Containment Only)									
295012	High Drywell Temperature	X						AK1.01 Pressure/temperature relationship	3.3	1
295013	High Suppression Pool Temperature									
295016	Control Room Abandonment			X				AK3.03 Disabling control room controls	3.5	1
295016	Control Room Abandonment					X		AA2.02 Reactor water level	4.2	1
295017	High Off-Site Release Rate									
295018	Partial or Complete Loss of Component Cooling Water						X	2.4.24 Knowledge of loss of cooling water procedures.	3.3	1
295019	Partial or Complete Loss of Instrument Air					X		AA2.02 Status of safety-related instrument air system loads (see AK2.1 - AK2.19)	3.6	1
295019	Partial or Complete Loss of Instrument Air		X					AK2.03 Reactor feedwater	3.2	1
295020	Inadvertent Containment Isolation									
295022	Loss of CRD Pumps					X		AA2.01 Accumulator pressure	3.5	1
295026	Suppression Pool High Water Temperature						X	2.4.6 Knowledge symptom based EOP mitigation strategies.	3.1	1
295027	High Containment Temperature (Mark III Containment Only)									
295028	High Drywell Temperature				X			EA1.04 Drywell pressure	3.9	1
295029	High Suppression Pool Water Level									
295030	Low Suppression Pool Water Level									
295033	High Secondary Containment Area Radiation Levels				X			EA1.03 Secondary containment ventilation	3.8	1
295034	Secondary Containment Ventilation High Radiation									
295038	High Off-Site Release Rate									

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
600000	Plant Fire On Site									
	K/A Category Point Totals:	2	4	2	4	4	3	Group Point Total:		19

Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
295021	Loss of Shutdown Cooling				X			AA1.02 RHR/shutdown cooling	3.5	1
295021	Loss of Shutdown Cooling					X		AA2.04 Reactor water temperature	3.6	1
295023	Refueling Accidents									
295032	High Secondary Containment Area Temperature			X				EK3.01 Emergency/normal depressurization	3.5	1
295035	Secondary Containment High Differential Pressure									
295036	Secondary Containment High Sump/Area Water Level					X		EA2.02 Water level in the affected area	3.1	1
	K/A Category Point Totals:	0	0	1	1	2	0	Group Point Total:		4

Plant Systems - Tier 2/Group 1

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
201001	Control Rod Drive Hydraulic System								X				A2.11 Valve openings	2.6	1
201002	Reactor Manual Control System							X					A1.02 Control rod position	3.4	1
201002	Reactor Manual Control System											X	2.1.32 Ability to explain and apply system limits and precautions.	3.4	1
201005	Rod Control and Information System (RCIS)														
202002	Recirculation Flow Control System								X				A2.05 Scoop tube lockup: BWR-2, 3, 4	3.1	1
203000	RHR/LPCI: Injection Mode (Plant Specific)			X									K3.03 Automatic depressurization logic	4.2	1
203000	RHR/LPCI: Injection Mode (Plant Specific)									X			A3.08 System initiation sequence	4.1	1
206000	High Pressure Coolant Injection System							X					A1.08 System lineup: BWR-2, 3, 4	4.1	1
206000	High Pressure Coolant Injection System										X		A4.12 Turbine trip controls: BWR-2, 3, 4	4.0	1
207000	Isolation (Emergency) Condenser														
209001	Low Pressure Core Spray System											X	2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	3.4	1
209001	Low Pressure Core Spray System				X								K4.04 Line break detection	3.0	1
209002	High Pressure Core Spray System (HPCS)														
211000	Standby Liquid Control System		X										K2.02 Explosive valves	3.1	1
212000	Reactor Protection System					X							K5.02 Specific logic arrangements	3.3	1
212000	Reactor Protection System										X		A4.07 System status lights and alarms	4.0	1
215003	Intermediate Range Monitor (IRM) System			X									K3.01 RPS	3.9	1
215004	Source Range Monitor (SRM) System							X					A1.05 SCRAM, rod block, and period alarm trip setpoints	3.6	1
215004	Source Range Monitor (SRM) System										X		A4.07 Verification of proper functioning/ operability	3.4	1
215005	Average Power Range Monitor/Local Power Range Monitor System	X											K1.16 Flow converter/comparator network: Plant-Specific	3.3	1
215005	Average Power Range Monitor/Local Power Range Monitor System										X		A4.06 Verification of proper functioning/ operability	3.6	1
216000	Nuclear Boiler Instrumentation								X				A2.11 Heatup or cooldown of the reactor vessel	3.2	1
217000	Reactor Core Isolation Cooling System (RCIC)		X										K2.01 Motor operated valves	2.8	1
218000	Automatic Depressurization System					X							K5.01 ADS logic operation	3.8	1

Plant Systems - Tier 2/Group 1

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
223001	Primary Containment System and Auxiliaries														
223002	Primary Containment Isolation System/Nuclear Steam Supply Shut-Off	X											K1.01 Main steam system	3.8	1
239002	Relief/Safety Valves						X						K6.05 Discharge line vacuum breaker	3.0	1
241000	Reactor/Turbine Pressure Regulating System			X									K3.11 RPS	3.8	1
259001	Reactor Feedwater System									X			A3.01 RFP auto start: Plant-Specific	3.3	1
259001	Reactor Feedwater System						X						K6.02 Condensate system	3.3	1
259002	Reactor Water Level Control System														
261000	Standby Gas Treatment System							X					A1.01 System flow	2.9	1
264000	Emergency Generators (Diesel/Jet)				X								K4.01 Emergency generator trips (normal)	3.5	1
	K/A Category Point Totals:	2	2	3	2	2	2	4	3	2	4	2	Group Point Total:		28

Plant Systems - Tier 2/Group 2

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
201003	Control Rod and Drive Mechanism	X											K1.01 Control rod drive hydraulic system	3.2	1
201003	Control Rod and Drive Mechanism											X	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
201004	Rod Sequence Control System (Plant Specific)														
201006	Rod Worth Minimizer System (RWM) (Plant Specific)					X							K5.01 Minimize clad damage if a control rod drop accident (CRDA) occurs: P-Spec(Not-BWR6)	3.3	1
202001	Recirculation System								X				A2.06 Inadvertent recirculation flow decrease	3.6	1
204000	Reactor Water Cleanup System								X				A2.07 Loss of plant air systems	2.5	1
205000	Shutdown Cooling System (RHR Shutdown Cooling Mode)					X							K5.02 Valve operation	2.8	1
214000	Rod Position Information System														
215002	Rod Block Monitor System						X						K6.05 LPRM detectors: BWR-3, 4, 5	2.8	1
219000	RHR/LPCI: Torus/Suppression Pool Cooling Mode										X		A4.14 The overrides for suppression pool cooling valve logic: Plant-Specific	3.7	1
226001	RHR/LPCI: Containment Spray System Mode														
230000	RHR/LPCI: Torus/Suppression Pool Spray Mode														
239001	Main and Reheat Steam System														
245000	Main Turbine Generator and Auxiliary Systems							X					A1.02 Turbine speed	2.6	1
256000	Reactor Condensate System														
262001	A.C. Electrical Distribution									X			A3.03 Load shedding	3.4	1
262002	Uninterruptable Power Supply (A.C./D.C.)				X								K4.01 Transfer from preferred power to alternate power supplies	3.1	1
263000	D.C. Electrical Distribution				X								K4.01 Manual/ automatic transfers of control: Plant- Specific	3.1	1
263000	D.C. Electrical Distribution			X									K3.03 Systems with D.C. components (i.e. valves, motors, solenoids, etc.)	3.4	1
271000	Offgas System	X											K1.06 Main steam system	2.8	1
272000	Radiation Monitoring System						X						K6.01 Reactor protection system	3.0	1
272000	Radiation Monitoring System							X					A1.01 Lights, alarms, and indications associated with normal operations	3.2	1
286000	Fire Protection System									X			A3.01 Fire water pump start	3.4	1

Plant Systems - Tier 2/Group 2

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
290001	Secondary Containment														
290003	Control Room HVAC														
300000	Instrument Air System (IAS)				X								K4.01 Manual/automatic transfers of control	2.8	1
400000	Component Cooling Water System (CCWS)											X	2.4.11 Knowledge of abnormal condition procedures.	3.4	1
	K/A Category Point Totals:	2	0	1	3	2	2	2	2	2	1	2	Group Point Total:		19

Plant Systems - Tier 2/Group 3

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
215001	Traversing In-Core Probe														
233000	Fuel Pool Cooling and Clean-up								X				A2.07 High fuel pool temperature	3.0	1
234000	Fuel Handling Equipment				X								K4.02 Prevention of control rod movement during core alterations	3.3	1
239003	MSIV Leakage Control System														
268000	Radwaste														
288000	Plant Ventilation Systems						X						K6.03 Plant air systems	2.7	1
290002	Reactor Vessel Internals	X											K1.02 Recirculation system	3.2	1
	K/A Category Point Totals:	1	0	0	1	0	1	0	1	0	0	0	Group Point Total:		4

Facility: Vermont Yankee	Date: January 25, 1999		Exam Level:	RO
Category	KA #	KA Topic	Imp.	Points
Conduct of Operations	2.1.1	Knowledge of conduct of operations requirements.	3.7	1
	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	3.0	1
	2.1.21	Ability to obtain and verify controlled procedure copy.	3.1	1
	2.1.22	Ability to determine Mode of Operation.	2.8	1
	Total			4
Equipment Control	2.2.13	Knowledge of tagging and clearance procedures.	3.6	1
	2.2.13	Knowledge of tagging and clearance procedures.	3.6	1
	2.2.22	Knowledge of limiting conditions for operations and safety limits.	3.4	1
	Total			3
Radiation Control	2.3.1	Knowledge of 10 CFR 20 and related facility radiation control requirements.	2.6	1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9	1
	Total			3
Emergency Procedures and Plan	2.4.12	Knowledge of general operating crew responsibilities during emergency operations.	3.4	1
	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions including: 1.Reactivity control 2.Core cooling and heat removal 3.Reactor coolant system integrity 4.Containment conditions 5.Radioactivity release control.	3.7	1
	2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
	Total			3
Tier 3 Target Point Total (RO/SRO)				13

Facility	Vermont Yanke	Date of Exam:	01/25/99					Exam Level:		SRO		
Tier	Group	K/A Category Points										Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	3	4	3				4	5			7	26
	2	2	3	3				3	3			3	17
	Tier Totals	5	7	6				7	8			10	43
2. Plant Systems	1	1	2	2	2	2	1	3	2	2	4	2	23
	2	1		1	2	1	2	1	1	1	2	1	13
	3	1					1					2	4
	Tier Totals	3	2	3	4	3	4	4	3	3	6	5	40
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		
					5		5		3		4		17

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.

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
295003	Partial or Complete Loss of A.C. Power		X					AK2.04 A.C. electrical loads	3.5	1
295003	Partial or Complete Loss of A.C. Power					X		AA2.02 Reactor power, pressure, and level	4.3	1
295003	Partial or Complete Loss of A.C. Power				X			AA1.03 Systems necessary to assure safe plant shutdown	4.4	1
295006	SCRAM			X				AK3.02 Reactor power response	4.2	1
295007	High Reactor Pressure			X				AK3.04 Safety/relief valve operation: Plant-Specific	4.1	1
295007	High Reactor Pressure				X			AA1.05 Reactor/turbine pressure regulating system	3.8	1
295009	Low Reactor Water Level		X					AK2.03 Recirculation system	3.2	1
295009	Low Reactor Water Level				X			AA1.02 Reactor water level control	4.0	1
295010	High Drywell Pressure									
295013	High Suppression Pool Temperature									
295014	Inadvertent Reactivity Addition									
295015	Incomplete SCRAM		X					AK2.04 RPS	4.1	1
295016	Control Room Abandonment					X		AA2.02 Reactor water level	4.3	1
295016	Control Room Abandonment						X	2.4.41 Knowledge of the emergency action level thresholds and classifications.	4.1	1
295016	Control Room Abandonment			X				AK3.03 Disabling control room controls	3.7	1
295017	High Off-Site Release Rate						X	2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions including:□ 1.Reactivity control□ 2.Core cooling and heat removal□ 3.Reactor coolant system integrity□ 4.Containment conditions□ 5.Radioactivity release control.	4.3	1
295023	Refueling Accidents	X						AK1.03 Inadvertent criticality	4.0	1
295024	High Drywell Pressure						X	2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes.	4.0	1
295025	High Reactor Pressure	X						EK1.03 Safety/relief valve tailpipe temperature/pressure relationships	3.8	1
295026	Suppression Pool High Water Temperature					X		EA2.01 Suppression pool water temperature	4.2	1
295026	Suppression Pool High Water Temperature						X	2.1.12 Ability to apply technical specifications for a system.	4.0	1
295027	High Containment Temperature (Mark III Containment Only)									
295030	Low Suppression Pool Water Level						X	2.4.18 Knowledge of the specific bases for EOPs.	3.6	1
295030	Low Suppression Pool Water Level		X					EK2.07 Downcomer/ horizontal vent submergence	3.8	1
295031	Reactor Low Water Level					X		EA2.04 Adequate core cooling	4.8	1
295031	Reactor Low Water Level				X			EA1.08 Alternate injection systems: Plant-specific	3.9	1
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown	X						EK1.06 Cooldown effects on reactor power	4.2	1

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown						X	2.4.48 Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and directives affect plant and system conditions.	3.8	1
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown					X		EA2.01 Reactor power	4.3	1
295038	High Off-Site Release Rate									
500000	High Containment Hydrogen Concentration						X	2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions including:□ 1.Reactivity control□ 2.Core cooling and heat removal□ 3.Reactor coolant system integrity□ 4.Containment conditions□ 5.Radioactivity release control.	4.3	1
	K/A Category Point Totals:	3	4	3	4	5	7	Group Point Total:		26

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

Number#	Name	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Pts.
295001	Partial or Complete Loss of Forced Core Flow Circulation		X					AK2.01 Recirculation system	3.7	1
295001	Partial or Complete Loss of Forced Core Flow Circulation	X						AK1.02 Power/flow distribution	3.5	1
295002	Loss of Main Condenser Vacuum			X				AK3.09 Reactor power reduction	3.2	1
295004	Partial or Complete Loss of D.C. Power		X					AK2.03 D.C. bus loads	3.3	1
295004	Partial or Complete Loss of D.C. Power						X	2.4.48 Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and directives affect plant and system conditions.	3.8	1
295005	Main Turbine Generator Trip			X				AK3.03 Feedwater temperature decrease	3.0	1
295008	High Reactor Water Level						X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
295011	High Containment Temperature (Mark III Containment Only)									
295012	High Drywell Temperature	X						AK1.01 Pressure/temperature relationship	3.5	1
295018	Partial or Complete Loss of Component Cooling Water						X	2.4.24 Knowledge of loss of cooling water procedures.	3.7	1
295019	Partial or Complete Loss of Instrument Air					X		AA2.02 Status of safety-related instrument air system loads (see AK2.1 - AK2.19)	3.7	1
295019	Partial or Complete Loss of Instrument Air		X					AK2.03 Reactor feedwater	3.3	1
295020	Inadvertent Containment Isolation									
295021	Loss of Shutdown Cooling				X			AA1.02 RHR/shutdown cooling	3.5	1
295021	Loss of Shutdown Cooling					X		AA2.04 Reactor water temperature	3.5	1
295022	Loss of CRD Pumps									
295028	High Drywell Temperature				X			EA1.04 Drywell pressure	4.0	1
295029	High Suppression Pool Water Level									
295032	High Secondary Containment Area Temperature			X				EK3.01 Emergency/normal depressurization	3.8	1
295033	High Secondary Containment Area Radiation Levels				X			EA1.03 Secondary containment ventilation	3.8	1
295034	Secondary Containment Ventilation High Radiation									
295035	Secondary Containment High Differential Pressure									
295036	Secondary Containment High Sump/Area Water Level					X		EA2.02 Water level in the affected area	3.1	1
600000	Plant Fire On Site									
	K/A Category Point Totals:	2	3	3	3	3	3	Group Point Total:		17

ES-401 BWR SRO Examination Outline ES-401-1

Plant Systems - Tier 2/Group 1

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
201005	Rod Control and Information System (RCIS)														
202002	Recirculation Flow Control System								X				A2.05 Scoop tube lockup: BWR-2, 3, 4	3.1	1
203000	RHR/LPCI: Injection Mode (Plant Specific)									X			A3.08 System initiation sequence	4.1	1
203000	RHR/LPCI: Injection Mode (Plant Specific)			X									K3.03 Automatic depressurization logic	4.3	1
206000	High Pressure Coolant Injection System										X		A4.12 Turbine trip controls: BWR-2, 3, 4	3.9	1
206000	High Pressure Coolant Injection System							X					A1.08 System lineup: BWR-2, 3, 4	4.0	1
207000	Isolation (Emergency) Condenser														
209001	Low Pressure Core Spray System				X								K4.04 Line break detection	3.2	1
209002	High Pressure Core Spray System (HPCS)														
211000	Standby Liquid Control System		X										K2.02 Explosive valves	3.2	1
211000	Standby Liquid Control System											X	2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
212000	Reactor Protection System					X							K5.02 Specific logic arrangements	3.4	1
212000	Reactor Protection System										X		A4.07 System status lights and alarms	3.9	1
215004	Source Range Monitor (SRM) System										X		A4.07 Verification of proper functioning/ operability	3.6	1
215005	Average Power Range Monitor/Local Power Range Monitor System										X		A4.06 Verification of proper functioning/ operability	3.8	1
216000	Nuclear Boiler Instrumentation								X				A2.11 Heatup or cooldown of the reactor vessel	3.3	1
217000	Reactor Core Isolation Cooling System (RCIC)							X					A1.03 Reactor water level	4.0	1
217000	Reactor Core Isolation Cooling System (RCIC)		X										K2.01 Motor operated valves	2.8	1
218000	Automatic Depressurization System					X							K5.01 ADS logic operation	3.8	1
223001	Primary Containment System and Auxiliaries														
223002	Primary Containment Isolation System/Nuclear Steam Supply Shut-Off	X											K1.01 Main steam system	3.9	1
226001	RHR/LPCI: Containment Spray System Mode														
239002	Relief/Safety Valves						X						K6.05 Discharge line vacuum breaker	3.2	1

ES-401	BWR SRO Examination Outline Plant Systems - Tier 2/Group 1												ES-401-1		
Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
241000	Reactor/Turbine Pressure Regulating System			X									K3.11 RPS	3.8	1
259002	Reactor Water Level Control System														
261000	Standby Gas Treatment System							X					A1.01 System flow	3.1	1
262001	A.C. Electrical Distribution									X			A3.03 Load shedding	3.5	1
264000	Emergency Generators (Diesel/Jet)											X	2.1.31 Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.	3.9	1
264000	Emergency Generators (Diesel/Jet)				X								K4.01 Emergency generator trips (normal)	3.7	1
290001	Secondary Containment														
	K/A Category Point Totals:	1	2	2	2	2	1	3	2	2	4	2	Group Point Total:		23

Plant Systems - Tier 2/Group 2

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
201001	Control Rod Drive Hydraulic System								X				A2.11 Valve openings	2.7	1
201002	Reactor Manual Control System										X		A4.02 Emergency in/notch override switch	3.5	1
201004	Rod Sequence Control System (Plant Specific)														
201006	Rod Worth Minimizer System (RWM) (Plant Specific)														
202001	Recirculation System														
204000	Reactor Water Cleanup System														
205000	Shutdown Cooling System (RHR Shutdown Cooling Mode)					X							K5.02 Valve operation	2.9	1
214000	Rod Position Information System														
215002	Rod Block Monitor System						X						K6.05 LPRM detectors: BWR-3, 4, 5	3.1	1
215003	Intermediate Range Monitor (IRM) System														
219000	RHR/LPCI: Torus/Suppression Pool Cooling Mode										X		A4.14 The overrides for suppression pool cooling valve logic: Plant-Specific	3.5	1
230000	RHR/LPCI: Torus/Suppression Pool Spray Mode														
234000	Fuel Handling Equipment				X								K4.02 Prevention of control rod movement during core alterations	4.1	1
239003	MSIV Leakage Control System														
245000	Main Turbine Generator and Auxiliary Systems							X					A1.02 Turbine speed	2.5	1
259001	Reactor Feedwater System						X						K6.02 Condensate system	3.4	1
262002	Uninterruptable Power Supply (A.C./D.C.)				X								K4.01 Transfer from preferred power to alternate power supplies	3.4	1
263000	D.C. Electrical Distribution			X									K3.03 Systems with D.C. components (i.e. valves, motors, solenoids, etc.)	3.8	1
271000	Offgas System	X											K1.06 Main steam system	2.9	1
272000	Radiation Monitoring System														
286000	Fire Protection System									X			A3.01 Fire water pump start	3.4	1
290003	Control Room HVAC														
300000	Instrument Air System (IAS)														
400000	Component Cooling Water System (CCWS)											X	2.4.11 Knowledge of abnormal condition procedures.	3.6	1
	K/A Category Point Totals:	1	0	1	2	1	2	1	1	1	2	1	Group Point Total:		13

Plant Systems - Tier 2/Group 3

Number#	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Pts.
201003	Control Rod and Drive Mechanism											X	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
215001	Traversing In-Core Probe														
233000	Fuel Pool Cooling and Clean-up														
239001	Main and Reheat Steam System														
256000	Reactor Condensate System														
268000	Radwaste														
288000	Plant Ventilation Systems						X						K6.03 Plant air systems	2.7	1
290002	Reactor Vessel Internals											X	2.1.12 Ability to apply technical specifications for a system.	4.0	1
290002	Reactor Vessel Internals	X											K1.02 Recirculation system	3.2	1
	K/A Category Point Totals:	1	0	0	0	0	1	0	0	0	0	2	Group Point Total:		4

Facility: Vermont Yankee	Date: January 25, 1999		Exam Level: SRO	
Category	KA #	KA Topic	Imp.	Points
Conduct of Operations	2.1.1	Knowledge of conduct of operations requirements.	3.8	1
	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	4.0	1
	2.1.12	Ability to apply technical specifications for a system.	4.0	1
	2.1.21	Ability to obtain and verify controlled procedure copy.	3.2	1
	2.1.22	Ability to determine Mode of Operation.	3.3	1
	Total			5
Equipment Control	2.2.11	Knowledge of the process for controlling temporary changes.	3.4	1
	2.2.13	Knowledge of tagging and clearance procedures.	3.8	1
	2.2.13	Knowledge of tagging and clearance procedures.	3.8	1
	2.2.22	Knowledge of limiting conditions for operations and safety limits.	4.1	1
	2.2.26	Knowledge of refueling administrative requirements.	3.7	1
	Total			5
Radiation Control	2.3.1	Knowledge of 10 CFR 20 and related facility radiation control requirements.	3.0	1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	3.1	1
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	3.3	1
	Total			3
Emergency Procedures and Plan	2.4.12	Knowledge of general operating crew responsibilities during emergency operations.	3.9	1
	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions including: 1.Reactivity control 2.Core cooling and heat removal 3.Reactor coolant system integrity 4.Containment conditions 5.Radioactivity release control.	4.3	1
	2.4.38	Ability to take actions called for in the facility emergency plan, including (if required)supporting or acting as emergency coordinator.	4.0	1
	2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
	Total			4
Tier 3 Target Point Total (RO/SRO)				17

Simulation Facility: Vermont Yankee **Scenario No.:** #1

Examiners: ____________________ **Operators:** ____________________ SCRO

____________________ ____________________ CRO

____________________ ____________________ ACRO

Objectives: Evaluate the crew's ability to operate plant equipment to support a normal power ascension, respond to and evaluate (TS) a level instrument failure and the resultant reactivity addition transient, recognize and take action for a Recirc Pump seal failure, recognize and limit the positive reactivity from a runaway Recirc Pump, determine the affect of a loss of a 480 VAC ESS bus on plant operation, and to implement the EOPs to monitor and control plant parameters for a major primary containment steam leak resulting in emergency depressurization as well as recognizing the inability to spray the drywell.

Initial Conditions: 40% power, ready for second Feedwater Pump Start

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malf. No.	Event Type*		Event Description
1		R	CRO SCRO	Continue power ascension IAW OP-0105
2		N	ACRO SCRO	Start the second Feedwater Pump
3	RR18A HP03	I	ACRO SCRO CRO	ECCS level instrument failure, Inadvertent HPCI initiation (TS)
4	RR07B RR08B	C	CRO SCRO	"B" Recirc Pump upper and lower seal failure
5	RR10	I	CRO SCRO	"A" Recirc Pump speed controller failure, pump speed increasing
6	ED05C	C	CRO ACRO SCRO	480 VAC ESS Bus 8 fails
7	MS06	M	CRO ACRO SCRO	Steam line leak in the drywell - emergency depressurization
8	RH03A	C	ACRO SCRO	Drywell Spray Valves do not open.

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

Simulation Facility: Vermont Yankee **Scenario No.:** #2 **Op Test No.:**

Examiners: ______________ **Operators:** ______________ SCRO

______________ ______________ CRO

______________ ______________ ACRO

Objectives: Evaluate the crew's ability to operate plant equipment to support a normal power ascension, to perform and recognize a failure of a safety related equipment surveillance and implement the required TS, recognize an instrumentation failure and resulting single control rod scram, recognize increasing turbine vibrations, to insert a manual scram after recognizing a second control rod scram, and to implement the EOPs to monitor and control plant parameters for a full core ATWS with an inability to inject boron and with inadequate pressure control capability including a determination that lowering reactor water level is required to control power.

Initial Conditions: IC- 8, 85% power

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malf. No.	Event Type*		Event Description
1		R	CRO SCRO	Continue power ascension IAW OP-0105
2	Override	N	ACRO SCRO	Core Spray surveillance fails, TS required shutdown
3	NM05C RD06	I C	CRO SCRO	APRM "C" failure upscale, control rod 22-15 scram, blown pilot valve fuse
4	TU03,3	C	ACRO SCRO	Main turbine bearing high vibration, slowly increasing
5	Override RD06	I C	CRO SCRO	Half scram from Event 3 will not reset, second control rod scrams 33-15
6	RD12A & B	M	CRO ACRO SCRO	SDV hydraulic lock - ATWS
7	SL01A & B	C	CRO ACRO SCRO	"A" SLC Pump trips, "B" SLC Pump fails to start
8	TC03	C	ACRO SCRO	9 of 10 Turbine Bypass Valves do not open

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

Simulation Facility: Vermont Yankee **Scenario No.:** #3 **Op Test No.:**

Examiners: ____________ **Operators:** ____________ SCRO

____________ ____________ CRO

____________ ____________ ACRO

Objectives: Evaluate the crew's ability to remove plant equipment from service by alternate means, evaluate the TS for failure of plant equipment, recognize and take actions for pressure oscillations without scramming the plant, recognize the indications for a failed jet pump and determine a plant shutdown is required by TS, recognize a Recirc Pump failure to respond during the power reduction, take actions for a fuel failure including a manual scram, , and to implement the EOPsto monitor and control plant parameters for a leak with fuel failure outside the primary containment while recognizing and taking actions for plant equipment failures.

Initial Conditions: IC-10, 100% power, "B" RHR Pump in Torus cooling

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malf. No.	Event Type*		Event Description
1	Override	N C	ACRO SCRO	Remove the "B" RHR Pump from service (Torus cooling), pump will not trip from the Control Room (TS)
2	TC04A	I	CRO SCRO ACRO	Pressure Regulator oscillations
3	RR03F	C	CRO ACRO SCRO	Recirc Jet Pump failure (TS)
4		R	CRO SCRO	Power reduction for jet pump failure
5	RR10 RR11A	I	CRO SCRO	Master flow controller failure (lowering Recirc Pump Speed)/"A" Recirc Pump does not respond
6	RX01	M	CRO ACRO SCRO	Fuel failure slowly increasing
7	RD18	M	CRO ACRO SCRO	Manual Scram/Scram Discharge Volume fails to isolate
8	ED12B	C	ACRO SCRO	4 KV Bus fails to auto transfer

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

VERMONT YANKEE
NUCLEAR POWER CORPORATION

185 Old Ferry Road, Brattleboro, VT 05301-7002
(802) 257-5271

December 23, 1998
BVY 98-98169
TDL 98-022

Regional Administrator, Region I
Attn: Todd Fish
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pa. 19406-1415

References: (a) License No. DPR-28 (Docket No. 50-271)

Subject: REACTOR AND SENIOR REACTOR OPERATOR LICENSING EXAMINATIONS – VERMONT YANKEE, JANUARY 1999

Enclosed, as Attachment I, for NRC review are the written examinations and operating tests intended to be given to the license candidates at Vermont Yankee the week of January 25, 1999. Enclosed within Attachment I are the applicable quality assurance checklists per NUREG 1021, Interim Rev. 8. Also included as Attachment II is a summary of changes between the previously submitted Examination Outline and the Examination.

The enclosed materials are to be withheld from public disclosure until after the related licensing examination is complete.

If you have any questions, please contact Mr. Mike Gosekamp, Operations Training Supervisor, in our Brattleboro office at (802) 258-4161.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Mike Gosekamp
Operations Training Supervisor

Attachment I – Withhold from Public Disclosure per NUREG 1021, Interim Rev. 8
Attachment I I – Withhold from Public Disclosure per NUREG 1021, Interim Rev. 8

c: USNRC Resident Inspector - VYNPS
USNRC Project Manager - VYNPS
Document Control Desk
Vermont Department of Public Service

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December 23, 1998

ATTACHMENT II

References: (a) License No. DPR-28 (Docket No. 50-271)

Subject: REACTOR AND SENIOR REACTOR OPERATOR LICENSING EXAMINATIONS – VERMONT YANKEE, JANUARY 1999

SUMMARY OF THE DIFFERENCES BETWEEN THE EXAMINATION OUTLINE SUBMITTED ON NOVEMBER 23, 1998, AND THE WRITTEN AND OPERATING EXAMINATIONS SUBMITTED ON DECEMBER 23, 1998.

SRO (I) JPM #4: Substituted "MHC/Swap From EPR to MPR" for "ADS/Return Auto Blowdown System to Normal," same Safety Function.

SRO (I) JPM #9: Changed applicable component from "LPCI Injection Valve" to "Containment Spray Valve," same Safety Function

Scenario #3: Crew is given Jet Pump Failure (Outline Event 4) as initial condition to set up conditions for power reduction. May not have been noticeable in a timely manner. Replaced "Scram Discharge Volume fails to isolate," (Outline Event 7) with "Reactor Water Cleanup leak" (Examination Event 6), due to simulator capability. Added ""A" Diesel Generator fails to start" at Examination Event 8 as a component failure.

Scenario #4: Deleted "RHR Pump amps pegged high,"(Outline Event 8) due to scenario run time and not needed.

Scenario #5: Replaced "Failure of "B" RBM upscale," (Outline Event 4) with APRM "A" failure upscale"(Examination Event 4), due to simulator capability.

If you have any questions, please contact Mr. Dan Jeffries, Operations Training Instructor, Vermont Yankee, in our Brattleboro office at (802) 258-4143.

COMPLETE EXAM

REVIEW

COPY

Returning to shift hours

Given the following conditions:

- A Control Room Operator (CRO) has just returned to work after 7 days vacation
- The CRO was called in 4 hours prior to the start of Day Shift, assumed the watch and worked through to the end of the shift

What is the MAXIMUM number of hours this CRO may work on Day #2 of Day Shift in accordance with Technical Specifications? Assume the current Operations 12-hour shifts.

a. 6 hours

b. 8 hours

c. 10 hours

d. 12 hours

Answer b **Exam Level** B **Cognitive Level** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.1 Conduct of Operations

2.1.1 Knowledge of conduct of operations requirements. 3.7 3.8

Explanation of Answer: AP 0894 allows 24 hours work in 48 hours. Working 16 hours first day 24-16 = 8 hours allowed on 2nd day.

Reference Title	Reference Number	Section	Page Number(s)	Revision	L. O.
Staffing And Overtime Limits	AP 0894	2.c	2	6	
Operations Dept Administrative Procedures - 1	LOT-00-400			16	CRO-9

Material Required for Examination None

Question Source: NRC Exam Bank **Question Modification Method:** Concept Used

Question Source Comments: Peach Bottom NRC Exam 02/98 - used idea, different number of hours worked, hours worked before shift. 1 new distractor

Comment Type **Comment**

Question Topic Requirements to maintain a license active

Given the following conditions:

- An operator stood 2 normal shifts in October
- The operator was then off shift with an extended illness
- The operator returned to work on December 16th

Which of the following describes the additional actions that shall be taken for the operator's license to remain active? Assume the current Operations 12-hour shifts.

a. A minimum of 40 hours of under instruction watches must be stood prior to January 1st.

b. All missed Licensed Operator Requalification training must be made up prior to January 1st.

c. A minimum of 3 shifts must be stood prior to January 1st.

d. A minimum of 5 shifts must be stood prior to January 1st.

Answer: c **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group:** 1 **SRO Group:** 1

GENERIC

2.1 Conduct of Operations

2.1.2 Knowledge of operator responsibilities during all modes of plant operation. 3.0 4.0

Explanation of Answer: a. - requirements for reactivation b. - not a requirement c. - correct answer for 12 hour shifts d. - assumes 8 hour shifts, VY stands 12 hour shifts

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Responsibilities And Authorities Of Operations Department Personnel	AP 0151	IX.A.1 & VYAPF 0151.01	17	8	
Operations Dept Administrative Procedures - 2	LOT-01-400			2	CRO-1 & SCRO-1

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

[illegible] Missed TS surveillance time limits

A weekly Technical Specification surveillance was last completed at 0700 on Monday, 01/25/99.

When will the next surveillance be considered "missed"?

- a. 0700, on Monday, 02/01/99
- b. 0100 on Tuesday, 02/02/99.
- c. 0700 on Tuesday, 02/02/99
- d. 0100 on Wednesday, 02/03/99

Answer: c **Exam Level:** S **[illegible]** Memory **[illegible]** Vermont Yankee **[illegible]** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group:** 1 **SRO Group:** 1

GENERIC

2.1 Conduct of Operations

2.1.12 Ability to apply technical specifications for a system. 2.9 4.0

Explanation of Answer: a. - 7 days b. - 7 days + 18 hours c. - correct answer, 8 days d. - 8 days + 18 hours The 1.25 extension for 7 days is rounded down, i.e., 8.75 days is rounded to 8 days

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O. #
VY Tech Spec Clarifications	Attachment D	2.2	D-4	1	
Introduction To Technical Specifications	LOT-00-308			11	CRO-2.d & SCRO-1

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Approval levels for Department Instruction procedure changes

While performing a High Pressure Coolant Injection surveillance on a weekend backshift the operators determine that a procedure change is needed to correct the sequence of operation of two valves. The Supervisory Control Room Operator (SCRO) determines that the change will not alter the intent of the procedure and that a Department Instruction (DI) is the appropriate method of changing the procedure.

Select the specific point at which the operators may continue on with the procedure.

a. Following approval by the SCRO and the Shift Supervisor.

b. After the 10CFR50.54(q) review is signed off.

c. Following approval by either of the on-shift Senior Reactor Operators.

d. After verbal concurrence form the Plant Manager or designee.

Answer: a **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **Exam Date:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.1 Conduct of Operations

2.1.21 Ability to obtain and verify controlled procedure copy 3.1 3.2

Explanation of Answer: a. - correct answer b. - not required unless procedure is EPIP c. - takes two SROs to approve d. - PM approval is not required, only his review later

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Plant Procedures	AP 0037	1.3 & VYAPF 0037.01	23	7	
Engineering Support & Plant Administrative Procedures	LOT-00-402				CRO-11 & SCRO-15

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Determination of plant mode of operation

Which of the following plant conditions does NOT meet the requirement for the reactor to be considered in the "Run" mode of operation?

- Reactor power is at 90 on Range 8 of the Intermediate Range Monitoring System.
- Reactor pressure is 785 psig.
- Reactor water level is +137 inches.
- K effective is 1.002.

b | B | Memory | Vermont Yankee | 1/25/99

Generic Knowledge and Abilities | 1 | 1

GENERIC

2.1 Conduct of Operations

2.1.22 Ability to determine Mode of Operation. 2.8 3.3

Explanation of Answer: a. - 33 on Range 10 is 10% power, 90 on Range 8 is >1% power b. - correct answer, must be >800 psig to place the RMS in "Run" c. - below normal level band but not a concern d - >1.0 is super critical

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
VY Tech Spec Definitions		1.0 R.2	3	84	
Introduction To Technical Specifications	LOT-00-308			11	CRO-2.j

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Changes to Temporary Modifications

A Temporary Modification (TM) has been approved and installed on a plant system. Eight weeks later it has been determined that changes to the modification are needed.

Which of the following describes how this change shall be accomplished?

a. The current TM shall be restored (removed) and a new TM incorporating the changes shall be approved and installed.

b. After determining the level of the required change (minor or major), the current TM shall be modified.

c. The current TM shall be restored (removed) and a Minor Modification incorporating the changes shall be approved and installed.

d. After determining the level of the required change, an Engineering Design Change Request shall be approved and initiated.

Answer: b **Exam Level:** S **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.2 Equipment Control

2.2.11 Knowledge of the process for controlling temporary changes. 2.5 3.4

Explanation of Answer: a. - not a requirement b. - correct answer c. - MM is for permanent changes d. - No such thing as a Major Modification

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Control Of Temporary And Minor Modifications	AP 0020	D.1.	14	19	
Engineering Support & Plant Administrative Procedures	LOT-00-402			12	SCRO-4

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Use of Lineup Deviations

Which of the following shall be documented on a Lineup Deviation form?

The "A" RHR Heat Exchanger Inlet Valve (RHR-23A) has been repositioned:

a. as required and documented by a Caution tagging order.

b. as required and directed by a surveillance test.

c. as required and documented by a White tagging order.

d. by an Auxiliary Operator who is standing by to return the valve to its original position in accordance with the system operating procedure.

Answer: a **Exam Level:** R **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group:** 1 **SRO Group:** 1

GENERIC

2.2 Equipment Control

2.2.13 Knowledge of tagging and clearance procedures. 3.6 3.8

Explanation of Answer: b., c. & d. - specific cases allowing the repositioning without Lineup Deviation Form a. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Current system Valve And Breaker Lineup And Identification	AP 0155	C.5	9	23	
Operations Dept Administrative Procedures - 2	LOT-01-400			2	CRO-9

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Human Tag requirements

Which of the following conditions allow use of a Human Tag to prevent operation of plant equipment?

A Human Tag may be used:

a. if the individual is a Licensed Operator.

b. with the specific permission of the Work Party Leader supervising the job.

c. during a plant emergency to prevent a plant trip.

d. only on non-safety related plant systems during a plant emergency.

Answer: c **Exam Level:** S **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group:** 1 **SRO Group:** 1

GENERIC

2.2 Equipment Control

2.2.13 Knowledge of tagging and clearance procedures. 3.6 3.8

Explanation of Answer: a. - not a requirement b. - SS permission required c. - correct answer d. - not limited to safety related systems.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
VY Local Control Switching Rules	AP 0140	F.1	14	21	
Operations Dept Administrative Procedures - 1	LOT-00-400			16	CRO-6

Material Required for Examination: None

Question Source: NRC Exam Bank **Question Modification Method:** Significantly Modified

Question Source Comments: River Bend NRC Exam 07/92 - rewrote question to VY specific requirements, 2 new distractors, different correct answer

Comment Type: **Comment:**

Question Topic: Verifying positions on inaccessible valves

Given the following conditions:

- The plant is operating at 100% power
- Operations is performing a valve lineup on a system with manually operated valves in the drywell
- These valves do not have Control Room indications

Which of the following describes how the operator shall verify the position of these drywell valves?

The operator shall sign off the valves' position after:

a. verifying system parameters (flow, pressure, etc.) are as expected for the current plant conditions.

b. obtaining their positions as noted on the most current Lineup Deviation Form.

c. noting the inaccessible valves for verification on the next planned or un-planned drywell entry.

d. referring to the last completed valve lineup on the system.

Answer: d **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.2 Equipment Control

2.2.13 Knowledge of tagging and clearance procedures. 3.6 3.8

Explanation of Answer: a. - not allowed by AP 0155 b. - LDF not required for these valves c. - not procedurally directed d. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Current system Valve And Breaker Lineup And Identification	AP 0155	B.2 Note	6	23	
Operations Dept Administrative Procedures - 2	LOT-01-400			2	AO-7, CRO-9

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Safety Limits and violations

Given the following conditions:

- The plant was operating at 40% power
- All Turbine Bypass Valves then failed open
- The Main Steam Isolation Valves (MSIV) did NOT automatically close on low reactor pressure but were closed by the operator

Which of the following resulting combinations of reactor power and pressure indicate violation of a Safety Limit?

a. Reactor power -- 38%
Reactor pressure -- 850 psig

b. Reactor power -- 30%
Reactor pressure -- 820 psig

c. Reactor power -- 28%
Reactor pressure -- 790 psig

d. Reactor power -- 20%
Reactor pressure -- 750 psig

Answer: c **Exam Level** R **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.2 Equipment Control

2.2.22 Knowledge of limiting conditions for operations and safety limits. 3.4 4.1

Explanation of Answer: Safety Limit violation if power above 25% with pressure less than 800 psig c. - only correct combination of conditions a. - pressure above 800 psig b. - pressure above 800 psig d. - power below 25%

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
VY Tech Spec		1.1.B	7	116	
Introduction To Technical Specifications	LOT-00-308			11	CRO-3 & 5

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: RHR operability requirements while augmenting NFPCC

Which of the following is the reason why the Residual Heat Removal (RHR) system is NOT used to augment the Normal Fuel Pool Cooling and Cleanup (FPC) system when the plant is operating at power?

a. The RHR system does not have the heat removal capacity to support the FPC system as well as the normal plant heat loads while at power.

b. The FPC system cooling capacity will only require the additional cooling of the RHR system during a complete core off-load to the spent fuel pool.

c. The FPC and RHR system interconnections cannot be made while the plant is at power due to component accessibility and radiation exposure concerns.

d. Using the RHR system to support the FPC system while at power reduces the number of operable Emergency Core Cooling Systems below the Tech Spec allowable limits.

Answer: d **Exam Level:** S **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.2 Equipment Control

2.2.22 Knowledge of limiting conditions for operations and safety limits 3.4 4.1

Explanation of Answer: a - incorrect statement b. - not necessarily true c. - incorrect statement d. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Residual Heat Removal System	OP 2124	P Notes	58	46	
Residual Heat Removal	LOT-00-205			18	CRO-4

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Refueling SRO requirements

Given the following conditions:

- The plant is operating at 75% power
- It has been determined that a single fuel assembly in the spent fuel pool needs to be moved to a new storage location
- This assembly has been in the pool (out of the reactor vessel) for 60 months

The Refueling Senior Reactor Operator:

a. shall be on the refuel floor for this transfer.

b. shall be assigned prior to the transfer but need not be on the refuel floor.

c. need not be assigned for this transfer.

d. duties may be assumed by the Shift Supervisor for the duration of the transfer.

Answer a **Exam Level** S **Cognitive Level** Memory **Facility** Vermont Yankee **ExamDate:** 1/25/99

Tier Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.2 Equipment Control

2.2.26 Knowledge of refueling administrative requirements. 2.5 3.7

Explanation of Answer a. - correct answer, Refuel SRO shall be on refuel floor b. - required to be on the floor c. - required to be assigned and on the floor d. - Refuel SRO shall have no concurrent duties

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Management Of Refueling Activities And Fuel Assembly Movement	OP 1101	2.a & A.2.a Note	2 & 8	30	

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic: 10CFR20 exposure limits versus all exposure received.

A fully qualified Vermont Yankee radiation worker with all previous exposure history on file has received 2355 mrem through the month of September for 1998.

Which of the following is the remaining Total Effective Dose Equivalent (TEDE) exposure this individual is allowed to receive during the final quarter (three months) of 1998? Assume no authorizations to exceed Vermont Yankee administrative limits have been received.

- 1145 mrem
- 1645 mrem
- 2145 mrem
- 2645 mrem

Answer: c **Exam Level:** B **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group:** 1 **SRO Group** 1

GENERIC

2.3 Radiological Controls

2.3.1 Knowledge of 10 CFR 20 and related facility radiation control requirements. 2.6 3.0

Explanation of Answer: a. - 3500 mrem - 2355 = 1145 mrem b. - 4000 - 2355 = 1645 mrem c. - correct answer, 4500 - 2355 = 2145 mrem d. - 10CRF20 limit - 2355 mrem = 2645 mrem

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Standard For Protection Against Radiation	10CFR20	10CFR20.3.a(10)	325	1-1-92	
Personnel Monitoring	AP 0506	Discussion	1	20	

Material Required for Examination: None

Question Source: Facility Exam Bank **Question Modification Method:** Significantly Modified

Question Source Comments: FEBQ #1455, rewrote to lower cog level,

Comment Type **Comment**

Question Topic Extensions of allowed radiation exposure during normal operation

An operator, possessing job specific skills, will be required to exceed the annual Vermont Yankee radiation exposure administrative limits in order to complete a task.

How is this additional exposure authorized?

- a. The Plant Manager shall approve an Administrative Radiation Exposure Control Change Request.
- b. All Operations Department personnel are automatically extended to the NRC TEDE limit.
- c. The Radiation Protection Manager provides verbal extension authorizations as needed.
- d. The Operations Manager shall approve an Administrative Radiation Exposure Control Change Request.

Answer: a **Exam Level** B **Cognitive Level** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.3 Radiological Controls

2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. 2.5 3.1

Explanation of Answer: a. - correct answer b. - 4500 limit for Ops personnel as well c. - no verbal authorizations used at VY d. - not authorized for this approval

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Personnel Monitoring	AP 0506	2.e	6	20	
VY Emergency Plan	LOT-00-900			16	None Identified

Material Required for Examination None

Question Source: NRC Exam Bank **Question Modification Method:** Concept Used

Question Source Comments: Hope Creek NRC Exam 02/98 - rewrote to VY specific information, one new distractor

Comment Type **Comment**

[illegible] Independent verification requirements waiver criteria

Given the following conditions:

- The Supervisory Control Room Operator (SCRO) has approved clearing a Tagging Order on the Reactor Water Cleanup (RCU) System
- An operator is performing an independent verification of the RCU components

Which of the following is the MINIMUM dose at which independent verification is NOT required by a second operator?

a. 14 mrem

b. 20 mrem

c. 50 mrem

d. 100 mrem

Answer: b **Exam Level** B **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.3 Radiological Controls

2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. 2.9 3.3

Explanation of Answer: 20 mrem dose is guideline limit a. - Group III isolation - changing the 20 mrem limit into a dose rate b. - correct answer c. - not procedurally directed d. - high radiation area limit posting

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
VY Local Control Switching Rules	AP 0140	G.1 Note	16	21	
Operations Dept Administrative Procedures - 1	LOT-00-400			16	CRO-6

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Criteria for departure from approved plant emergency operating procedures

Plant conditions are such that it is determined that deliberate actions contradicting the Emergency Operating Procedures must be taken.

These actions shall be taken only if:

a. approved by either NRC Resident Inspector.

b. immediately needed specifically to protect the health and safety of those personnel located outside the site boundary.

c. approved by any on-shift Licensed Operator.

d. immediately needed specifically to protect the health and safety of those personnel located in the owner controlled area.

Answer: b **Exam Level:** B **Cognitive Level:** Memory **Facility:** Vermont Yankee **Exam Date:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group:** 1 **SRO Group:** 1

GENERIC

2.4 Emergency Procedures and Plan

2.4.12 Knowledge of general operating crew responsibilities during emergency operations. 3.4 3.9

Explanation of Answer: a. - NRC approval not required b. - correct answer per 10CFR50.54(x) c. - must be approved by Licensed Senior Operator d. - plant/facility personnel not considered in these actions

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Domestic Licensing Of Production And Utilization Facilities	10CFR50	10CFR50.54 (x)	729	1-1-92	
Operations Department Administrative Procedures - 2	LOT-01-400			2	CRO-1 & SCRO-1
Responsibilities And Authorities Of Operations Department Personnel	AP 0151 Appendix A	4.5.e)	6	8	

Material Required for Examination

Question Source: NRC Exam Bank **Question Modification Method:** Significantly Modified

Question Source Comments: Brunswick NRC Exam 12/92 - rewrote question to higher level, from approval to why actions are being taken, modified 3 distractors

Comment Type **Comment**

[illegible] Transitioning between EOPs/EOP entry conditions

Following a reactor scram on high drywell pressure, what plant parameters must be monitored to make the decision to exit EOP-1, "RPV Control" and enter EOP-2, "ATWS RPV Control"?

- Average Power Range Monitoring power levels
- Torus water temperature
- Intermediate Range Monitoring power levels
- Control rod positions

[illegible]	d	[illegible]	B	[illegible]	Memory	[illegible]	Vermont Yankee	[illegible]	1/25/99

[illegible]	Generic Knowledge and Abilities	[illegible]	1	SRO Group	1

GENERIC

2.4 Emergency Procedures and Plan

2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions including: 3.7 4.3

1. Reactivity control
2. Core cooling and heat removal
3. Reactor coolant system integrity
4. Containment conditions
5. Radioactivity release control.

Explanation of Answer a - EOP-1 entry condition b. - used as basis to inject SLC c. - not referred to in EOPs d. - correct answer, Reactor Shutdown conditions

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
RPV Control	EOP-1	2nd override step		Draft	

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Time line for notifications following the actual event

Given the following conditions:

- The plant is operating at 75% power
- A fire was reported in the "A" Recirc MG Set at 0720 ~~this morning~~
- An Alert was declared at 0730

Notifications to the state must be made not later than:

a. 0735

b. 0745

c. 0820

d. 0830

Answer: b **Exam Level:** S **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.4 Emergency Procedures and Plan

2.4.38 Ability to take actions called for in the facility emergency plan, including (if required)supporting or acting as emergency coordinator. 2.2 4.0

Explanation of Answer: a. - 15 minutes from fire report, NRC guidelines for classifying an event from discovery b. - correct answer, 15 minutes from classification c. - corresponds to NRC notification if made one hour from report d. - corresponds to NRC notification if made one hour from classification

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
NRC Emergency Preparedness Position letter	August 17, 1995				
Alert	OP 3501	Discussion	1	18	
VY Emergency Plan	LOT-00-900			16	SCRO-3 & 4

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Operator actions when an expected automatic action did not occur

Given the following conditions:

- The plant is operating at 100% power
- A feedwater level control malfunction has resulted in lowering reactor water level
- Reactor water level has reached +120 inches
- There has been NO response from the Reactor Protection System (RPS)

What are the EXPECTED Control Room Operator actions for these conditions?

a. Insert a manual reactor scram and inform the Supervisory Control Room Operator of the condition and the action taken.

b. Do not insert a manual reactor scram until the RPS failure has been verified by two separate indications.

c. Inform the Supervisory Control Room Operator of the condition and insert a manual reactor scram when directed.

d. Perform an immediate power reduction to raise reactor water level to above the scram set point as soon as possible.

Answer: a **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Generic Knowledge and Abilities **RO Group:** 1 **SRO Group:** 1

GENERIC

2.4 Emergency Procedures and Plan

2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. 4.0 4.0

Explanation of Answer: a. - correct answer b. - not procedurally driven c. - operators are required to take manual actions when automatic fails especially on a scram condition, not appropriate to wait for the order d. - not procedurally driven

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Responsibilities And Authorities Of Operations Department Personnel	AP 0151 Appendix A	4.5.b)	4	8	
Operations Dept Administrative Procedures - 2	LOT-01-400			2	CRO-1

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic: Leaking scram outlet valve

With the plant at 100% power, the Scram Outlet Valve (127) for control rod 26-27 begins leaking.

What will be the expected response to this failure?

a. Control rod insertion/withdrawal will not be possible and water flow to the Reactor Building Equipment Drain Sump will rise.

b. The control rod will begin to drift in and a Scram Discharge Volume Not Drained (North or South) alarm will be received.

c. Control rod insertion/withdrawal will not be possible and a Scram Discharge Volume Not Drained (North or South) alarm will be received.

d. The control rod will begin to drift in and water flow to the Reactor Building Equipment Drain Sump will rise.

Answer: d **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 1 **SRO Group** 2

201001 Control Rod Drive Hydraulic System

A2. Ability to (a) predict the impacts of the following on the CONTROL ROD DRIVE HYDRAULIC SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.11 Valve openings 2.6 2.7

Explanation of Answer: a. & c. - still should be able to insert/withdraw the control rod b. - SDV Vent and Drain Valves remain open directing flow to the sump d. - correct answer, leaking outlet valve lowers pressure on top of CRDM op piston allowing reactor pressure to start moving rod in

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Control Rod Drive Hydraulics	LOT-01-201	III.G.6.b.3.b) & TP 1	21	14	CRO-1.j & 2

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment type **Comment**

[illegible] RMCS timer failure

Given the following conditions:

- Control rod withdrawals for a reactor startup are in progress
- While withdrawing control rod 26-27 one notch, the Reactor Manual Control System Master Timer fails

Select the expected control rod response.

Control Rod 26-27 will:

a. withdraw for a total of 2 seconds and then will receive a Rod Select Block and will be deselected.

b. withdraw for a total of 2.0 seconds and then will receive a withdraw block only.

c. immediately receive a withdraw block only and stop moving.

d. immediately receive a Rod Select Block and will be deselected.

Answer: a **Exam Level:** R **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 1 **SRO Group** 2

201002 Reactor Manual Control System

A1. Ability to predict and/or monitor changes in parameters associated with operating the REACTOR MANUAL CONTROL SYSTEM controls including:

A1.02 Control rod position 3.4 3.3

Explanation of Answer: a. - correct answer, aux timer allows 2 second withdrawal then deenergizes select power to select matrix b. - normal master timer withdraw time, incorrect rod block c. - no withdraw block received d. - 2 seconds before deselection, no withdraw block received

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Reactor Manual Control System	LOT-02-201	III.E.6.e	19	13	CRO-1.c & 3

Material Required for Examination: None

Question Source: Facility Exam Bank **Question Modification Method:** Significantly Modified

Question Source Comments: FEBQ #3384 - rewrote question to more operationally oriented, 3 new distractors, rewrote correct answer

Comment Type: **Comment:**

Question Topic: RMCS operation in "Emergency In"

Control rod insertions using the "Emergency In" position of the Rod Out Notch Override Switch are in progress. Following selection of control rod 26-11, inward motion stops without releasing the switch.

Which of the following is preventing insertion of this control rod?

- A Rod Block Monitor control rod block has been received.
- A Rod Worth Minimizer control rod block has been received.
- A Rod Position Information System Inoperative condition has occurred.
- A Reactor Manual Control System Timer malfunction has occurred.

Answer: b **Exam Level:** S **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 1 **SRO Group** 2

201002 Reactor Manual Control System

A4. Ability to manually operate and/or monitor in the control room:

A4.02 Emergency in/notch override switch 3.5 3.5

Explanation of Answer: a. - RBM provides withdrawal blocks only b. - correct answer, RWM blocks not bypassed by Emergency In c. - RPIS Inop bypassed by Emergency In d. - RMCS master timer bypassed by Emergency In

Reference Title:	Facility Reference Number:	Section:	Page Number(s):	Revision:	LO:
Reactor Manual Control	LOT-02-201	III.E.2.d.	17	13	CRO-1.b

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

[illegible] SRM period limits during reactor startup

Which of the following is the reactor period limit imposed by OP 0105, "Reactor Operations", during a reactor startup?

- 20 seconds
- 30 seconds
- 80 seconds
- 100 seconds

[illegible] b [illegible] R [illegible] Memory [illegible] Vermont Yankee [illegible] 1/25/99

[illegible] Plant Systems [illegible] 1 [illegible] 2

201002 Reactor Manual Control System

2.1 Conduct of Operations

2.1.32 Ability to explain and apply system limits and precautions. 3.4 3.8

Explanation of Answer: Procedural limit is a 30 second period b. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Reactor Operations	OP 0150	A.25	15	4	
Reactor Manual Control System	LOT-02-201			13	CRO-5

Material Required for Examination: None

Question Source: New

Question Modification Method:

Question Source Comments:

Comment Type: Comment:

Question Topic: Actions for a mispositioned control rod

Given the following conditions:

- Reactor power is 25% with control rod withdrawals in progress
- A group of 4 control rods (14-15, 30-15, 14-31, 30-31) is being withdrawn from Notch 20 to Notch 22
- The withdrawals are single notch and in the order listed
- Control rods 14-15 and 30-15 have been withdrawn from Notch 20 to Notch 22
- When withdrawn, control rod 14-31 moves from Notch 20 to Notch 26

The Control Room Operator shall immediately:

a. discontinue control rod movement including leaving 14-31 at Notch 26.

b. insert 14-31 to Notch 22, then withdraw 30-31 to Notch 22 in sequence.

c. discontinue control rod movement after inserting 14-31 to Notch 22.

d. insert all group rods to Notch 20 then discontinue further control rod movement.

Answer: a **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **Exam Date:** 1/25/99

Tier: Plant Systems **RO Group:** 2 **SRO Group:** 3

201003 Control Rod and Drive Mechanism

2.4 Emergency Procedures and Plan

2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. 4.0 4.0

Explanation of Answer: a. - correct answer, double notching beyond 2 notches is mispositioned rod b. - true if double notch is 2 or less notches c. - do not return double notched rod to target position d. - not per procedure

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Mispositioned Control Rod	OT 3166	IOA 2. & FA 2.	1	1	
Operational Transient Procedures	LOT-00-602			10	CFO-2 & 7

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Control rod speed adjustments

During a control rod withdrawal at normal reactor pressure, the Control Room Operator (CRO) reports that the time for the rod to move one "notch" seems to be much shorter than normal.

Which of the following would be used to correct this problem?

- **a.** The controller setpoint for the Drive Water Pressure Control Valve (CRD 20) would be adjusted
- **b.** The throttle setting for the water entering and leaving the above-the-piston area of that rod's hydraulic control unit would have to be adjusted.
- **c.** The controller setpoint for the in-service Control Rod Drive Hydraulic Flow Control Valve (CRD 19) would be adjusted.
- **d.** The throttle setting for the water entering and leaving the below-the-piston area of that rod's hydraulic control unit would have to be adjusted.

Answer: d **Exam Level** R **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 2 **SRO Group** 3

201003 Control Rod and Drive Mechanism

K1. Knowledge of the physical connections and/or cause- effect relationships between CONTROL ROD AND DRIVE MECHANISM and the following:

K1.01 Control rod drive hydraulic system 3.2 3.3

Explanation of Answer: a. - PCV is a non-automatic MOV b. - needle valves on DCV to/from below piston area c. - FCV does not affect drive pressure d. - correct answer, needle valves on DCV to/from below piston area

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Control Rod Drive Hydraulics	LOT-01-201	II.D.3	12	15	CRO - 1.h & 3

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic RWM operation above 20% power

Select the reason why Control Room Operator control of the rod withdrawal sequence is considered to be adequate protection while raising power above 20%.

a. The requirement to have each control rod manipulation verified by the Reactor Engineer ensures the correct sequence is maintained.

b. As power is raised to between 20% and 30%, the Rod Block Monitor provides adequate protection by ensuring the correct sequence is maintained.

c. Above this power level, a power excursion from the reactivity added during a single control rod drop accident will not result in other than minor fuel damage.

d. Above this power level, a power excursion from the worst possible single control rod withdrawal error cannot result in any fuel damage.

Answer: c **Exam Level:** R **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 2 **SRO Group:** 2

201006 Rod Worth Minimizer System (RWM) (Plant Specific)

K5. Knowledge of the operational implications of the following concepts as they apply to ROD WORTH MINIMIZER SYSTEM (RWM):

K5.01 Minimize clad damage if a control rod drop accident (CRDA) occurs: P-Spec(Not-BWR6) 3.3 3.7

Explanation of Answer: a. - RE verification only required for RWM computer sequence not for rod movement b. - RBM does not control sequence c. - correct answer, worst possible rod drop accident will result in less than 280 cal/gm, this is fuel damage but of little consequence d. - RBM basis

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
VY Tech Specs		3.3.B.3 Bases	90	70	
Rod Worth Minimizer	LOT-04-201	I.B	6	11	SO-1

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Speed limiting circuitry

Given the following conditions:

- The plant is operating at 100% power
- Both Recirculation Pumps are operating at 90% speed with their respective Manual/Automatic (M/A) transfer stations in "Automatic"
- A failure in the "B" Recirculation Pump M/A station results in a demanded pump speed signal to the scoop tube positioner of 15%
- No operator actions are taken

The "B" Recirculation Pump:

a. scoop tube will lockup as soon as the error limiter difference exceeds 8%.

b. speed will lower to and stop at 15% .

c. scoop tube will immediately lockup at the current pump speed of 90%.

d. speed will lower to and stop at 20%.

Answer: d **Exam Level** R **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

202001 Recirculation System

A2. Ability to (a) predict the impacts of the following on the RECIRCULATION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.06 Inadvertent recirculation flow decrease 3.6 3.8

Explanation of Answer: a. - error limiter circuitry does not input to scoop tube lockup b. - Dual speed demand limiter will stop speed decrease at 20% c. - no cause for scoop tube lockup for these conditions d. - correct answer, dual speed limiter should halt speed decrease at lower limit of 20%

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO:
Reactor Recriculation System	LOT-00-202	V.B.2	34	18	CRO-7

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic Actions for transients with Recirc Pump scoop tube locked

Given the following conditions:

- The plant is operating at 55% power
- A signal failure on the "A" Recirculation Pump has resulted in a Scoop Tube Lock
- Preparations are in progress to take local manual control of the "A" Scoop Tube Positioner
- Prior to taking control a reactor scram occurs

Which of the following actions are REQUIRED for these conditions?

a. Trip the "A" Recirculation Pump immediately.

b. If the difference in recirculation loop flows is greater than 5% at the time of the scram, then trip the "A" Recirculation Pump.

c. Place the Local Master Disconnect Switch to "Off", then trip the "A" Recirculation Pump.

d. Direct a Licensed Operator to manually position the "A" Recirculation Pump scoop tube to "minimum" speed.

Answer: a **Exam Level** B **Cognitive Level** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

202002 Recirculation Flow Control System

A2. Ability to (a) predict the impacts of the following on the RECIRCULATION FLOW CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.05 Scoop tube lockup: BWR-2, 3, 4 3.1 3.1

Explanation of Answer: a. - correct answer b. - not a requirement c. - not procedurally directed or required d. - not procedurally directed

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Reactor Recirculation System	OP 2110	F 1st Note	17	30	
Reactor Recirculation System	LOT-00-202			18	CRO-5 & 7

Material Required for Examination None

Question Source: NRC Exam Bank **Question Modification Method:** Significantly Modified

Question Source Comments: Peach Bottom NRC Exam 09/97 - rewrote stem to provide more specific plant conditions, two new distractor, reword one distractor

Comment Type **Comment**

[illegible] RHR heat exchanger bypass valve operation during LPCI initiation

Which of the following describes how the Residual Heat Removal (RHR) Heat Exchanger Bypass Valves (RHR 65A & B) should be positioned following a LPCI initiation signal on low-low reactor water level concurrent with low reactor pressure?

If only one RHR Pump per loop is running, RHR 65A & B should be:

- overridden and closed once full injection flow has been established and reactor water level has been raised above 82.5 inches.
- positioned to 50% open to provide additional Low Pressure Coolant Injection (LPCI) flow.
- closed as directed by the Emergency Operating Procedures after 1 minute from the initiation signal.
- overridden and closed if torus water temperature reaches 90 degrees F and EOP-3, "Primary Containment Control" is entered.

Answer: c **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

[illegible] Plant Systems **RO Group** 1 **SRO Group** 1

203000 RHR/LPCI: Injection Mode (Plant Specific)

A3. Ability to monitor automatic operations of the RHR/LPCI: INJECTION MODE including:

A3.08 System initiation sequence 4.1 4.1

Explanation of Answer: a. - no procedural direction for this b. - valves must be closed for maximum cooling following a LOCA c. - correct answer d. - only if adequate core cooling is assured.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
RPV Control	EOP-1 Flowchart	Table C		Draft	
Residual Heat Removal System	LOT-00-205			18	CRO-2 & 4

Material Required for Examination: None

Question Source: NRC Exam Bank **Question Modification Method:** Significantly Modified

Question Source Comments: River Bend NRC Exam 01/97 - question modified for VY specific information, reword stem, one new distractor

Comment Type: **Comment:**

Question Topic RHR input into the ADS logic

Following a steam leak in the drywell and subsequent actuation of the Automatic Depressurization System (ADS), the following conditions exist.

- 4 ADS Safety Relief Valves (SRV) are open and have been open for 5 minutes
- All 4 SRV switches are in "Auto"
- Drywell pressure is 4.5 psig
- Reactor water level reached 70 inches and is currently 95 inches
- The Core Spray Pumps have been secured
- The "B" Residual Heat Removal (RHR) Pump is providing drywell sprays
- The remaining 3 RHR Pumps have been shutdown

Which of the following will result in the ADS SRVs closing and remaining closed?

a. Suction strainer clogging has reduced "B" RHR Pump discharge pressure to 85 psig.

b. Drywell pressure lowers to 2.2 psig.

c. The ADS Auto Logic Reset Buttons are pressed.

d. The individual SRV control switches are placed in "Close".

Answer: a **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group:** 1

203000 RHR/LPCI: Injection Mode (Plant Specific)

K3. Knowledge of the effect that a loss or malfunction of the RHR/LPCI: INJECTION MODE will have on following:

K3.03 Automatic depressurization logic 4.2 4.3

Explanation of Answer: a. - correct answer, only one ECCS pump greater than 100 psig needed to meet logic, loss of pump closes valves b. - must press the Drywell Logic Pressure Reset pushbuttons c. - high drywell pressure still present d. - no such switch position

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Automatic Depressurization System	LOT-00-218	IV.B.2.c.2)	18	15	CRO-4.b & c

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Loss of air affect on RCU operation during letdown

Given the following plant conditions:

- The plant is performing a reactor startup and heatup
- Reactor water level control is via Reactor Water Cleanup (RCU) letting down to the main condenser
- The RCU Demin Bypass Valve (CU-74) is open
- Main condenser vacuum has been established with the Mechanical Vacuum Pump

Which of the following is the effect of a loss of instrument air to the RCU system for these conditions?

a. High letdown flows will cause RCU to isolate on high Non-Regenerative Heat Exchanger outlet temperature.

b. The running RCU Pump will trip on overcurrent from pump runout.

c. A loss of RCU letdown flow will result in rising reactor water level.

d. The running RCU Pump will trip on low flow.

Answer: c **Exam Level:** R **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

204000 Reactor Water Cleanup System

A2. Ability to (a) predict the impacts of the following on the REACTOR WATER CLEANUP SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.07 Loss of plant air systems 2.5 2.6

Explanation of Answer: a. - RCU Dump Valve (CU-55) fails closed on loss of air b. - system flow goes down on CU-55 failing closed c. - correct answer, CU-55 closes and with heatup in progress level goes up d. - low flow trip bypassed with CU-74 open

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Low Instrument/Scram Air Header Pressure	ON 3146	Appendix A	5	13	
Reactor Water Cleanup System	LOT-00-204			14	CRO-1.f & 2

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic RHR Min Flow Valve interlocks during SDC/pump protection

Given the following conditions:

- The plant is shutdown making preparations to place the "B" Loop of Residual Heat Removal (RHR) into shutdown cooling
- The "B" RHR Pump is ready to be started with all valves lined up per procedure

How is this RHR Pump protected from damage due to no or low-flow conditions while being started?

a. The pump minimum flow valve will open to provide flow until the Outboard Injection Valve (RHR-27B) is opened.

b. The operator is required to establish pump flow to the reactor vessel immediately after starting the pump.

c. The pump is started with a complete, established shutdown cooling flowpath (all valves fully open) to prevent this.

d. The operator will open the RHR Minimum Flow Valve (RHR-16B) until pump flow exceeds 3000 gpm.

Answer: b **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

205000 Shutdown Cooling System (RHR Shutdown Cooling Mode)

K5. Knowledge of the operational implications of the following concepts as they apply to SHUTDOWN COOLING SYSTEM/MODE:

K5.02 Valve operation 2.8 2.9

Explanation of Answer: a. - Valve is interlocked closed with RHR-15B open b. - correct answer c. - no procedural direction, will place pump in runout condition d. - valve is interlocked closed with RHR-15B open

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Residual Heat Removal System	LOT-00-205	V.E.1	37	18	CRO-2

Material Required for Examination None

Question Source: NRC Exam Bank **Question Modification Method:** Concept Used

Question Source Comments: Grand Gulf NRC Exam 07/95 - rewrote question to reflect VY RHR Min Flow Valve interlock. 2 new distractors, new correct answer

Comment Type **Comment**

[illegible] Steam line isolation valve auto-open signals

Given the following conditions:

- The plant is operating at 50% power
- The High Pressure Coolant Injection (HPCI) system is in its normal standby lineup with the exception of the Inboard Steam Isolation Valve (HPCI-15) being closed during the completion of a surveillance
- The valve is powered, not tagged or in any way disabled

Which of the following describes the availability and operability of the HPCI system for these conditions? (Assume all other plant systems are available and operable.)

HPCI is:

a. available for manual initiation but is not capable of carrying out its intended function.

b. administratively inoperable with only the manual start capability available.

c. capable of injection only if the operator opens HPCI-15.

d. available for automatic initiation and capable of carrying out its intended function.

Answer: d **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

[illegible] Plant Systems **RO Group** 1 **SRO Group** 1

206000 High Pressure Coolant Injection System

A1. Ability to predict and/or monitor changes in parameters associated with operating the HIGH PRESSURE COOLANT INJECTION SYSTEM (HPCI) controls including:

A1.08 System lineup: BWR-2, 3, 4 4.1 4.0

Explanation of Answer: a. - manual initiation will not open the HPCI-15 valve b. - auto start signal will open the HPCI-15 valve c. - will auto open w/o operator action d. - per the procedures HPCI will unisolate and start on an auto start signal

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
High Pressure Coolant Injection System	LOT-00-206	IV.A.4	26	19	CRO-3

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic HPCI response to failed level instrumentation

Given the following conditions:

- The High Pressure Coolant Injection (HPCI) system has started and is injecting in "Automatic" following a valid initiation signal
- System operation is normal
- The wide range reactor water level instrumentation supplying HPCI (LT-72A & B) has just failed full "upscale"

Which of the following describes the expected response of HPCI? Assume no operator actions are taken.

The HPCI:

a. Turbine Steam Supply Inlet Valve (HPCI-14) will close.

b. Injection Valve (HPCI-19) will close and the Minimum Flow Valve (HPCI-25) will open (HPCI operating on minimum flow).

c. Turbine Stop Valve closes.

d. flow controller will reduce turbine speed attempting to lower reactor water level.

Answer: c **Exam Level** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

206000 High Pressure Coolant Injection System

A4. Ability to manually operate and/or monitor in the control room:

A4.12 Turbine trip controls: BWR-2, 3, 4 4.0 3.9

Explanation of Answer: a. - no auto close signals b. - HPCI-19 has no auto close features c. - correct answer, normal high level trip d. - trip will occur before controller has a chance to respond

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
High Pressure Coolant Injection	LOT-00-206	Table 1	1	19	CRO-3 & 5.b
Reactor Vessel Instrumentation	LOT-00-216	III.B.5.c.4)	56	13	

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Core Spray Operability while lineup to the CST

In accordance with OP 2123, "Core Spray", the suction of the "A" Loop of Core Spray has been lined up to the Condensate Storage Tank (CST) to support refueling operations.

Which of the following describes why this lineup requires the "A" Loop of Core Spray be declared "Inoperable"?

a. Operator actions are required to lineup the Core Spray system for injection if an initiation signal occurs.

b. The CST does not have the capacity to meet minimum core reflood requirements while in Cold Shutdown.

c. Operator actions are required to provide a suction flowpath for the Core Spray Pump.

d. The CST to Core Spray piping size limits flowrates to less than system design requirements.

Answer: c **Exam Level** R **Cognitive Level** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

209001 Low Pressure Core Spray System

2.1 Conduct of Operations

2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. 3.4 4.0

Explanation of Answer: Tech Spec defines CS subsystem as "....which combine to inject torus water into a recirculation loop.", CST does not support a "subsystem" and there is no auto swap to the torus a. - CS pump start and discharge valve opening occurs as normal b. - not a concern for these conditions c. - correct answer, no suction flowpath available during swap d. - piping sizes not limiting in this lineup

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Core Spray	OP 2123	E.2.a Caution	10	29	
Core Spray	LOT-00-209			15	CRO-2 & 6
VY Tech Spec		Bases 3.5.A	110	128	

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Normal Core Spray line break indications

The "A" Core Spray leak detection differential pressure normally reads -0.2 psid at 10% power.

How will this reading change as power is raised to 75%?

- a. Goes more negative.
- b. Does not change.
- c. Goes to 0.0 psid.
- d. Goes positive.

[illegible]	a	**Exam Level**	B	**Cognitive Level**	Memory	[illegible]	Vermont Yankee	[illegible] 1/25/99

Tier Plant Systems **RO Group** 1 **SRO Group** 1

209001 Low Pressure Core Spray System

K4. Knowledge of LOW PRESSURE CORE SPRAY SYSTEM design feature(s) and/or interlocks which provide for the following:

K4.04 Line break detection 3.0 3.2

Explanation of Answer a. - correct answer, normal 100% d/p is -1.9, 75% is approx. -1.4 assuming linear change as power increases, more negative b., c. & d. - incorrect changes.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Core Spray	LOT-00-209	III.B.6	10 & 11	15	CRO-1.c

Material Required for Examination None

Question Source: Facility Exam Bank **Question Modification Method:** Concept Used

Question Source Comments: FEBQ #1203 - used idea for development of analysis question, more operationally oriented, all new stem and distractors

Comment Type **Comment**

Question Topic Basis for Standby Liquid Control injection flow rate

In order to meet the "ATWS Rule", 10CFR50.62, requirement for an equivalent Standby Liquid Control System (SLC) flowrate of 86 gpm of 13% (by weight) sodium pentaborate for injection during an ATWS,:

- the contents of the storage tank must be maintained above 73 degrees F to meet concentration requirements
- the entire contents of the storage tank must be injected to meet concentration requirements in the reactor.
- Boron-10 concentration must be enriched to meet injection requirements.
- the capacity of the SBLC Pumps was raised to meet this requirement.

Answer: c **Exam Level:** S **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group** 1

211000 Standby Liquid Control System

2.2 Equipment Control

2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. 2.5 3.7

Explanation of Answer: a. - enriched solution does not need to be above 43 degrees F now b. - gallons of solution injected will not meet requirements if solution is incorrect c. - correct answer one pump at 43 gpm meets requirement with enriched solution d. - pump capacities not changed.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
VY Tech Spec		Bases 3.4.A	97	128	
Standby Liquid Control System	LOT-00-211			10	CRO-5

Material Required for Examination: None

Question Source: Facility Exam Bank **Question Modification Method:** Editorially Modified

Question Source Comments: Peach Bottom NRC Exam 09/98 - cleaned up stem and distractors

Comment Type **Comment**

Question Topic Loss of power to SLC Pump

With the plant operating at 50% power, the breaker for the "A" Standby Liquid Control (SLC) Pump has opened.

Other than the loss of the "A" SLC Pump, what will be the effect on the SLC system for this failure?

a. The "A" SLC Squib Valve may only be opened (fired) via local battery.

b. Initiation of SLC Sys 2 will not close the Reactor Water Cleanup Inboard Inlet Isolation Valve (CU-15).

c. The "A" SLC Squib Valve may be opened (fired) via the local SLC control switches.

d. Initiation of SLC Sys 2 will not close the Reactor Water Cleanup Outboard Inlet Isolation Valve (CU-18)

Answer: a **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group:** 1

211000 Standby Liquid Control System

K2. Knowledge of electrical power supplies to the following:

K2.02 Explosive valves 3.1 3.2

Explanation of Answer: Squib valves are powered from the associated SLC Pump breaker a. - only means available to get squib valve open b. - either pump started results in full RWCU isolation c. - local switches start pumps but do not fire squibs d. - either pump started results in full RWCU isolation

Reference Title	Facility Reference Number	Section	Page Numbers	Revision	LO
SLC Squib Valve Continuity Loss	ARS 5-A-1	Causes	1	3	
Standby Liquid Control System	LOT-00-211			10	CRO-2.d

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Indications for a reactor scram on high pressure

Given the following conditions:

- The plant had been operating at 100% power
- A main turbine trip occurred
- Reactor pressure on the transient reached 1075 psig and has returned to 980 psig
- Reactor water level reached 105 inches and has returned to 150 inches
- All plant systems responded as designed

Given that the Scram Pilot Air Valves are de-energized, what is the status of the following components:

-- Backup Scram Valve (BSV) solenoids
-- Alternate Rod Insertion (ARI) valve solenoids

a. BSV -- energized
ARI -- energized

b. BSV -- energized
ARI -- de-energized

c. BSV -- de-energized
ARI -- energized

d. BSV -- de-energized
ARI -- de-energized

Answer: b **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group:** 1

212000 Reactor Protection System

A4. Ability to manually operate and/or monitor in the control room:

A4.07 System status lights and alarms 4.0 3.9

Explanation of Answer: High pressure scram but no RPT/ARI actuation, should have picked up SPV - deenergized, BSV - energized (open) ARI - deenergized (closed) a., c, & d. - incorrect positions b. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Reactor Protection System	LOT-00-212	II.E & III.B	13, 14 & 43	17	CRO-1.c & 2

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Scram Discharge Volume "Bypass" switch operation

The Scram Discharge Volume Water Level Bypass keylock switch was placed in "Bypass" to reset a scram and was left in that position.

Which of the following ensures that a scram will still occur on high level in the scram discharge volume (SDV) during the ensuing startup?

- a. The SDV high level scram is automatically re-enabled when RPS subchannels A3 and B3 are reenergized.
- b. The SDV Water Level Bypass switch is active only after a valid RPS scram signal is received.
- c. The SDV high level scram is automatically re-enabled when the volume is drained below the high level scram setpoint.
- d. The SDV Water Level Bypass switch is overridden when the Reactor Mode Switch is placed in "Startup/Hot Standby".

Answer: d **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group** 1

212000 Reactor Protection System

K5. Knowledge of the operational implications of the following concepts as they apply to REACTOR PROTECTION SYSTEM:

K5.02 Specific logic arrangements 3.3 3.4

Explanation of Answer: a. - Manual scram channels, no consequence for these conditions b. - active status based upon RMS position c. - scram enabled based upon RMS position d. - correct answer, when RMS placed in "Startup/Hot Standby" SDV Bypass switch is bypassed

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Reactor Protection System	LOT-00-212	II.B.5.c.	24	17	CRO-3 & 4

Material Required for Examination None

Question Source: Facility Exam Bank **Question Modification Method:** Concept Used

Question Source Comments: FEBQ #1368 - rewrote question to operationally oriented conditions if switch not placed in "Normal" when required, all new distractors and stem

Comment Type **Comment**

Question Topic: Effect of low reading LPRMs on RBM for a selected center

Given the following conditions:

- The plant is operating at 45% power
- Control rod 22-27 has just been selected for movement
- Two LPRM inputs to Rod Block Monitor (RBM) Channel "B" are reading 7/125 and 10/125 of scale respectively
- The remaining LPRM inputs to RBM "B" are all reading 90 to 100/125 of scale

Which of the following describes how RBM Channel "B" will compensate for these conditions?

a. The high reading LPRMs will be considered "inoperative" by the count circuit and will result in a RBM Inop Trip and a control rod withdrawal block.

b. The two low reading LPRMs will be considered "Inoperative" and will not be averaged into the local average thermal power value.

c. The high reading LPRMs will be averaged into the local average thermal power value and the average value of these two will be inputted as the High Level Trip setpoint.

d. The two low reading LPRMs will be averaged into the local average thermal power value which then is adjusted up to the reference power value.

Answer: d **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 2 **SRO Group:** 2

215002 Rod Block Monitor System

K6. Knowledge of the effect that a loss or malfunction of the following will have on the ROD BLOCK MONITOR SYSTEM:

K6.05 LPRM detectors: BWR-3, 4, 5 — 2.8 3.1

Explanation of Answer: center rod selected, should have 8 LPRM inputs a. - LPRM inop if less 5/125, these are good signals b. - Not inop until less than 5/125 c. - local average thermal power is not used as the high level trip, used to compare actual local power with max allowed value d. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Rod Block Monitor	LOT-03-201	III.B. & D.	7-10	9	CRO-1.b., c., d. & 2

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Loss of DC power to IRMs during shutdowns

Which of the following describes how a loss of both 24 VDC power supplies to Intermediate Range Monitoring (IRM) Channels "C" and "F" will affect the plant operation during a shutdown? Assume reactor power is 11%, IRMs "C" and "F" have NOT been bypassed and all other plant systems are operating as designed.

- a. The reactor will scram when the Reactor Mode Switch is taken out of "Run".
- b. A Detector Wrong Position control rod block will occur upon the power loss.
- c. The Reactor Mode Switch must be placed in "Shutdown" when the IRM '"Inop" alarms are received.
- d. A reactor shutdown utilizing control rod insertions to "all rods fully inserted" may continue.

Answer: a **Exam Level:** R **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group:** 2

215003 Intermediate Range Monitor (IRM) System

K3 Knowledge of the effect that a loss or malfunction of the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM will have on following

K3.01 RPS 3.9 4.0

Explanation of Answer: a. - correct answer, RMS out of "Run" enables the IRM trips, one trip per RPS channel => full scram b. - not a part of this circuitry c. - no guidance for these actions d. - reactor will scram when RMS taken out of "Run".

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Intermediate Range Monitors	LOT-02-215	III.I. & IV.B.3	17-18 & 23-24	10	CRO-3 & 8

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic SRM rod blocks vs detector positions

Given the following conditions:

- The plant is performing a reactor startup
- Reactor power is 5.0 E4 counts per second (cps) and rising with a stable period on the Source Range Monitoring (SRM) instrumentation
- Required SRM overlap with the Intermediate Range Monitoring (IRM) instrumentation has been observed
- Upon selecting and withdrawing SRM detectors it is noted that the "B" SRM detector "Out" light does NOT illuminate
- All SRM indications are reflecting current plant conditions

With this SRM detector stuck, control rod withdrawals:

a. may continue normally because the control rod withdrawal block logic is one-out-of-two-taken-twice for SRM detectors.

b. will be allowed until power reaches 5.0 E5 cps and then will be blocked until power reaches Range 8.

c. will be blocked until reactor power is greater than IRM Range 3.

d. will be blocked until the three fully withdrawn SRM detector power levels are all reading less than 100 cps.

Answer: b **Exam Level** R **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 1 **SRO Group:** 1

215004 Source Range Monitor (SRM) System

A1. Ability to predict and/or monitor changes in parameters associated with operating the SOURCE RANGE MONITOR (SRM) SYSTEM controls including:

A1.05 SCRAM, rod block, and period alarm trip setpoints 3.6 3.8

Explanation of Answer: a. - no such logic b. - correct answer, rod block at 5.0 E5 then bypassed at Range 8 (POAH is approx. mid-range of Range 8) c. - Downscale and detector retract permissive bypassed at Range 3 d. - no such block

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Source Range Monitors	LOT-01-215	IV.B.3	24 & 25	12	CRO-3 & 7

Material Required for Examination None

Question Source: NRC Exam Bank **Question Modification Method:** Concept Used

Question Source Comments: Hope Creek NRC Exam 09/97 - rewrote question to reflect when rod block occurs and when it is bypasses, 3 new distractors, reworded correct answer

Comment Type **Comment**

Question Topic SRM shorting links vs RPS

Given the following conditions:

- The plant is shutdown with core alterations in progress
- The Reactor Protection System (RPS) shorting links have been removed

Which of the following describes how this effects the RPS system during refueling.

Shorting link removal:

a. enables the SRM scram signal as a non-coincident input into RPS while bypassing the unnecessary IRM and APRM scrams.

b. reduces the SRM control rod block and scram setpoints and provides them as independent inputs to RMCS and RPS, respectively.

c. ensures that any single nuclear instrumentation high flux condition will result in insertion of all withdrawn control rods.

d. provides a non-coincident input for the Fuel Loading (Dunking) Chamber protection signals to RPS.

Answer: c **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group:** 1

215004 Source Range Monitor (SRM) System

A4. Ability to manually operate and/or monitor in the control room:

A4.07 Verification of proper functioning/ operability 3.4 3.6

Explanation of Answer: a. - first part is true, but does not bypass IRM and APRM scrams b. - shorting links do not change setpoints, just enables the scrams c. - correct answer d. - Dunking Chambers are for indication only, no protective features

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Source Range Monitor	LOT-01-215	IV.B.4.	25	12	CRO-5 & 9

Material Required for Examination: None

Question Source: NRC Exam Bank **Question Modification Method:** Significantly Modified

Question Source Comments: Hope Creek NRC Exam 09/90 - rewrote entire question to higher cog level standards, stem in bullet format, 3 new distractors, reworded answer

Comment Type **Comment**

Question Topic: APRM to CTP calibration with scale factors

When used to calculate APRM gain adjustment, the Scale Factor will:

- not cause a change in indicated power but will affect the scram and rod block setpoints.
- cause indicated power to read less than actual power without affecting scram and rod block setpoints.
- widen the margin to the ARPM scram and rod block setpoints.
- reduce the margin to the APRM scram and rod block setpoints.

[illegible]	d	Exam Level	B	[illegible]	Application	[illegible]	Vermont Yankee
[illegible]	1/25/99						
[illegible]	Plant Systems	RO Group	1	SRO Group	1		

215005 Average Power Range Monitor/Local Power Range Monitor System

A4. Ability to manually operate and/or monitor in the control room:

A4.06 Verification of proper functioning/ operability 3.6 3.8

Explanation of Answer: d. - correct answer a., b. & c. - incorrect changes in the margins.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Calibration Of The Average Power Range Monitoring System To Core Thermal Power	OP 4400	Discussion 1st paragraph	2	20	
Average Power Range Monitor	LOT-05-215	IV.E	20 & 21	13	CRO-3

Material Required for Examination: VYOPF 4400.01 (Optional)

Question Source: New

Question Modification Method:

Question Source Comments:

Comment Type | Comment

Failed Recirc Flow Converter/Comparator Unit during power increase

Given the following conditions:

- A plant startup is in progress
- The Recirculation flow input signal to Average Power Range Monitoring (APRM) is 25%
- As recirculation flow is raised, the output signal from the "B" Flow Converter/Comparator Unit remains at 25%
- Actual recirculation loop flows respond as expected

What will be the FIRST effect on plant operation as recirculation flow continues to be raised?

a. A full scram will occur due to flow biased neutron flux high.

b. A control rod block will occur due to a flow converter/comparator out of limits trip.

c. A half scram will occur due to a flow converter/comparator unit "inop" signal.

d. A control rod block will occur due to flow biased neutron flux high.

Answer: b **Exam Level:** R **Cognitive Level:** Application **Facility:** Vermont Yankee **Exam Date:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group:** 1

215005 Average Power Range Monitor/Local Power Range Monitor System

K1. Knowledge of the physical connections and/or cause- effect relationships between APRM/LPRM and the following:

K1.16 Flow converter/comparator network: Plant-Specific 3.3 3.4

Explanation of Answer: a. - failure only going to one side of RPS (APRMs B, D & F) b. - correct answer, greater than 7% differential trip, rod block c. - should not reach this point d. - should not reach this point

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Average Power Range Monitor	LOT-05-215	III.D.6.c	14	13	CRO-2.d & 5

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic: outgassing or notching affects on level indication

Given the following conditions:

- The plant has been manually scrammed
- A normal reactor depressurization/cooldown with the main turbine bypass valves is in progress
- The Control Room Operator (CRO) reports that narrow range reactor water level "notching" (out-gassing) is occurring

The most accurate indicated water level from this "notching" level indicator is:

a. the water level at the bottom of the "notch".

b. an average of the water levels from all indicators that are "notching".

c. the water level at the top of the "notch".

d. an average of the water levels from the top and bottom of the "notch".

Answer: a **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group:** 1

216000 Nuclear Boiler Instrumentation

A2. Ability to (a) predict the impacts of the following on the NUCLEAR BOILER INSTRUMENTATION; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.11 Heatup or cooldown of the reactor vessel 3.2 3.3

Explanation of Answer: a. - out-gassing is a step increase from the actual level then a step decrease back to normal b. - out-gassing may not occur on all indicators or even more than just one c. - outgassing is a step increase from actual level d. - would be a value higher than actual level

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Reactor Vessel Instrumentation	LOT-00-216	II.A.16.b & TP 29	44	13	CRO-11.i

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: RCIC response to initiation signals during testing

Given the following conditions:

- The plant is operating at 90% power
- Reactor Core Isolation Cooling (RCIC) is running in the full flow test mode (CST to CST) in accordance with OP 4121, "RCIC Surveillance"
- The RCIC Full Flow Test Valve (RCIC-30) is open
- The RCIC Flow Controller is in "Manual" and with 300 gpm returning to the Condensate Storage Tank

While in this lineup a loss of feedwater occurs with reactor water level reaching 75 inches.

Which of the following describes what MUST occur for RCIC to inject at 400 gpm as designed?

a. The operator must close the Full Flow Test Valve (RCIC-30) before the Pump Discharge Valves (RCIC-20 & 21) will automatically open.

b. The operator should place the RCIC Flow Controller in "Automatic" and close the Full Flow Test Valve (RCIC-30).

c. RCIC will realign for, and inject at, 400 gpm with no operator action required.

d. The operator should place the RCIC Flow Controller in "Automatic".

Answer: d **Exam Level:** S **Cognitive Level:** Application **Facility:** Vermont Yankee **Exam Date:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group:** 1

217000 Reactor Core Isolation Cooling System (RCIC)

A1. Ability to predict and/or monitor changes in parameters associated with operating the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) controls including:

A1.03 Reactor water level 4.0 4.0

Explanation of Answer: a. - RCIC-30 auto closes on initiation signal, no interlock with the RCIC-20 & 21 valves b. - RCIC-30 auto closes on initiation signal c. - requires operator action to place the flow controller to "automatic" d. - correct answer, only operator action required to inject at design

Reference Title	Facility Reference Number	Section	Page Numbers	Revision	L.O.
Reactor Core Isolation Cooling	LOT-00-217			16	CRO-4.a & 22
Reactor Core Isolation Cooling Surveillance	OP 4121	Precaution 2.	4	36	

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

INTENTIONALLY
BLANK

Question Topic: RCIC response with isolation and loss of AC power

Given the following conditions:

- The plant has experienced a loss of feedwater from 50% power
- Reactor Core Isolation Cooling (RCIC) received an initiation signal on low-low reactor water level
- Upon starting, RCIC received a spurious high steam line flow isolation signal and responded as designed
- Before the isolation signal could be reset a loss of all AC power occurred (station blackout)
- Reactor water level is 70 inches and lowering slowly

Which of the following describes the MINIMUM actions required to re-inject with RCIC for these conditions?

a. The Auxiliary Operator will have to locally reset the turbine trip and manually reopen the Turbine Steam Supply Valve (RCIC-131) to restart the turbine.

b. AC power must be restored, the isolation signal reset and the Trip Throttle Valve reset to allow the turbine to restart.

c. The Control Room Operator will reset the isolation signal and place the Steam Supply Isolation Valve (RCIC-15 & 16) keylock switch in "Bypass" to restart the turbine.

d. AC power must be restored and the Trip Throttle Valve switch placed in "Reset" to allow the turbine to restart.

Answer:	b	**Exam Level:**	B	**Cognitive Level:**	Application	**Facility:**	Vermont Yankee	**Exam Date:** 1/25/99
Tier:	Plant Systems			**RO Group:**	1	**SRO Group:**	1	

217000 Reactor Core Isolation Cooling System (RCIC)

K2. Knowledge of electrical power supplies to the following:

K2.01 Motor operated valves 2.8 2.8

Explanation of Answer: Full isolation occurred with power then loss of AC occurred so RCIC-15 cannot be reopened a. - no overspeed occurred b. - correct answer, with power and isolation signal reset and TTV reset and initiation signal present RCIC-15 will reopen and RCIC restarts c. - RCIC-15/16 bypass used for steam line warm-up only d. - still must reset the isolation

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Reactor Core Isolation Cooling	LOT-00-217	Table 9	15	16	CRO-10.a & 22
Reactor Core Isolation Cooling System	OP 2121	Discussion	1	27	

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question ADS logic operation with loss of power and with alternate control

Given the following conditions:

- Plant conditions are approaching those required for initiation of the Automatic Depressurization System (ADS)
- The transfer switches for the 71A and 71B Safety Relief Valves (SRV) are in "Emergency" for a surveillance
- Subsequent to the transfer, the breaker supplying normal power to the "A" Automatic Depressurization System (ADS) logic opens

What will be the expected ADS response if the appropriate initiation conditions are met?

a. After an automatic transfer of the "A" Logic to the alternate power supply, all four SRVs will open.

b. Only the two SRVs (71A & 71B) in "Emergency" will open.

c. All four SRVs will open normally.

d. Only the two "Control Room" SRVs (71C & 71D) will open.

Answer: d **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

218000 Automatic Depressurization System

K5. Knowledge of the operational implications of the following concepts as they apply to AUTOMATIC DEPRESSURIZATION SYSTEM:

K5.01 ADS logic operation 3.8 3.8

Explanation of Answer: a. - "A" logic does not have alternate power, not needed anyway b. - SRV logic not affected by "emergency" c. - Switches block operation of "A" and "B" d. - Correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Automatic Depressurization System	LOT-00-218	IV.B.3. & TP 5	19	15	CRO-9

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic Torus cooling with LPCI initiation signal present

Placing the Containment Spray Valve Manual Open control switch (pistol grip) in "Manual" during a loss of coolant accident will:

- **a** allow the Drywell Spray valves automatic closing features to operate when drywell pressure is less than 2.0 psig.
- **b** override and allow the Low Pressure Coolant Injection (LPCI) injection valves to be closed with an initiation signal present.
- **c** override and allow starting the RHR Service Water Pumps with an LPCI initiation signal present.
- **d** allow the Residual Heat Removal system to be realigned to torus cooling if reactor water level is above -48 inches.

Answer: d **Exam Level** B **Cognitive Level** Application **Facility** Vermont Yankee **Exam Date:** 1/25/99

Tier Plant Systems **RO Group** 2 **SRO Group** 2

219000 RHR/LPCI: Torus/Suppression Pool Cooling Mode

A4. Ability to manually operate and/or monitor in the control room:

A4.14 The overrides for suppression pool cooling valve logic: Plant-Specific 3.7 3.5

Explanation of Answer: a. - not a part of that circuitry and the valves auto close at 2.5 psig decreasing b. - no input to that circuitry, need 5 minute time delay timed out and UPS Feeder Trip Signal Block switch must be in "Block" c. - not required per the logics d. - correct answer, only override required if level above 2/3 core height

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Residual Heat Removal System	LOT-00-205	Table 1	11 & 12	18	CRO-2

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic MSL high flow while in "Startup/Hot Standby"

Given the following conditions:

- The plant is operating at 3% power performing a startup
- The Reactor Mode Switch is in "Startup/Hot Standby"
- Main turbine shell warming is in progress
- A VALID high steam flow signal is sensed in the "A" Main Steam Line

Which of the following describes the expected automatic response of the Primary Containment Isolation System (PCIS) to these conditions?

a. Only the "A" main steam line inboard and outboard MSIVs will close.

b. Only the Channel "A" of the PCIS Group 1 Logic will de-energize.

c. A Group 1 containment isolation signal will result.

d. One solenoid on each of the eight (8) MSIVs will de-energize but no valve closures will occur

Answer: c **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group:** 1

223002 Primary Containment Isolation System/Nuclear Steam Supply Shut-Off

K1. Knowledge of the physical connections and/or cause- effect relationships between PCIS/NSSSS and the following:

K1.01 Main steam system 3.8 3.9

Explanation of Answer: a., b. & d. - PCIS logic for Group 1 is a single line with high flow will trip all four subchannels and gives a complete isolation c. - correct answer

Reference Title	Facility Reference Number	Section	Page Numbers	Revision	LO
Primary Containment Isolation System	LOT-01-223	I.A.3.d & TP 6	20	10	CRO-4

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

[illegible] Spent fuel pool draindown actions

Following a refueling outage, reactor well draindown has begun. The Pump Common Suction Isolation Valves From Fuel Pool (FPC-220 and FPC-221) have been opened. This lineup will:

- drain down the fuel pool until level reaches the top of the fuel pool gates.
- result in automatic closure of FPC-220 and 221 when the low fuel pool level setpoint is reached.
- drain down the fuel pool until the normal fuel pool suction line is uncovered.
- result in a normal reactor well draindown via the desired valve lineup.

[illegible] b Exam Level: R [illegible] Comprehension [illegible] Vermont Yankee [illegible] 1/25/99

[illegible] Plant Systems [illegible] 3 [illegible] 3

233000 Fuel Pool Cooling and Clean-up

A2. Ability to (a) predict the impacts of the following on the FUEL POOL COOLING AND CLEAN-UP; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.02 Low pool level 3.1 3.3

Explanation of Answer: b. - correct answer, auto closure on low level a. and c. - level will not be reached d. - not normal lineup

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Normal And Standby Fuel Pool Cooling And Cleanup System	LOT-00-233	II.B.3.a	9	13	CRO-1

Material Required for Examination: None

Question Source: Facility Exam Bank

Question Modification Method: Editonally Modified

Question Source Comments: FEBQ #152 - modified the distractors and changed order.

Comment Type | Comment

Question Topic: "One Rod Out" interlock/rod block

The plant is shutdown for refueling. Which of the following describes the interlocks associated with rod withdrawal during refueling activities.

a. Control rod withdrawal is prevented anytime the Refueling Platform is over the core.

b. A control rod withdrawal block will be inserted if one rod is fully withdrawn (Notch 48) and a second rod is withdrawn past Notch 02.

c. A control rod withdrawal block will be inserted anytime one rod is not fully inserted and a second rod is selected.

d. With the Reactor Mode Switch in "Startup/Hot Standby", no control rod withdrawal interlocks are in effect.

Answer: c **Exam Level:** B **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 3 **SRO Group:** 2

234000 Fuel Handling Equipment

K4. Knowledge of FUEL HANDLING EQUIPMENT design feature(s) and/or interlocks which provide for the following:

K4.02 Prevention of control rod movement during core alterations 3.3 4.1

Explanation of Answer: One rod out interlock is any rod withdrawn and any additional rod is selected a. - not an interlock b. - not required c. - correct answer d. - not true

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Refueling Equipment	LOT-00-234	IV.A.2.b & TP 33	28	15	CRO-1

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic Failed SRV vacuum breaker indications

Following a Main Steam Isolation Valve closure from 90% power, reactor pressure control is via the Safety Relief Valves operating in "Automatic".

Which of the following is a direct indication that one of the SRV discharge line 10 inch vacuum breakers has failed "open" for these conditions?

- a. Plant parameters reaching the "Unsafe" region of the Drywell Spray Initiation Limit curve earlier than expected.
- b. Unexpected operation of the Suppression Chamber to Drywell vacuum breakers.
- c. Plant parameters reaching the "Unsafe" region of the Heat Capacity Temperature Limit curve earlier than expected.
- d. Unexpectedly high SRV tail pipe temperatures.

Answer: a **Exam Level** B **Cognitive Level** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

239002 Relief/Safety Valves

K6. Knowledge of the effect that a loss or malfunction of the following will have on the RELIEF/SAFETY VALVES:

K6.05 Discharge line vacuum breaker 3.0 3.2

Explanation of Answer: a. - vacuum breakers discharge open to drywell, drywell press and temp going up, DWSIL reached earlier
b. - breakers relieve excess chamber pressure to drywell c. - not a factor, little energy input to torus water
d. - not affected by different discharge path

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Main Steam System	LOT-00-239	III.C.3.	9	12	CRO-2.f & 4
Primary Containment Design	LOT-00-223	TP 5		16	
Primary Containment Control	EOP-3	DWSIL Curve		Draft	

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: TCV scram on power increase

During power ascension, the "generator acceleration relay" is required to be reset prior to reaching 25% power.

Which of the following is the DIRECT result if this is NOT done as power is raised?

- a. A main turbine trip will occur at 30% load.
- b. A reactor scram could occur.
- c. A generator load reject may result in a turbine overspeed and trip.
- d. The Turbine Bypass Valves will not respond on a generator load reject.

Answer: b **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group:** 1

241000 Reactor/Turbine Pressure Regulating System

K3. Knowledge of the effect that a loss or malfunction of the REACTOR/TURBINE PRESSURE REGULATING SYSTEM will have on following:

K3.11 RPS 3.8 3.8

Explanation of Answer: a. - no direct turbine trip b. - correct answer, must reset to avoid TCV/TSV closure scram as power goes greater than 30% c. - MHC should prevent trip under most conditions, this reset does not impact MHC d. - no relationship between this reset, MHC and bypass valve operation.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Mechanical Hydraulic Control System	LOT-00-249	III.E.2	15	12	CRO-6 & 8
Generator Load Reject	ON 3154	Discussion	4	8	

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic: Actions for leaking Turbine Stop and Control Valves

Given the following conditions:

- A plant startup is in progress following a refueling outage
- The generator is on the grid and with preparations in progress for turbine overspeed testing
- The Control Room Operator (CRO) has reduced load to 25 MWe and opened the Generator Output Breakers (ATB 1T and ATB 81-1T)
- The Turbine Bypass Valves have opened to control pressure
- The ACRO notes turbine first stage pressure is not lowering and turbine speed is rising
- All Turbine Control Valves indicated "Closed"

Which of the following describes the operator action directed by OP 0105, "Reactor Operations", for these conditions?

a. Trip MTS-2.

b. Close the Main Steam Isolation Valves.

c. Rapidly reduce the speed-load changer setpoint to "Minimum".

d. Insert a manual reactor scram.

Answer: b **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

245000 Main Turbine Generator and Auxiliary Systems

A1. Ability to predict and/or monitor changes in parameters associated with operating the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS controls including:

A1.02 Turbine speed 2.6 2.5

Explanation of Answer: Though in a "OP" procedure, this action is "immediate" in it's scope for an overspeeding turbine a. - not procedurally directed, if the TSV and TCV are leaking by a turbine trip most likely will not close them further from the "unloaded" condition b. - correct answer, positive overspeed control c. - not effective for these conditions d. - doesn't shut off the steam flow

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO:
Reactor Operations	OP 0105	Phase 3 C.20.a.12)	57	4	
Turbine Startup And Synchronization	LOT-00-304			6	CRO-2 & 3

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic Auto RFP starts during low power conditions

Given the following conditions:

- The plant is operating at 35% with the "A" Feedwater Pump in service and the "B" Feedwater Pump in standby
- The "A" and "B" Condensate Pumps are in service
- All plant systems/components are in their expected lineups for these conditions

Which of the following describes what must occur to provide feedwater to the reactor if the 4 KV Bus #1 is lost for these conditions?

a. The control switch for the "C" Feedwater Pump must be placed in "Auto".

b. The operator must open the "B" Feedwater Pump Discharge Valve.

c. The "B" Feedwater Pump will automatically start.

d. The "C" Feedwater Pump will automatically start if the remaining Condensate Pumps are providing adequate suction pressure.

Answer: a **Exam Level:** R **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 1 **SRO Group** 2

259001 Reactor Feedwater System

A3. Ability to monitor automatic operations of the REACTOR FEEDWATER SYSTEM including:

A3.01 RFP auto start: Plant-Specific 3.3 3.5

Explanation of Answer: a. - correct answer, the "B" Pump is in "Standby" for these conditions and "C" is in PTL, loss of Bus #1 takes out "A" and "B", must get "C" out of PTL to allow it to auto start b. - no power available to "B" c. - no power available to "B" d. - loss of Bus #1 leaves one Condensate Pump ("B"), "C" Feedwater Pump must come out of PTL

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Feedwater System	LOT-00-259	III.B.4. & V.A.1 - 2	8 & 15	12	CRO-4 & 6

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Feed System operation versus operating Condensate Pumps

Which of the following describes how the Feedwater Pumps are started with a "low flow trip" condition present?

The "low flow trip" is:

a. manually bypassed for the first feedwater pump started and then that pump provides the "flow" signal for the second pump.

b. bypassed until normal feedwater pump discharge pressure is achieved if the Condensate Pump breakers are closed.

c. bypassed until flow is established through the feedwater pump upon opening the pump discharge valve.

d. automatically bypassed for a preset time period for each of the three feedwater pumps.

Answer: d **Exam Level:** B **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group:** 2

259001 Reactor Feedwater System

K6. Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR FEEDWATER SYSTEM:

K6.02 Condensate system 3.3 3.4

Explanation of Answer: a. - no manual bypass capability available b. - breaker input for "Condensate Pump running" signals c. - not a part of the logic d. - correct answer, 8 seconds running then 2 more seconds to get above 300,000 lbm/hr

Reference Title	Facility Reference Number	Section	Page Numbers	Revision	LO
Feedwater System	LOT-00-259	III.A.5.b	8	12	CRO-3 & 5

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic SBGT auto start while HPCI operating

Given the following conditions:

- The plant is operating at 70% power
- High Pressure Coolant Injection (HPCI) is running for a surveillance test
- The "A" Standby Gas Treatment (SBGT) train is running to support HPCI operation
- The "B" SBGT train was secured after HPCI was started
- A valid SBGT initiation signal on Reactor Building Refuel Floor high radiation is received
- All plant systems respond as designed
- No operator actions are taken

Which of the following is the expected response of SBGT for these conditions?

a. The "B" SBGT Train will not start. The "A" Train will begin processing the Reactor Building atmosphere after the HPCI Gland Seal Exhauster discharge isolates.

b. The "B" SBGT Train starts and begins processing the Reactor Building atmosphere. The "A" Train will trip and isolate as part of the HPCI Gland Seal Exhauster discharge isolation.

c. The "B" SBGT Train will not start. The "A" Train will begin processing the Reactor Building atmosphere along with the HPCI Gland Seal Exhauster discharge.

d. The "B" SBGT Train starts and begins processing the Reactor Building atmosphere. The "A" Train will divert to process the HPCI Gland Seal Exhauster discharge exclusively.

Answer: c **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **Exam Date:** 1/25/99

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

261000 Standby Gas Treatment System

A1. Ability to predict and/or monitor changes in parameters associated with operating the STANDBY GAS TREATMENT SYSTEM controls including:

A1.01 System flow 2.9 3.1

Explanation of Answer: a. - no auto isolation on HPCI b. - "A" Train continues to run on RB and HPCI, "B" Train in PTL c. - correct answer, no auto isolation on HPCI, "B" Train in PTL d. - no dedicated SBGT Train operation for these conditions, "B" Train in PTL

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Standby Gas Treatment System	LOT-00-261	V.B.	22 & 23	19	CRO-7 & 8

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Loss of Power affects on non-emergency running RHR Pump

Given the following conditions:

- The plant is operating at 90% power
- Reactor Core Isolation Cooling (RCIC) is running for a surveillance
- The "C" Residual Heat Removal (RHR) Pump is in torus cooling
- 4 KV Bus #3 has just experienced a momentary voltage dip initiating a "loss of normal power" signal

The "C" RHR Pump will:

a. continue to run if bus voltage remains >25% during the fast transfer.

b. continue to run if the fast transfer is completed in <0.50 seconds.

c. trip but will automatically restart after bus voltage is restored.

d. trip on bus undervoltage and must be manually restarted.

Answer: d **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 2 **SRO Group:** 1

262001 A.C. Electrical Distribution

A3. Ability to monitor automatic operations of the A.C. ELECTRICAL DISTRIBUTION including:

A3.03 Load shedding 3.4 3.5

Explanation of Answer: a. - actual value is about 1925 volts b. - fast transfer must complete within 0.3 seconds c. - no auto start signal present d. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
4 KV Electrical Distribution System	LOT-01-262	IV.G.1 & 2	23-25	15	CRO-6 & 7

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

ECCS signal affects on RUPS with failure of feeder breaker

With the plant operating at 75% power, a leak results in rising drywell pressure. When drywell pressure exceeds 2.5 psig, the "B" Uninterruptable Power Supply (UPS) Feeder Breaker FAILS to open.

Which of the following describes how this failure affects the "B" UPS?

The UPS Feeder Breaker Failure:

a. maintains voltage on the AC drive motor. There will be no transfer to DC drive and no noticeable change in the power to Bus 89B.

b. causes a trip of the UPS Tie Breaker. Bus 89B is then reenergized from the Control Room by closing the Maintenance Tie Breaker.

c. maintains voltage on the AC drive motor. The AC Input Breaker will trip causing the transfer to DC drive of the AC generator maintaining power to Bus 89B.

d. causes a reverse current trip of the DC Bus Breaker. Bus 89B will be repowered via Maintenance Tie Breaker automatic closure after bus voltage reaches 85%.

Answer: a **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Test: Plant Systems **RO Group** 2 **SRO Group** 2

262002 Uninterruptable Power Supply (A.C./D.C.)

K4. Knowledge of UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) design feature(s) and/or interlocks which provide for the following:

K4.01 Transfer from preferred power to alternate power supplies 3.1 3.4

Explanation of Answer: a. - correct answer, no transfer to DC drive, less reliable condition but should have no noticeable affect b. - no interlock between Feeder and UPS Tie breakers c. - no interlock between Feeder and AC Input breakers d. - no auto close feature on Maintenance Tie breaker

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
RUPS	LOT-03-262	V.B.	14	2	CRO-7

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic: DC bus operations without the battery available

Given the following conditions:

- The battery supply breaker supplying the DC-1 125 VDC bus has just opened
- Bus voltage is being supplied by the CA-1 Battery Charger

With this lineup the battery charger:

a. has the capacity to supply both normal and emergency loads for an unlimited time.

b. overcurrent trip setpoint may be exceeded as emergency loads are started.

c. is designed to supply emergency loads for a period of up to one (1) hour.

d. is designed to supply emergency loads for a period of up to eight (8) hours.

Answer: b **Exam Level:** B **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 2 **SRO Group:** 2

263000 D.C. Electrical Distribution

K3. Knowledge of the effect that a loss or malfunction of the D.C. ELECTRICAL DISTRIBUTION will have on following:

K3.03 Systems with D.C. components (i.e. valves, motors, solenoids, etc.) 3.4 3.8

Explanation of Answer: a. - not by design b. - correct answer, may trip causing loss of normal and emergency loads c. - not a part of the charger design d. - battery emergency load time

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
DC Electrical Distribution	LOT-00-263	III.A.5.a.	28	12	CRO-5

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Alternate DC power transfer for RCIC

The plant is operating in accordance with OP 3126, "Shutdown Using Alternate Shutdown Methods". The operator has just placed the MTS-13-1 transfer switch to "Emergency".

Which of the following describes the expected effect on Reactor Core Isolation Cooling (RCIC) for this transfer? Consider this switch transfer ONLY.

a. All RCIC interlocks, isolations and protective features (except for mechanical overspeed) will be bypassed.

b. RCIC DC valves will be lined up to an alternate power source.

c. All RCIC control circuits to and from the Main Control Room will be disabled.

d. The RCIC Inboard Steam Isolation Valve (RCIC-15) will be lined up to an alternate power source.

Answer: b **Exam Level:** R **Cognitive Level:** Application **Facility:** Vermont Yankee **Exam Date:** 1/25/99

Tier: Plant Systems **RO Group:** 2 **SRO Group:** 2

263000 D.C. Electrical Distribution

K4. Knowledge of D.C. ELECTRICAL DISTRIBUTION design feature(s) and/or interlocks which provide for the following:

K4.01 Manual/ automatic transfers of control: Plant- Specific 3.1 3.4

Explanation of Answer: a. - true when the Transfer Switches on the RCIC Shutdown Panel are placed in "Emergency" b. - correct answer, only swaps DC power sources c. - function of the Transfer Switches d. - power transfer done by different switch

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
DC Electrical Distribution	LOT-00-263	III.B.3.c & TP 11	30	12	CRO-5

Material Required for Examination None

Question Source: Facility Exam Bank **Question Modification Method:** Concept Used

Question Source Comments: FEBQ #604 - carried original question out to a more operationally oriented format.

Comment Type **Comment**

Question Topic DG response to LNP followed by LOCA

Following a loss of normal power to 4 KV Bus 3, the "B" Diesel Generator (DG) started and its output breaker closed. The following parameters exist:

- "B" DG load 1050 KW
- "B" DG frequency 59.8 Hz
- Bus 3 voltage 4090 Volts
- Approximately 5 minutes after conditions are stable, a valid high drywell pressure signal is received
- All plant systems respond as designed

Upon receipt of the LOCA signal,:

a. the DG will continue to run but may be overloaded as the bus emergency loads sequence on.

b. DG control will swap from "isochronous" to "droop" and the bus emergency loads will sequence on.

c. all bus loads will be shed to allow the DG to support the bus emergency loading requirements.

d. the DG output breaker will trip and operator action will be required to reenergize the bus to support emergency loading.

Answer: a **Exam Level** S **Cognitive Level** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 1 **SRO Group:** 1

264000 Emergency Generators (Diesel/Jet)

2.1 Conduct of Operations

2.1.31 Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup 4.2 3.9

Explanation of Answer: a. - correct answer, load greater than 800 KW may result in overload as emergency loads come on b. - droop is for parallel operation c. - no load shed for these conditions d. - DG should remain loaded, no operator actions required

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Diesel Generators	OP 2126	F.3.d. Caution	21	29	
Emergency Diesel Generator	LOT-00-264			16	CRO-2 & 5

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Special cautions for operation following a slow start

During a "slow" start surveillance test of the "A" Diesel Generator (DG), when are the automatic protective features enabled?

- a. When engine speed exceeds 810 rpm.
- b. When the diesel engine Remote/At Engine Control Switch is placed in "Remote".
- c. When the diesel engine Test Status Switch is in "Test".
- d. When the local Voltage Reset pushbutton is pressed.

Answer a **Exam Level** B **[illegible]** Memory **[illegible]** Vermont Yankee **[illegible]** 1/25/99

Tier Plant Systems **[illegible]** 1 **[illegible] Group** 1

264000 Emergency Generators (Diesel/Jet)

K4. Knowledge of EMERGENCY GENERATORS (DIESEL/JET) design feature(s) and/or interlocks which provide for the following:

K4.01 Emergency generator trips (normal) 3.5 3.7

Explanation of Answer a. - correct answer, trips not enabled until 810 rpm, startup idle speed is 400-500 rpm b. - no affect on trips c. - no affect on trips d. - no affect on trips

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Emergency Diesel Generator	LOT-00-264	I.B.6.d. - g.	57 & 58	16	CRO-16

Material Required for Examination None

Question Source New **Question Modification Method**

Question Source Comments

Comment Type **Comment**

Question Topic: Loss of the dilution steam flow effect on AOG

With the plant operating at 100%, the dilution steam entering the off-gas flow at the second stage air ejectors is lost.

Which of the following is the expected Advanced Off-Gas (AOG) system indication of this failure?

a. Recombiner operating temperature would lower.

b. Recombiner discharge Iodine concentration would rise.

c. Hydrogen concentration on the recombiner outlet would rise.

d. Moisture removal capability of the recombiner would lower.

Answer: c **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 2 **SRO Group:** 2

271000 Offgas System

K1. Knowledge of the physical connections and/or cause- effect relationships between OFFGAS SYSTEM and the following:

K1.06 Main steam system 2.8 2.9

Explanation of Answer: a. - would most likely rise due to increased hydrogen concentration b. - Iodine removed in charcoal adsorber beds, no affect in recombiners c. - correct answer, less inlet hydrogen dilution, greater hydrogen concentration on outlet d. - little if any moisture removal in the recombiner

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Advanced Off-Gas System	LOT-00-271	II.A.5	9	9	CRO-2 & 4.b

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

[illegible] Process rad monitor bypassed operation

Given the following conditions:

- The plant is operating at 100% power
- The keylock Bypass switch for RAN-OG-3128 is in "Bypass"
- A Hi-Hi alarm on RAN-OG-3127 is received

The Main Stack Isolation valve (FCV-11) will:

a. not isolate.

b. isolate in 2 minutes.

c. isolate in 30 minutes.

d. isolate in 45 minutes.

Answer: c Exam Level: R Cognitive Level: Memory Facility: Vermont Yankee ExamDate: 1/25/99

Tier: Plant Systems RO Group: 2 SRO Group: 2

272000 Radiation Monitoring System

A1. Ability to predict and/or monitor changes in parameters associated with operating the RADIATION MONITORING SYSTEM controls including:

A1.01 Lights, alarms, and indications associated with normal operations 3.2 3.2

Explanation of Answer: One-out-of-two logic for isolation c. - correct answer, normal time delay for FCV-11 isolation.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Process Radiation Monitoring	LOT-00-273				CRO-2.b

Material Required for Examination: None

Question Source: Facility Exam Bank Question Modification Method: Editorially Modified

Question Source Comments: FEBQ#205 - changed to "bullet" format.

Comment Type	Comment

Question Topic: Scram logic for MSL Rad Monitors

Given the following conditions:

- The plant is performing a reactor startup
- Reactor power is 2% with the Reactor Mode Switch in "Startup/Hot Standby"
- The Main Steam Isolation Valves (MSIV) are open
- The "C" Main Steam Line (MSL) Radiation Monitor has failed "downscale"
- No Technical Specification actions have been taken

Considering ONLY the direct relationship between RPS and MSL Radiation Monitors, which of the following conditions will result in all control rods fully inserting?

a. The "B" and "D" Main Steam Line Radiation Monitors fail "upscale" and the Mode Selector Switch is placed in "Run".

b. The "C" Main Steam Line Radiation Monitor fails "downscale" and the Mode Selector Switch is placed in "Run".

c. The "B" Reactor Protection System (RPS) MG Set trips.

d. The "A" and "D" Main Steam Line Radiation Monitors fail "upscale".

Answer: d **Exam Level:** R **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 2 **SRO Group:** 2

272000 Radiation Monitoring System

K6. Knowledge of the effect that a loss or malfunction of the following will have on the RADIATION MONITORING SYSTEM:

K6.01 Reactor protection system 3.0 3.2

Explanation of Answer: a. - RMS position has nothing to do with RPS trips on high MSL rad b. - RMS position has nothing to do with RPS trips on high MSL rad c. - causes trip of "B" and "D", doesn't meet logic for RPS d. - correct answer, A or C and B or D

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Process Radiation Monitoring	LOT-00-273			11	CRO-2.a
Reactor Protection System	LOT-00-212	TP 3B		17	CRO-3

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Loss of power effects on fire protection

Given the following conditions:

- A loss of power to Buses 2, 4 and 9 has occurred
- The "A" Diesel Generator started and loaded
- The "B" Service Water Pump is out of service
- The "Diesel Fire Pump Trouble" alarm (K-9 on CRP 9-6) is alarming
- The "Electric Fire Pump Trouble" alarm (M-9 on CRP 9-6) is alarming

For the given conditions,:

a. both alarms are expected.

b. the Diesel Fire Pump Trouble alarm is expected. The Electric Fire Pump Trouble alarm is not expected and should be investigated.

c. neither alarm is expected and both should be investigated.

d. the Electric Fire Pump Trouble alarm is expected. The Diesel Fire Pump Trouble alarm is not expected and should be investigated.

Answer: d **Exam Level** B **Cognitive Level** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

286000 Fire Protection System

A3. Ability to monitor automatic operations of the FIRE PROTECTION SYSTEM including:

A3.01 Fire water pump start 3.4 3.4

Explanation of Answer d - correct answer a., b., & c. - loss of power to Electric Fire Pump, should not affect Diesel Fire Pump

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Fire Protection System	LOT-00-286	IV.C	26	16	CRO-2.b
Fire Suppression Systems	OP 2186	C.1	11	24	

Material Required for Examination None

Question Source: Facility Exam Bank **Question Modification Method** Significantly Modified

Question Source Comments FEQB #1110 - modified from requal format to initial exam format. Bullets in the stem, cleaned up all four choices.

Comment Type **Comment**

[illegible] Loss of instrument air effect on Reactor Building HVAC

With the plant operating at power instrument air pressure begins to slowly lower.

Which of the following will occur?

- a. The Outboard Main Steam Isolation Valves will drift close.
- b. Reactor Building Ventilation Supply and Exhaust Valves close.
- c. The Auxiliary Feedwater Regulating Valve (FW-13) opens.
- d. Diesel Generator Room Supply louvers close.

[illegible] b **Exam Level** B **[illegible]** Memory **[illegible]** Vermont Yankee **[illegible]** 1/25/99

[illegible] Plant Systems **RO Group** 3 **SRO Group** 3

288000 Plant Ventilation Systems

K6. Knowledge of the effect that a loss or malfunction of the following will have on the PLANT VENTILATION SYSTEMS

K6.03 Plant air systems 2.7 2.7

Explanation of Answer a. Outboard MSIVs will lose air and fast close once spool shifts b. - correct answer, RB HVAC supply and exhaust isolation valves will close c. - fails closed d. - fail open

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Low Instrument/Scram Air Header Pressure	ON 3146	Appendix A	2	13	
Heating, Ventilating And Air Conditioning System	OP 2192	Precaution 5	7	25	
Reactor Building HVAC	LOT-00-288			10	CRO-5

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic: Tech Spec thermal limits vs. APRM gain

Given the following conditions:

- The plant is operating at 85% power
- Total Recirculation flow is 80%
- Maximum Fraction of Limiting Power Density (MFLPD) is 0.89
- Maximum Fraction of Limiting Critical Power Ratio (MFLCPR) is 0.78

Select the required actions for these conditions.

a. Reduce the APRM Gain by the ratio of MFLPD to Fraction of Rated Power.

b. Take immediate action to restore LHGR to less than the limit within 1 hour.

c. Reduce the APRM scram setpoints by the ratio of MFLPD to Fraction of Rated Power.

d. Take immediate action to restore MCPR to less than the limit within 1 hour.

Answer: c **Exam Level:** S **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group** 3 **SRO Group** 3

290002 Reactor Vessel Internals

2.1 Conduct of Operations

2.1.12 Ability to apply technical specifications for a system. 2.9 4.0

Explanation of Answer: a. TS requires a gain increase for these conditions b. - LHGR limit not being exceeded c. - correct answer, gain increase required which reduces the scram setpoints d. - MCPR limit not being exceeded.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
VY Tech Specs		2.1.A.1	7	116	
VY Tech Specs		2.1.A.1.a Bases	14	146	
Introduction To Technical Specifications	LOT-00-308			11	CRO-3, SCRO-1

Material Required for Examination: T.S Sections 1.1, 2.1, 3.1 & 4.1 with Bases

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic Jet pump operability

Technical Specifications require a plant shutdown to Cold Shutdown within 24 hours if a Recirculation System Jet Pump is found to be Inoperable.

Which of the following is the Technical Specification concern for continued plant operation with an Inoperable (or failed) jet pump?

a. The total core flow signal input to the Average Power Range Monitoring system may be inaccurate.

b. The ability to reflood the core during a Loss of Coolant Accident may be limited.

c. The neutron flux (axial and radial) across the core may be unbalanced due to flow variations.

d. The assumptions made in development of the power to flow map may be invalid.

Answer: b **Exam Level:** B **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 3 **SRO Group:** 3

290002 Reactor Vessel Internals

K1. Knowledge of the physical connections and/or cause- effect relationships between REACTOR VESSEL INTERNALS and the following:

K1.02 Recirculation system 3.2 3.2

Explanation of Answer: a. - not the TS reason for requiring an operable jet pump b. - correct answer, cannot guarantee 2/3 core coverage on reflood c. - should not be noticeable by the time flow reaches the core d. - not the TS reason for requiring an operable jet pump

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
VY Tech Spec		3.6.F Bases	143	141	
Reactor Recirculation System	LOT-00-202			18	CRO-4

Material Required for Examination None

Question Source: NRC Exam Bank **Question Modification Method:** Significantly Modified

Question Source Comments: Quad Cites NRC Exam 03/93 - rewrote stem, two new distractors.

Comment Type **Comment**

Automatic actions on lowering instrument air pressure

Which of the following is the only automatic action that occurs on lowering instrument air pressure?

- Isolation of the Service Air Header
- Bypassing of the instrument air dryer
- Cross-connecting the service and instrument air systems
- Placing the off-service scram air header pressure control valve in service.

a | R | Memory | Vermont Yankee | 1/25/99

Plant Systems | 2 | 2

300000 Instrument Air System (IAS)

K4. Knowledge of (INSTRUMENT AIR SYSTEM) design feature(s) and or interlocks which provide for the following:

K4.01 Manual/automatic transfers of control 2.8 2.9

Explanation of answer: a. - correct answer b. - requires operator action c. - requires operator action d. - requires operator action

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Low Instrument/Scram Air Header Pressure	ON 3146	AA.1.	1	13	

Material Required for Examination: None

Question Source: New

Question Modification Method:

Question Source Comments:

Comment:

Question Topic Loss of RBCCW flow to the drywell

With the plant operating at power a short develops in the Reactor Building Closed Cooling Water (RBCCW) Drywell Return Valve (V70-117) causing the valve to go fully closed. The valve cannot be reopened from the Control Room.

Select the required action as directed by ON 3147, "Loss of RBCCW".

a. Immediately trip both Recirculation Pumps.

b. Secure the normal Fuel Pool Cooling system and operate the standby Fuel Pool Cooling System.

c. Monitor rising Reactor Water Cleanup filter demin outlet temperature and verify the system isolates.

d. If the valve cannot be reopened locally within 2 minutes scram the reactor and trip both Recirculation Pumps.

Answer: d **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Plant Systems **RO Group:** 2 **SRO Group:** 2

400000 Component Cooling Water System (CCWS)

2.4 Emergency Procedures and Plan

2.4.11 Knowledge of abnormal condition procedures. 3.4 3.6

Explanation of Answer: a. - not required for 2 minutes with no flow b. - this loop should still have flow c. - this loop should have flow d. - correct answer, loss of RBCCW flow out of drywell, puts the 2 minute limit in effect.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Loss Of RBCCW	ON 3147	OA 1. & 2.	1	8	
Reactor Building Closed Cooling Water	LOT-00-208	II.B.3 & III.F.1	7 & 12	15	CRO-1.f & 3

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Flow response to failed jet pump

Given the following conditions:

- The plant is operating at 100% power
- A failure of one Recirculation System Jet Pump has occurred
- No operator actions have been taken

Which of the following would be the expected response of ACTUAL and INDICATED core flows?

a. Actual core flow would rise as indicated core flow lowers.

b. Both actual and indicated core flows would lower.

c. Actual core flow would lower as indicated core flow rises.

d. Both actual and indicated core flows would rise.

Answer: c **Exam Level:** R **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295001 Partial or Complete Loss of Forced Core Flow Circulation

AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION:

AA2.03 Actual core flow 3.3 3.3

Explanation of Answer: a., b., & d. - per ON 3141, Core plate d/p indication (actual flow) has a sudden decrease while indicated core flow has a sudden increase c. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Jet Pump Failure	ON 3141	Sym 1 & 2	1	7	
Off-Normal Procedures	LOT-00-601			15	CRO-1

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Actions to exit the Exclusion region of the Limits of Power Operation figure

Given the following conditions:

- The plant was operating at 80% power
- Core flow was 31.5 mlbm/hour
- Recirculation Pump speeds were 62%
- The "A" Recirculation Pump then tripped
- Reactor power stabilized at 60%
- Total core flow stabilized at 19.5 mlbm/hour
- No operator actions have been taken

Which of the following are the directed operator actions for these conditions? COLR Figure 2.4-1 is attached.

a. Raise flow by raising the speed of the "B" Recirculation Pump.

b. Reduce power by insertion of control rods by single rod scrams.

c. Raise flow by restarting the "A" Recirculation Pump.

d. Reduce power by lowering recirculation flow.

Answer: a **Exam Level** B **Cognitive Level** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295001 Partial or Complete Loss of Forced Core Flow Circulation

AK1. Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION:

AK1.02 Power/flow distribution 3.3 3.5

Explanation of Answer: a. - correct answer, raise flow to exit Exclusion Region b. - single rod scrams not authorized except for testing c. - not allowed to restart tripped pump to exit Exclusion Region d. - would drive plant further into Exclusion Region.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Reactor Instability	OT 3117	IOA.3.	2	8	

Material Required for Examination COLR Figure 2.4-1

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Core flow determination following a Recirc Pump trip

With the plant at 100% power the "B" Recirculation Pump has tripped. The pump discharge valve has been closed and then reopened as directed by procedure. Plant conditions have stabilized.

The actual core flow can be determined:

a. by direct observation of the core flow recorder.

b. if the operator adds the indicated "B" loop recirculation flow and the indicated "A" loop recirculation flow.

c. by direct observation of "A" loop jet pump flow making the assumption that "B" loop flow is "0".

d. if the operator adds the indicated "B" loop jet pump flow and the indicated "A" loop jet pump flow.

Answer: a **Exam Level:** B Application **Facility:** Vermont Yankee 1/25/99

Tier: Emergency and Abnormal Plant Evolutions 2 **SRO Group:** 2

295001 Partial or Complete Loss of Forced Core Flow Circulation

AK2. Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION and the following:

AK2.01 Recirculation system 3.6 3.7

Explanation of Answer: a. - correct answer, idle loop subtracted from op loop and value sent to recorder b. - added only for two loop operation or no pumps running c. - idle loop flow is still taken into account d. - added only for two loop operation or no pumps running

Reference Title	Facility Reference Number	Section	Page Numbers	Revision	LO
Reactor Recirculation System	LOT-00-202	IV.B.4	31& 32	18	CRO-7

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Low vacuum vs low load

OT 3120, "High Condenser Back Pressure", requires continued power reduction if condenser backpressure cannot be maintained less than 4 inches HgA with generator load less than 30%.

During high condenser backpressure operation, these actions are designed to:

a. prevent rupture of the condenser shell rupture diaphragms.

b. protect the flexible seal (exhaust boot) between the low pressure turbines and the condenser shell.

c. prevent initiation of Exhaust Hood Sprays while at power.

d. protect the last row, or stage, of blading (buckets) on each of the low pressure turbines.

Answer: d **Exam Level:** B **Cognitive Level:** Memory **Facility:** Vermont Yankee **Exam Date:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 2 **SRO Group:** 2

295002 Loss of Main Condenser Vacuum

AK3. Knowledge of the reasons for the following responses as they apply to LOSS OF MAIN CONDENSER VACUUM:

AK3.09 Reactor power reduction 3.2 3.2

Explanation of Answer: a. - these diaphragms rupture at a positive pressure in the shell b. - hood spray provides protection c. - not an operational concern d. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO(s)
High Condenser Back Pressure	OT 3120	IOA.5. Note	2	10	
Operational Transient Procedures	LOT-00-602			10	CRO-2 & 3

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic: Reopening MSIVs with a loss of RPS Bus

Given the following conditions:

- The plant has scrammed on low reactor water level
- Reactor water level is 76 inches
- The "B" Reactor Protection System bus is deenergized and cannot be restored
- The Supervisory Control Room Operator has directed implementation of OE Appendix P, "Bypassing Of PCIS Group I Isolation Signals" and reopening of the Main Steam Isolation Valves (MSIV)

What will be the expected MSIV reopening capabilities following the implementation of Appendix P for these conditions?

a. Only the four outboard MSIVs can be reopened.

b. Only the four inboard MSIVs can be reopened.

c. None of the eight MSIVs can be reopened.

d. All eight of the MSIVs may be reopened.

Answer: d **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295003 Partial or Complete Loss of A.C. Power

AA1. Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER:

AA1.03 Systems necessary to assure safe plant shutdown 4.4 4.4

Explanation of Answer: a., b. & c. - Appendix P and MSIV solenoid design requires only one RPS bus available to reopen the MSIVs d. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Bypassing Of PCIS Group I Isolation Signals	OE Appendix P	Prerequisites	1	10	
Main Steam System	LOT-00-239			12	CRO-2.a

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic Shorting links versus loss of power

Given the following conditions:

- The plant is performing a startup following a refueling outage
- The Reactor Mode Switch is in "Startup/Hot Standby"
- The "A" Reactor Protection System (RPS) MG set is being returned to service following maintenance
- When the operator placed the RPS Bus "A" Power Supply Selector to "Normal", a full reactor scram resulted (all rods in)

How could this evolution result in a full reactor scram signal?

a APRM Channel "F" was upscale and not bypassed during the transfer.

b The Scram Discharge Volume was not fully drained.

c The Reactor Protection System shorting links are still installed.

d A PCIS Group 1 half isolation was present during the transfer.

Answer: a **Exam Level:** S **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295003 Partial or Complete Loss of A.C. Power

AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER:

AA2.02 Reactor power, pressure, and level 4.2 4.3

Explanation of Distractors: a. - Correct answer, opposite channel that was deenergized by loss of RPS "A" b. - a scram signal would have already been present c. - APRMs and IRMs remain in coincident d. - RMS in "Startup/Hot Standby" bypasses MSIV closure scram

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Reactor Protection System	OP 2134	Prec. 1.g	3	15	
Reactor Protection System	LOT-00-212			17	CRO-3 & 5

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Vital Instrument AC auto transfer while at power

With the plant operating at 75% power a loss of power occurred on MCC-8B resulting in the Vital AC MG Set transferring to DC drive. During the transfer an underfrequency condition occurred on the MG Set causing a swap from normal to alternate power. This swap resulted in a short interruption of power to the AC vital loads.

Which of the following describes how this power interruption will effect continued plant operation?

- a. The Main Steam Isolation Valve AC solenoids will deenergize.
- b. There will be a slight reduction in reactor water level.
- c. The Reactor Core Isolation Cooling Turbine will trip, if running.
- d. There will be a slight rise in reactor pressure.

Answer: d **Exam Level:** B **Cognitive Level:** Application C **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 2 **SRO Group:** 1

295003 Partial or Complete Loss of A.C. Power

AK2. Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF A.C. POWER and the following:

AK2.04 A.C. electrical loads 3.4 3.5

Explanation of Answer: a. - reenergize as soon as the transfer complete b. - should be no change with steady state conditions, FRV lockup c. - not a concern for this transfer d. - correct answer, EPR deenergized - MPR takes over with pressure increase

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
120/240 VAC Vital Bus	OP 2144	Prec 2.b	3	24	
120/240 VAC Electrical Distribution System	LOT-04-262			8	CRO-8 & 9

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Loss of 24 VDC scram

Given the following conditions:

- The plant is at 2% power performing a startup
- Main turbine shell warming is in progress
- The "A" Reactor Feed Pump is feeding the reactor
- The Mechanical Vacuum Pump is maintaining condenser vacuum with the Steam Jet Air Ejectors just being placed in service
- A loss of all +/- 24 VDC power occurs causing a reactor scram

The cause of the scram was:

a. closure of the Main Steam Isolation Valves.

b. a loss of reactor power indication.

c. a main turbine trip.

d. loss of Main Steam Line Radiation Monitors.

Answer b **Exam Level** S **Cognitive Level** Application **Facility** Vermont Yankee **ExamDate** 1/25/99

Tier Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295004 Partial or Complete Loss of D.C. Power

2.4 Emergency Procedures and Plan

2.4.48 Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and directives affect plant and system conditions. 3.5 3.8

Explanation of Answer a. - not for these conditions b. - correct answer, loss of power/inop trip of IRMs c. - no scram since power less than 30% d. - no 24 VDC power to these rad monitors

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Intermediate Range Monitors	LOT-02-215	III.I. & IV.B.3	17-18 & 23-24	10	CRO-3 & 8

Material Required for Examination None

Question Source: NRC Exam Bank **Question Modification Method:** Significantly Modified

Question Source Comments: Peach Bottom NRC Exam 02/98 - rewrote stem, different correct answer, two new distractors

Comment Type **Comment**

Question Topic Reactor scram on loss of DC-3A

Following a loss of DC-3A, which of the following is the limiting plant parameter or equipment that would require a scram if power cannot be restored immediately?

- Reactor Feed Pump Recirc valves failing open.
- Loss of all Control Room annunciators.
- Main and Aux Transformer cooling and protective relaying logic is deenergized.
- Loss of all control rod position indication.

[illegible] c [illegible] B [illegible] Memory [illegible] Vermont Yankee [illegible] 1/25/99

[illegible] Emergency and Abnormal Plant Evolutions [illegible] 2 [illegible] 2

295004 Partial or Complete Loss of D.C. Power

AK2. Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF D.C. POWER and the following:

AK2.03 D.C. bus loads 3.3 3.3

Explanation of Answer a. - lost with DC-3 but does not require immediate scram b. - lost with DC-3 but does not require immediate scram c. - correct answer d. - not affected by loss of DC-3

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Loss Of DC-3	ON 3161	OA.2. Caution & OA.4.	1 & 2	1	
Off-Normal Procedures	LOT-00-601			15	CRO-3 & 4

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Reason for power reduction on loss of stator water cooling

Given the following conditions:

- The plant was operating at 100% power
- A loss of Stator Water Cooling occurred
- All expected automatic actions occurred
- Stator water cooling is not immediately recoverable
- Due to a problem with the Recirculation Pump controls the operator is unable to reduce recirc flow to 27.5 - 29 E6 lbm/hr as directed by OT 3119, "Loss Of Stator Cooling"

What would be an expected result for these conditions?

a. The generator stator amps will not reach 4271 within the 3 minute limit.

b. A reactor scram on high power will occur.

c. The Turbine Bypass Valves will not control reactor pressure less than the high pressure scram setpoint.

d. An immediate turbine trip will occur.

Answer: b **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 2

295005 Main Turbine Generator Trip

AK3. Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP:

AK3.03 Feedwater temperature decrease 2.8 3.0

Explanation of Answer: a. - not related to power reduction b. - correct answer, loss of feed heating may take power to scram setpoint c. - bypass valves will control any possible pressure transient for these conditions d. - no trip parameter will be immediately exceeded

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Loss Of Stator Cooling	OT 3119	IOA 2. Note	1	7	
Operational Transient Procedures	LOT-00-602			10	CRO-2 & 3

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic Reason for RMS to "Shutdown" after a scram

Which of the following is the reason why OT 3100, "Reactor Scram", directs placing the Reactor Mode Switch in "Shutdown" after a reactor scram once main steam line flows are within limits?

The Reactor Mode Switch is placed in "Shutdown" to:

a. provide a redundant Reactor Protection System actuation without losing the preferred heat sink.

b. prevent a Group 1 low pressure isolation and to reduce the Average Power Range Monitoring high flux scram setpoint.

c. allow opening the Scram Discharge Volume Vent and Drain Valves without losing the preferred heat sink.

d. prevent a Group 1 low pressure isolation and to enable the Intermediate Range Monitoring scram functions.

Answer: a **Exam Level** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295006 SCRAM

AK3. Knowledge of the reasons for the following responses as they apply to SCRAM:

AK3.02 Reactor power response 4.1 4.2

Explanation of Answer: a. - correct answer, RPS scram but without MSIV closure on high flow b. - ARPM setpoint required for startup not for a completed scram c. - not a requirement until scram reset required d. - IRM scrams needed for subsequent startup

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
OT 3100 Scram Procedure	LOT-00-600	III.A.4	10	15	CRO-2 & 3

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Actions for pressure increase

Given the following conditions:

- The plant is operating at 100% power
- The Control Room Operator (CRO) reports lowering main generator output (MWe)
- Further investigation shows a corresponding rise in reactor pressure
- The Electric Pressure Regulator is controlling reactor pressure

Select the FIRST action that should be taken by the CRO for these conditions.

a. Manually scram the reactor.

b. Control pressure via the bypass valve opening jack.

c. Reduce the Mechanical Pressure Regulator setpoint.

d. Turn off power to the Electric Pressure Regulator.

Answer: c **Exam Level:** S **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295007 High Reactor Pressure

AA1. Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE:

AA1.05 Reactor/turbine pressure regulating system 3.7 3.8

Explanation of Answer: a. & b. - required only if the EPR and MPR are not responding c. - correct answer, assumes the MPR takes control as designed d. - last of the follow-up Actions

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Reactor High Pressure	OT 3116	IOA 2.	1	6	
Operational Transient Procedures	LOT-00-602			10	2 & 3

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Reason for sustained SRV openings on loss of pneumatic supply

Given the following conditions:

- A reactor scram and MSIV isolation has occurred after an extended period of full power operation
- All control rods fully inserted
- A loss of all available nitrogen/air supply for the Safety Relief Valves (SRV) occurs

What operator action is required to cooldown the reactor under these conditions?

a. Sustained SRV opening should be utilized to conserve nitrogen for an Emergency Depressurization if required by changing plant conditions.

b. Sustained SRV opening should be utilized to maximize cooldown rate before valve operation is lost.

c. The SRVs should be placed in "Automatic" to conserve nitrogen for an Emergency Depressurization if required by changing plant conditions.

d. The SRVs should be placed in "Automatic" to maximize cooldown rate before valve operation is lost.

Answer: a **Exam Level** B **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295007 High Reactor Pressure

AK3. Knowledge of the reasons for the following responses as they apply to HIGH REACTOR PRESSURE:

AK3.04 Safety/relief valve operation: Plant-Specific 4.0 4.1

Explanation of Answer: a. - correct answer b. - not allowed to exceed cooldown limits here c. - does not conserve nitrogen in accumulators d. - not allowed to exceed cooldown limits here

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
BWROG Pegs/Sags Appendix B	6. RPV Control EPG	Step RC/P-3	B-6-50	1	
RPV Control	LOT-00-610			10	CRO-3

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: HPCI response to a high level condition with a High Drywell Pressure signal present

Given the following conditions:

- The plant had been operating at 90% power
- A small break has caused drywell pressure to reach 2.6 psig
- High Pressure Coolant Injection (HPCI) has initiated and is injecting
- Reactor Core Isolation Cooling and Feed Water are not available
- The leak rate is approximately 3500 gpm

For these conditions, HPCI will:

a. trip at 177 inches reactor water level and will require operator action to restart to maintain level.

b. automatically maintain reactor water level between 82.5 inches and 177 inches.

c. not allow the operator to take manual control of the flow rate to maintain level 155 to 165 inches.

d. will not be able to maintain reactor water level greater than 82.5 inches.

Answer: b **Exam Level:** R **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 2 **SRO Group:** 2

295008 High Reactor Water Level

AA1. Ability to operate and/or monitor the following as they apply to HIGH REACTOR WATER LEVEL:

AA1.04 HPCI: Plant-Specific 3.5 3.5

Explanation of Answer: a. - HPCI will operate between the high and low level setpoints without operator actions b. - correct answer c. - flow controller operation not affected by initiation signals, can place in "Manual" and vary flow rate d. - 3500 gpm leak within HPCI capacity of 4230 gpm

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
High Pressure Coolant Injection	LOT-00-206	Table 1	1	19	CRO-5 & 7

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Level instrument for MSIV closure decisions

With the plant operating at 45% power, a feedwater control system malfunction results in a rapidly rising reactor water level.

Which of the following water level indicators has the range to allow the operator to determine if Main Steam Isolation Valve closure is required per OT 3114, "Reactor High Level"?

a. Shroud level Instruments

b. Wide Range Level Rosemonts

c. Shutdown Level Instrument

d. Narrow Range GEMAC

Answer: c **Exam Level** B **Cognitive Level** Memory **Facility** Vermont Yankee **Exam Date** 1/25/99

Tier Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295008 High Reactor Water Level

2.1 Conduct of Operations

2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. 3.7 4.4

Explanation of Answer a., b. & d. - level instruments do not go above 200 inches. MSIV closure required at 217 inches c. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Reactor Vessel Instrumentation	LOT-00-216	III.A.3	13	13	CRO-1a. & 2

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Operation of feedwater control on lowering level

Given the following conditions:

- The plant is operating at 35% with power ascension in progress
- Power is being raised from 35% to 45%
- The "A" Feedwater Reg Valve (FRV) did not move during the power change
- The demanded valve position is the same for both Feedwater Reg Valves
- Reactor water level lowered during the power change

How do the Immediate Actions of OT 3113, "Reactor Low Level", direct the operation of the Feedwater Control System for these conditions?

a. The "A" and "B" FRVs should be immediately placed in "Manual".

b. The Master Controller should be placed in "Manual" followed by the individual FRVs.

c. Place the "A" FRV in "Manual" and allow the "B" FRV to control level in "Automatic".

d. The Master Controller should be placed in "Manual" followed by the "A" FRV with the "B" FRV left in "Automatic".

Answer: b **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295009 Low Reactor Water Level

AA1. Ability to operate and/or monitor the following as they apply to LOW REACTOR WATER LEVEL:

AA1.02 Reactor water level control 4.0 4.0

Explanation of Answer: a. - must place Master Controller to "Manual" first b. - correct answer c. - not procedurally directed d. - procedure directs all in "Manual"

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Reactor Low Level	OT 3113	IOA. 3.	1	9	
Operational Transients	LOT-00-602			10	CRO-2 & 7

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic: Recirc Pump runbacks

Given the following conditions:

- The plant is operating at 90% power
- The controlling Narrow Range GEMAC has just failed full "upscale"
- Actual reactor water level on the remaining Narrow Range GEMAC is reading 145 inches and is lowering
- No operator actions have been taken

Which of the following describes the expected response of the Recirculation pumps for these conditions?

The Recirculation Pumps:

a. will runback to a speed of 20%.

b. scoop tubes will lockup.

c. will runback to a speed of 30%.

d. speeds will remain unchanged.

Answer: a **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295009 Low Reactor Water Level

AK2. Knowledge of the interrelations between LOW REACTOR WATER LEVEL and the following:

AK2.03 Recirculation system 3.1 3.2

Explanation of Answer: a. - runback is based upon low feed flows, FRV will close on rising level and feed flow will go less than 20% b. - no such lockup c. - no such run back d. - short term no effect on pump speeds until low level trip reached

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO:
Reactor Low Level	OT 3113	Auto Action Ver 1.	3	9	
Reactor Recirculation System	LOT-00-202			18	CRO-6

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Drywell conditions vs level instrumentation - above the Saturation curve

During a loss of coolant accident the following conditions exist:

- Reference leg temperature is 350 degrees F
- Reactor pressure is 100 psig

Which of the following describes the accuracy and trending capabilities of wide range reactor water level indication for the given conditions?

Wide Range level instrumentation:

a. may not be providing accurate reactor water level or level trend information.

b. is providing accurate reactor water level and level trend information.

c. may not be providing accurate reactor water level but level trend is reliable.

d. is providing accurate reactor water level but level trend may not be reliable.

Answer: a **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 2 **SRO Group:** 2

295012 High Drywell Temperature

AK1. Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL TEMPERATURE:

AK1.01 Pressure/temperature relationship 3.3 3.5

Explanation of Answer: Answer may be determined with steam tables. EOP-3 RPV Saturation Graph is not needed a. - correct answer, values are in the Unsafe region of the RPV Saturation Graph b. - in the Unsafe region, level and trend is not accurate c. - trending is not possible in the Unsafe region d. - level is not accurate in the Unsafe region

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
BWROG Pegs/Sags Appendix B	5. Cautions	EPG/SAG Step Caution #1	B-5-2	1	
Reactor Vessel Instrumentation	LOT-00-216			13	CRO-11.d

Material Required for Examination: Steam tables

Question Source: NRC Exam Bank **Question Modification Method:** Concept Used

Question Source Comments: Hope Creek NRC Exam 02/98 - reversed question from below the curve to above the curve

Comment Type **Comment**

Question Topic Determine cause of ATWS and method to scram

Given the following conditions:

- The plant had been operating at 90% power
- A complete Group 1 isolation occurred
- There was NO control rod movement on the scram signal
- The eight (8) full core display white "scram" lights are NOT illuminated
- The Control Rod Scram Pilot Valve Solenoid white lights are NOT illuminated
- The Scram Discharge Volume Level High alarm (9-5 L-6) is NOT illuminated
- Reactor power is approximately 24%

Select the OE 3107 Appendix that, if implemented, would be the most appropriate and expedient method to insert the control rods?

a. Isolate and vent the scram air header in accordance with Appendix D.

b. Manually insert control rods bypassing the Rod Worth Minimizer in accordance with Appendix G.

c. Vent the control rod drive over piston volumes in accordance with Appendix H.

d. Defeat the RPS logic, reset the scram and initiate a manual scram in accordance with Appendix F.

Answer: a **Exam Level** R **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295015 Incomplete SCRAM

2.4 Emergency Procedures and Plan

2.4.48 Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and directives affect plant and system conditions. 3.5 3.8

Explanation of Answer: a. - correct answer, indications are of a air header venting failure b. - would insert rods but does not correct cause c. - would insert rods but does not correct cause d. - probably no rod movement

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
OE Appendix D	OE 3107 Appendix D	Purpose	1	10	
BWROG Pegs/Sags Appendix B	6. RPV Control EPG	EPG/SAG Step RC/Q-7	B-6-74	1	
RPV Control	LOT-00-610			10	CRO-2 & 3

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic: Pressure effects on reactor power during an ATWS

The plant has scrammed from 100% power and the following conditions exist:

- 45 control rods are not fully inserted (all are at Notch 40 or above)
- Reactor power is 22%
- Standby Liquid Control is injecting
- The Main Steam Isolation Valves (MSIV) are open
- The Main Turbine has tripped
- Reactor pressure is being controlled at 850 psig by the Turbine Bypass Valves
- Reactor water level is 146 inches
- The Control Room Operator reports that reactor power is rising

Which of the following would cause this rise in reactor power?

a. The Electric Pressure Regulator setpoint is lowering.

b. The running Standby Liquid Control Pump has tripped.

c. The MSIVs have closed.

d. The on-service Feedwater Regulating Valve is drifting closed.

Answer: c **Exam Level:** R **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 1 **SRO Group:** 1

295015 Incomplete SCRAM

AK1. Knowledge of the operational implications of the following concepts as they apply to INCOMPLETE SCRAM:

AK1.03 Reactivity effects 3.8 3.9

Explanation of Answer: a - lowering pressure, more voids, less power b. - boron stops going in, power decrease may stop but not increase c. - correct answer, loss of turbine bypass valves, pressure rise, power rise d. - lowering level, power lowers

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
BWROG Pegs/Sags Appendix B	6. RPV Control EPG	EPG/SAG Step RC/P-3	B-6-48	1	
RPV Control	LOT-00-610			10	CRO-2

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Failure to scram actions

Given the following conditions:

- A turbine trip has occurred with the plant operating at 25% power
- Average Power Range Monitoring channels "A", "C" and "F" spike full upscale with no response from the Reactor Protection System

The operator shall:

a. reduce power to the Intermediate Range and place the Reactor Mode Switch in "Startup/Hot Standby" within 8 hours.

b. immediately insert a manual reactor scram.

c. within two hours, insert a manual reactor scram.

d. place either of the reactor protection trip systems in the "trip" condition within 8 hours.

Answer: b **Exam Level** S **Cognitive Level** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group:** 1

295015 Incomplete SCRAM

AK2. Knowledge of the interrelations between INCOMPLETE SCRAM and the following:

AK2.04 RPS 4.0 4.1

Explanation of Answer: a. - actions for less than minimum number of operable instrument channels per trip system in both trip systems b. - correct answer, actions for a failure to scram c. - no time delays allowed for failure to scram actions d. - actions for less than minimum number of operable instrument channels per trip system in one trip system

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Reactor Scram	OT 3100	Step R/Q-3		4	
OT 3100 Scram Procedure	LOT-00-600			15	CRO-1 & 4

Material Required for Examination Tech Spec 3.1/4.1 without bases

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Reactor pressure following control room abandonment

Given the following conditions:

- A transient occurred requiring Control Room evacuation
- All required immediate actions of OP 3126, "Shutdown Using Alternate Shutdown Methods", were completed
- Reactor Core Isolation Cooling (RCIC) is being operated for reactor water level control from the RCIC Alternate Shutdown Panel (ASP)
- The RCIC turbine coasted to a stop with NO reason indicated at the ASP

Which of the following describes what occurred to the RCIC system and the system's current status?

a. A RCIC turbine trip setpoint has been exceeded that can be locally reset allowing RCIC to be restarted from the ASP.

b. A RCIC system isolation has been exceeded and RCIC is no longer available for reactor water level control from the ASP.

c. A RCIC turbine trip setpoint has been exceeded that cannot be reset preventing RCIC from being restarted from the ASP.

d. A RCIC system isolation setpoint has been exceeded with RCIC restart possible once the isolation signal is reset from the ASP.

Answer: a **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 2 **SRO Group:** 1

295016 Control Room Abandonment

AA2. Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT:

AA2.02 Reactor water level 4.2 4.3

Explanation of Answers: a. - correct answer, overspeed trip, can be reset at the turbine and then restarted from the panel b. & d. - no automatic isolations with transfer switches in "Emergency" c. - overspeed trip, can be reset locally, can be restarted from panel

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Shutdown Using Alternate Shutdown Methods	OP 3126	Appendix C 8. Caution	2	15	
Shutdown Using Alternate Shutdown Methods	LOT-00-612			16	CRO-4

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: E-Plan implementation for Control Room abandonment

Which of the following describes the Shift Supervisor's responsibilities regarding Emergency Plan implementation when OP 3126, "Shutdown Using Alternate Shutdown Methods", is entered?

The Shift Supervisor shall declare:

- a. an Alert after plant control is established and stable at the alternate shutdown panels.
- b. a Site Area Emergency after plant control is established and stable at the alternate shutdown panels.
- c. an Alert concurrently with implementation of OP 3126 Immediate Actions.
- d. a Site Area Emergency concurrently with implementation of OP 3126 Immediate Actions.

Answer: d **Exam Level:** S **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295016 Control Room Abandonment

2.4 Emergency Procedures and Plan

2.4.41 Knowledge of the emergency action level thresholds and classifications. 2.3 4.1

Explanation of Answer: a., b. & c. - OP 3126 requires SAE with immediate actions d. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Shutdown Using Alternate Shutdown Methods	OP 3126	3.a. Note	4	15	
Shutdown Using Alternate Shutdown Methods	LOT-00-612			16	SCRO-A.1

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: "A" RHR Pump in pull-to-lock upon control room evacuation

While performing the immediate actions of OP 3126, "Shutdown Using Alternate Shutdown Methods", from 75% power, the operator is directed to place the "A" RHR Pump control switch in "Pull-to-lock".

Considering that this pump will be used for reactor water level control and/or shutdown cooling, which of the following is the reason for this switch manipulation prior to leaving the Control Room?

The Control Room switch for the "A" RHR Pump is placed in "Pull-To-Lock":

a. to meet the interlock with the RHR Alternate Shutdown Transfer Switches required for local control.

b. to ensure the pump does not start and meet the logic for Automatic Depressurization System actuation.

c. to prevent pump starts until the RHR Shutdown Cooling Isolation Valves (RHR-17 & 18) are open for a suction path.

d. to ensure the pump does not start without minimum flow protection during the transfer to local control.

Answer: d **Exam Level** B **Cognitive Level** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295016 Control Room Abandonment

AK3. Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT:

AK3.03 Disabling control room controls 3.5 3.7

Explanation of Answer: a. - not interlocked, transfer switches bypass control room switches b. - ADS will be inhibited on control room evacuation c. - not a concern, RHR used for level control first d. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Shutdown Using Alternate Shutdown Methods	LOT-00-612	I.C.3.e	6	16	CRO-A.4

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Transition from EOPs to Sags

Given the following plant conditions:

- The plant has experienced a major transient resulting in fuel failure combined with a steam line rupture in the Turbine Building
- The steam line rupture cannot be isolated
- Offsite release rates have exceeded those requiring an Alert classification

Select the specific conditions requiring the Supervisory Control Room Operator to transition from the Emergency Operating Procedures (EOPs) to the Severe Accident Guidelines (Sags)?

a. Offsite release rates have reached levels requiring a General Emergency classification.

b. Containment hydrogen concentration has reached levels requiring primary containment flooding.

c. Off-site dose calculations show dose rates at the site boundary in excess of the 10CFR100 limits.

d. The primary systems discharging outside the primary and secondary containments cannot be isolated without impacting the execution of the EOPs.

Answer: b **Exam Level:** S **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 2 **SRO Group:** 1

295017 High Off-Site Release Rate

2.4 Emergency Procedures and Plan

2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions including: 3.7 4.3

1. Reactivity control
2. Core cooling and heat removal
3. Reactor coolant system integrity
4. Containment conditions
5. Radioactivity release control.

Explanation of Answer: a., c. & d. - EOP to SAG transition only made when primary containment flooding required

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Severe Accident Guidelines	LOT-01-624	IV.	6 & 7	0	SCRO-3

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Actions for loss of Cooling Towers while in Closed Cycle

Given the following conditions:

- The plant is operating at 80% power
- The Cooling Tower system is in Closed Cycle operation
- A complete loss of the Cooling Tower system has occurred
- It cannot be returned to service for 36 hours

Which of the following are the required actions?

a. Insert a manual reactor scram, transfer to Open Cycle operation and complete a cooldown within 24 hours.

b. Reduce power to less than 25% within 24 hours and transfer to Hybrid Cycle operation.

c. Perform an immediate power reduction to less than 25%, transfer to Open Cycle operation and then shutdown within 24 hours.

d. Operation may continue at the current power while monitoring the NPDES Permit limits for up to 24 hours after transferring to Open Cycle operation.

Answer: c **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295018 Partial or Complete Loss of Component Cooling Water

2.4 Emergency Procedures and Plan

2.4.24 Knowledge of loss of cooling water procedures. 3.3 3.7

Explanation of Answer: a. - not required to shutdown immediately b. - immediate reduction to 25% required c. - correct answer d. - must reduce power to 25% immediately

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Circulating Water	OP 2180	Ref 1.	3	32	
VY Tech Specs	Facility Operating License	3.E.1	4		
Introduction To Technical Specifications	LOT-00-308			11	CRO-5

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: CRD operation vs loss of instrument air

Which of the following conditions will result in a Control Rod Drive (CRD) mechanism high temperature?

- a. Loss of air to the in-service CRD Flow Control Valve (CRD-FCV-19).
- b. The in-service CRD Stabilizing Valve fails closed.
- c. Loss of power to the CRD Pressure Control Valve (CRD-PCV-3-20).
- d. The Charging Water Header Supply Valve (CRD-56) is repositioned closed.

[illegible]	a	[illegible]	B	[illegible]	Comprehension	[illegible] Vermont Yankee	[illegible] 1/25/99

[illegible] Emergency and Abnormal Plant Evolutions [illegible] Group 2 SRO Group 2

295019 Partial or Complete Loss of Instrument Air

AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR:

AA2.02 Status of safety-related instrument air system loads (see AK2.1 - AK2.19) 3.6 3.7

Explanation of Answer: a. correct answer, FCV fails closed, cooling flow stops b. - no affect on cooling flow c. - fails as is on loss of power d. - no affect on cooling flow

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Low Instrument/Scram Ai Header Pressure	ON 3146	Symp 2.a.	1	13	
Off-Normal Procedures	LOT-00-601			15	CRO-1 & 2

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic Reactor Scram on low air pressure

Given the following plant conditions:

- The plant is operating at 5% power performing a startup
- The Control Room has just received a report of a leak in the instrument air system
- Control Room indications show a slow but steadily lowering instrument air header pressure

The Control Room Operator shall insert a manual reactor scram when:

a. the Service Air Header Pressure Control Valve automatically closes.

b. the lowering reactor water level is approaching 127 inches.

c. more than two control rod drive mechanism high temperature alarms are received.

d. scram air header pressure cannot be maintained greater than 105 psig.

Answer: b **Exam Level** B **Cognitive Level** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295019 Partial or Complete Loss of Instrument Air

AK2. Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR and the following:

AK2.03 Reactor feedwater 3.2 3.3

Explanation of Answer a. - occurs at 85 psig, too early to scram IAW ON 3146 b. - correct answer, scram prior to reaching auto scram setpoint, Aux FRV fails closed on loss of air c. - not required by ON 3146 d. - too early IAW ON 3146

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Low Instrument/Scram Ai Header Pressure	ON 3146	OA 7.	2	13	
Off-Normal Procedures	LOT-00-601			15	CRO-3

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: RHR SDC/torus cooling response to valid low level conditions

Given the following conditions:

- The plant is in Cold Shutdown
- Reactor coolant temperature is 190 degrees F
- The reactor vessel head is installed
- The Residual Heat Removal (RHR) lineup is as follows:
  - -- The "A" Loop is in shutdown cooling on the "C" RHR Pump
  - -- The "B" Loop is in torus cooling on the "D" RHR Pump
  - -- The "A" and "B" RHR Pumps are NOT available
- Reactor water level is lowering and has reached 77 inches

What is the expected automatic RHR system response to these conditions? Assume no operator actions taken.

a. Both RHR Pumps trip, the "B" Loop realigns to the injection mode with the "D" RHR Pump restarting, and the "C" RHR Pump remains shutdown.

b. The "C" RHR Pump trips and the "D" RHR Pump continues to run and aligns to the injection mode.

c. The "C" RHR Pump continues in shutdown cooling and the "B" Loop realigns to the injection mode.

d. The "C" RHR Pump trips and the "B" Loop continues in torus cooling.

Answer: b **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **Exam Date:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 3 **SRO Group:** 2

295021 Loss of Shutdown Cooling

AA1. Ability to operate and/or monitor the following as they apply to LOSS OF SHUTDOWN COOLING:

AA1.02 RHR/shutdown cooling 3.5 3.5

Explanation of Answer: a. - The torus cooling pump does not trip b. - correct answer, SDC takes operator action to inject, torus cooling doesn't c. - "C" Pump trips on no-suction path as the SDC suction valve close on low level d. - "B" loop swaps to LPCI injection

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Residual Heat Removal System Handouts	LOT-00-205H	Tables 1-4	1-14	18	CRO-2

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Loss of SDC affects on temperature indications

Given the following conditions:

- The plant is in Cold Shutdown with no Recirculation Pumps operating
- The reactor vessel head is installed
- A Group IV isolation has occurred on low reactor water level
- Reactor Water Cleanup (RCU) is not in service
- Control Rod Drive Hydraulic Pumps are not running
- Reactor water level is 155 inches
- The "A" RHR Pump has just tripped
- No operator actions have been taken

Which of the following actions taken alone will provide conditions for making a determination on whether thermal stratification is occurring?

a. Maintain reactor water level between 127 inches and 177 inches.

b. Reactor Water Cleanup should be started with flow from the "A" Recirculation loop.

c. One Control Rod Drive Hydraulic Pump should be started.

d. Natural circulation flow should be established by raising reactor water level to 185".

Answer d **Exam Level** B **Cognitive Level** Application **Facility** Vermont Yankee **ExamDate** 1/25/99

Tier Emergency and Abnormal Plant Evolutions **RO Group** 3 **SRO Group** 2

295021 Loss of Shutdown Cooling

AA2. Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING:

AA2.04 Reactor water temperature 3.6 3.5

Explanation of Answer a. - level must be above 185 inches to provide natural circulation and temp indications b. - not enough forced flow through core c. - not enough forced flow through core d. - correct answer ,natural circulation flow once established will provide temperature indications

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Loss Of Shutdown Cooling	ON 3156	B.6.a. Note	4	4	
Off-Normal Procedures	LOT-00-601			15	CRO-3 & 4

Material Required for Examination None

Question Source New **Question Modification Method**

Question Source Comments

Comment Type **Comment**

Question Topic Loss of CRD actions during startup

Given the following conditions:

- The plant is performing a startup with reactor pressure at 700 psig
- The Reactor Mode Switch is in "Startup/Hot Standby"
- Control rod 34-35 (at Notch "10") has an accumulator alarm in for low pressure and is being recharged
- Both CRD Pumps are Inoperable
- Control rod 10-11 and 26-19 (both fully inserted) accumulator alarms have just been received

What are the required actions for these conditions?

a. Declare control rod 34-35 "Inoperable" within 8 hours.

b. Place the plant in Hot Shutdown within 12 hours.

c. Place the plant in Cold Shutdown within 24 hours.

d. Insert a manual reactor scram.

Answer d **Exam Level** R **Cognitive Level** Application **Facility** Vermont Yankee **ExamDate** 1/25/99

Tier Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295022 Loss of CRD Pumps

AA2. Ability to determine and/or interpret the following as they apply to LOSS OF CRD PUMPS:

AA2.01 Accumulator pressure 3.5 3.6

Explanation of Answer a. - not procedurally required b. - not a required action c. - actions for inop rods d. - correct answer, scram for more than one inop accumulator

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Loss Of CRD Regulating Function	ON 3145	OA 1	1	8	
Off-Normal Procedures	LOT-00-601			15	CRO-3

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Actions for SRM count rate doubling during refueling

Given the following conditions:

- The plant is shutdown with the core completely off-loaded
- After loading the first two fuel bundles next to Source Range Monitoring (SRM) Channel "A", it reads 8 counts per second (cps)
- After the third bundle is loaded next to the same channel, it is reading 20 cps and is steady

Which of the following are the required actions for these conditions?

a. Contact the Reactor Engineer for guidance on continued fuel movement.

b. Terminate core alterations after removing the third fuel bundle from the core and returning it to the Spent Fuel Pool.

c. Compare SRM Channel "A" count rate with the other channels, continuing fuel movements if within Technical Specification limits.

d. Terminate core alterations if SRM Channel "A" count rate increases to 100 cps.

Answer a **Exam Level** S **Cognitive Level** Memory **Facility** Vermont Yankee **ExamDate** 1/25/99

Tier Emergency and Abnormal Plant Evolutions **RO Group** 3 **SRO Group** 1

295023 Refueling Accidents

AK1. Knowledge of the operational implications of the following concepts as they apply to REFUELING ACCIDENTS:

AK1.03 Inadvertent criticality 3.7 4.0

Explanation of Answer a. - correct answer, count rate doubling requires RE contact b. - not procedurally directed c. - not procedurally directed d. - not procedurally directed.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Management Of Refueling Activities And Fuel Assembly Movement	OP 1101	A.3.a	9	30	

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Effects of continuing drywell sprays below 0 psig.

EOP-3, "Primary Containment Control", directs the operator to verify that torus and drywell sprays isolate when pressure is approaching 0 psig.

Which of the following would be the expected consequences of continuing sprays beyond this point?

Continuing sprays below this pressure:

a. may exceed the pressure equalization capacity of the torus-drywell vacuum breaker system.

b. prevents using the Residual Heat Removal pumps as needed to assure adequate core cooling.

c. may dilute the primary containment nitrogen concentration to a value where hydrogen combustion will occur.

d. will reduce net positive suction head of the running emergency core cooling pumps causing immediate cavitation

Answer: c **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295024 High Drywell Pressure

2.4 Emergency Procedures and Plan

2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes. 3.3 4.0

Explanation of Answer: a. - at this low a pressure, the flowrates through the vacuum breakers is minimal b. - the operator can divert RHR Pumps to injection at any time if sprays do not isolate c. - correct answer, negative drywell pressure may result and may dilute nitrogen with oxygen d. - not a concern for these conditions

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
BWROG Pegs/Sags Appendix B	7. Primary Containment Control EPG	EPG/SAG Step (Second PC Override)	B-7-5	1	
OE 3102 Drywell Pressure, Temperature and Hydrogen Control	LOT-00-607			13	CRO-2 & 3

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Drywell cooling response to LOCA

Given the following conditions:

- Drywell pressure is 2.0 psig and slowly rising due to a small leak
- Drywell cooling has been maximized as directed by OT-3111, "High Drywell Pressure"
- Eight Drywell RRUs are running
- Drywell pressure subsequently reaches 2.5 psig

The RRUs will:

a. automatically shift to 1A/B, 2A/B "running" and 3A/B, 4A/B "off" and may be shifted to all eight running after a time delay.

b. trip and can be restarted by the operator after bypassing the trip logic.

c. continue to run until manually shifted by the operator.

d. trip and cannot be restarted until drywell pressure is lowered to less than 2.0 psig.

Answer: b **Exam Level:** R **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 1 **SRO Group** 1

295024 High Drywell Pressure

EK2. Knowledge of the interrelations between HIGH DRYWELL PRESSURE and the following:

EK2.18 Ventilation 3.3 3.4

Explanation of Answer: a. - not true b. - correct answer, will trip but can be restarted c. - auto trip d. - can be restarted with trip logic bypassed

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Primary Containment	OP 2115	F.2. Notes	22	38	
Reactor Building HVAC	LOT-01-288			10	CRO-5

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Plant response to high pressure

Given the following conditions:

- The plant had been operating at 100% power
- A spurious Group 1 isolation occurred
- All automatic actions and systems have operated as designed
- Peak reactor pressure on the transient was 1175 psig
- Reactor water level reached 95 inches

Which of the following is the energized/de-energized status of the Reactor Protection System (RPS) solenoids and the Alternate Rod Insertion (ARI) solenoids following the scram? (Assume no operator actions have been taken.)

Scram Solenoid Pilot Valve solenoids = SSPV
Backup Scram Valve solenoids = BSV
Alternate Rod Insertion Valve solenoids = ARIV

a. SSPV - De-energized
BSV - Energized
ARIV - De-energized

b. SSPV - Energized
BSV - De-energized
ARIV - Energized

c. SSPV - De-energized
BSV - Energized
ARIV - Energized

d. SSPV - Energized
BSV - De-energized
ARIV - De-energized

Answer: c **Exam Level:** R **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 1 **SRO Group:** 1

295025 High Reactor Pressure

EA1. Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE:

EA1.07 ARI/RPT/ATWS: Plant-Specific 4.1 4.1

Explanation of Answer: a., b. & d. - plant conditions resulted in a scram signal and an ARI initiation. SSPV de-energized, BSV energized, ARI energized c. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Control Rod Drive Hydraulics	LOT-01-201	III.G.6.c., K & L	22, 29 & 30	15	CRO-3

Material Required for Examination None

Question Source: NRC Exam Bank **Question Modification Method:** Editorially Modified

Question Source Comments: River Bend NRC Exam 07/92 - cleaned up question stem, bullet format, changed format of distractors and correct answer

Comment Type	Comment

Question Topic: Stuck open SRV tail pipe temp

Which of the following is the steady state tail pipe temperature of a stuck open Safety Relief Valve at 1000 psig reactor pressure?

a. 195 degrees F

b. 212 degrees F

c. 320 degrees F

d. 545 degrees F

Answer: c **Exam Level:** S **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295025 High Reactor Pressure

EK1. Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE:

EK1.03 Safety/relief valve tailpipe temperature/pressure relationships 3.6 3.8

Explanation of Answer: a. - leaking SRV b. - sat temp for atmospheric pressure c. - correct answer d. - 545 is sat for 1000 psig,

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Main Steam System	LOT-00-239	III.D.1.	13	12	CRO-2.f
Steam Tables		Mollier diagram			

Material Required for Examination Steam tables

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

[illegible] ADS actuation when in the Unsafe region of the HCTL graph

The following conditions exist during a major plant transient:

- Drywell temperature 185 degrees F
- Torus water temperature 200 degrees F
- Reference leg temperature 200 degrees F
- Torus water level 10.5 feet
- Reactor pressure 1000 psig

Which of the following would be expected to occur if the Automatic Depressurization System initiated for these conditions? See attached figure.

- Reactor water level indication would be lost.
- The Primary Containment Pressure Limit may be exceeded.
- The Torus to Drywell vacuum breaker capacity may be exceeded.
- The Safety Relief Valve tail pipe supports would fail.

Answer: b **Exam Level:** S **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

[illegible] Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295026 Suppression Pool High Water Temperature

EA2. Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE:

EA2.01 Suppression pool water temperature 4.1 4.2

Explanation of Answer: Initiation of Emergency depressurization while in unsafe region of HTCL graph a. - not a concern b. - correct answer, not enough remaining energy absorption capacity to handle a blowdown c. - they are designed for LOCA energy release d. - torus level not a concern for this failure

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	[illegible]
BWROG Pegs/Sags Appendix B	17.4 Heat Capacity Temperature Limit		B-17-14	1	
OE 3104 Torus Temperature And Level Control	LOT-00-609			12	CRO-A.2

Material Required for Examination: HTCL Graph from EOP-1

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Operations with stuck open Safety Relief Valve

Given the following conditions:

- The plant is operating at 85% power
- Following a reactor high pressure transient, the "B" Safety Relief Valve (SRV) opened below its setpoint and did not close
- Reactor pressure peaked at 1040 psig.

Plant operation at power may continue until:

a. directed otherwise by the immediate actions of OT 3121, "Inadvertent Opening Of A Relief Valve".

b. entry conditions for EOP-3, "Primary Containment Control", are met.

c. torus water temperature has reached 100 degrees F and station loads have been transferred to the startup transformer.

d. entry into EOP-1, "RPV Control", is directed.

Answer: d **Exam Level:** S **Cognitive Level:** Memory **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 2 **SRO Group:** 1

295026 Suppression Pool High Water Temperature

2.1 Conduct of Operations

2.1.12 Ability to apply technical specifications for a system. 2.9 4.0

Explanation of Answer: a. - allowed to operate well into the follow-up actions b. - entry conditions are 90 deg F, no shutdown actions required c. - no procedural requirements for this d. - correct answer, 110 deg F by Tech Specs and EOP-3

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO(s)
Primary Containment Control	EOP-3	Torus Temp Leg		Draft	
Introduction To Technical Specifications	LOT-00-308			11	SCRO-1

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic EOP-1 entry requirements while in EOP-3 for high torus temperature

While performing the Torus Temperature Control leg of EOP-3, "Primary Containment Control", the operator is directed to enter EOP-1, "RPV Control", and execute concurrently before torus temperature reaches 110 degrees F.

Which of the following describes the reason for entering and performing EOP-1 concurrently without a specific EOP-1 entry condition being met?

- **a.** This ensures Residual Heat Removal is dedicated to torus cooling regardless of reactor water level.
- **b.** This ensures that torus temperature will never exceed the Heat Capacity Temperature Limit.
- **c.** This provides direction for reactor pressure control should torus temperature reach the point requiring emergency depressurization with the Turbine Bypass Valves.
- **d.** This directs a reactor scram and removes the main source of potential energy addition to the torus before conditions warrant injection of boron.

Answer: d **Exam Level:** R **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295026 Suppression Pool High Water Temperature

2.4 Emergency Procedures and Plan

2.4.6 Knowledge symptom based EOP mitigation strategies. 3.1 4.0

Explanation of Answer: a. - Adequate Core Cooling will not be sacrificed for torus cooling b. - no guarantee the reactor will scram c. - no such direction in EOP-1, any depressurization would be a rapid depress d. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
BWROG Pegs/Sags Appendix B	7. Primary Containment Control EPG	EPG/SAG Step SP/T-2	B-7-21	1	
Severe Accident Guidelines	LOT-01-624			0	CRO-1

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Loss of cooling effects on containment parameters.

Given the following conditions:

- The plant is operating at 100% power
- All Reactor Building Closed Cooling Water supplying the drywell RRUs has been lost

What would be the expected response of drywell pressure and indicated torus water level to these conditions?

Drywell pressure:

a. rises, indicated torus water level remains steady.

b. remains steady, indicated torus water level rises.

c. and indicated torus water level both rise.

d. rises and indicated torus water level lowers.

Answer:	c	**Exam Level:**	B	**Cognitive Level:**	Comprehension	**Facility:**	Vermont Yankee	**ExamDate:**	1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 2 **SRO Group:** 2

295028 High Drywell Temperature

EA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE:

EA1.04 Drywell pressure 3.9 4.0

Explanation of Answer: a., b., & d. - rising temperature causes rising drywell pressure which displaces water from downcomers into torus, indicated level rises c. - correct answer

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Primary Containment Design	LOT-00-223	V.F & TP-5	48	16	CRO-11

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question [illegible] | Reason why RCIC is not mentioned on lowering torus water level

During a lowering torus water level condition, EOP-3, "Primary Containment Control", directs securing High Pressure Coolant Injection (HPCI) if level cannot be maintained above 7 feet even if HPCI is required to assure adequate core cooling.

Which of the following describes why this same restriction is NOT placed on the operation of Reactor Core Isolation Cooling (RCIC)?

a. Primary containment venting capacity can accommodate decay heat or the energy added by an uncovered RCIC exhaust.

b. RCIC is the only remaining high pressure source of injection and, though limited, is required to ensure adequate core cooling.

c. The Severe Accident Guideline (SAG) procedures will direct RCIC operation for these conditions.

d. The RCIC turbine exhaust line remains submerged at this torus water level.

Answer: a **Exam Level:** S **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295030 Low Suppression Pool Water Level

2.4 Emergency Procedures and Plan

2.4.18 Knowledge of the specific bases for EOPs. 2.7 3.6

Explanation of Answer: a. - correct answer b. - not required for ACC c. - If SAG were in effect, EOP-3 would have been exited by now d. - exhaust line is at approximately same level as HPCI

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
BWROG Pegs/Sags Appendix B	7. Primary Containment Control EPG	EPG/SAG Step SP/L-2.2	B-7-47	1	
OE 3104 Torus Temperature And Level Control	LOT-00609			12	CRO-2

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic: Lowering torus water level vs PSP curve.

Which of the following describes how torus water level effects primary containment control during a Loss of Coolant Accident?

- Rising torus water level reduces the number of Safety Relief Valves required for Emergency Depressurization.
- Lowering torus water level limits the flow rate when venting the primary containment via the torus.
- Rising torus water level will adversely affect the lifting setpoints for the Safety Relief Valves.
- Lowering torus water level places the plant closer to the conditions requiring emergency depressurization for a given torus pressure.

Answer: d **Exam Level:** S **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **Exam Date:** 1/25/99

[illegible]: Emergency and Abnormal Plant Evolutions **RO Group:** 2 **SRO Group:** 1

295030 Low Suppression Pool Water Level

EK2. Knowledge of the interrelations between LOW SUPPRESSION POOL WATER LEVEL and the following:

EK2.07 Downcomer/ horizontal vent submergence 3.5 3.8

Explanation of Answer: a. - no impact on number of SRVs required to be open for ED b. - should not reduce venting flow rate c. - not a concern for these conditions d. - correct answer, entering the unsafe region of PSP graph

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
BWROG Pegs/Sags Appendix B	7. Primary Containment Control EPG	EPG/SAG Step PC/P-3	B-7-36	1	
OE 3104 Torus Temperature And Level Control	LOT-00-609			12	CRO-2

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Minimum level for terminate and prevent during an ATWS

Given the following conditions:

- The plant has experienced a failure to scram (ATWS)
- Reactor water level is being deliberately lowered to reduce power

Which of the following is the reason why the operator is provided with a MINIMUM level limit (-22") while lowering level?

The minimum level allowed ensures that:

a. thermal hydraulic instabilities (oscillations) will not occur.

b. inadvertent low pressure ECCS starts will not occur.

c. adequate core cooling is maintained during the ATWS.

d. narrow range water level variable leg instrument tap is not uncovered.

Answer: c **Exam Level:** S **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 1 **SRO Group:** 1

295031 Reactor Low Water Level

EA1. Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL:

EA1.08 Alternate injection systems: Plant-specific 3.8 3.9

Explanation of Answer: a. - not a concern during a ATWS b. - already well below ECCS start signals at this point c. - correct answer, -22" Minimum Steam Cooling Water Level d. - not a concern

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
BWROG Pegs/Sags Appendix B	14. EPG Cont #5 - Level/Power Control	EPG/SAG Step C5-5	B-14-28	1	
RPV Control	LOT-00-610			10	CRO-2 & 3

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type: **Comment:**

Question Topic Safety Limit for reactor water level while shutdown

Which of the following is the reason why Technical Specification Safety Limits requires RPV water level to be maintained 12 inches above the top of active fuel ONLY when the reactor is shutdown with irradiated fuel in the reactor vessel?

a. This Tech Spec Safety Limit is only concerned with personnel radiation exposure during refueling operations.

b. At power, the Reactor Protection System provides protection if water level lowers to the top of active fuel so no safety limit is required.

c. Heat removal is accomplished by boiling during power operations therefore core submergence is not a safety limit concern.

d. This Tech Spec Safety Limit is only concerned with the removal of core decay heat while shutdown.

Answer: d **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Vermont Yankee **Exam Date:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295031 Reactor Low Water Level

EA2. Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL:

EA2.04 Adequate core cooling 4.6 4.8

Explanation of Answer: a. - not a concern for these conditions, TS reference b. - no RPS trips at TAF c. - water above TAF still required at power d. - correct answer, only concern is with decay heat removal.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
VY Tech Specs		1.1.D & Bases	7 & 13	116 & 150	
Introduction To Technical Specifications	LOT-00-308			11	CRO-3 & 5

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Basis for ED on high secondary containment temperatures

While operating in EOP-4, "Secondary Containment Control", two area temperatures are above their maximum safe operating limits. Safety Relief Valve failures prevent an Emergency Depressurization.

Which of the following is the specific concern for these conditions?

a. The Automatic Depressurization system logic and power circuit components will continue to deteriorate.

b. Failures of the HPCI and RCIC electrical components will "Inop" these high pressure injection systems.

c. Secondary Containment Integrity may be compromised.

d. Reactor water level indication is no longer providing accurate level and trending information.

Answer: c **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **Exam Date:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 3 **SRO Group:** 2

295032 High Secondary Containment Area Temperature

EK3. Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE:

EK3.01 Emergency/normal depressurization 3.5 3.8

Explanation of Answer: a. - not the bases for ED on high temperature b. - these are qualified for higher temperatures than this c. - correct answer d. - not a concern for these conditions

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
BWROG Pegs/Sags Appendix B	8. Secondary Containment Control	EPG/SAG Step SC/T-4.2	B-8-14	1	
OE 3105 Secondary Containment Control	LOT-00-611			7	CRO-2

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

[illegible] Reducing off-site releases during a problem in Secondary Containment

Given the following conditions:

- The plant is operating at 75% power
- Radioactivity is being released from a primary system leaking into secondary containment
- EOP-4, "Secondary Containment Control", has been entered

Select the EOP-4 directed action that does NOT reduce the offsite doses being produced for these conditions?

The Control Room Operator:

a. isolates all plant systems discharging into the area except for those required by the EOPs or to suppress a fire.

b. enters and carries out the actions as directed in EOP-1, "RPV Control".

c. enters and carries out the actions as directed in EOP-5, "RPV-ED".

d. restarts Reactor Building HVAC defeating interlocks as necessary.

Answer: d   Exam Level: B   Cognitive Level: Comprehension   Facility: Vermont Yankee   ExamDate: 1/25/99

Tier: Emergency and Abnormal Plant Evolutions   RO Group 2   SRO Group 2

295033 High Secondary Containment Area Radiation Levels

EA1. Ability to operate and/or monitor the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS:

EA1.03 Secondary containment ventilation 3.8 3.8

Explanation of Answer: a. - reduces/stops the leak and the source of offsite doses b. - reactor scram reduces the driving head of the source of the offsite doses c. - reduces the total driving head of the source of the offsite doses d. - correct answer, RB HVAC allows for monitored, elevated release but does not treat that release, no change in offsite doses

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
BWROG Pegs/Sags Appendix B	8. Secondary Containment Control	EPG/SAG Step 3rd SC override	B-8-6	1	
OE 3105 Secondary Containment Control	LOT-00-611			7	CRO-2

Material Required for Examination: None

Question Source: New   Question Modification Method:

Question Source Comments:

Comment Type   Comment

[illegible] Methods for determining Secondary Containment water levels

Select the condition requiring entry into EOP-4, "Secondary Containment Control"?

- Reactor Building HVAC has automatically shutdown on low reactor water level.
- The Reactor Building Floor Drain Sump Hi-Hi Level alarm is in continuously.
- A primary system has been confirmed to be discharging into the Secondary Containment.
- The Turbine Building Floor Drain Sump Hi-Hi Level alarm is in continuously.

[illegible] b [illegible] B [illegible] Memory [illegible] Vermont Yankee [illegible] 1/25/99

[illegible] Emergency and Abnormal Plant Evolutions [illegible] 3 [illegible] 2

295036 Secondary Containment High Sump/Area Water Level

EA2. Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL:

EA2.02 Water level in the affected area 3.1 3.1

Explanation of Answer: a. - only if shutdown due to high radiation b. - correct answer, allowed to be used to assume greater than 1" level in the RB somewhere c. - not an entry condition d. - TB not part of secondary containment

Reference Title	[illegible]	[illegible]	[illegible]	Revision	[illegible]
BWROG Pegs/Sags Appendix B	8. Secondary Containment Control EPG	EPG/SAG Step SC/L-1	B-8-22	1	
OE 3105 Secondary Containment Control	LOT-00-611	I.H	16	7	CRO-1

Material Required for Examination: None

Question Source: New [illegible]

Question Source Comments:

Comment Type: Comment:

Question Topic Injecting actions with power increase during an ATWS

Given the following conditions:

- The plant has experienced a failure to scram (ATWS)
- Reactor power is mid-range on IRM Range 9
- Hot shutdown boron weight has been injected
- High Pressure Coolant Injection (HPCI) is being used to restore reactor water level between 127 inches and 177 inches
- As injection is increased, the APRM "downscale" alarms begin clearing and power continues to rise

Which of the following describes what should be done with HPCI for these conditions?

a. Place the HPCI Turbine Trip/Inhibit pushbutton selector to "Inhibit".

b. Place the HPCI Flow Controller in "Manual" and reduce flow.

c. Close the HPCI Steam Supply Valve and place the Aux Oil Pump in "Pull-To-Lock".

d. With the HPCI Flow Controller in "Automatic", reduce the controller setpoint.

Answer: a **Exam Level:** S **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown

EA2. Ability to determine and/or interpret the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN:

EA2.01 Reactor power 4.2 4.3

Explanation of Answer: a. - correct answer, EOP directs return to "Terminate and Prevent" injection b., c. & d. - not procedurally directed

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
ATWS RPV Control	EOP-2	RPV Level Leg		Draft	
OE Appendices	OE 3107 Appendix GG	Procedure 4.b	2	10	
RPV Control	LOT-00-610			10	CRO-2 & 3

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Resetting a scram during an ATWS

During a failure-to-scram transient, the following conditions exist:

- Reactor power 18%
- Reactor water level +130 inches
- Drywell pressure 1.9 psig
- The Scram Discharge Volume is full and isolated
- All of the full core display "white" scram lights are illuminated
- All scram actions were carried out

In order to reset the scram to allow draining the Scram Discharge Volume for these conditions,:

a. the Scram Discharge Volume Water Level Bypass keylock switch must first be placed in "Normal".

b. the Scram Reset Switch must be taken to the right (Group 2 & 3) and then to the left (Group 1 & 4).

c. the Reactor Protection System logic trips must first be defeated in accordance with OE 3107, Appendix F, "Initiation Of A Manual Scram".

d. the operator must verify that OE 3107, Appendix E, "Individual Control Rod Scrams", was not able to insert any control rods.

Answer: c **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown

2.4 Emergency Procedures and Plan

2.4.48 Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and directives affect plant and system conditions. 3.5 3.8

Explanation of Answer: Scram signal still in (APRM upscale 15%) a. - will not allow scram reset b. - will not work, scram signal still present c. - correct answer, Appendix F defeats the SDV high level scram as well d. - Appendix E needs SDV drained or draining

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
Reactor Protection System	LOT-00-212	II.B.10.a.2)	30	17	CRO-3
OE Appendices	OE 3107	Appendix F	1 & 2	10	
RPV Control	LOT-00-610			10	CRO-2 & 3

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Core Spray use during an ATWS

Which of the following is the reason the Core Spray System is listed as an "Alternate ATWS Injection System" and is not allowed to be used for injection during an ATWS until it is determined that water level cannot be maintained above the Minimum Steam Cooling Water Level?

The Core Spray system:

a. is specifically utilized for the special conditions associated with entering Severe Accident Guidelines (SAG-1 and SAG-2).

b. injection flowpath may add undesired positive reactivity during the ATWS

c. does not provide the capability for precise level control needed while injecting during an ATWS.

d. does not have a reactor grade source of water available without local, manual valve manipulations.

Answer: b **Exam Level:** B **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 1 **SRO Group:** 1

295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown

EK1. Knowledge of the operational implications of the following concepts as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN:

EK1.06 Cooldown effects on reactor power 4.0 4.2

Explanation of Answer: a. - CS used in SAG-1 & 2 but is also just before exiting EOP-2 to the Sags b. - correct answer, no preheating, injects inside the shroud c. - CS can be throttled d. - true but not the reason why it isn't used during an ATWS

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
BWROG Pegs/Sags Appendix B	14. EPG Contingency #5-Level/Power Control	EPG/SAG Step C5-5	B-14-31	1	
Severe Accident Guidelines	LOT-01-624			0	CRO-4

Material Required for Examination None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question 100 SAG operations for containment venting

While operating as directed by SAG-2, "RPV, Containment, and Radioactivity Release Control", the operator is allowed to defeat all isolations and exceed release rate limits when venting and purging the drywell.

Which of the following will be used by the Supervisory Control Room Operator to determine if these actions can be taken?

These actions will be taken based upon:

a. the Technical Support Center projected drywell hydrogen and oxygen concentrations.

b. how soon the Primary Containment Pressure limit will be exceeded.

c. the current drywell hydrogen and oxygen concentrations.

d. the total time with water below top of active fuel.

Answer: c **Exam Level:** S **Cognitive Level:** Application **Facility:** Vermont Yankee **ExamDate:** 1/25/99

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 1 **SRO Group:** 1

500000 High Containment Hydrogen Concentration

2.4 Emergency Procedures and Plan

2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions including: 3.7 4.3
1. Reactivity control
2. Core cooling and heat removal
3. Reactor coolant system integrity
4. Containment conditions
5. Radioactivity release control.

Explanation of Answer: a. - venting is not based upon projections b. - venting for excessive pressure automatically allows defeating isolations and exceeding release rate limits c. - correct answer d. - water level not a factor with hydrogen/oxygen levels high enough to allow exceeding release rate limits and defeating all isolations, hydrogen is generated once fuel is being uncovered.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	LO
RPV, Containment, and Radioactivity Release Control	SAG-2	Hydrogen/oxygen leg, Box H-5		0	
Severe Accident Guidelines	LOT-01-624			0	SRO-2

Material Required for Examination: None

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

COMMON
EXAM
REPORTS

Exam Level Count

Exam Level	*Total Of KA*
B	74
R	26
S	26

Question Source

Question Source	*Number*
Facility Exam Bank	9
New	104
NRC Exam Bank	13

Question Cross Reference

KA		Record Number	Exam Level	RO	SRO
GENERIC	2.1.1	1	B	1	1
GENERIC	2.1.2	2	B	2	2
GENERIC	2.1.12	3	S		3
GENERIC	2.1.21	4	B	3	4
GENERIC	2.1.22	5	B	4	5
GENERIC	2.2.11	6	S		6
GENERIC	2.2.13	7	R	5	
GENERIC	2.2.13	8	S		7
GENERIC	2.2.13	9	B	6	8
GENERIC	2.2.22	10	R	7	
GENERIC	2.2.22	11	S		9
GENERIC	2.2.26	12	S		10
GENERIC	2.3.1	13	B	8	11
GENERIC	2.3.4	14	B	9	12
GENERIC	2.3.10	15	B	10	13
GENERIC	2.4.12	16	B	11	14
GENERIC	2.4.21	17	B	12	15
GENERIC	2.4.38	18	S		16
GENERIC	2.4.49	19	B	13	17
201001	A2.11	20	B	14	18

KA		Record Number	Exam Level	RO	SRO
201002	A1.02	21	R	15	
201002	A4.02	22	S		19
201002	2.1.32	23	R	16	
201003	2.4.49	24	B	17	20
201003	K1.01	25	R	18	
201006	K5.01	26	R	19	
202001	A2.06	27	R	20	
202002	A2.05	28	B	21	21
203000	A3.08	29	B	22	22
203000	K3.03	30	B	23	23
204000	A2.07	31	R	24	
205000	K5.02	32	B	25	24
206000	A1.08	33	B	26	25
206000	A4.12	34	B	27	26
209001	2.1.33	35	R	28	
209001	K4.04	36	B	29	27
211000	2.2.25	37	S		28
211000	K2.02	38	B	30	29
212000	A4.07	39	B	31	30
212000	K5.02	40	B	32	31
215002	K6.05	41	B	33	32

KA		Record Number	Exam Level	RO	SRO
295004	AK2.03	84	B	71	65
295005	AK3.03	85	B	72	66
295006	AK3.02	86	B	73	67
295007	AA1.05	87	S		68
295007	AK3.04	88	B	74	69
295008	AA1.04	89	R	75	
295008	2.1.7	90	B	76	70
295009	AA1.02	91	B	77	71
295009	AK2.03	92	B	78	72
295012	AK1.01	93	B	79	73
295015	2.4.48	94	R	80	
295015	AK1.03	95	R	81	
295015	AK2.04	96	S		74
295016	AA2.02	97	B	82	75
295016	2.4.41	98	S		76
295016	AK3.03	99	B	83	77
295017	2.4.21	100	S		78
295018	2.4.24	101	B	84	79
295019	AA2.02	102	B	85	80
295019	AK2.03	103	B	86	81
295021	AA1.02	104	B	87	82

KA		Record Number	Exam Level	RO	SRO
295021	AA2.04	105	B	88	83
295022	AA2.01	106	R	89	
295023	AK1.03	107	S		84
295024	2.4.20	108	B	90	85
295024	EK2.18	109	R	91	
295025	EA1.07	110	R	92	
295025	EK1.03	111	S		86
295026	EA2.01	112	S		87
295026	2.1.12	113	S		88
295026	2.4.6	114	R	93	
295028	EA1.04	115	B	94	89
295030	2.4.18	116	S		90
295030	EK2.07	117	S		91
295031	EA1.08	118	S		92
295031	EA2.04	119	B	95	93
295032	EK3.01	120	B	96	94
295033	EA1.03	121	B	97	95
295036	EA2.02	122	B	98	96
295037	EA2.01	123	S		97
295037	2.4.48	124	B	99	98
295037	EK1.06	125	B	100	99

	KA	Record Number	Exam Level	RO	SRO
500000	2.4.21	126	S		100

Question Source Listing

KA	Level	Source	Mod Method	Comments
201001A211	B	New		
201002A102	R	Facility Exam B	Significantly Mod	FEBQ #3384 - rewrote question
201002A402	S	New		
201002G132	R	New		
201003G449	B	New		
201003K101	R	New		
201006K501	R	New		
202001A206	R	New		
202002A205	B	NRC Exam Ban	Significantly Mod	Peach Bottom NRC Exam 09/97
203000A308	B	NRC Exam Ban	Significantly Mod	River Bend NRC Exam 01/97 -
203000K303	B	New		
204000A207	R	New		
205000K502	B	NRC Exam Ban	Concept Used	Grand Gulf NRC Exam 07/95 - r
206000A108	B	New		
206000A412	B	New		
209001G133	R	New		
209001K404	B	Facility Exam B	Concept Used	FEBQ #1203 - used idea for dev
211000G225	S	Facility Exam B	Editorially Modifi	Peach Bottom NRC Exam 09/98
211000K202	B	New		
212000A407	B	New		
212000K502	B	Facility Exam B	Concept Used	FEBQ #1368 - rewrote question
215002K605	B	New		
215003K301	R	New		
215004A105	R	NRC Exam Ban	Concept Used	Hope Creek NRC Exam 09/97 -
215004A407	B	NRC Exam Ban	Significantly Mod	Hope Creek NRC Exam 09/90 -
215005A406	B	New		

KA	Level	Source	Mod Method	Comments
215005K116	R	New		
216000A211	B	New		
217000A103	S	New		
217000K201	B	New		
218000K501	B	New		
219000A414	B	New		
223002K101	B	New		
233000A202	R	Facility Exam B	Editorially Modifi	FEBQ #152 - modified the distra
234000K402	B	New		
239002K605	B	New		
241000K311	B	New		
245000A102	B	New		
259001A301	R	New		
259001K602	B	New		
261000A101	B	New		
262001A303	B	New		
262002K401	B	New		
263000K303	B	New		
263000K401	R	Facility Exam B	Concept Used	FEBQ #604 - carried original qu
264000G131	S	New		
264000K401	B	New		
271000K106	B	New		
272000A101	R	Facility Exam B	Editorially Modifi	FEBQ#205 - changed to "bullet"
272000K601	R	New		
286000A301	B	Facility Exam B	Significantly Mod	FEQB #1110 - modified from re
288000K603	B	New		
290002G112	S	New		
290002K102	B	NRC Exam Ban	Significantly Mod	Quad Cites NRC Exam 03/93 - r

KA	Level	Source	Mod Method	Comments
294001G101	B	NRC Exam Ban	Concept Used	Peach Bottom NRC Exam 02/98
294001G102	B	New		
294001G112	S	New		
294001G121	B	New		
294001G122	B	New		
294001G211	S	New		
294001G213	R	New		
294001G213	B	New		
294001G213	S	NRC Exam Ban	Significantly Mod	River Bend NRC Exam 07/92 - r
294001G222	R	New		
294001G222	S	New		
294001G226	S	New		
294001G301	B	Facility Exam B	Significantly Mod	FEBQ #1455, rewrote to lower c
294001G304	B	NRC Exam Ban	Concept Used	Hope Creek NRC Exam 02/98 -
294001G310	B	New		
294001G412	B	NRC Exam Ban	Significantly Mod	Brunswick NRC Exam 12/92 - r
294001G421	B	New		
294001G438	S	New		
294001G449	B	New		
295001A203	R	New		
295001K102	B	New		
295001K201	B	New		
295002K309	B	New		
295003A103	B	New		
295003A202	S	New		
295003K204	B	New		
295004G448	S	NRC Exam Ban	Significantly Mod	Peach Bottom NRC Exam 02/98
295004K203	B	New		

KA	Level	Source	Mod Method	Comments
295005K303	B	New		
295006K302	B	New		
295007A105	S	New		
295007K304	B	New		
295008A104	R	New		
295008G107	B	New		
295009A102	B	New		
295009K203	B	New		
295012K101	B	NRC Exam Ban	Concept Used	Hope Creek NRC Exam 02/98 -
295015G448	R	New		
295015K103	R	New		
295015K204	S	New		
295016A202	B	New		
295016G441	S	New		
295016K303	B	New		
295017G421	S	New		
295018G424	B	New		
295019A202	B	New		
295019K203	B	New		
295021A102	B	New		
295021A204	B	New		
295022A201	R	New		
295023K103	S	New		
295024G420	B	New		
295024K218	R	New		
295025A107	R	NRC Exam Ban	Editorially Modifi	River Bend NRC Exam 07/92 -
295025K103	S	New		
295026A201	S	New		

KA	Level	Source	Mod Method	Comments
295026G112	S	New		
295026G406	R	New		
295028A104	B	New		
295030G418	S	New		
295030K207	S	New		
295031A108	S	New		
295031A204	B	New		
295032K301	B	New		
295033A103	B	New		
295036A202	B	New		
295037A201	S	New		
295037G448	B	New		
295037K106	B	New		
300000K401	R	New		
400000G411	B	New		
500000G421	S	New		

Material Required for Examination Administration

Exam Level	*KA*	*MaterialRequiredforExamination*
B	201001A211	None
	201003G449	None
	202002A205	None
	203000A308	None
	203000K303	None
	205000K502	None
	206000A108	None
	206000A412	None
	209001K404	None
	211000K202	None
	212000A407	None
	212000K502	None
	215002K605	None
	215004A407	None
	215005A406	VYOPF 4400.01 (Optional)
	216000A211	None
	217000K201	None
	218000K501	None
	219000A414	None
	223002K101	None
	234000K402	None
	239002K605	None
	241000K311	None
	245000A102	None
	259001K602	None
	261000A101	None
	262001A303	None
	262002K401	None
	263000K303	None
	264000K401	None
	271000K106	None
	286000A301	None
	288000K603	None
	290002K102	None
	294001G101	None
	294001G102	None
	294001G121	None
	294001G122	None
	294001G213	None
	294001G301	None
	294001G304	None
	294001G310	None

Exam Level	*KA*	*MaterialRequiredforExamination*
B	294001G421	None
	294001G449	None
	295001K102	COLR Figure 2.4-1
	295001K201	None
	295002K309	None
	295003A103	None
	295003K204	None
	295004K203	None
	295005K303	None
	295006K302	None
	295007K304	None
	295008G107	None
	295009A102	None
	295009K203	None
	295012K101	Steam tables
	295016A202	None
	295016K303	None
	295018G424	None
	295019A202	None
	295019K203	None
	295021A102	None
	295021A204	None
	295024G420	None
	295028A104	None
	295031A204	None
	295032K301	None
	295033A103	None
	295036A202	None
	295037G448	None
	295037K106	None
	400000G411	None
R	201002A102	None
	201002G132	None
	201003K101	None
	201006K501	None
	202001A206	None
	204000A207	None
	209001G133	None
	215003K301	None
	215004A105	None
	215005K116	None
	233000A202	None
	259001A301	None
	263000K401	None

Exam Level	*KA*	*MaterialRequiredforExamination*
R	272000A101	None
	272000K601	None
	294001G213	None
	294001G222	None
	295001A203	None
	295008A104	None
	295015G448	None
	295015K103	None
	295022A201	None
	295024K218	None
	295025A107	None
	295026G406	None
	300000K401	None
S	201002A402	None
	211000G225	None
	217000A103	None
	264000G131	None
	290002G112	T.S Sections 1.1, 2.1, 3.1 & 4.1 with Bases
	294001G112	None
	294001G211	None
	294001G213	None
	294001G222	None
	294001G226	None
	294001G438	None
	295003A202	None
	295004G448	None
	295007A105	None
	295015K204	Tech Spec 3.1/4.1 without bases
	295016G441	None
	295017G421	None
	295023K103	None
	295025K103	Steam tables
	295026A201	HTCL Graph from EOP-1
	295026G112	None
	295030G418	None
	295030K207	None
	295031A108	None
	295037A201	None
	500000G421	None

?

RO REPORTS

RO Answer Distribution

Answer	*Number of Questions*
a	26
b	25
c	24
d	25

RO Cognitive Level

Cognitive Level	*Number of Questions*
Application	48
Comprehension	29
Memory	23

SRO Answer Distribution

Answer	*Number of Questions*
a	26
b	25
c	24
d	25

SRO Cognitive Level

Cognitive Level	*Number of Questions*
Application	51
Comprehension	20
Memory	29

Scenarios

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#1)

– GENERAL REQUIREMENTS

- All chart recorders will be rolled forward, timed and dated.
- Paper from selected chart recorders will be saved for the examination team as requested.
- All procedures, flow charts, curves, graphs, etc. will be returned to their normal storage place and closed.
- All markable procedures, boards, etc will be erased.
- All paper used by the previous crew will be removed and kept for the examination team as requested.
- The simulator operator, or designated person, will keep a rough log of all communications into and out of the "control room" during the scenario as requested by the examination team.

-- INITIAL SETUP.

- IC-87, setup for ~40% power ready to start the "C" Feedwater Pump
- Ensure the "A" Feedwater Pump is running with "C" in Standby
- Place RCIC out of service (Pre-insert RC01, RCIC turbine trip)
- Pre-insert RHR03A (RHR "A" Cont Spray 26A fails to open)

– DURING THE SCENARIO

- The examination team will determine when each event is to be inserted and when to "Freeze" and will inform the simulator operator.

- **EVENT 1** -- Provide copy of VYOPF 2404.02 for rod withdraw sequence. Support crew as Reactor Engineer as requested.

- **EVENT 2** -- If Crew continues to raise power direct them to start the second feedpump at 45% power. When directed as AO to perform prestart checks for Feedpump start inform Control Room checks are completed.

- **EVENT 3** -- Insert malfunction for LT-72A to fail to "0" after Feed Pump running and plant stable. Insert HPCI start concurrent with level instrument failure. Acknowledge request as I&C. They know of no reason why a single level instrument failure could have started HPCI. Report that HPCI initiation relays K-1 and K-2 are energized.

- **EVENT 4** -- Insert seal leak rate low and ramp up after recognized by crew. Use RDR12 to secure seal purge. Recirc cooling is SWR-52 and SWR-53.

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#1) (Con't)

- **EVENT 5** -- Insert malfunction after "B" Pump isolated. Attempt to provide a slow speed increase to allow operators to recognize it and take actions. Master Controller fails. If they place "A" in "Manual" pump speed control will work. Acknowledge request as I&C to respond to CR to investigate Recirc Flow Control trouble.

- **EVENT 6** -- Insert malfunction as soon as plant stable following Event 5. Allow crew time to discuss plant status, plans for continued operation/shutdown. Support crew as requested on bus failure. It will not be available anytime soon.

- **EVENT 7** -- Insert leak at low rate to allow time for recognition then ramp up to get the high drywell pressure automatic actions.

- **EVENT 8** -- Acknowledge request to attempt manual opening of Outbd Drywell Spray Valve (RHR-26A). At Exam Team direction after ED is performed, remotely open requested valve to allow sprays.

- **TERMINATION** -- After vessel depressurization/drywell sprays in service or as Exam Team directs

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#1) (Con't)

Event No.	Malf. No.	Event Type*		Event Description
1		R	CRO SCRO	Continue power ascension IAW OP-0105
2		N	ACRO SCRO	Start the second Feedwater Pump
3	RR18A HP03 Key 1	I	ACRO SCRO	ECCS level instrument failure, Inadvertent HPCI initiation (TS)
4	RR07B Key 2 RR08B Key 3 Need ramps	C	CRO SCRO	"B" Recirc Pump lower and upper seal failure
5	RR10 Key 4 100 @ 3600 sec	I	CRO SCRO	"A" Recirc Pump speed controller failure, pump speed increasing
6	ED05C Key 5	C	CRO ACRO SCRO	480 VAC ECCS Bus 8 fails
7	MS06 10% over 360 sec	M	CRO ACRO SCRO	Steam line leak in the drywell - emergency depressurization
8	RH03A Pre-insert	C	ACRO SCRO	RHR Cont Spray 26A fails to open.

SHIFT TURNOVER (#1)

PLANT CONDITIONS:

-- Approximately 40% power with startup in progress
-- Sequence A2 Group 63

INOPERABLE EQUIPMENT/LCOs:

-- RCIC out of service for an oil leak on the governor valve. 6 hours into LCO 3.5.G. Estimated return to service is 48 hours.

SCHEDULED EVOLUTIONS:

-- Continue planned startup. Hold at 45% power for the startup of second Feedwater pump.

SURVEILLANCES DUE THIS SHIFT:

-- Per OP-0105 during startup

ACTIVE CLEARANCES:

-- N/A

GENERAL INFORMATION:

-- ISI Group performing visual inspection of PCIS Outboard Isolation valves in Secondary Containment.

Simulation Facility: Vermont Yankee **Scenario No.:** #1

Examiners: ______________ **Operators:** ______________ SCRO

______________ ______________ CRO

______________ ______________ ACRO

Objectives: Evaluate the crew's ability to operate plant equipment to support a normal power ascension, respond to and evaluate (TS) a level instrument failure and the resultant reactivity addition transient, recognize and take action for a Recirc Pump seal failure, recognize and limit the positive reactivity from a runaway Recirc Pump, determine the affect of a loss of a 480 VAC ECCS bus on plant operation, and to implement the EOPs to monitor and control plant parameters for a major primary containment steam leak resulting in emergency depressurization as well as recognizing the inability to spray the drywell.

Initial Conditions: IC-87, 40% power, ready for second Feedwater Pump Start

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malf. No.	Event Type*		Event Description
1		R	CRO SCRO	Continue power ascension IAW OP-0105
2		N	ACRO SCRO	Start the second Feedwater Pump
3	RR18A HP03	I	ACRO SCRO	ECCS level instrument failure, Inadvertent HPCI initiation (TS)
4	RR07B RR08B	C	CRO SCRO	"B" Recirc Pump lower and upper seal failure
5	RR10	I	CRO SCRO	"A" Recirc Pump speed controller failure, pump speed increasing
6	ED05C	C	CRO ACRO SCRO	480 VAC ECCS Bus 8 fails
7	MS06	M	CRO ACRO SCRO	Steam line leak in the drywell - emergency depressurization
8	RH03A	C	ACRO SCRO	Drywell Spray Valves do not open.

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

Op Test No.: Scenario No.: #1 Event No.: 1

Event Description: Power ascension IAW OP-0105

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct continued power ascension IAW OP 0105 Phase 4 A.23
	CRO	Continue control rod withdrawals per the sequence and limits VYOPF 2404.01 For each control rod withdrawal: – Desired control rod selected – Rod Movement Control Switch on CRP 9-5 positioned to "Notch Out" – Observes normal drive pressure, flow and RMCS indications – Monitors nuclear instrumentation for proper response
	ACRO	Monitor plant parameters/assist as necessary Make preparations for second Feedwater Pump start

Event Description: "C" Feedwater Pump start

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct startup of "C" Feedwater Pump per Phase 4 section B of OP 0105
	ACRO	Start the second feedwater pump per OP 0105 Phase 4.B – Review Phase 2 & 4 Precautions and Administrative Limits – Verify both heater strings are in service – Verify Standby Lube Oil pump in service – Close feed pump discharge valve (FDW-4C) – Position "C" pump control switch to "Start" – Verify pump breaker closes, discharge valve opens and auxiliary lube oil pump stops – Check seal water temp. – Monitor lube oil and bearing temps until stabilized – Monitor running current (max. 666 amps) – Check bus 3 / 4 undervoltage relay targets
	CRO	Observe system flow and reactor level stabilizes
	ACRO	Report "C" Feedwater Pump placed in service. Place "B" Feedwater Pump in Standby – Control switch placed in "Auto" – Open Feedwater Pump Discharge Valve (FDW-4B)

Op Test No.: **Scenario No.: #1** **Event No.: 3**

Event Description: ECCS level instrument (LT-72A) failure low, Inadvertent HPCI initiation (TS)

Cause: Electrical short in low level sensing circuit (K1 & K2 energize)

Initial Automatic Actions: HPCI initiation and injection, alarms 9-3 R-1 & R-5 for SBGT start

Effects (General Sequence): Power and level increase (positive reactivity addition)

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	Recognize/report ECCS level instrument LT-72A on CRP 9-5 downscale, inform SCRO Recognize/report HPCI initiation and injection beginning, inform SCRO
	SCRO	Enter/direct actions IAW OT 3110, Positive Reactivity Insertion" May refer to OT 3114, "Reactor High Level", may direct securing one SBGT train
	ACRO	Verifies by two or more independent indications that HPCI initiation is spurious, informs SCRO Secure HPCI – Press/hold the HPCI Turbine Trip/Inhibit pushbutton selector switch then rotate to "Inhibit" – Verify HPCI Stop & Control Valves close & Aux Oil Pump auto starts Verify both Standby Gas Treatment Trains running – Open SGT-1A and 1B – Secure one train when/if directed
	CRO	Verify reactor power and level return to normal.
	SCRO	Refer to Tech. Spec. 3.5.E and Table 3.2.1, determine HPCI is Inoperable but available if needed to inject, 24 hour shutdown with RCIC Inoperable Direct I&C investigate cause of failure.

Event Description: "B" Recirc Pump upper and lower seal failure

Cause: Worn seals

Initial Automatic Actions: Initially receive alarms 9-4 G-1 & G-2

Effects (General Sequence): Both seals on the "B" Recirc pump fail requiring pump removal and isolation, increasing drywell temperature/pressure until isolated

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	Recognize/take action IAW 9-4 G-2 & G-1, inform SCRO – Monitor "B" Recirc Pump parameters – Determine failure of both pump seals, inform SCRO – Monitor Drywell equipment drain sump, temperature and pressure
	SCRO	Enter/direct actions IAW ON 3142, "Recirc Pump Seal Failure" – Direct "B" Recirc Pump shutdown and isolation Enter/direct actions IAW OT 3117, "Reactor Instability", and OT 3118, "Recirc Pump Trip" – May direct monitoring for reactor instabilities Refer to Tech Spec 3.6.G and direct actions for single loop operation, inform RE
	CRO	Secure and isolate the "B" recirc pump IAW ON 3142 – Open "B" Recirc Pump MG Set Motor Breaker – Close suction valve RV-43B – When suction indicates closed, close discharge bypass valve RV-54B and discharge valve RV-53B – Direct Aux Operator to secure seal purge IAW OP 2111 – Place controller in "Manual" and run down to "minimum"
	CRO	Determine operating point on COLR Figure 2.4-1 Monitor LRPM readings by selecting STBLTY on ERFIS – May initiate stability monitoring

Op Test No.: **Scenario No.: #1** **Event No.: 5**

Event Description: "A" Recirc Pump speed controller failure, pump speed increasing

Cause: Master Controller output failure high

Initial Automatic Actions: Reactor power rise, alarms 9-5 D-2 & D-3

Effects (General Sequence): Pump speed increasing, power rise

Time	Position	Applicant's Actions Or Behavior
	CRO	Recognize/report rising reactor power, inform SCRO Recognize/report "A" Recirc Pump speed rising, inform SCRO Recognize/take actions IAW 9-5 D-2 & D-3 – Monitor flow and power to confirm control rod blocks
	SCRO	Enter/direct actions IAW 0T 3110, "Positive Reactivity Insertion" – Direct the manual control of "A" Pump controller (may already be in manual)
	CRO	When directed raise speed of "A" Recirc Pump to 50-70% – Place pump controller in "Manual" (or use Master) and raise pump speed – Do not exceed 1% CTP/min power change
	SCRO	Contact I&C and inform them of the recirc flow controller failure.
	ACRO	Monitor RPV level pressure and power for return to normal Assist as necessary

Event Description: 480 VAC ECCS Bus 8 fails

Cause: Bus fault due to ground on 8

Initial Automatic Actions: Half scram, PCIS Group 3 isolation, multiple alarms

Effects (General Sequence):

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	Recognize/take actions IAW 9-5 K-1, inform SC RO – Recognize half scram and PCIS GP 3 isolation – Recognize loss of 480 VAC Bus 8
	SCRO	Take actions for loss of Bus 8 – Direct identification of lost loads – Direct backup of PCIS GP 3 – Enter/direct actions IAW ON 3145, "Loss Of CRD Regulating Function" Refer to Tech Spec 3.5.B. – Determine 30 day shutdown LCO required – Other LCOs reviewed Direct troubleshooting/repair
	CRO/ ACRO	Determine the following loads lost on Bus 8, inform SCRO – A RPS half scram – PCIS GP 3 isolation – B CRD pump loss – B RBCCW pump – A TBCCW pump – B RHR – B CS – B SBGT

Event Description: 480 VAC ECCS Bus 8 fails (Con't)

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	– B SBLC pump – Stack Gas I,II,III indication loss – Loss of RWCU (CU-15 loss of power) – Vital MG Set swap to DC drive – Loss of RCIC (RCIC-15 loss of power)
	ACRO	Backup Group 3 isolations IAW posted Operator Aid

Op Test No.: **Scenario No.: #1** **Event No.: 7**

Event Description: Steam line leak in the drywell

Cause: "A" MSL 18 inch pipe rupture between reactor vessel and flow restrictor

Initial Automatic Actions: High drywell pressure scram

Effects (General Sequence): Slowly rising drywell pressure to scram setpoint then rapid increase MSIV high flow closure setpoint

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	Recognize rising drywell pressure, inform SCRO – Check backpanel indications Recognize/take actions IAW 9-5 G-1 & F-1 – Check for leaks – Maximize drywell cooling
	SCRO	Enter/direct actions IAW OT 3111, "High Drywell Pressure" – Direct power reduction/ transfer house loads/manual scram Direct manual scram per OT-3100 and enter/direct actions IAW EOP-1 and 3
	CRO	Insert manual scram when directed/recognize automatic scram on high drywell pressure, inform SCRO – Press manual scram pushbuttons, concurrently execute OT-3100. Recognize/report EOP-1 and 3 entries on high drywell pressure. May recognize high steam flow in "A" MSL, inform SCRO
	ACRO	Monitor and report RHR, CS, EDG and SBGT initiations and PCIS GROUP 2, 3 and 4 isolations. Noting failures from previous power failure. Recognize/report MSIV closure on low pressure/high flow

Op Test No.: **Scenario No.: #1** **Event No.: 7**

Event Description: Steam line leak in the drywell (Con't)

Time	Position	Applicant's Actions Or Behavior
	CRO	Maintain level in 127 - 177 inches using preferred systems (Feedwater and HPCI)
	ACRO	Attempt reactor pressure control below 1055 psig, report pressure lowering with MSIVs closed Report drywell/torus pressure trending up to 10 psig
CT	SCRO	Direct Torus Sprays on "A" RHR loop before torus pressure reaches 10 psig
	ACRO	Place "A" RHR in torus spray per OP 2124, Appendix D: – Place CRP 9-3 RHRSW PP LPCI A/C AUTOSTOP OVERRIDE SWITCH to MANUAL OVERRD – Start one RHRSW pump – Adjust RHR-89A to maintain RHRSW pressure at >20 psig above RHR pressure and to achieve RHRSW HX flow 2950-3050 gpm – Start appropriate RHR pump – Turn RHR LOGIC CTMT SPRAY VLV LPCI SIG BYPASS to MANUAL – Open RHR-39A – Open RHR-38A – Close RHR-65A if desired – Report torus sprays initiated
CT	SCRO	Direct drywell sprays with "A" RHR loop before reaching "Unsafe" region of DWSIL graph – Verify torus level < 22.8 ft and in "Safe" region of DWSIL graph

Op Test No.: **Scenario No.: #1** **Event No.: 8**

Event Description: Drywell Spray Valve (RHR-26A) motor overload failure

Cause: Containment spray valve mechanically binds in the closed position.

Initial Automatic Actions: N/A

Effects (General Sequence): Valve will not open from Control Room

Time	Position	Applicant's Actions Or Behavior
	ACRO	Place "A" RHR loop in Drywell spray per OP-2124, Appendix E: – Check closed RHR-34A – Open RHR31A – Open RHR-26A – Report inability to open RHR-26A – Recognize loss of valve position indication when drywell spray valve opened
	SCRO	Direct ACRO to coordinate with Aux Operator to locally open RHR-26A loop spray valve – Recognize RHR-26B not available due to bus loss
CT		Recognize torus level/pressure cannot be maintained in the "Safe" region of PSP graph or drywell temperature cannot be maintained below 280 deg. F, Exits EOP-1, RPV pressure leg , enter/direct actions IAW EOP-5 – Direct rapid depressurization with bypass valves/may go direct to Emergency Depressurization
	ACRO	Perform an Emergency Depressurization when directed – Prevent injection from CS and RHR Pumps – Open all SRVs Report Aux Operator is able to manually open "A" RHR Drywell Spray valve – Recognize/report lowering drywell pressure once valve is open
	SCRO	Classify event IAW AP 3125 – Alert per A-3-b/A-3-a

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#2)

-- GENERAL REQUIREMENTS

- All chart recorders will be rolled forward, timed and dated.
- Paper from selected chart recorders will be saved for the examination team as requested.
- All procedures, flow charts, curves, graphs, etc. will be returned to their normal storage place and closed.
- All markable procedures, boards, etc will be erased.
- All paper used by the previous crew will be removed and kept for the examination team as requested.
- The simulator operator, or designated person, will keep a rough log of all communications into and out of the "control room" during the scenario as requested by the examination team.

-- INITIAL SETUP

- IC-89, 85% power
- A calibrated stopwatch will be required for the surveillance test.
- Provide copy of OP 4123 marked up to appropriate steps
- Remove RCIC from service (Pre-inert RC01, RCIC turbine trip)
- Pre-insert 7 of 10 Bypass Valves fail to open, TC03, A, B, D, F, H, I & J
- Pre-insert RP14A Scram Switch Failure

-- DURING THE SCENARIO

- The examination team will determine when each event is to be inserted and when to "Freeze" and will inform the simulator operator.

- **EVENT 1** -- Continue with power ascension using recirc flow, limited to 1% power per minute.

- **EVENT 2** -- Support Core Spray Surveillance. When pump started and CS-26B opened override flow indicator to allow a maximum of 2200 gpm flow. Aux Operator reports no noted problems at the pump. Support requests for troubleshooting.

- **EVENT 3** -- When a Tech Spec review is in progress from Event 2 and when directed by the exam team, insert these malfunctions to simultaneously fail the “C” APRM upscale and have rod 22-15 scram. Support crew as Reactor Engineer. Will develop a plan to recover the rod. Support trouble shooting of APRM and rod (blown fuse) as requested. If crew wants to reset scram too soon (i.e. before Event 5, as I&C, request they do not bypass the APRM until you get to the Control Room)

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#2) (Con't)

- **EVENT 4** -- When directed by the exam team, enter this malfunction, causing a slow rise in Main Turbine vibration. Would like to receive this alarm BEFORE the crew can reset the half scram from Event 3. This severity will not cause turbine trip. Should stop at 8.5 mils.

- **EVENT 5** -- Call Control Room as I&C and tell them you are ready to bypass the "C" APRM and reset the half scram when directed by the exam team. Insert this malfunction causing a second control rod 38-15 to scram. Prefer to have the rod scram when the crew attempts to reset the half scram from Event 3. See Event 6 note.

- **EVENT 6** -- Insert this right after Event 5 and before manual scram. Ensure both single rod scrams have already occurred.

- **EVENT 7** -- When the "A" or "B" SLC Pump starts allow it to run for 10 seconds then insert this malfunction to trip the pump. Support requests to troubleshoot the SLC Pumps.

- **EVENT 8** -- Pre-insert this malfunction causing seven of the ten Bypass Valves to fail closed.

- **TERMINATION** -- After power less than 2% and water level being restored as Exam Team directs

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#2) (Con't)

Event No.	Malf. No.	Event Type*		Event Description
1		R	CRO SCRO	Continue power ascension IAW OP-0105
2	Override Analog Out 01A4M5 Value 0.2, insert at pump start	N	ACRO SCRO	Core Spray surveillance fails, 7 day LCO
3	NM05C Key 1 RD06 Key 1 NM05C @ 100%	I C	CRO SCRO	APRM "C" failure upscale, control rod 22-15 scram, blown pilot valve fuse
4	TU03,3 Key 2 55% over 300 sec	C	ACRO SCRO	Main turbine bearing high vibration, slowly increasing
5	RP14A RD06 Key 3	I C	CRO SCRO	Half scram from Event 3 will not reset, second control rod scrams 38-15
6	RD12A & B Key 4	M	CRO ACRO SCRO	SDV hydraulic lock - ATWS
7	SL01A & B Key 5 Key 6	C	CRO ACRO SCRO	"A" SLC Pump trips, "B" SLC Pump trips
8	Pre-insert TC03 (1,2,4,6,8,9,10)	C	ACRO SCRO	7 of 10 Turbine Bypass Valves do not open

<u>SHIFT TURNOVER</u> (#2)

PLANT CONDITIONS:

-- A Plant startup is in progress with power at 85%
-- OP 0105, Phase 4B, Step 14 has just been completed.

INOPERABLE EQUIPMENT/LCOs:

-- RCIC out of service for an oil leak on the governor valve. 12 hours into LCO 3.5.G. Estimated return to service is 36 hours.

SCHEDULED EVOLUTIONS:

-- Continue with the plant startup in accordance with OP 0105 Phase 4 to rated conditions at a rate of 1%/minute. Hold power at 90% for completion of Core Spray surveillance.

SURVEILLANCES DUE THIS SHIFT:

-- OP 4123, "Core Spray System Surveillance", Section A, Full Flow Test on the "B" Core Spray Pump. Completed through Step A.5. Prerequisites have all been completed. IST Vibration Monitoring instrumentation is installed. A visual inspection has been completed on the Core Spray systems, and the Core Spray system is filled and vented.

ACTIVE CLEARANCES:

-- N/A

GENERAL INFORMATION:

-- Load Dispatcher has reported some minor grid disturbances (cycling +/- 0.1 Hz). Investigation is in progress

Scenario Outline

Simulation Facility: Vermont Yankee **Scenario No.:** #2 **Op Test No.:**

Examiners: ____________________ **Operators:** ____________________ SCRO

____________________ ____________________ CRO

____________________ ____________________ ACRO

Objectives: Evaluate the crew's ability to operate plant equipment to support a normal power ascension, to perform and recognize a failure of a safety related equipment surveillance and implement the required TS, recognize an instrumentation failure and resulting single control rod scram, recognize increasing turbine vibrations, to insert a manual scram after recognizing a second control rod scram, and to implement the EOPs to monitor and control plant parameters for a full core ATWS with an inability to inject boron and with inadequate pressure control capability including a determination that lowering reactor water level is required to control power.

Initial Conditions: IC- 89, 85% power

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malf. No.	Event Type*		Event Description
1		R	CRO SCRO	Continue power ascension IAW OP-0105
2	Override	N	ACRO SCRO	Core Spray surveillance ~~fails~~ fails after SAT start + short run
3	NM05C RD06	I C	CRO SCRO	APRM "C" failure upscale, control rod 22-15 scram, blown pilot valve fuse
4	TU03,3	C	ACRO SCRO	Main turbine bearing high vibration, slowly increasing
5	Override RD06	I C	CRO SCRO	Half scram from Event 3 will not reset, second control rod scrams 38-15
6	RD12A & B	M	CRO ACRO SCRO	SDV hydraulic lock - ATWS
7	SL01A & B	C	CRO ACRO SCRO	"A" SLC Pump trips, "B" SLC Pump trips
8	TC03	C	ACRO SCRO	7 of 10 Turbine Bypass Valves do not open

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

Event Description: Continue with the reactor startup in accordance with OP 0105

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct CRO to continue power ascension to 90% using recirc flow with a 1% power change per 3 minutes limit
	CRO	Raises power to 90% IAW OP 0105 - Using the Recirc Master Manual Controller, raises recirc flow - 1% power change per 3 minutes - Monitors recirc flow and nuclear instrumentation
	ACRO	Monitors plant parameters/assists as necessary Makes preparations for Core Spray surveillance

Op Test No.: **Scenario No.: #2** **Event No.: 2**

Event Description: Core Spray System "B" Surveillance Test/Will not achieve rated flow

Cause: Deteriorated pump clearances

Initial Automatic Actions: N/A

Effects (General Sequence): Upon starting pump and opening CS-26B, pump will not achieve rated flow.

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct ACRO to commence full flow surveillance test OP 4123 for the "B" Core Spray Pump.
	ACRO	Reviews OP 4123 Admin limits and Precautions - Starts the "B" Core Spray pump - Verifies Min Flow Valve (CS-5B) remains open, ADS Permissive RHR/CS Running alarm received and RRU-8 starts - Opens CS-26B to achieve 3100 gpm
CT		Recognize flow not reaching 3100 gpm with CS-26B fully open, inform SCRO, approx 2250 gpm - Verifies Min Flow Valve (CS-5B) closes
	SCRO	Refer to Tech Spec 3.5.A - Declare "B" Core Spray inoperable - 7 days to restore, 24 hours to complete surveillances on other CS loop Direct ACRO to secure "B" Core Spray/return the system to "Standby"
	ACRO	Secure "B" Core Spray - Close CS-26B and verify CS-5B opens - Secure the "B" CS Pump - Verify ADS Permissive RHR/CS Running alarm clears and RRU-8 stops
	CRO	Monitor plant parameters/assist as necessary

Op Test No.:	Scenario No.: #2	Event No.: 3	Page 3 of 9

Event Description: APRM "C" Fails Upscale and Control Rod 22-15 scrams

Cause: The APRM fails due to a failure in the Averaging Amplifier, and the rod scrams due to a Blown fuse.

Initial Automatic Actions: Alarms 9-5 K-1, L-2 , M-1, M-3, B-8, D-3 & D-5

Effects (General Sequence): APRM upscale alarm with half scram. Concurrent single rod scram

Time	Position	Applicant's Actions Or Behavior
	CRO	Recognize/take action IAW 9-5 K-1, L-2, M-2 & M-3, inform SCRO - Recognize APRM "C" upscale and half scram - Recognize rod drift alarm
		Recognize control rod 22-15 has scrammed, inform SCRO - Verifies only one rod scrammed - Monitors power, pressure, level
	ACRO	Checks APRM "C" upscale on the back panel
	SCRO	Refers to Tech Specs 1.1 and 3.1
		Enter/direct actions IAW OT 3167 and 3166 - Inform Reactor Engineer - Initiate Event Report per AP 0009.
	CRO	Select scrammed control rod and verify fully inserted
		Reduce core flow to 27.5 - 29 Mlbm/hr

Event Description: Main turbine bearing vibration slowly rises.

<u>Cause</u>: Rotor Unbalance

<u>Initial Automatic Actions</u>: Alarm 9-7 F-2

<u>Effects (General Sequence)</u>: Turbine vibration slowly rising

Time	**Position**	**Applicant's Actions Or Behavior**
	ACRO	Recognize/take action IAW 9-7 F-2, inform SCRO - Monitors Vibration Recorder R-110-1 and confirm a rising vibration condition - Continues to monitor turbine vibration trend
	SCRO	Direct Turbine load reduced not to exceed 1%/minute reactor power
	ACRO	Reduces VARs on the Main Generator if directed. – Reduce turbine load with speed/load changer – Recognize vibration rising rate is slowing, inform SCRO
	CRO	Reduces load using Recirc flow as directed, if not at minimum – Inserts control rods to reduce load

Op Test No.: **Scenario No.: #2** **Event No.: 5**

Event Description: Event 3 Half Scram Fails to Reset, Causes Second Control Rod Scram 38-15

Cause: Blown Fuse

Initial Automatic Actions: N/A

Effects (General Sequence): Half scram will not reset, when attempted, a second control rod scrams

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct Event 3 APRM "C" bypassed, half scram reset
	CRO	Bypasses APRM "C"
		Attempts to reset half scram, recognize will not reset, inform SCRO
CT		Recognize second control rod 38-15 scram, inform SCRO - Inform SCRO inserting manual scram
	SCRO	Acknowledge manual scram per OT 3167, "Control Rod Drift" (2 rods scrammed)
		Enter/directs actions IAW OT 3100 - Directs manual scram inserted
	ACRO	Continue monitoring/reporting rising turbine vibrations

Op Test No.: **Scenario No.: #2** **Event No.: 6**

Event Description: SDV Hydraulic Lock - ATWS

Cause: SDV blockage

Initial Automatic Actions: Normal RPS scram indications, no rod motion

Effects (General Sequence): No rod motion, manual scram and ARI do not work

Time	Position	Applicant's Actions Or Behavior
CT	CRO	Insert manual reactor scram, recognize failure to scram, inform SCRO - Initiate ARI/RPT - Place the Reactor Mode Switch in "Shutdown" when steam flow < 0.5 Mlbm/hr per line - Inform SCRO rods have not inserted
	SCRO	Enter/direct actions IAW EOP-2 concurrently with OT 3100/EOP-1 - Direct initiation of ARI/RPT
CT		- Direct SLC initiation before 110 degrees F in Torus
		Determines hydraulic ATWS exists - Direct EOP-2 Appendix E-H actions as necessary
	ACRO	Inhibits ADS
		Bypass MSIV low level interlock per Appendix P when directed
		Verify turbine trips on scram

Op Test No.: **Scenario No.:** **#2** **Event No.:** **7**

Event Description: "A" SLC Pump trips, "B" Pump Fails to Start

Cause: Overcurrent trip, relay failure, high vibration

Initial Automatic Actions: Alarms 9-5 K-4 & L-4

Effects (General Sequence): Either SLC Pump started trips after 10 seconds, Main turbine trip places pressure control on the bypass valves

Time	Position	Applicant's Actions Or Behavior
	CRO	Starts the "A" SLC Pump - Monitors normal start indications and indications of injection - Verify RWCU isolates Recognize "A" SLC Pump trips, informs SCRO - Starts the "B" SLC pump - Recognizes the pump trips, informs SCRO Direct troubleshooting "A" and "B" SLC Pump
	ACRO	Recognize/take actions IAW 9-5 K-4/L-4, inform SCRO of main turbine trip - Verify MSIVs open and turbine bypass valves opening to control pressure, recognize not all bypass valves responding
	CRO	Performs Appendix F & G actions for rod insertion as time allows

Event Description: 7 of 10 Bypass Valves Fail to Open/Lowering Reactor water Level

Cause: Valve servo failures

Initial Automatic Actions: N/A

Effects (General Sequence): Only 1 valve opens, pressure rises, SRVs may open if operators do not open them

Time	Position	Applicant's Actions Or Behavior
	ACRO	Recognize that more than 3 bypass valves should be open and that reactor pressure is rising, inform SCRO - Open SRVs as necessary to augment Bypass Valves to maintain pressure less than 1055 psig (800-1000 psig)
	SCRO	Direct terminate and prevent injection and lower level to 90 inches - When power <2% or TAF or SRVs closed with <2.5 psig drywell pressure, direct injection to maintain -22 inches and level to which it was lowered Enter/direct actions IAW EOP-3 for high torus temperature – Direct implementation of Appendix P
	ACRO	Terminates and prevents Feed and Condensate - Feed Pumps in "pull-to-lock" - Close HP Heater Outlet Valves (FDW-7A & B) - Monitors power and level Terminates and prevents HPCI, CS and RHR - CS and RHR Pumps in "pull-to-lock" - HPCI in "Inhibit" - Monitors power and level Place available RHR in torus cooling

Op Test No.: **Scenario No.: #2** **Event No.: 8**

Event Description: 7 of 10 Bypass Valves Fail to Open/Lowering Reactor water Level (Con't)

Time	Position	Applicant's Actions Or Behavior
	CRO	When directed, injects with Condensate/Feedwater to maintain level –22 inches and the level it was lowered to
	SCRO	Monitors plant parameters - Exit EOP-2 and Enter EOP-1 when reactor shutdown Classify event IAW AP 3125 - Site Area Emergency IAW S-7-c

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#3)

-- GENERAL REQUIREMENTS

- All chart recorders will be rolled forward, timed and dated.
- Paper from selected chart recorders will be saved for the examination team as requested.
- All procedures, flow charts, curves, graphs, etc. will be returned to their normal storage place and closed.
- All markable procedures, boards, etc will be erased.
- All paper used by the previous crew will be removed and kept for the examination team as requested.
- The simulator operator, or designated person, will keep a rough log of all communications into and out of the "control room" during the scenario as requested by the examination team.

-- INITIAL SETUP

- IC-85, 100% power (built from IC-19)
- Place "C" RHR Pump in torus cooling
- Remove RCIC from service, pre-insert (RC01 RCIC turbine trip)
- Pre-insert Reactor Water Cleanup failure to isolate
  - PC1CU15, CU 15 fails to close
  - PC1CU18, CU 18 fails to close
- Digital Input, 01A3S19 "PTL" and "Stop" to "Off"
- Pre-insert 4 KV Bus 2 failure to auto transfer (ED12B)
- Pre-insert "A" DG failure to start (DG05A)
- Pre-insert jet pump failure (RR03F)
- Provide marked up copy of OP 4110 with data for riser for jet pumps "L" & "M" indicating it is failed

-- DURING THE SCENARIO

- The examination team will determine when each event is to be inserted and when to "Freeze" and will inform the simulator operator.

- **EVENT 1** -- Support crew as Aux Operator for troubleshooting and local operation of the "C" RHR Pump breaker. DC control power is available. No problems with breaker noted locally. Breaker will not open from Control Room but can be opened locally. Coordinate with Control Room for torus cooling securing. Support requested troubleshooting. Use Remote RHR13 to open breaker locally.

- **EVENT 2** -- Pre-insert malfunction. Jet Pump riser for "L" & "M" fails. Provide the surveillance OP 4110 as part of shift turnover. If they are slow to start the shutdown, direct an immediate shutdown as Ops Boss. Support crew during power reduction as requested.

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#3) (Con't)

- **EVENT 3** -- Insert this malfunction at a low value. Enough for the crew to notice but not enough for them to feel the need to scram on the idea that THI is occurring. Support troubleshooting as requested

- **EVENT 4** -- Insert these malfunctions once at least a total of 5% power reduction has been made. Intent is that the Master controller is failed trying to take both pumps down in speed but the "A" Pump does not go down with the "B" Pump. Support requested troubleshooting. Try and insert the failures when the operator is actually lowering speed. If the pumps are placed in "Manual", allow the "B" Pump to be controlled. "A" Pump does not respond in any mode.

- **EVENT 5** -- Insert this malfunction after the power/recirc reductions of Event 4. Ramp up rate to MSIV closure. Intent here with Event 6, is for fuel/rad problems outside Pri Containment.

- **EVENT 6** -- Insert the leak with the scram from Event 6. Pre-insert the failure to isolate. Need a drain path from reactor to secondary containment. Cannot isolate RCU. Provide radiation levels inside Secondary Containment as necessary.

- **EVENT 7 & 8** -- Pre-insert these malfunctions on Bus 2 and the "A" DG. No fast transfer occurs. "A" DG does not pickup bus. Allow the Operator to re-energize this bus via the diesel generator, manual transfer or the Vernon Tie.

- **TERMINATION** -- After vessel depressurization and water level being restored as Exam Team directs

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#3) (Con't)

Event No.	Malf. No.	Event Type*	Event Description
1	Pre-insert 01A3519 - Stop-off 01A3519 - PTL-Off	N/C ACRO SCRO	Remove the "C" RHR Pump from service (Torus cooling), pump will not trip from the Control Room (TS)
2	RR03F Pre-insert	R CRO SCRO*	Power reduction for jet pump failure
3	TC04A Key 1 100% @ 600 sec	I CRO SCRO	Pressure Regulator oscillations
4	RR10 Key 2 0% @ 1200 sec RR11A Key 2 *	I CRO SCRO	Master flow controller failure (lowering Recirc Pump Speed)/"A" Recirc Pump does not respond
5	RX01 Key 3 **	M CRO ACRO SCRO	Fuel failure slowly increasing
6	CU03 100% @ 200 sec	M CRO ACRO SCRO	Reactor Water Cleanup leak with failure to isolate/reactor leak to secondary containment
7	ED12B Pre-inert	C ACRO SCRO	4 KV Bus fails to auto transfer
8	DG05A Pre-insert	C ACRO SCRO	"A" Diesel Generator fails to auto start

* At the same severity as the pump is at prior to inserting malfunction (approx. 88%)

** Triple ramp 1 -- 1% @ 600 sec

2 -- When crew takes ON/OT actions that exam team wants to see (just prior to manual scram) insert RX01 @ 60% @ 800sec

3 -- If time dragging put RX01 @ 100% with no ramp

SHIFT TURNOVER (#3)

PLANT CONDITIONS:

-- 100% power
-- "C" RHR Pump in torus cooling with RHR-65A open to limit torus temperature drop. HPCI surveillance was performed last shift.
-- The daily Jet Pump Operability Surveillance (OP 4110) shows that the riser supplying Jet Pumps "L" and "M" has failed. No other actions have been taken.

INOPERABLE EQUIPMENT/LCOs:

-- RCIC out of service for an oil leak on the governor valve. 24 hours into LCO 3.5.G. Estimated return to service is 12 hours.
-- Currently in 7 day LCO of Tech Spec 3.5.A.4.b for the "C" RHR in torus cooling

SCHEDULED EVOLUTIONS:

-- Secure torus cooling after shift brief complete
-- Verify Tech Specs for Jet Pump Operability and commence plant shutdown

SURVEILLANCES DUE THIS SHIFT:

-- N/A

ACTIVE CLEARANCES:

-- N/A

GENERAL INFORMATION:

-- N/A

Simulation Facility: Vermont Yankee **Scenario No.:** #3 **Op Test No.:**

Examiners: ______________________ **Operators:** ______________________ SCRO

______________________ ______________________ CRO

______________________ ______________________ ACRO

Objectives: Evaluate the crew's ability to remove plant equipment from service by alternate means, evaluate the TS for failure of plant equipment, evaluate TS for failed jet pump and commence plant shutdown, recognize and take actions for pressure oscillations without scramming the plant, recognize a Recirc Pump failure to respond during the power reduction, take actions for a fuel failure including a manual scram, recognize RCU leak with failure to isolate, and to implement the EOPs to monitor and control plant parameters for a leak with fuel failure outside the primary containment while recognizing and taking actions for plant equipment failures.

Initial Conditions: IC-85, 100% power, "C" RHR Pump in Torus cooling

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malf. No.	Event Type*		Event Description
1	Override	N/ C	ACRO SCRO	Remove the "C" RHR Pump from service (Torus cooling), pump will not trip from the Control Room (TS)
2		R	CRO SCRO	Power reduction for jet pump failure
3	TC04A	I	CRO SCRO	Pressure Regulator oscillations
4	RR10 RR11A	I	CRO SCRO	Master flow controller failure (lowering Recirc Pump Speed)/"A" Recirc Pump does not respond
5	RX01	M	CRO ACRO SCRO	Fuel failure slowly increasing
6	CU03	M	CRO ACRO SCRO	Reactor Water Cleanup leak with failure to isolate/reactor leak to secondary containment
7	ED12B	C	ACRO SCRO CRO	4 KV Bus fails to auto transfer
8	DG05A	C	ACRO SCRO	"A" Diesel Generator fails to auto start

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

Event Description: Remove the "C" RHR Pump from service (Torus cooling), pump will not trip from the Control Room (TS)

Cause: Relay failure

Initial Automatic Actions: N/A

Effects (General Sequence): No response when Control Room attempts to stop "C" RHR Pump, breaker can be opened locally

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct ACRO to secure torus cooling, return RHR to Standby
	ACRO	Secures torus cooling IAW OP 2124, Section E – Close RHR-34A, Torus cooling – Secure the "C" RHR Pump Recognize "C" RHR Pump fails to trip, inform SCRO – Direct Aux Operator to investigate
	SCRO	Direct ACRO to coordinate with Aux Operator to secure the "C" RHR Pump Refer to OP 2142 Step J.1 for breaker operations Refer to Tech Spec 3.5.A – Declare "C" RHR inoperable – 7 days to restore, 24 hours to complete remaining RHR surveillances
	ACRO	Complete securing torus cooling – Direct Aux Operator to open "C" RHR Pump breaker – Close RHR-39A – Secure running RHRSW Pump – Open/check open RHR-65A – Open/check open RHR-16A
	CRO	Monitor plant parameters/assist as necessary

Op Test No.: **Scenario No.: #3** **Event No.: 2**

Event Description: Jet Pump Failure/Tech Spec Shutdown Required

Cause: Jet pump riser is failed on Jet Pump 11 & 12 (L & M)

Initial Automatic Actions: N/A

Effects (General Sequence): Reduced core flow, power reduction

Time	Position	Applicant's Actions Or Behavior
	SCRO	Enter/direct actions IAW ON 3141
		Inform Duty and Call Officer, and Ops Manager
		Refer to Tech Spec 3.6.F – Declare Jet Pump "L" & "M" inoperable – Required to be in cold shutdown in 24 hours
		Direct immediate power reductions IAW OP 0105
		Notify Load Dispatcher
	CRO	Commence power reduction when directed, IAW OP 0105 - Using the Rx Recirc Master Manual Controller, lowers recirc flow - Reduction rate < 10%/min - Monitors recirc flow and nuclear instrumentation
	ACRO	Monitor plant conditions/assist as necessary

Op Test No.: **Scenario No.: #3** **Event No.: 3**

Event Description: MHC (EPR) pressure regulator oscillations

Cause: Control system failures

Initial Automatic Actions: N/A

Effects (General Sequence): TCV, pressure, steam flow, feed flow and power oscillations

Time	Position	Applicant's Actions Or Behavior
	CRO	Recognize reactor power/pressure oscillations, inform SCRO – Recognize EPR as cause of oscillations – Monitor power/level/pressure for thermal hydraulic instabilities
	SCRO	Enter/direct actions IAW OT 3115, Reactor Low Pressure", and/or OT 3116, "Reactor High Pressure". May also enter OT 3110, "Positive Reactivity Insertion" – May direct power reduction (if cause not known) to steady power/pressure – Direct EPR placed in "Cutout" after MPR in control of pressure
	CRO	Place MPR in service – Go to "lower" on MPR setpoint – Ensure MPR takes control of pressure – Place EPR Cutout Switch in "Cutout"
	ACRO	Monitors plant parameters/assists as necessary

Op Test No.: **Scenario No.: #3** **Event No.: 4**

Event Description: Master Recirc Flow Controller Fails Lowering Pump Speeds/"A" Recirc Pump Does Not Respond

Cause: Master controller output failure, "A" Controller failure

Initial Automatic Actions: N/A

Effects (General Sequence): Master controller is failed attempting to lower speeds on both pumps but the "A" Pump speed is not changing

Time	Position	Applicant's Actions Or Behavior
	CRO	Continue power reduction IAW OP 0105 Recognize lowering speed on the "B" Recirc Pump and no response on the "A" Pump, inform SCRO – Place both Recirc Pumps in "Manual" and attempt to control speed Recognize "B" Recirc Pump speed can be controlled in "Manual" but still no response from "A" – Monitor and report current loop flow values and magnitude of mismatch
	SCRO	May enter/direct actions IAW OT 3118, "Recirc Pump Trip", and/or OT 3117, "Reactor Instability" May refer to Tech Spec 3.6.G and H – No actions required
	ACRO	Monitor plant parameters/assist as necessary

Op Test No.: **Scenario No.: #3** **Event No.: 5**

Event Description: Slowly Increasing Fuel Failure

Cause: Mismatched Recirc flows on power reduction

Initial Automatic Actions: Various Off-Gas and Main Steam Line radiation alarms

Effects (General Sequence): Slowly rising rad levels progressing to automatic MSIV/scram setpoints if no operator actions taken

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	Recognize/take action IAW 9-3 F-1 & G-2, inform SCRO – Monitor off-gas and steam line radiation levels for trends, report rising levels – Monitor plant parameters
	SCRO	Enter/direct actions IAW OT 3112, "Main Steam Line High Rad", and ON 3152, "Off Gas High Rad" – Direct power reduction – Direct preparations for scram and MSIV closure Direct Manual Scram BEFORE MSL Rad reaches 3 X Normal
	CRO	Continue power reduction – Trips the "A" Recirculation Pump – Closes the "A" Recirculation Pump Discharge Valve – Using the "B" Recirc Pump Manual Controller, lowers recirc flow to 27.5 to 29 Mlbm/hour – Inserts control rods IAW Rapid Shutdown Sequence – Monitors recirc flow and nuclear instrumentation
	ACRO	Monitor plant parameters/radiation levels - Recognize radiation levels are not lowering, inform SCRO - Start both Standby Gas Treatment trains

Event Description: Reactor Water Cleanup leak/failure to isolate/reactor leak to secondary containment

Cause: Piping failure upstream Regen HX, isolation logic failure

Initial Automatic Actions: Alarms for system high flow

Effects (General Sequence): RCU leak (reactor coolant) to Rx Building (secondary containment) with fuel failure present. Rising Rx Building rad levels

Time	Position	Applicant's Actions Or Behavior
	SCRO	Enter/direct actions IAW OT 3100 – Direct manual scram – May direct MSIV closure Enter/direct actions IAW EOP-1 & ON 3153, "Excessive Rad Levels" May enter/direct actions IAW EOP-4 once RCU leak/isolation failure reported
	CRO	Manually scram the reactor – Place the Reactor Mode Switch in "Shutdown" when steam flow < 0.5 Mlbm/hr per line – Verify all control rods fully inserted, inform SCRO – Verify power lowering to IRM range
	ACRO	Recognize/take actions IAW 9-5 H-6, J-6 & K-6, inform SCRO – Close/verify Group 1 valves – Close Off-gas Outlet Valve (OG-FCV-11) – Verify SJAE and AOG isolated Manually open SRVs to control pressure 800-1000 psig – Place RHR in torus cooling
CT		Recognize/take action for RCU system leak indications, inform SCRO – Recognize RCU did not auto isolate, inform SCRO – Attempt to manually isolate, recognize RCU cannot be isolated, inform SCRO

Op Test No.:	**Scenario No.:** **#3**	**Event No.:** **7**	**Page 7 of 8**

Event Description: 4 KV Bus 2 Failure to Transfer

Cause: Relay failure

Initial Automatic Actions: N/A

Effects (General Sequence): Bus de-energized on the transfer but did not re-energize. Operator action will be able to re-energize the bus from the Startup Transformer

Time	Position	Applicant's Actions Or Behavior
	ACRO	Recognize Bus 2 did not transfer to the Startup Transformer, inform SCRO – Energize Bus 2 from the Startup Transformer
		When directed, begin cooldown at less than 100 deg F/hour with SRVs and/or HPCI
		Monitor secondary containment parameters – Recognize increasing Reactor Building radiation levels, 9-3 E-3
	CRO	Maintain water level 127 - 177 inches with feedwater
	SCRO	Enter/direct actions IAW EOP-4 – Monitor increasing RB rad levels – Recognize primary system (RCU) is discharging into secondary Containment
CT		When rad levels in two RB areas are greater than Max Safe Operating Limit, enter/direct actions IAW EOP-5 – Direct Emergency Depressurization
	ACRO	Perform an Emergency Depressurization – Prevent injection from CS and RHR Pumps – Open all SRVs

Op Test No.:	**Scenario No.: #3**	**Event No.: 8**	**Page 8 of 8**

Event Description: "A" Diesel Generator fails to auto start

Cause: Relay failure

Initial Automatic Actions: N/A

Effects (General Sequence): DG will not auto start. Operator action will be able to start the DG and re-energize the bus if desired/directed

Time	**Position**	**Applicant's Actions Or Behavior**
	ACRO	Recognize the Diesel Generator did not start, inform SCRO – Start the "A" DG and re-energize Bus 2 or via the Vernon Tie or the Startup Transformer
	SCRO	May direct "A" DG to be started and bus re-energized
	SCRO	Classify event IAW AP 3125 – Site Area Emergency per S-3-a

Spare

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#4)

– GENERAL REQUIREMENTS

- All chart recorders will be rolled forward, timed and dated.
- Paper from selected chart recorders will be saved for the examination team as requested.
- All procedures, flow charts, curves, graphs, etc. will be returned to their normal storage place and closed.
- All markable procedures, boards, etc will be erased.
- All paper used by the previous crew will be removed and kept for the examination team as requested.
- The simulator operator, or designated person, will keep a rough log of all communications into and out of the "control room" during the scenario as requested by the examination team.

– INITIAL SETUP

- IC-91, 27% power, ready to synch to the grid
- Remove RCIC from service (Pre-insert RC01, RCIC Turbine Trip)
- Remove "C" RHR Pump from service, place in PTL, remote function RHR13 to open breaker
- Turbine rpm on 9-7 ERFIS digital display, T005
- Pre-insert BPV fail to close
- Pre-insert 10 rods stuck out

– DURING THE SCENARIO

- The examination team will determine when each event is to be inserted and when to "Freeze" and will inform the simulator operator.

- **EVENT 1** -- Support crew while placing generator on the grid. Keep them moving if they are slow in getting started.

- **EVENT 2** -- Insert this malfunction after the generator is on the grid and they are in their "exhaust hood cooling" wait period. Support troubleshooting as requested.

- **EVENT 3** -- Support power increase as crew requests. Support BPV troubleshooting as requested. Ensure reactivity change between Event 1 and 3 meets Exam Team requirements.

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#4) (Con't)

- **EVENT 4** -- Insert this malfunction after SRV Tech Spec call has been made and before the power increase from Event 3. All bypass valves fail as is.

- **EVENT 5** -- May insert this malfunction during Event 4 depending upon how long it takes to become noticeable. Do not insert it so early that the crew does not have time to take actions for Event 4. Start with a leak rate high enough for the crew to notice but slow enough for them to take EOP-3 & 4 actions. Support requests for finding the leak but do not find it too early. Once found, leak cannot be isolated. Provide reports of rising water level in Torus area - 10 inches in one area.

- **EVENT 6** -- Insert these malfunctions when the crew decides to manually scram for the lowering torus level. If possible, fail the "A" SRV in a "throttled" position such that the depressurization is over a long period of time. May be able to insert this when the operator opens an SRV to control pressure less than 1055 psig since the Bypass Valves aren't functioning. Close all the bypass valves on the scram. Remove the failed Turbine Bypass Valve malfunction on the scram.

- **EVENT 7** -- Insert at least 10 rods stuck full out on the scram. Allow the rods to be driven in. Ensure all bypass valves do not open on the scram. Allow any remaining rods out after the ED to go in.

- **TERMINATION** -- After vessel depressurization and water level being restored as Exam Team directs

<u>**SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO**</u> **(#4) (Con't)**

Event No.	Malf. No.	Event Type*		Event Description
1		N	ACRO SCRO	Place the main generator on the grid
2	AD09B Key 1	I	ACRO SCRO	Relief Valve electrical short (TS)
3		R	CRO SCRO	Increase power
4	Pre-insert TC02 (1-10)	I	ACRO SCRO	Turbine Bypass Valves fail to close (all fail as is)
5	PC-10 Key 2 50 @ 600 sec	M	CRO ACRO SCRO	Torus water leak/Manual Scram
6	AD01A Key 3 @20%	C	ACRO SCRO	Relief valve opens/stuck open/uncontrolled depressurization
7	Pre-insert RD02	C	CRO SCRO	10 control rods stuck out 2-19 10-7 30-39 34-39 6-11 14-7 30-27 6-35 18-11 30-23

SHIFT TURNOVER (#4)

PLANT CONDITIONS:

- -- Plant startup at 27% power, turbine ready to be synched to the grid
- -- Sequence A2, Group 55

INOPERABLE EQUIPMENT/LCOs:

- -- RCIC out of service for an oil leak on the governor valve. 36 hours into LCO 3.5.G. Estimated return to service late this shift.
- -- "C" RHR Pump breaker failed to open from the Control Room last shift. Awaiting a work package for troubleshooting. 4 hours into LCO 3.5.A.4.b, 7 day LCO. All LPCI operability surveillances are completed and current. No time estimate for return to service.

SCHEDULED EVOLUTIONS:

- -- Continue plant startup and place the main generator on the grid. Currently in OP 0105, Phase 3, at Step C.7

SURVEILLANCES DUE THIS SHIFT:

- -- OP 0105 startup surveillances

ACTIVE CLEARANCES:

- -- "C" RHR Pump

GENERAL INFORMATION:

- -- N/A

Scenario Outline

Simulation Facility: Vermont Yankee **Scenario No.:** #4 **Op Test No.:**

Examiners: ______________ **Operators:** ______________ SCRO

______________ ______________ CRO

______________ ______________ ACRO

Objectives: Evaluate the crew's ability to place the main generator on the grid and operate the plant during low power conditions, recognize the SRV failure and take the required TS actions, recognize the failure of the BPV to respond to increasing power, recognize and evaluate the lowering torus water level, take actions for a stuck open SRV and uncontrolled depressurization after a manual scram, and to implement the EOPs to monitor and control plant parameters for a ATWS (rods out) with lowering torus level resulting in an emergency depressurization while taking actions for additional plant equipment failures.

Initial Conditions: IC-91, 27%, ready to synch to the grid

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malf. No.	Event Type*		Event Description
1		N	ACRO SCRO	Place the main generator on the grid
2	AD09B	I	ACRO SCRO	Relief Valve electrical short (TS)
3		R	CRO SCRO	Increase power
4	TC02	I	ACRO SCRO CRO	Turbine Bypass Valves fail to close
5	PC-10	M	CRO ACRO SCRO	Torus water leak/Manual Scram
6	AD01A	C	ACRO SCRO	Relief valve opens/stuck open/uncontrolled depressurization
7	RD02	C	CRO SCRO	10 control rods stuck out/

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

Op Test No.: **Scenario No.:** #4 **Event No.:** 1 **Page** 1 **of** 9

Event Description: Synch the Main Generator to the Grid

Time	Position	Applicant's Actions Or Behavior
	SCRO	Direct ACRO to place main generator on the gird per OP 0105, Phase 3 beginning at Step C.7 Notify Load Dispatcher
	ACRO	Place main generator on the grid IAW OP 0105, Phase 3, Section C – Open Bkr 81-1T – Open Bkr 1T – Close T-1 MOD – Place reclosure switches to "Off" for 81-1T and 1T – Place breaker switch in synch scope and turn synch scope on – Adjust generator output voltage to be equal or slightly higher than line voltage – Adjust generator speed to achieve synch scope moving slowly in the "Fast" direction – When synch scope between 5 min of 12 and 12, close Bkr 81-1T – Immediately pick up 25-50 MWe load by going to "Raise" on speed/load changer – When Bkr 81-1T closed and generator at desired load, synchronize and close Bkr 1T – Turn off synch scope and remove breaker switch – Per Velco, place reclosure switch for 1T to "Inst" and 81-1T to "Sync Ck" – Remain at current load to allow exhaust hoods to cool (5 minutes) – Close drains per Step C.10 – Adjust voltage to maintain reactive load at minimum – Monitor generator parameters
	CRO	Monitor plant parameters/assist as necessary

Op Test No.: **Scenario No.: #4** **Event No.: 2**

Event Description: Safety Relief Valve "B" electrical short

Cause: Fuse F3/F11 blows

Initial Automatic Actions: Alarm 9-3 A-4

Effects (General Sequence): Loss of SRV indication and switch manipulation

Time	Position	Applicant's Actions Or Behavior
	ACRO	Recognize/take action IAW 9-3 A-4, inform SCRO – Recognize loss of position indication on SRV 71B, inform SCRO – Check back panel fuses, recognize fuse F12B/F11B blown May refer to prints (B191301 Sh 753) for SRV operational capability with fuse blown – Determine SRV cannot be opened with the switch or as part of ADS, inform SCRO
	SCRO	Refer to Tech Spec 3.5.F.2 & 3.6.D – Declare the "B" SRV Inoperable – 7 day LCO and 24 hours to prove HPCI operability Direct troubleshooting/repair
	CRO	Monitor plant parameters/assist as necessary

Op Test No.: **Scenario No.: #4** **Event No.: 3**

Event Description: Raise power

Time	**Position**	**Applicant's Actions Or Behavior**
	SCRO	Direct CRO to raise power IAW OP 0105, Phase 3. Step C.28
		Notify Load Dispatcher
	CRO	Continue control rod withdrawals per the sequence and limits VYOPF 2404.02
		For each control rod withdrawal: – Desired control rod selected – Rod Movement Control Switch on CRP 9-5 positioned to "Notch Out" – Observes normal drive pressure, flow and RMCS indications – Monitors nuclear instrumentation for proper response
	ACRO	Monitor main generator parameters
		Determines normal response from other Turbine Bypass Valves

Event Description: Turbine Bypass Valves Fail to Close

Cause: Valve servo motor failure

Initial Automatic Actions: N/A

Effects (General Sequence): No response from the currently open Bypass Valves as speed load changer is raised

Time	**Position**	**Applicant's Actions Or Behavior**
	SCRO	Direct closing Turbine Bypass Valves with Speed Load Changer
	ACRO	Raise the Speed Load Changer setpoint to close the Turbine Bypass Valves
		Recognize Turbine Bypass Valves are not responding (closing) to Speed Load Changer rise, inform SCRO – Attempt to close Bypass Valves by raising speed-load changer to less than 10% above generator load – Recognize valves still do not respond, inform SCRO
	SCRO	Direct power rise stopped
		Direct troubleshooting/repair

Op Test No.: **Scenario No.: #4** **Event No.: 5**

Event Description: Torus Water Leak/Manual Scram

Cause: Leak on the "A" RHR Pump suction line

Initial Automatic Actions: Alarms 9-4 L-4, L-6, M-4 & M-6, 9-5 F-5

Effects (General Sequence): Lowering torus water level with rise in RB Floor Drain Sump levels, once leak is found to be unisolable, EOP-3/4 will require a manual scram

Time	Position	Applicant's Actions Or Behavior
	CRO/ ACRO	Recognize lowering torus water level or recognize/take action IAW 9-4 L-4, L-6, M-4, M-6 & 9-5 F-5, inform SCRO – Monitor sump levels – Verify pumps running – Determine source of water – Monitor/trend lowering torus water level, inform SCRO
	SCRO	Enter/direct actions IAW EOP-4 (on high sump alarms) – Direct monitoring of secondary containment parameters Enter/direct actions IAW EOP-3 (on low torus water level) – Determine approximate leak rate – Direct Aux Operators to look for leak – Direct Table 11 torus makeup actions
	ACRO	Makeup to the torus per the Table N Appendices as directed – Appendix X - RHRSW – Appendix W - Core spray – Others as needed
CT	SCRO	Based on report of leak location and that it cannot be isolated, determine that torus water level cannot be maintained above 7.0 feet. – Enter/direct actions IAW EOP-1 and EOP-5 – Direct manual scram before one area is 12 inches per EOP-4

Op Test No.: **Scenario No.: #4** **Event No.: 6**

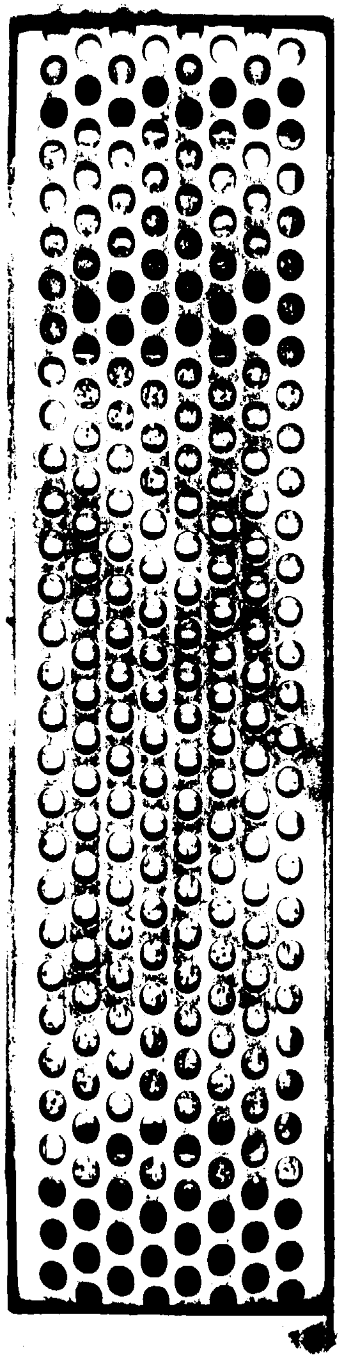
Event Description: Partially stuck open SRV/Uncontrolled depressurization

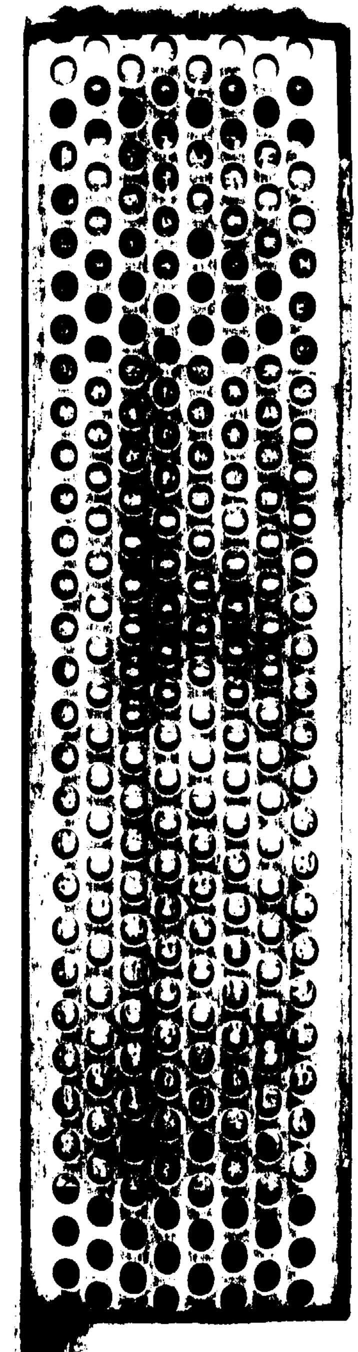
Cause: Valve mechanically bound partially open

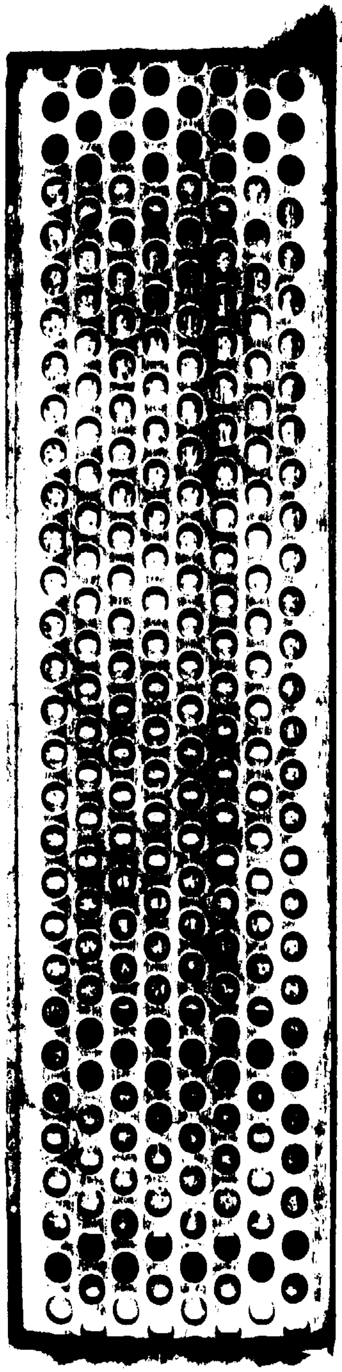
Initial Automatic Actions: N/A

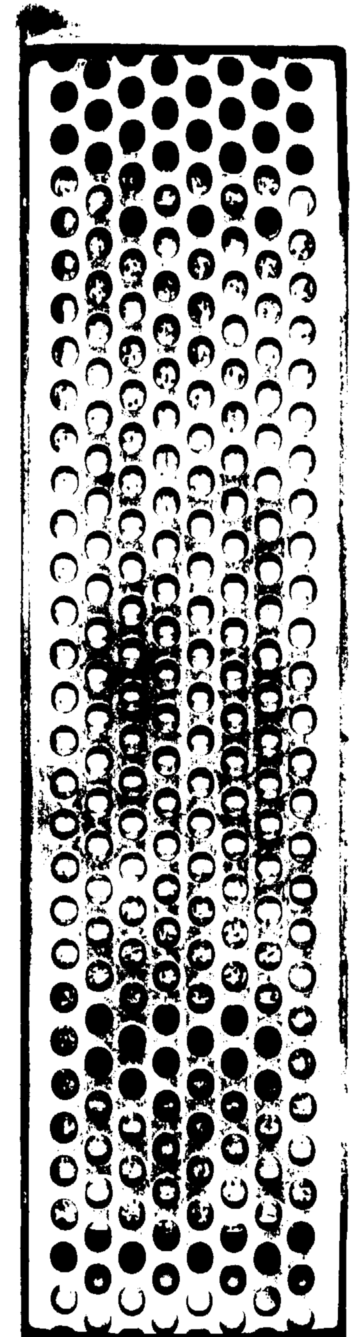
Effects (General Sequence): When SRV "A" is opened by operator or opens by pressure, it sticks partially open. Uncontrolled depressurization to a lowering water level torus.

Time	Position	Applicant's Actions Or Behavior
	ACRO	Recognize "A" SRV did not close (when pressure lowered or when the operator closed it), inform SCRO – Cycle the control switch from "Auto" to "Open" to "Auto" – Recognize that the valve did not respond, inform SCRO
	SCRO	Enter/direct actions IAW OT 3121 – Direct torus cooling on the "B" RHR Loop ("A" RHR pump has the suction leak) – Direct close monitoring of the torus temperature and level trends per the HCTL graph









Op Test No.: **Scenario No.:** **#4** **Event No.:** **7**

Event Description: Manual Scram/10 Control Rods Stuck out (Con't)/Emergency Depressurization due to torus conditions (Con't)

Time	Position	Applicant's Actions Or Behavior
	SCRO	Exit EOP-3 and enter/direct actions IAW OT 3100
		Classify event IAW AP 3125 – Alert per A-7-c

RO ADMIN

Facility: Vermont Yankee **Examination Level:** RO		**Date of Examination:** 01/25/99 **Operating Test Number:** #1
	Administrative Topic/Subject Description	**Describe method of evaluation:** **1. ONE Administrative JPM, OR** **2. TWO Administrative Questions**
A.1	Short Term Info/ SO #98-02 Actions	JPM - Evaluate CRO logs for Torus water level/volume and determine required actions. K/A 2.1.33 (3.4/4.0)
	Reactor Startup Requirements	Given a starting SRM count rate, when is criticality expected? K/A 2.4.47 (3.4/3.7)
		Specific temperature limits for criticality and SDM determination. K/A 2.2.25 (2.5/3.7)
A.2	Piping and Instrument Drawings	Trace the flowpath from the Conn. River to the reactor vessel. K/A 2.1.24 (2.8/3.1)
		SLC operation vs RWCU isolation and Squib Valve firing. K/A 2.1.24 (2.8/3.1)
A.3	RWP/High Rad Area Entry Actions	JPM - Locate & determine radiological requirements for inspection of valve CU-19A (in locked high rad area). K/A 2.3.4 (2.5/3.1)
A.4	Emergency Plan Actions	Evacuation actions while dressed out in a Contaminated Area (OP 3524). K/A 2.3.1 (2.6/3.0)
		Control Room actions for medical emergency. K/A 2.4.11 (3.4/3.6)

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Evaluate CRO Logs for Torus Water Level / Volume Out of Specifications and Determine Required Actions.
Failure Mode:	N/A
Reference:	AP-0150, "Conduct of Operations and Operator Rounds", Rev.31
Task Number:	
Facility JPM #:	N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes ___ No _X_

Time Critical: Yes __ No _X_

Operator Performing Task: ______________________

Examiner: ______________________

Date of Evaluation: ______________

Method of Testing: Simulation _X_ Performance __ Discuss __

Setting: Classroom __ Simulator __ Plant _X_

Performance Expected Completion Time: 8 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: ______________

Prepared by:	______________________ Operations Training Instructor	12/23/98 Date
Reviewed by:	______________________ SRO Licensed/Certified Reviewer	12-23-98 Date
Approved by:	______________________ Operations Training Supervisor	12/23/98 Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: You have just completed the CRO rounds for Day Shift but have not completed a review of the last 4 sheets of this rounds sheet (Shts 10–13)

Initiating Cues: Complete the review the last sheets and submit for SCRO review

Task Standards: CRP 9-23 panel compensated Torus Water volume identified as out of spec. and circled and identified with a capital letter at the item and in the remarks. And the SS notified.

Required Materials: AP-0150, "Conduct of Operations and Operator Rounds", Rev.31

Simulator Setup: N/A

JPM Modification: N/A

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain ProcedureAP-0150, Operator Rounds and review Procedure.**
	Standard:	AP-0150 obtained and reviewed.
Interim Cue:	Provide completed log sheets 10, 11, 12, 13 and 13a.	
SAT/UNSAT	**Step 2:**	**Review log sheet data for sheets provided.**
	Standard:	Identifies requirement to reference OP 2115
Interim Cue:	none	
SAT/UNSAT	***Step 3:**	**Obtain OP 2115, Figure 1.**
	Standard:	Locate and plot recorded Torus diff. Pressure and allowable torus indicated level.
Interim Cue:	none	
SAT/UNSAT	***Step 4:**	**Identify Torus volume in unacceptable region of Fig 1**
	Standard:	Plot point on unacceptable region of figure.
Interim Cue:	none.	
SAT/UNSAT	***Step 5:**	**Refer to NOTE #5 requirement for out of spec. conditions.**
	Standard:	Notify SCRO of notification requirement and T.S. LCO 3.7.A.8 entry requirement.
Interim Cue:	Acknowledge report as SCRO	

SAT/UNSAT	**Step 6:**	**Refer to AP-0150 Procedure section for instructions for out of spec recording requirements.**
	Standard:	Circle the Compensated Torus Water Volume reading and assign a capitol letter next to the entry then denote this letter in the Remarks sections

Interim Cue:	Reading circled and denoted per AP-0150

TIME FINISH: ____________

Terminating Cue: CRP 9-23 panel compensated Torus Water volume identified as out of spec, circled and identified with a capital letter at the item and in the remarks. And the SS notified.

Evaluators Comments:

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Locate and Determine Radiological Requirements for Inspection of RCU Valve V12-19A (CU-19A).
Failure Mode:	N/A
Reference:	AP 0541, "Access to High and Very High Radiation Areas", Rev.4
Task Number:	
Facility JPM #:	N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes ___ No _X_

Time Critical: Yes ___ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation _X_ Performance ___ Discuss ___

Setting: Classroom ___ Simulator ___ Plant _X_

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: ____________

Prepared by: ____________________ 12/23/98
Operations Training Instructor Date

Reviewed by: ____________________ 12-23-98
SRO Licensed/Certified Reviewer Date

Approved by: ____________________ 12/23/98
Operations Training Supervisor Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: - The previous shift prepared the "A" RCU pump for startup to swap operating pumps per OP-2112 Section B
- When you attempted startup of the pump abnormal indications were observed
- You request an Aux operator to verify the CU-19A, Pump "A" suction valve, is in the correct position.

Initiating Cues: Locate this valve using plant reference material and identify any radiological requirements the Aux Operator must comply with to perform the desired task.

Task Standards: Valve identified in High Radiation Area and AP-0541 requirements identified..

Required Materials: - OP-2112, "Reactor Water Cleanup System", Rev. 28
- AP-0503, "Establishing and Posting Restricted Areas", Rev. 23(VYAPF 0503.01)
- AP-0541, "Access to High and Very High Radiation Areas", Rev. 4

Simulator Setup: N/A

JPM Modification: N/A

Evaluation	**Performance Steps**	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OP2112, RCU and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	OP 2112 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	**Step 2:**	**Review Procedure section for positioning of suction valve.**
	Standard:	Section B Step 3.b. identified.
Interim Cue:	none	
SAT/UNSAT	***Step 3:**	**Using Appendix A identify location of CU-19A.**
	Standard:	App. A, Reactor Water Cleanup Valve Lineup, pg. 1 of 4 located identifying valve in RCU A Pump room.
Interim Cue:	none	
SAT/UNSAT	***Step 4:**	**Refer to AP-0503, Attachment 1 High and Very High Radiation Area Logsheet**
	Standard:	Identifies RCU A Pump Room as a High Radiation Area.
Interim Cue:	none.	
SAT/UNSAT	***Step 5:**	**Refer to AP-0541, to determine access requirements.**
	Standard:	Identifies requirement for an RWP covering the scope of the work, RP notification prior to entry, continuous dose rate monitoring, or integrated dose rate device with alarm or continuous RP technician coverage
Interim Cue:	none	

TIME FINISH: ____________

Terminating Cue: Valve identified in HRA and AP-0541 requirements identified.

Evaluators Comments:

ADMIN QUESTIONS

CANDIDATE: ____________________ DOCKET: ______________ DATE: ______________

QUESTION: A.1.Q#2.a.

Prior to control rod withdrawal initial SRM power is130 cps. At what indicated count rate is the CRO withdrawing control rods required to stop and allow power to stabilize per station startup requirements?

ANSWER:

Per OP-0105 when count rate reaches two doublings or 520 cps.

RESPONSE:

SAT ______ UNSAT ______ K/A NUMBER: 2.4.47 3.4/3.7

REFERENCES: OP-0105, Reactor Operation, Rev. 4, Phase 1A, Step 20, Page 14

QUESTION: A.1.Q#2.b.

Following a refuel outage the Reactor Engineer states that a Shutdown Margin Calculation will be performed on the startup. What minimum and maximum RPV temperature limits apply for this test during startup?

ANSWER:

RPV coolant temp. must be below 180 deg. F and above 80 deg. F per the startup procedure and T.S..

RESPONSE:

SAT ______ UNSAT ______ K/A NUMBER: 2.2.22 3.4/4.1

REFERENCES: OP-0105, Reactor Operation, Rev. 4, Phase 1A, Step 7, Page 11
Tech Spec 3.6.A.1 and Figure 3.6.1

QUESTION: A.2.Q#1.a.

Plant conditions require use of Alternate Injection Systems to restore reactor water level in an emergency. Using plant piping and instrumentation drawings trace the procedural flow path to inject water from the Connecticut River into the reactor with the RHR "A" loop injection valve stuck closed

ANSWER:

Using OE-3107 Appendix M, trace Fire Water through SW-8 crosstie through Emer.Fill valves RHR-184/183 to the RHR-20 valve to the "B" loop injection valves to the reactor.

RESPONSE:

SAT _____ **UNSAT** _____ **K/A NUMBER:** 2.1.24 2.8/3.1

REFERENCES: Print G191159, Service Water
Print G191172, RHR
OE-3107, OE Appendices, Appendix M, Rev. 10

QUESTION: A.2.Q#1.b.

During a failure to scram event the Standby Liquid Control System initiation switch is positioned to the SYS 1 position. The associated squib valve fires but the pump immediately trips on overload. Using system logic prints identify the expected status of the Reactor Water Cleanup System isolation with this pump start fault condition.

ANSWER:

Identify with prints that the RCU isolation comes directly off the system initiation switch and would not be effected by the pump failure.

RESPONSE:

SAT _____ **UNSAT** _____ **K/A NUMBER:** 2.1.24 2.8/3.10

REFERENCES: Print (CWD) B-191301, Sh 1201, 912, 909

QUESTION: A.4.Q#1.a.

What actions should be taken if a station Site Area Emergency is announced while you are working, dressed out, in a contaminated area?

ANSWER:

Immediately report to RP control point to receive instructions for monitoring.
Then report to the Plant Admin Building and report as required to the TSC, or OSC and EOF

RESPONSE:

SAT _____ **UNSAT** _____ **K/A NUMBER:** 2.3.1 2.6/3.0

REFERENCES: OP-3524, Emergency Actions To Ensure Initial Accountability and Security Response, Rev. 15, Sections I.A & IV.A, Pages 2 & 9

QUESTION: A.4.Q#1.b.

While on night shift you receive a report from the Aux Operator in the Turbine Building that another AO has smashed his thumb while working on a valve. He reports that the injured operator's thumb is bleeding badly and an RP Technician is assisting by applying pressure to the wound. What actions must you take from the Control Room under this condition?

ANSWER:

Obtain location and acknowledge report
Turn page volume increase switch to "alert"
Make "Medical Emergency" announcement
Provide known radiological conditions to the Medical Response Technician
Record info provided by the MRT on VYOPF 3508.01, Medical Status Record Sheet.
Notify "Rescue, Inc" and Hospital if transportation offsite is required.

RESPONSE:

SAT _____ **UNSAT** _____ **K/A NUMBER:** 2.4.11 3.4/3.6

REFERENCES: OP-3508, Onsite Medical Emergency Procedure, Rev. 21, Sections A & B.6, Pages 3 & 7

SRO ADMIN

Facility: Vermont Yankee **Examination Level:** SRO		**Date of Examination:** 01/25/99 **Operating Test Number:** #2
Administrative Topic/Subject Description		**Describe method of evaluation:** **1. ONE Administrative JPM, OR** **2. TWO Administrative Questions**
A.1	Parameter Verification/	Determination of RPV flooding condition to restore Adequate Core Cooling K/A 2.4.6 (3.1/4.0)
	Adequate Core Cooling	Determination of the Maximum Core Uncovery Time Limit K/A 2.4.47 (3.4/3.7)
	Reportability	Time limits and personnel requirements for notifications. K/A 2.4.30 (2.2/3.6)
	Requirements	Notification requirements for incorrect reports. K/A 2.1.18 (2.9/3.0)
A.2	Surv. Testing/Failed Surveillance Actions	JPM - Review completed surveillance/take actions for OOS data. K/A 2.1.33 (3.4/4.0)
A.3	Radiation Work	Specific Shift Supervisor responsibilities for RWP authorization. K/A 2.3.7 (2.0/3.3)
	Permits	Requirements for TIP Room entry. K/A 2.3.10 (2.9/3.3)
A.4	EP/Protective Action Recommendation	JPM - Perform off-site protective action recommendations using rad dose Information from the nomograms (JPM-20037 modified). K/A 2.4.44 (2.1/4.0)

ADMIN QUESTIONS

CANDIDATE: ____________________ DOCKET: ______________ DATE: ______________

QUESTION: A.1.Q#1.a.

Assuming the following conditions during execution of EOP-6, "RPV Flooding", what conditions are required to reestablish Adequate Core Cooling with reactor water level unknown:

- All rods are fully inserted except 6 at position 02.
- RPV pressure is 110 psig and stable with 3 SRVs open.
- RHR "A" is injecting at rated flow.
- Torus level is 14 ft.
- Torus pressure is 15 psig and lowering slowly.

ANSWER:

Maintain the current conditions for at least 62 minutes to ensure the reactor is flooded to at least TAF.

RESPONSE:

SAT ______ UNSAT ______ K/A NUMBER: 2.4.6 3.1/4.0

REFERENCES: EOP-6, RPV Flooding

QUESTION: A.1.Q#1.b.

How long can injection into the RPV be stopped during execution of EOP-6, "RPV Flooding", once the Minimum RPV Flooding Interval is met assuming only three SRVs were opened to emergency depressurize? Assume it has been 5 hours since all rods were fully inserted.

ANSWER:

Approximately 6 (six) minutes after the Flooding Interval of 62 minutes is met.

RESPONSE:

SAT ______ UNSAT ______ K/A NUMBER: 2.4.47 3.4/3.7

REFERENCES: EOP-6, RPV Flooding

QUESTION: A.1.Q#2.a.

Ten minutes ago, while operating at rated conditions, an initiation and injection of HPCI occurred. The CRO secured the system after verifying reactor water level and Drywell pressure normal by two independent indications. What notifications (if any) must be made?

ANSWER:

This requires a 4 hour notification.

RESPONSE:

SAT _____ **UNSAT** _____ **K/A NUMBER:** 2.4.30 2.2/3.6

REFERENCES: AP-0156, "Notification of Significant Events", 50.72(b)(2)(ii)

QUESTION: A.1.Q#2.b.

During an outage the crew has made a 1 hour non-emergency notification to the NRC per 10 CFR 50.72 (b) 1 (ii) due to a loss of shutdown cooling capability. During your review of the event you determine that the event should have been reported under 10 CFR 50.72 (b) 2 (iii) B as a 4 hour non-emergency report. What actions should be taken?

ANSWER:

The NRC should be notified of a downgrade of the initial notification.

RESPONSE:

SAT _____ **UNSAT** _____ **K/A NUMBER:** 2.1.18 2.9/3.0

REFERENCES: AP-0156, "Notification of Significant Events", discussion section

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QUESTION: A.3.Q#1.a.

During a refueling outage an RWP for inspection of the upper bioshield wall in the drywell is brought to the control room for your (Shift Supervisor) review and approval. What conditions and/or actions must you address to approve this work and the RWP?

ANSWER:

SS review of evolutions that may effect the radiological conditions is required by AP-0502. Additionally AP-0518 requires suspension of all fuel movement activities in the RV cavity if work is approved.

RESPONSE:

SAT _____ **UNSAT** _____ **K/A NUMBER:** K/A 2.3.7 (2.0/3.3)

REFERENCES: AP-0502, "Radiation Work Permits", Rev. 32, Section 2.a
AP-0518, "Radiation Protection Requirements For The Drywell When The Reactor Is Shutdown", Rev.8, Section 5.b.1)b)

QUESTION: A.3.Q#1.b.

Following LRPM calibration using the TIP machines on the previous shift, the Maintenance Department requests permission to go into the TIP room to inspect the TIP tube connections on one of the machines that hung up momentarily during its last withdraw. What requirements must be established for access control to the room at this time? Why?

ANSWER:

Plant Manager and Radiation Protection Manager must provide permission for entry since TIPs have been in the core within the last 24 hours.

RESPONSE:

SAT _____ **UNSAT** _____ **K/A NUMBER:** K/A 2.3.10 (2.9/3.3)

REFERENCES: AP 0508, "Traversing In-Core Probe (TIP) Room Entry", Rev. 9, Admin Limit 2.b.

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Review Completed Surveillance And Take Action For Out Of Specification Data.
Failure Mode:	N/A
Reference:	OP-4124, "Residual Heat Removal System Surveillance Procedure", Rev.47
Task Number:	
Facility JPM #:	N/A

Task Performance: AO/RO/SRO __ RO/SRO __ SRO Only X

Sequence Critical: Yes __ No X

Time Critical: Yes __ No X

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation X Performance __ Discuss __

Setting: Classroom __ Simulator __ Plant X

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____________

Prepared by: ____________________ 12/23/98
Operations Training Instructor — Date

Reviewed by: ____________________ 12-23-98
SRO Licensed/Certified Reviewer — Date

Approved by: ____________________ 12/23/98
Operations Training Supervisor — Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: The RHR system surveillance for RHR "A" Loop has been submitted to you for review and signature.

Initiating Cues: Review the provided surveillance data and sign as the Shift Supervisor.

Task Standards: OOS closure time for RHR-65A valve noted on surveillance and T.S. 3.5.A.4.b identified.

Required Materials: - OP-4124, "Residual Heat Removal System Surveillance Procedure", Rev. 47
- VYOPF-4124.01, "RHR Valve Operability Test", Rev. 47
- VY Technical Specifications , LCO 3.5.A.4.b.

Simulator Setup: N/A

JPM Modification: N/A

Evaluation **Performance Steps**

TIME START: ____________

SAT/UNSAT **Step 1: Obtain Procedure OP-4124, Residual Heat Removal System Surveillance Procedure and review Procedure.**

Standard: OP-4124 obtained and reviewed.

Interim Cue: Provide completed VYOPF 4124.01 for RHR loop A.

SAT/UNSAT ***Step 2: Review log sheet data for sheets provided.**

Standard: Identifies RHR-65A closure time OOS.

Interim Cue: none

SAT/UNSAT ***Step 3: Reviews acceptance criteria 1. And 2. On log sheet.**

Standard: Slow closure time fails acceptance criteria 2..

Interim Cue: none

SAT/UNSAT ***Step 4: Declares RHR – 65A inoperable.**

Standard: Identifies OP-4124 criteria for operability.

Interim Cue: none.

SAT/UNSAT ***Step 5: Refer to Tech. Spec. section 3.5.**

Standard: Locates action 3.5.A.4.b. as applicable T.S.

Interim Cue: none

SAT/UNSAT ***Step 6:** **Identify LCO as seven day spec.**

Standard: Seven day LCO 3.5.A.4.b. identified

Interim Cue: none

TIME FINISH: ____________

Terminating Cue: Valve closure time identified as OOS and correct LCO entered.

Evaluators Comments:

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Off-Site Protective Action Recommendations.
Failure Mode:	N/A
Reference:	OP-3511 Off-Site Protective Action Recommendations
Task Number:	
Facility JPM #:	JPM-20037 (Modified)

Task Performance: AO/RO/SRO __ RO/SRO X SRO Only __

Sequence Critical: Yes __ No X

Time Critical: Yes __ No X

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance X Discuss __

Setting: Classroom __ Simulator __ Plant X

Performance Expected Completion Time: 15 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: ____________

Prepared by: ____________________ 12/23/98
Operations Training Instructor — Date

Reviewed by: ____________________ 12-23-98
SRO Licensed/Certified Reviewer — Date

Approved by: ____________________ 12/23/98
Operations Training Supervisor — Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **PLANT** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: A failure to scram transient has occurred resulting in fuel damage. Reactor power has been below 2% for two hours. A release through the stack has been occurring for almost two hours and Chemistry Stack silver zeolite samples have been taken however the results of this sample and field monitoring data is not yet available. ODPS is not available and the TSC is not yet fully staffed. A General Emergency has been declared and initial PARs have been issued.

Initiating Cues: As the PED make off-site PARs based on radiological dose information from the Nomogram given the attached data sheet.

Task Standards: PARs made for towns downwind 5 miles and remaining initial shelter recommendations retransmitted per initial PAR sheet.

Required Materials:
- OP-3511,VYOPF 3511.01 for initial PARs from GE classification(identifying shelter for Brattleboro, Guiford, Vernon, and Bernardston) ,
- OP-3513 including App.B, and Figure II (Vermont Yankee Emergency Dose Rate Nomogram)

Simulator Setup: N/A

JPM Modification: Modified initial plant conditions and provided data to complete rad assessment for a new wind direction. Also required re-transmittal of existing PARs from initial classification.

Evaluation **Performance Steps**

TIME START: ____________

SAT/UNSAT **Step 1: Obtain Procedure OP-3511 section II and review the precautions.**

Standard: OP-3511 obtained and precautions reviewed.

Interim Cue: none.

SAT/UNSAT **Step 2: Implement OP-3513 Section I.**

Standard: Obtain OP-3513 section I, review precautions and obtain VYOPF 3513.01.

Interim Cue: Provide operator with VYOPF 3513.01 from initial PARs and blank for new data.

SAT/UNSAT **Step 3:Obtain OP 3513 Appendix B.**

Standard: OP 3513 App. B located.

Interim Cue: Provide operator a blank copy of App. B for data.

SAT/UNSAT **Step 4: Record required data in App B per OP 3513**

Standard: Record:

- Date and time
- 2 Hour time since shutdown
- 2 mph upper wind speed
- 100 deg. Upper wind direction
- Maintain assumed stab. Class
- 2 E 4 mR/hr Stack High Range monitor reading
- 100,000 scfm Stack flow

Interim Cue: Provide data to candidate as each requested/needed.

SAT/UNSAT	***Step 5:**	**Use OP 3513 App. B Full Scale Nomogram to determine Site Boundary Dose Rate..**
	Standard:	Identifies 1.5 E 3 mR/hr Stack Site Boundary Dose Rate using Nomogram and record on App.B.
Interim Cue:	none	
SAT/UNSAT	***Step 6:**	**Calculate the Stack Site Boundary Dose using App. B.**
	Standard:	Calculates 3 R Stack Site Boundary Dose using Step 3 calculation and records on App. B.
Interim Cue:	none	
SAT/UNSAT	***Step 7:**	**Implement OP 3511 Section II Step A.2. to formulate PARs.**
	Standard:	Compares dose at site boundary with OP-3511 EPA guidelines and determines they are exceeded.
Interim Cue:	none	
SAT/UNSAT	***Step 8:**	**Choose the town affected by the PAR per OP 3511 step 2.b. and Table 5.**
	Standard:	Evacuate Guilford, Vernon and Hinsdale identified in sector E and recorded on VYOPF 3511.01 sheet in Section II.
Interim Cue:	none	
SAT/UNSAT	**Step 9:**	**Record PAR information from previous VYOPF 3511.01 in section I.**
	Standard:	Shelter Brattleboro and Bernardston identified and recorded on VYOPF 3511.01 Section I.
Interim Cue:	none	

TIME FINISH: ____________

Terminating Cue: Operator completes VYOPF 3511.01 with PARs completed..

Evaluators Comments:

SRO JPMs

Facility: Vermont Yankee **Date of Examination:** 01/25/99
Examination Level: SRO(I) **Operating Test No:** #2

System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description
1. Feedwater/Transfer Level Control Aux To Main Feed Reg Valve/D,S,L	2	a. 259002K410 - 3.4/3.4 - Power changes while in single element control
		b. 259001K301 - 3.9/3.9 - Loss of FRV control signal plant response
2. SBGT/Manually Initiate SBGT Train "A", does not reach rated flow/M,A,S	9	a. 261000K302 - 3.6/3.9 - Inop SBGT vs Secondary Containment Integrity
		b. 261000A304 - 3.0/3.1 - SBGT heater indications during an accident
3. AC Dist/Energize Bus 8 From Bus 9/ D,S	6	a. 215005K601 - 3.7/3.8 - Bus loss with inop APRMs
		b. 212000A412 - 3.9/3.9 - Reset SDV scram with loss of RPS bus
4. MHC/Swap From EPR To MPR/ N,S	3	a. 241000K607 - 3.4/3.4 - Effects of failed steam pressure signal on MPR
		b. 241000A409 - 3.2/3.1 - TCV/IV operations on slow and fast overspeed
5. CRD/Actions For Stuck Control Rod W/ PCV Failure/N,A,S	1	a. 201001G2.1.25 - 2.8/3.1 - Overcharging HCU accumulator effects
		b. 201001A308 - 3.0/2.9 - Rod insertions with failed stabilizing valve
6. PCIS/Reset A Group III Isolation/ D,S	5	a. 223002A403 - 3.6/3.5 - Attempted reset with failed valve switch contacts
		b. 223002K408 - 3.3/3.7 - RHR/SDC isolations from Alternate Shutdown Panels
7. HPCI/RPV Venting Via HPCI/ D,S	4	a. 295024K104 - 3.6/3.9 - Minimum RPV Flooding Pressure during Emergency Depress
		b. 295024G2.4.21 - 3.7/4.3 - Post ED SRV actions with lowering torus water level
8. RPS/Startup The "A" RPS MG Set/ D,P	7	a. 212000K602 - 3.7/3.9 - APRM vs RPS Tech Spec actions
		b. 212000G2.2.26 - 2.5/3.7 - RPS operable trips during refueling interlock checks
9. CTMT/Manually Open Containment Spray Valve/N,P,R	5	a. 223001G2.2.22 - 3.4/4.1 - Operability of manually operated MOV
		b. 223001A210 - 3.6/3.8 - Drywell leak location determination
10. SDC/Placing SDC Isolation Valve On Alternate Power/N,P	4	a. 295021A205 - 3.4/3.4 - Thermal stratification indications
		b. 295021G2.1.22 - 2.8/3.3 - Time to mode change on loss of SDC

* 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

Facility: Vermont Yankee	**Date of Examination:** 01/25/99
Examination Level: SRO(U)	**Operating Test No:** #3

System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description
1. Feedwater/Transfer Level Control Aux To Main Feed Reg Valve/D,S,L	2	a. 259002K410 - 3.4/3.4 - Power changes while in single element control
		b. 259001K301 - 3.9/3.9 - Loss of FRV control signal plant response
2. SBGT/Manually Initiate SBGT Train "A", does not reach rated flow/M,A,S	9	a. 261000K302 - 3.6/3.9 - Inop SBGT vs Secondary Containment Integrity
		b. 261000A304 - 3.0/3.1 - SBGT heater indications during an accident
3. N/A		a.
		b.
4. MHC/Swap From EPR To MPR/ N,S	3	a. 241000K607 - 3.4/3.4 - Effects of failed steam pressure signal on MPR
		b. 241000A409 - 3.2/3.1 - TCV/IV operations on slow and fast overspeed
5. N/A		a.
		b.
6. N/A		a.
		b.
7. N/A		a.
		b.
8. N/A		a.
		b.
9. CTMT/Manually Open Containment Spray Valve/N,P,R	5	a. 223001G2.2.22 - 3.4/4.1 - Operability of manually operated MOV
		b. 223001A210 - 3.6/3.8 - Drywell leak location determination
10. SDC/Placing SDC Isolation Valve On Alternate Power/N,P	4	a. 295021A205 - 3.4/3.4 - Thermal stratification indications
		b. 295021G2.1.22 - 2.8/3.3 - Time to mode change on loss of SDC

* 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

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Transfer Vessel Level Control From Auxiliary To Main Feedwater Regulator Valve
Failure Mode:	N/A
Reference:	OP 0105, "Reactor Operations", Rev. 4
Task Number:	
Facility JPM #:	JPM-25902, Rev. 4, Updated to latest procedure Rev

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes __ No _X_

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation ___ Performance _X_ Discuss ___

Setting: Classroom ___ Simulator _X_ Plant ___

Performance Expected Completion Time: 9 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: ____________

Prepared by:	[signature] Operations Training Instructor	12/23/98 Date
Reviewed by:	[signature] SRO Licensed/Certified Reviewer	12-23-98 Date
Approved by:	[signature] Operations Training Supervisor	12/23/98 Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: A plant startup is in progress

Initiating Cues: The SCRO directs you to transfer level control from the Auxiliary FRV to the "A" Main Feed Regulating Valve. The Aux FRV is approximately 80% open.

Task Standards: Reactor level control switched from Auxiliary to Main Feedwater Reg. Valve in accordance with OP 0105.

Required Materials: OP 0105, "Reactor Operations", Rev. 4

Simulator Setup: Low power IC. One feedwater pump running with the Auxiliary Feedwater Regulating Valve about 80% open

JPM Modification: N/A

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OP 0105, Phase 2, Section D.13, and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	OP 0105 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	**Step 2:**	**Check Vessel Level Control Mode Switch in 1 ELEMENT**
	Standard:	Single element/3 element switch in 1 ELEMENT on CRP 9-5 vertical board
SAT/UNSAT	***Step 3:**	**Check Rx Vessel Level Master Controller in MAN and Adjust Manual Pot to Zero (Full Closed)**
	Standard:	Controller verified in MAN and manual pot turned fully counter-clockwise on CRP 9-5 horizontal board
SAT/UNSAT	***Step 4:**	**Place "A" Feedwater Reg Valve FDW-12A Controller in BAL**
	Standard:	"A" FRV M/A station placed in BAL on CRP 9-5 horizontal panel
SAT/UNSAT	**Step 5:**	**Check Feedwater Reg Valve FDW-12B Controller in Manual and Pot at Zero**
	Standard:	"B" FRV M/A station checked in MAN and pot checked to zero (full counter-clockwise) position on CRP 9-5 horizontal panel
SAT/UNSAT	***Step 6:**	**Open FDW-11A Blocking Valve**
	Standard:	FDW-11A control switch placed in OPEN on CRP 9-5
SAT/UNSAT	**Step 7:**	**Verify FDW-11A OPEN**
	Standard:	Observes FDW-11A red light on, green light off on CRP 9-5

SAT/UNSAT **Step 8:** **Check the reactor level stable and the Auxiliary Feed Reg Valve compensates for leakage through the Main Feed Reg Valve**

Standard: Observes level indicators on CRP 9-5 are stable and Auxiliary Reg valve controlling level

SAT/UNSAT ***Step 9:** **Slowly Open the "A" Main Feed Reg Valve with the Rx Vessel Level Master Control Manual Pot**

Standard: Master control station manual pot turned slowly clockwise.

SAT/UNSAT **Step 10:** **Observe Auxiliary FRV FDW-13 Slowly Closing**

Standard: Observes valve position on Auxiliary FRV controller on CRP 9-5

SAT/UNSAT **Step 11:** **When Auxiliary Feed Reg Valve is Less than 20% Open Balance the Manual Pot**

Standard: Auxiliary FRV controller balanced on CRP 9-5

SAT/UNSAT **Step 12:** **Transfer Auxiliary FRV to MANUAL**

Standard: Auxiliary FRV controller placed in MANUAL

SAT/UNSAT ***Step 13:** **Fully Close the Auxiliary FRV**

Standard: Auxiliary FRV controller manual pot turned fully counter-clockwise

SAT/UNSAT **Step 14:** **Verify Auxiliary Reg Valve fully shut**

Standard: Observe FDW-13 valve indication green light ON, red light OFF on CRP 9-5

SAT/UNSAT **Step 15:** **Adjust Rx Vessel Level Master Controller to maintain level**

Standard: Level being adjusted by master controller pot on CRP 9-5

SAT/UNSAT **Step 16: Adjust the Setpoint Tape on the Rx Vessel Level Master Controller to Zero Deviation**

Standard: Setpoint tape adjusted to null indication

SAT/UNSAT ***Step 17: Switch Rx Vessel Level Master Controller to BAL**

Standard: Master FRV controller switched to BAL

TIME FINISH: ____________

Terminating Cue: Reactor level control switched from Auxiliary to Main Feedwater Reg. Valve in accordance with OP 0105.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: _1_

Due to a malfunction, the Feedwater Level Control system had to be placed in "Single Element" at 95% power and then a 20% rapid power reduction was made. How would the feed system and reactor water level respond?

EXPECTED ANSWER:

Level would rise as power is reduced then would slowly catch up to the demanded level but won't reach it until the power reduction is completed. (The feed system and reactor water level response would be very sluggish. A level dominant system.)

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 259002K410 3.4/3.4

REFERENCES: OP 2172, "Feedwater System", Rev. 20,

JPM QUESTIONS

QUESTION NO: 2

With the plant operating at 100% power, a loss of control signal to the "A" Feedwater Regulating Valve occurs. Assuming no operator actions taken, what would be the expected response of reactor water level and the Feedwater System over the next 20 minutes?

EXPECTED ANSWER:

Initially, the "A" FRV would lockup (fail as-is) and there would be no noticeable level or feedwater system changes. As time goes on, the "A" FRV would begin to drift open. The resulting reactor water level rise would be compensated for by the "B" FRV closing down with a net "zero" change in level. Eventually the "A" FRV would be fully open and the "B" FRV would be throttled in the "closed" direction with normal reactor water level.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 259001K301 3.9/3.9

REFERENCES: LOT-00-259, "Feedwater System", Rev. 12, Section III.E.1.d, Page 10

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Manually Initiate SBGT Train "A"
Failure Mode:	Does not reach rated flow
Reference:	OP 2117, "Standby Gas Treatment", Rev. 16
Task Number:	
Facility JPM #:	JPM-26101, Rev. 9, Modified

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes __ No _X_

Time Critical: Yes __ No _X_

Operator Performing Task: ______________________

Examiner: ______________________

Date of Evaluation: ______________

Method of Testing: Simulation ___ Performance _X_ Discuss ___

Setting: Classroom ___ Simulator _X_ Plant ___

Performance Expected Completion Time: 8 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: ______________

Prepared by: ______________________ 12/23/98
Operations Training Instructor — Date

Reviewed by: ______________________ 12-23-98
SRO Licensed/Certified Reviewer — Date

Approved by: ______________________ 12/23/98
Operations Training Supervisor — Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: The plant is operating at power, normal plant operation. The "B" SBGT Train is not available. There are no open Chemical Use Permits or Fire Permits.

Initiating Cues: The SCRO directs you to start Standby Gas Treatment Train "A" and take suction on the Reactor Building.

Task Standards: SBGT Train "A" manually started and taking a suction on the Reactor Building, failure to reach rated flow recognized and flow adjusted.

Required Materials: OP 2117, "Standby Gas Treatment", Rev.16
Figures I and II of OP 4117, Rev. 20
OP 2115, "Primary Containment", Rev. 40

Simulator Setup: Any "at-power" IC
Inop SBGT Train "B"
Call ERFIS
- Sensor Data
- ECCS Status
- SBGT "A" Status to be able to see fan start
- Analog out
  -- Set 18A2M01 @0.2, insert at fan start (500 cfm)
  -- When asked to throttle damper, insert 18A2M01 @0.35 (1000cfm)
  -- Then delete 18A2M01 to allow to go to normal value

JPM Modification: Modified to an alternate path JPM by failing flow requiring the operator to recognize SBGT not developing required flow.

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OP 2117, and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	OP 2117 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	**Step 2:**	**Check for open Chemical or Fire Permits for location and existing status of work.**
	Standard:	Checks on open Chemical or Fire permits.
Interim Cue:	If asked, per initial conditions, no Chemical Use permits or Fire permits are currently open.	
SAT/UNSAT	***Step 3:**	**Place REF-2A Fan Switch to the START Position on CRP 9-26**
	Standard:	SBGT Fan "A" Switch taken to START on CRP 9-26
SAT/UNSAT	**Step 4:**	**Verify SBGT A start**
	Standard:	Observes SBGT Fan "A" red light ON, green light OFF on CRP 9-26
SAT/UNSAT	**Step 5:**	**Verify SGT-2A OPEN**
	Standard:	Observes SGT-2A OPEN on CRP 9-26 red light ON, green light OFF
SAT/UNSAT	**Step 6:**	**Verify SGT-3A OPEN**
	Standard:	Observes SGT-3A OPEN on CRP 9-26, red light ON, green light OFF.
SAT/UNSAT	***Step 7:**	**Open SGT-1A**
	Standard:	SGT-1A handswitch on CRP 9-26 taken to OPEN

SAT/UNSAT **Step 8: Verify SGT-1A OPENS**

Standard: Operator observes SGT-1A red light ON, green light OFF on CRP 9-26

SAT/UNSAT **Step 9: Check that SGT-4A is closed**

Standard: Operator observes SGT-4A is closed on CRP 9-26, green light ON, red light OFF

SAT/UNSAT **Step 10: Close/check closed the idle SBGT Train inlet and outlet valves SGT-2B, SGT-3B**

Standard: Observes SGT-2B/3B CLOSED on CRP 9-26, red light OFF and green light ON.

SAT/UNSAT ***Step 11: Recognize Actual Flow is not between 1425 - 1500 CFM, inform SCRO**

Standard: Obtains indicated flow reading on CRP 9-26 and verifies actual flow as shown on Figure I of OP 4117, recognizes flow is less than 1425 cfm

Note: An indicated flow between 1263 and 1332 corresponds to an actual flow of 1425-1500. An indicated flow of 1300 is an actual flow of 1465.

Interim Cue: Acknowledge report as SCRO. Another operator will adjust SBGT flow to required value in accordance with the Surveillance procedure.

TIME FINISH: ____________

Terminating Cue: SBGT Train "A" manually started and taking a suction on the Reactor Building. SGT-4A closed with malfunction noted.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

With the plant operating at power, both trains of Standby Gas Treatment have been declared "Inoperable". What are the restrictions on continued plant operation for these conditions?

EXPECTED ANSWER:

With both SBGT "Inoperable", must immediately initiate procedures to ensure Secondary Containment Integrity is maintained to be completed within 24 hours (3.7.B.4) With both trains "Inop", cannot maintain Secondary Containment Integrity (3.7.C.1.a). Have an additional 4 hours to restore Secondary Containment Integrity (3.7.C.2). Then must be in Hot Shutdown within 12 hours and Cold Shutdown within following 24 hours (3.7.C.3).

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 261000K302 3.6/3.9

REFERENCES: Tech Specs 3.7.B and 3.7.C, Amendments 143 & 147, Pages 152 - 155a

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JPM QUESTIONS

QUESTION NO: 2

On a loss of coolant accident with fuel failure, both trains of Standby Gas Treatment have started and are operating normally. The "B" SBGT train is shutdown 30 minutes into the accident. 90 minutes into the accident the CRO checking indications on CRP 9-26 notes that BOTH the Heater Green Light and Red Light on the "A" SBGT train are illuminated. Is this an expected indication? Justify your answer.

EXPECTED ANSWER:

-- Yes, expected indication
-- Once the charcoal bed has reached operating temperature, the heaters will cycle off. With both lights on, the fan is running and a high temperature (150 degrees F) condition exists and the heater has cycled off.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 261000A304 3.0/3.1

REFERENCES: LOT-00-261, "Standby Gas Treatment", Rev. 19, Section IV.E.6, Pages 18 & 19

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Energize Bus 8 From Bus 9
Failure Mode:	N/A
Reference:	OP 2143, "480 And Lower Voltage AC System", Rev. 39
Task Number:	
Facility JPM #:	JPM-26208, Rev. 4, Updated to latest procedure Rev

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 5 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: ____________

Prepared by:	[signature] Operations Training Instructor	12/23/98 Date
Reviewed by:	[signature] SRO Licensed/Certified Reviewer	12-23-98 Date
Approved by:	[signature] Operations Training Supervisor	12/23/98 Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: The plant has experienced a fault that has caused a loss of 4KV Bus 3 while operating at power. All other power sources are operable. "A" FPC Pump, "A" RBCCW Pump and "B" TBCCW Pump are operating. The Vital MG is on DC drive and Switchyard control power is on ALT. Chemistry has been notified.

Initiating Cues: The SCRO directs you to energize 480 VAC Bus 8 from Bus 9.

Task Standards: Bus 8 is re-energized from Bus 9.

Required Materials: OP 2143, "480 And Lower Voltage AC System", Rev. 39

Simulator Setup: Any IC. Insert malfunction EDO4A (Bus 3 ground) and IDA EDR47 to ALT (Switchyard control power)

JPM Modification: N/A

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OP 2143, Section O and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	OP 2143 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	**Step 2:**	**Notify Chemistry that Stack Gas I, II and Stack Flow indicator FT-108-22 will be deenergized/inoperable. Inform SCRO of Tech Spec applicability**
	Standard:	Notifies Chemistry of power transfer and informs SCRO of Tech Spec concerns, given in initial conditions.
Interim Cue:	Acknowledge report as Chemistry. Inform operator that Tech Specs have been reviewed and applicable actions taken	
SAT/UNSAT	**Step 3:**	**Shift redundant equipment to Bus 9 to minimize Bus 8 loads**
	Standard:	Per initial conditions, verifies "A" FPC Pump, "A" RBCCW Pump and "B" TBCCW Pump running, the Vital MG Set on DC drive and Switchyard control power on ALT
Interim Cue:	If Auxiliary Operator called, inform operator that switchyard control power in on ALT	
SAT/UNSAT	**Step 4:**	**Secure Shutdown Cooling per OP 2124**
	Standard:	Per initial conditions verifies SDC secured
SAT/UNSAT	**Step 5:**	**Ensure that Bus 9 is energized**
	Standard:	Checks Bus 9 energized using voltage indication on CRP 9-8 or via appropriate breaker line-up
SAT/UNSAT	+***Step 6:**	**Open Breaker 88**
	Standard:	Places control switch for Breaker 88 to OPEN

SAT/UNSAT	**Step 7:**	**Verify Breaker 88 open and Bus 8 voltage zero**
	Standard:	Observes green light on, red light off, checks Bus 8 voltage on all three phases reading zero on CRP 9-8
SAT/UNSAT	**Step 8:**	**Enter the LCOs for the "A" DG, Bus 8 Inop and admin 24 hour Cold Shutdown while Bus 8 powered from Bus 9**
	Standard:	Informs SCRO of LCO requirements for these conditions
Interim Cue:	Acknowledge report as SCRO. Inform operator that Tech Specs have been reviewed and applicable actions taken.	
SAT/UNSAT	+***Step 9:**	**Close Breaker 8T9 from CRP 9-8**
	Standard:	Places switch for 8T9 to CLOSE and releases, observes red light on, green light off
SAT/UNSAT	+***Step 10:**	**Close Breaker 9T8 from CRP 9-8**
	Standard:	Places switch for 9T8 to CLOSE and releases, observes red light on, green light off
SAT/UNSAT	**Step 11:**	**Observe Bus 8 voltage approximately 480 VAC**
	Standard:	Checks Bus 8 voltage on all three phases reading 480 on CRP 9-8 by moving the Bus 8 Voltmeter Selector Switch from AB to BC and CA
SAT/UNSAT	**Step 12:**	**Return the "A" RPS MG Set to service**
	Standard:	Directs Aux Operator to place the "A" RPS MG Set in service.
Interim Cue:	When called, acknowledge order to place MG Set in service. Inform operator that another operator will complete the procedure.	

\+ **Step 6 must be done before Steps 9 & 10 but Steps 9 & 10 may be reversed**

TIME FINISH: ____________

Terminating Cue: Bus 8 is reenergized from Bus 9

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

The Caution associated with Step O.5 of OP 2143 states that: "If the number of operable LPRMs is less than 9 on APRM "D" or APRM "F", opening Breaker 88 will result in a full reactor scram." Why is this true? Why isn't APRM "C" included in this Caution?

EXPECTED ANSWER:

-- This transfer causes a loss of the "A" RPS MG Set and a half scram on "A" RPS. Less than 9 LPRMs on APRM "D" or "F" result in an Inop Trip (the other side's companion LPRMs have already been lost) and a half scram on "B" RPS giving a full scram.
-- APRM "C" doesn't lose any companion LPRMs thus no Inop trip.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 215005K601 3.7/3.8

REFERENCES: LOT-05-215, "Average Power Range Monitor", Rev. 13, Section VI.F.2, Page 30

JPM QUESTIONS

QUESTION NO: 2

Why must both RPS buses be energized in order to successfully reset the Scram Discharge Volume High Level Scram? Prove your answer?

EXPECTED ANSWER:

Both solenoids must be reenergized to reset the scram. The contacts are in series.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 212000A412 3.9/3.9

REFERENCES: LOT-00-212, "Reactor Protection System", Rev. 17, Section I.B. Page 37

CWD 830

DWG 5920-2119

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Swap Pressure Regulators (EPR to MPR)
Failure Mode:	N/A
Reference:	OP 2160, "Turbine Generator Support Systems Operation", Rev. 23
Task Number:	
Facility JPM #:	N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ______________________________

Examiner: ______________________________

Date of Evaluation: __________________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 8 minutes

Evaluation Results:

Performance: PASS __ FAIL __ Time Required: ____

Prepared by:	Operations Training Instructor	12/23/98 Date
Reviewed by:	SRO Licensed/Certified Reviewer	12-23-98 Date
Approved by:	Operations Training Supervisor	12/23/98 Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: - The plant is operating at power
- The White light for the EPR Regulator is lit.

Initiating Cues: The SCRO directs you to swap from the EPR Pressure Regulator to the MPR Pressure Regulator.

Task Standards: The MPR Pressure Regulator is placed in service in accordance with procedure OP 2160, Section B.1.

Required Materials: OP 2160, "Turbine Generator Support Systems Operation", Rev. 23

Simulator Setup: - 100% power
- EPR Regulator in service

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OP 2160 and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	OP 2160 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	Inform operator Prerequisites are SAT.	
SAT/UNSAT	**Step 2:**	**Verify MPR output stroke.**
	Standard:	Verify the MPR Output Stroke is approximately 10% below the EPR Output Stroke setting.
SAT/UNSAT	**Step 3:**	**Verify MPR bulb.**
	Standard:	Verifies the white light bulb for the MPR is good. (removes bulb and checks it/swaps bulb with one currently illuminated)
SAT/UNSAT	***Step 4:**	**Lower MPR Setpoint.**
	Standard:	Rotates the MPR Output Switch to the Lower Position and observes the MPR Output Stroke moves in the direction of the EPR Output Stroke setting, and continues to hold the switch until the MPR takes control.
SAT/UNSAT	**Step 5:**	**Verify the MPR has Pressure Control.**
	Standard:	Observes the white light on above the MPR Setpoint Switch, white light off above the EPR Setpoint switch, and Reactor Pressure stable on CRP 9-5.
SAT/UNSAT	**Step 6:**	**Adjust the EPR Setpoint.**
	Standard:	Rotates the EPR Setpoint control to the raise position until the EPR Output Stroke slowly decreases to zero.

SAT/UNSAT **Step 7:** **Report Pressure Regulators swapped.**

Standard: Notifies the SCRO that the MPR is in control.

Interim Cue: Acknowledge report as SCRO, if asked, placing the EPR in "Cutout" is not required.

TIME FINISH: ____________

Terminating Cue: The MPR Pressure Regulator is in service and controlling Reactor Pressure in accordance with procedure OP 2160, Section B.1.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

Assume the EPR is controlling pressure with the MPR acting as backup. Concerning the main steam pressure signal FROM the main steam line averaging manifold TO the Mechanical Pressure Regulator (MPR), explain why this signal to the MPR failing HIGH results in a reactor scram while this signal to the MPR failing LOW does not.

EXPECTED ANSWER:

-- The MPR is set at a higher pressure setpoint than the EPR. A high pressure input signal will cause the MPR to raise its output signal until it is greater than the normally controlling EPR. When its signal is greater than the EPR it will cause the Turbine Control Valves to open in an attempt to lower pressure. Low main steam line pressure with RMS in "Run" results in MSIV closure and reactor scram.

-- If a failed low main steam pressure input is sent to the MPR it will lower MPR output. Since the MPR is deliberately set to be at a lower setpoint than the EPR lowering the signal further will not affect the Turbine Control Valves because the EPR is in control. No large pressure change or reactor scram.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 241000K607 3.4/3.4

REFERENCES: LOT-00-249, "Mechanical Hydraulic Control System", Rev. 12, Section III.E.3.a & b. Pages 16 - 18

JPM QUESTIONS

QUESTION NO: 2

Why are "overspeed control valves" (Intercept Valves) placed between the High Pressure turbine and the two Low Pressure Turbines for steam control? Describe the expected response of the Turbine Control Valves and Intercept Valves on a turbine "slow" overspeed condition as opposed to a "fast" overspeed condition?

EXPECTED ANSWER:

-- Specifically designed to control steam admission to the low pressure turbines on "overspeed" transients when the Turbine Control Valves (supplying steam to the High Pressure Turbine) are already closed. Control of the large amount of high energy steam in the cross-around headers and moisture separators (between HP and LP turbines) is needed to prevent overspeeding an unloaded turbine.

-- On "slow" overspeed the TCV ramp closed from 100% to 105% speed, the IV then ramp closed from 105% to 107% speed

-- On a "fast" overspeed, the TCV will close at 100%, the IV will ramp closed from 100% to 103% speed.

ACTUAL ANSWER:

SAT ________ UNSAT ________

K/A NUMBER: 241000A409 3.2/3.1

REFERENCES: LOT-00-245, "Main Turbine", Rev. 11, Section III.C.3, Page 31

LOT-00-249, "Mechanical Hydraulic Control System", Rev. 12, TP- 8

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Actions for a stuck Control Rod
Failure Mode: CRD Pressure Control Valve Fails
Reference: ON 3143, "Stuck Control Rod", Rev. 6
ON 3145, "Loss Of CRD Regulating Function", Rev. 9
Task Number:
Facility JPM #: N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 15 minutes

Evaluation Results:

Performance: PASS __ FAIL __ Time Required: ____

Prepared by: ____________________ 12/23/98
Operations Training Instructor Date

Reviewed by: ____________________ 12-23-98
SRO Licensed/Certified Reviewer Date

Approved by: ____________________ 12/23/98
Operations Training Supervisor Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- The plant is operating at power.
- A control rod pattern adjustment is in progress
- Control rod 14-23 has just been discovered to be stuck at Notch 30.

Initiating Cues: The SCRO directs you to take the actions for the stuck control rod and attempt to free that rod.

Task Standards: The control rod is freed and the CRD Pressure control valve is bypassed in accordance with procedure ON 3143, and ON 3145 Step 8.

Required Materials: ON 3143, "Stuck Control Rod", Rev. 6
ON 3145, "Loss of CRD Regulating Function", Rev. 9

Simulator Setup:

- IC-19, Group 138, 93.7% power, 41.918 mlbm/hour flow
- Control Rod 14-23 selected and stuck at Notch 30
- CRD Pressure Control valve failed as-is.
- No insert or withdraw control rod blocks exist.
- Remove stuck rod when directed by evaluator
- Support operator requests for Aux Operator on bypassing the CRD PCV

- Analog out 03A1M11 @0.75
  03A1M13 @0.5
  03A1M17 @0.5

- May override lights on PCV and FCV

- When requested to isolate PCV-20
  Insert 03A1M11 @1.0
  Then 03A1M11 @0.83

- When requested to restore d/p
  Insert 03A1M11@0.75

Evaluation **Performance Steps**

TIME START: ____________

SAT/UNSAT **Step 1: Obtain Procedure ON 3143 and review.**

Standard: ON 3143 obtained and reviewed.

SAT/UNSAT **Step 2: Verify no rod blocks exist.**

Standard: Verifies that no control rod insert or withdraw blocks are present.

SAT/UNSAT **Step 3: Attempt a one rod notch insert and withdrawal with normal drive water pressure and monitor drive flow, drive pressure and Reactor Manual Control indications**

Standard: Places the Rod Movement Control Switch on CRP 9-5 to "Rod In" then to "Notch Out". Observes normal drive pressure, flow and RMCS indications but no rod movement, informs SCRO

SAT/UNSAT **Step 4: Raise drive water DP.**

Standard: At CRP 9-5, rotates the CRD Pressure Control Valve control switch to the closed position and observes drive water DP on DPI-3-303.

SAT/UNSAT ***Step 5: Recognize failure of the Pressure Control Valve to reposition.**

Standard: At CRP 9-5, observes no change in drive water DP and notifies the SCRO.

Interim Cue: Acknowledge the report and direct the operator to enter ON 3145.

SAT/UNSAT **Step 6: Obtain Procedure ON 3145 and review, determine that Section 8 actions are required.**

Standard: ON 3145 obtained and reviewed, takes actions IAW Section 8.

SAT/UNSAT **Step 7: Establish Communications with the drive water station.**

Standard: Operator dispatches an Aux Operator to the CRD Drive Water Station and establishes communications.

Interim Cue: Acknowledge order to dispatch an operator and inform the operator that communications are established with the drive water station.

SAT/UNSAT **Step 8: Isolate the Drive Water Pressure Control Valve.**

Standard: Directs the Plant Operator to isolate the Drive Water Pressure Control Valve CRD-PCV-20, by closing the Inlet Valve CRD-82.

Interim Cue: Acknowledge order and inform the operator that CRD-82 is closed.

NOTE: Have Simulator Operator remove stuck rod malfunction.

SAT/UNSAT **Step 9: Monitor drive water DP.**

Standard: At CRP 9-5, monitors drive water DP on DPI-3-303.

SAT/UNSAT ***Step 10: Obtain required drive water DP .**

Standard: Directs the Aux Operator to establish required drive water pressure 10-50 psid, by operating the bypass valve CRD-21.

Interim Cue: Acknowledge order and have the Simulator Operator raise Drive Water DP.

SAT/UNSAT **Step 11: Attempt to insert control rod 14-23 one notch.**

Standard: Rotates the Rod Movement Control Switch on CRP 9-5 to the "Rod In" position and observes control rod insert movement, then releases the switch when Notch 28 is observed and allows the rod to settle at Notch 28. Observes normal drive flow and RMCS indications, informs SCRO of successful rod movement.

Interim Cue: Acknowledge report as SCRO.

SAT/UNSAT **Step 12: Withdraw control rod 14-23 one notch.**

Standard: Rotates the Rod Movement Control Switch on CRP 9-5 to the "Notch Out" position and observes control rod insert movement, then releases the switch when Notch 30 is observed and allows the rod to settle at Notch 30. Observes normal drive flow and RMCS indications, informs SCRO of successful rod movement.

Interim Cue:	Acknowledge report as SCRO.

SAT/UNSAT **Step 13: Attempt to insert control rod 14-23 one notch.**

Standard: Rotates the Rod Movement Control Switch on CRP 9-5 to the "Rod In" position and observes control rod insert movement, then releases the switch when Notch 28 is observed and allows the rod to settle at Notch 28. Observes normal drive flow and RMCS indications

SAT/UNSAT **Step 14: Withdraw control rod 14-23 one notch.**

Standard: Rotates the Rod Movement Control Switch on CRP 9-5 to the "Notch Out" position and observes control rod insert movement, then releases the switch when Notch 30 is observed and allows the rod to settle at Notch 30. Observes normal drive flow and RMCS indications, informs SCRO

Interim Cue:	Inform operator that control rod withdrawals will stop here while additional troubleshooting is done on the CRD Pressure Control Valve. Direct the operator to return drive water pressure to normal.

SAT/UNSAT **Step 15: Return drive water DP to Normal.**

Standard: Directs the Aux Operator to reduce drive water pressure to 260 psid, by operating the bypass valve CRD-21. Observes Drive Water DP on DPI-3-303 returns to 260 psid.

Interim Cue:	Acknowledge order and have the Simulator Operator lower drive water DP. Inform operator that another operator will support troubleshooting.

TIME FINISH: ____________

Terminating Cue: Control rod 14-23 is freed and the CRD PCV is bypassed in accordance with procedure ON 3143 and 3145.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

The plant is making preparations for a reactor startup from a refueling outage. Reactor Building ambient temperature is 65 degrees F. The hydraulic control unit accumulators have been charged with nitrogen to a pressure of 620 psig. Several days later, with the plant at power, Reactor Building temperatures have stabilized at 91 degrees F

Which of the following describes the expected impact on the Control Rod Drive Hydraulic system operations for these conditions? Why is this true?

EXPECTED ANSWER:

-- Control rod scram speeds will be faster and may result in mechanism damage.
-- As RB heats up, accumulator operating pressure will be higher due to the higher (above limits allowed) starting pre-charge pressure. This results in a higher differential pressure across the operating piston on a reactor scram. Higher d/p gives faster scram speeds. Potential for mechanism damage.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 201001G2.1.25 2.8/3.1

REFERENCES: OP 2111, "Control Rod Drive System", Rev. 33, Section B and Tables 1 & 2, Pages 9 - 11

JPM QUESTIONS

QUESTION NO: 2

During a reactor shutdown, the CRO notes that control rod speeds seem slower than normal and the Aux Operator reports the CRD Flow Control Valve is stroking slightly closed while the rod is in motion. The FCV reopens when the rod stops. What is the cause of the slower rod speeds? Explain your answer.

EXPECTED ANSWER:

-- The in-service CRD Insert Stabilizing Valve has failed open.
-- If the Insert Stabilizing Valve has failed open, the 4 gpm flow required to insert control rods will not be diverted from cooling water. Instead, total demand from the CRD system will go up by 4 gpm and the FCV will attempt to momentarily reduce flow back to its setpoint. This will result in a small close, then reopen cycle of the FCV every time a rod is inserted.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 201001A308 3.0/2.9

REFERENCES: LOT-01-201, "Control Rod Drive Hydraulics", Rev. 15, II.C & TP-1, Page 11

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Reset Group III Isolation
Failure Mode:	N/A
Reference:	OP 2115, "Primary Containment", Rev. 40
Task Number:	
Facility JPM #:	JPM- 22303, Rev. 10, Updated to latest procedure Rev

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 12 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: ____________

Prepared by:	[signature] Operations Training Instructor	12/23/98 Date
Reviewed by:	[signature] SRO Licensed/Certified Reviewer	12-23-98 Date
Approved by:	[signature] Operations Training Supervisor	12/23/98 Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: A Group III isolation has occurred on high drywell pressure
Drywell pressure has been restored to less than 2.5 psig

Initiating Cues: The SCRO directs you to reset the Group III isolation logic (IAW OP 2115).

Task Standards: Group III isolation reset

Required Materials: OP 2115, "Primary Containment", Rev. 40

Simulator Setup: Any IC
Insert then delete malfunction RP05

JPM Modification: N/A

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OP 2115, Section G and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	OP 2115 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	***Step 2:**	**Place the control switch for CA-38A to the CLOSED position per Appendix D**
	Standard:	Control switch for CA-38A on CRP 9-3 in CLOSED
SAT/UNSAT	***Step 3:**	**Place the control switch for CA-38B to the CLOSED position per Appendix D**
	Standard:	Control switch for CA-38B on CRP 9-3 in CLOSED
SAT/UNSAT	***Step 4:**	**Place the control switch for SGT-6 to the CLOSED position per Appendix D**
	Standard:	Control switch for SGT-6 on CRP 9-3 in CLOSED
SAT/UNSAT	***Step 5:**	**Place the control switch for AC-7 to the CLOSED position per Appendix D**
	Standard:	Control switch for AC-7 on CRP 9-3 in CLOSED
SAT/UNSAT	***Step 6:**	**Place the control switch for AC-8 to the CLOSED position per Appendix D**
	Standard:	Control switch for AC-8 on CRP 9-3 in CLOSED

SAT/UNSAT **<u>*Step 7: Place the control switch for AC-9 to the CLOSED position per Appendix D</u>**

Standard: Control switch for AC-9 on CRP 9-3 in CLOSED

SAT/UNSAT **<u>*Step 8: Place the control switch for AC-10 to the CLOSED position per Appendix D</u>**

Standard: Control switch for AC-10 on CRP 9-3 in CLOSED

SAT/UNSAT **<u>*Step 9: Place the control switch for AC-6A to the CLOSED position per Appendix D</u>**

Standard: Control switch for AC-6A on CRP 9-3 in CLOSED

SAT/UNSAT **<u>*Step 10: Place the control switch for AC-6B to the CLOSED position per Appendix D</u>**

Standard: Control switch for AC-6B on CRP 9-3 in CLOSED

SAT/UNSAT **<u>*Step 11: Place the control switch for AC-7A to the CLOSED position per Appendix D</u>**

Standard: Control switch for AC-7A on CRP 9-3 in CLOSED

SAT/UNSAT **<u>*Step 12: Place the control switch for AC-7B to the CLOSED position per Appendix D</u>**

Standard: Control switch for AC-7B on CRP 9-3 in CLOSED

SAT/UNSAT **<u>*Step 13: Place the control switch for AC-20 to the CLOSED position per Appendix D</u>**

Standard: Control switch for AC-20 on CRP 9-3 in CLOSED

SAT/UNSAT **<u>*Step 14: Place the control switch for AC-22A to the CLOSED position per Appendix D</u>**

Standard: Control switch for AC-22A on CRP 9-3 in CLOSED

SAT/UNSAT **<u>*Step 15: Place the control switch for AC-22B to the CLOSED position per Appendix D</u>**

Standard: Control switch for AC-22B on CRP 9-3 in CLOSED

SAT/UNSAT **<u>*Step 16: Place the control switch for AC-23 to the CLOSED position per Appendix D</u>**

Standard: Control switch for AC-23 on CRP 9-3 in CLOSED

SAT/UNSAT **<u>*Step 17: Place the control switch for HVAC-9 to the CLOSED position per Appendix D</u>**

Standard: Control switch for HVAC-9 on CRP 9-26 in CLOSED

SAT/UNSAT **<u>*Step 18: Place the control switch for HVAC-10 to the CLOSED position per Appendix D</u>**

Standard: Control switch for HVAC-10 on CRP 9-26 in CLOSED

SAT/UNSAT **<u>*Step 19: Place the control switch for HVAC-11 to the CLOSED position per Appendix D</u>**

Standard: Control switch for HVAC-11on CRP 9-26 in CLOSED

SAT/UNSAT **<u>*Step 20: Place the control switch for HVAC-12 to the CLOSED position per Appendix D</u>**

Standard: Control switch for HVAC-12 on CRP 9-26 in CLOSED

SAT/UNSAT	***Step 21:**	**Place the control switches for VG-26, VG-23, VG-76A & VG-76B to the CLOSED position per Appendix D**
	Standard:	Control switches for VG-26, VG-23, VG-76A & VG-76B on CRP 9-26 in CLOSED
SAT/UNSAT	**Step 22:**	**Ensure the Reset Permissive Lights are lit**
	Standard:	Checks Reset Permissive Lights on CRP 9-5 are on, Group III red lights (Sys 1 and Sys 2) on lower right section of panel
SAT/UNSAT	***Step 23:**	**Reset the PCIS Logic when the signal has cleared**
	Standard:	Resets PCIS Logic by positioning the Reset Switch on CRP 9-5 to INBD then OUTBD or OUTBD then INBD
SAT/UNSAT	**Step 24:**	**Reset Containment Air Monitor isolation using PB 5 & 6**
	Standard:	Presses PB 5 & 6 (labeled VG-76A & VG-26 isolate reset/BG-76B & VG-23 isolation reset) on CRP 9-47.

TIME FINISH: ____________

Terminating Cue: Group III logic reset as indicated by isolation reset red light energized on CRP 9-3 mimic

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

During the reset of a PCIS Group 3 isolation, the "close" contacts on the switch did not make up for the AC-7A valve. How would this affect resetting the inboard isolation? What would be the indication of this failure? Is there any way to bypass this failure to allow resetting the inboard isolation? Explain your answers utilizing the actual contacts, relays, etc.

EXPECTED ANSWER:

-- The inboard isolation could not be reset. All inboard Group 3 valve switches must be in "Close" to satisfy the IOPC Logic. (The valve contacts are in series.) Inboard isolation will not reset.
-- The PCIS SYS 1 Reset Permissive red light on CRP 9-5 would not be received.
-- This failure cannot be bypassed other than by jumpering out the contacts for the valve switch.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 223002A403 3.6/3.5

REFERENCES: LOT-01-223, "Primary Containment Isolation System", Rev. 11, Section I.C.5 & TP-18, Page 36

JPM QUESTIONS

QUESTION NO: 2

Following a toxic gas problem the Control Room has been evacuated. Shutdown cooling has been established at the Alternate Shutdown Panels and RHR-18 has been placed on its alternate power supply (MCC-9B). A fouled RHR heat exchanger is resulting in rising reactor temperature and pressure. Assuming the pressure rise does not stop, what will be the response of the RHR system? Explain your answer.

EXPECTED ANSWER:

-- The normal RHR-17 isolation will not occur at 135 psig. RHR-18 will close and the RHR Pump will trip.
-- With the RHR Alternate Shutdown Transfer Switches in "Emergency" the RHR-17 isolations are bypassed and the RHR-18 isolations, except for high pressure, are bypassed. RHR-18 on MCC-9B does not affect this isolation.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 223002K408 3.3/3.7

REFERENCES: LOT-01-223, "Primary Containment Isolation System", Rev. 11, Section I.D.3 & TP-22, Pages 38 & 39

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	RPV Venting Via HPCI
Failure Mode:	N/A
Reference:	OE 3107, Appendix EE, "RPV Venting Via HPCI", Rev. 12
Task Number:	
Facility JPM #:	JPM-20045, Rev. 1, Updated to latest procedure Rev

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes __ No _X_

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____________

Prepared by: ____________________ 12/23/98
Operations Training Instructor Date

Reviewed by: ____________________ 12-23-98
SRO Licensed/Certified Reviewer Date

Approved by: ____________________ 12/23/98
Operations Training Supervisor Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: A plant transient has occurred and the SCRO has entered EOP-5, "RPV-ED", and is performing Emergency Depressurization. Only 2 SRVs can be opened. HPCI has been terminated per Appendix GG of OE 3107. Torus pressure is 18 psig.

Initiating Cues: The SCRO directs you to emergency depressurize via HPCI to the main condenser defeating interlocks as necessary per OE 3107, Appendix EE. The TSC concurs with this action and I&C is available for assistance.

Task Standards: The reactor vented via HPCI to the main condenser per Appendix EE

Required Materials: OE 3107, Appendix EE, "RPV Venting Via HPCI", Rev. 12

Simulator Setup: Any IC. Place remote function RPR24 to BYPASS. No HPCI initiation signals present.

JPM Modification: Provided some amplifying initial conditions.

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OE 3107, Appendix EE and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	OE 3107, Appendix EE obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	***Step 2:**	**Place HPCI Aux Oil Pump in Pull-To-Lock**
	Standard:	Places HPCI Aux Oil Pump P-85-1A control switch on CRP 9-3 in Pull-To-Lock
SAT/UNSAT	**Step 3:**	**Defeat Steam Supply HPCI-14 opening signal due to initiation logic**
	Standard:	Directs I&C to perform Step 2.a. of Appendix EE
	NOTE:	May not be performed based upon initial conditions and indications in the simulator
Interim Cue:	If directed, as I&C inform operator Step 2.a of Appendix EE is complete	
SAT/UNSAT	**Step 4:**	**Close or check closed Steam Supply HPCI-14**
	Standard:	Checks green light on, red light off for HPCI-14 on CRP 9-3
SAT/UNSAT	***Step 5:**	**Close or check closed Steam Line Drain HPCI-42**
	Standard:	Places HPCI-42 control switch to CLOSE, observes green light on, red light off on CRP 9-3
SAT/UNSAT	***Step 6:**	**Close or check closed Steam Line Drain HPCI-43**
	Standard:	Places HPCI-43 control switch to CLOSE, observes green light on, red light off on CRP 9-3

SAT/UNSAT ***Step 7: Defeat PCIS Group VI isolation interlocks for Steam Isolation HPCI - 15**

Standard: Directs I&C to perform Step 6 of Appendix EE

Interim Cue: When directed, as I&C inform operator Step 6 of Appendix EE is complete

SAT/UNSAT ***Step 8: Defeat PCIS Group VI isolation interlocks for Steam Isolation HPCI - 16**

Standard: Directs I&C to perform Step 7 of Appendix EE

Interim Cue: When directed, as I&C inform operator Step 7 of Appendix EE is complete

SAT/UNSAT **Step 9: Open or check open Steam Isolation HPCI-15**

Standard: Observes red light on, green light off for HPCI-15 on CRP 9-3

SAT/UNSAT **Step 10: Open or check open Steam Isolation HPCI-16**

Standard: Observes red light on, green light off for HPCI-16 on CRP 9-3

SAT/UNSAT ***Step 11: Open or check open Steam Trap Bypass HPCI-53**

Standard: Places HPCI-53 switch to OPEN on CRP 9-3, observes red light on, green light off

SAT/UNSAT ***Step 12: Open or check open Steam Line Drain HPCI-42**

Standard: Places HPCI-42 switch to OPEN on CRP 9-3, observes red light on, green light off

SAT/UNSAT ***Step 13: Open or check open Steam Line Drain HPCI-43**

Standard: Places HPCI-43 switch to OPEN on CRP 9-3, observes red light on, green light off

TIME FINISH: ____________

Terminating Cue: The reactor is vented through HPCI to the main condenser per Appendix EE.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

During the performance of RPV - Emergency Depressurization with only two (2) Safety Relief Valves open, what is the MAXIMUM allowed reactor pressure? Why shouldn't reactor pressure be allowed to rise above this limit?

EXPECTED ANSWER:

- 68 psig (50 psig above torus pressure)
- This value is the maximum pressure allowed to ensure the vessel is depressurized such that low pressure systems can inject for RPV flooding and there still will be sufficient steam flow for decay heat removal

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 295024A204 3.9/3.9

REFERENCES: EOP-5, "RPV-ED" Flowchart, Rev. Draft

BWROG EPGs/SAGs, Appendix B, Section 11, Step C2-1.3, Pages B-11-15 - B11-19

BWROG EPGs/SAGs, Appendix B, Section 17.23, Pages B-17-58 - B-17-60

JPM QUESTIONS

QUESTION NO: 2

Following an Emergency Depressurization in which all Safety Relief Valves were successfully opened, reactor pressure is 35 psig with a torus pressure of 9 psig. Torus water level subsequently lowers to less than 5.5 feet. What actions should be taken with the SRVs? Explain your answer?

EXPECTED ANSWER:

-- With the SRVs open and the reactor depressurized, the SRVs should be left open (even with level below their discharges)

-- Any additional energy going to the containment (with the discharges uncovered) is within the capacity of the containment vent. (Maintaining the reactor depressurized takes priority, any containment pressure problems can be controlled by venting.)

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 295024G2.4.21 3.7/4.3

REFERENCES: BWROG EPGs/SAGs, Appendix B, Section 11, Step C2-1.3, Pages B-11-16

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Startup The "A" RPS MG Set
Failure Mode:	N/A
Reference:	OP 2134, Reactor Protection System, Rev. 15
Task Number:	
Facility JPM #:	JPM-21202, Rev. 7, Updated to latest procedure Rev

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes __ No _X_

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation _X_ Performance __ Discuss __

Setting: Classroom __ Simulator __ Plant _X_

Performance Expected Completion Time: 15 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____________

Prepared by: ____________________ Operations Training Instructor — 12/23/98 Date

Reviewed by: ____________________ SRO Licensed/Certified Reviewer — 12-23-98 Date

Approved by: ____________________ Operations Training Supervisor — 12/23/98 Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: The "A" RPS MG Set is being returned to service after brush replacement. There is an operator available in the Control Room to assist you

Initiating Cues: The SCRO directs you to startup the "A" RPS MG set per OP 2134 Section1. Inform the SCRO when the MG set is ready to be placed in service.

Task Standards: "A" RPS MG Set running producing 118 +/- 1 volts
"A" RPS MG Set output beaker shut
Power Panels A-1 and A-2 breakers shut

Required Materials: OP 2134, Reactor Protection System, Rev. 15

Simulator Setup: N/A

JPM Modification: N/A

Evaluation	**Performance Steps**
	TIME START: ____________
SAT/UNSAT	**Step 1:** **Obtain Procedure OP 2134, Section 1 and review Admin Limits, Precautions, and Prerequisites.**
	Standard: OP 2134 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.
SAT/UNSAT	**Step 2:** **Check at CRP 9-15:**
	a. RPS Bus "A" Normal/Alternate selector switch in either ALT or Off
	b. "A" system power supply circuit breaker 5A-CB1A is ON
	c. Both scram test switches are positioned to NORMAL
	Standard: Contacts Control Room and requests verification that all switches and breakers are properly positioned
Interim Cue:	When requested, inform operator that OP 2134 Section 1, Step a. has been verified
SAT/UNSAT	***Step 3:** **Check power available to the MG Set from MCC 8A**
	Standard: Contacts Control Room and requests verification that power available to MG Set from MCC 8A
Interim Cue:	When requested, inform operator that power is available to the "A" RPS MG Set
SAT/UNSAT	**Step 4:** **Check MG 3-1A Output Breaker on local panel is OFF**
	Standard: Checks position of MG Set Output Breaker, observes breaker is OFF, DOWN position
Interim Cue:	When checked, inform operator that breaker is in the OFF, DOWN position.

SAT/UNSAT **Step 5: Check circuit breakers on RPS Power Protection Panels A1 and A2 are OFF**

Standard: Checks position of the RPS Power Protection Panel breakers, observes breakers are OFF, DOWN

Interim Cue: When checked, inform operator the breakers are OFF, DOWN

SAT/UNSAT ***Step 6: Press the Motor ON pushbutton on local control panel**

Standard: Simulates starting the "A" RPS MG Set, checks "Motor ON" red light ON

Interim Cue: When simulated, inform operator the pushbutton has been pushed, MG Set starting and coming to speed, Motor ON red light is on

SAT/UNSAT **Step 7: Check output voltage**

Standard: Checks MG Set output voltage on local panel "A-C Volts" meter after reaching operating speed

Interim Cue: When checked, inform operator voltage rising, now reading 119 volts

SAT/UNSAT ***Step 8: Close the MG Set Output Breaker**

Standard: Simulates operating the output breaker in the UP, CLOSED position

Interim Cue: When simulated closed, inform operator breaker is in the UP, CLOSED position

SAT/UNSAT **Step 9: Check Panel A-1 Power In lamp is ON**

Standard: Checks "Power In, Motor Gen" red light ON on Panel A-1

Interim Cue: When checked, inform operator Power In, Motor Gen red light on

SAT/UNSAT ***Step 10: Position Panel A-1 Output Breaker to OFF to reset it**

Standard: Simulates placing breaker in OFF

Interim Cue: When simulated OFF, inform operator breaker is OFF, DOWN.

SAT/UNSAT ***Step 11: Position Panel A-1 Output Breaker to ON**

Standard: Simulates placing breaker in ON

Interim Cue:	When simulated, inform operator breaker is ON, UP and that the "Power Out" light on Panel A-1 is on

SAT/UNSAT **Step 12: Check Panel A-2, "Power In PPP A-1" light is ON**

Standard: Checks "Power In" light on A-2 is ON

Interim Cue:	When checked, inform operator "Power In" light is on.

SAT/UNSAT **Step 13: Position Panel A-2 Output Breaker to OFF to reset it**

Standard: Simulates placing breaker in OFF

Interim Cue:	When simulated OFF, inform operator breaker is OFF, DOWN.

SAT/UNSAT ***Step 14: Position Panel A-2 Output Breaker to ON**

Standard: Simulates placing breaker in ON

Interim Cue:	When simulated, inform operator breaker is ON, UP and that the "Power Out" light on Panel A-2 is on

SAT/UNSAT **Step 15: Inform SCRO "A" RPS MG Set ready to be placed in service**

Standard: Makes report to SCRO

Interim Cue:	Acknowledge report as SCRO, inform operator another operator will place the MG Set in service

JPM QUESTIONS

QUESTION NO: _1_

The plant is operating at 100%. The "B" RPS Bus is deenergized due to a fault on the bus. APRM "A" is bypassed due to an "upscale" failure. I&C has just reported that the "C" ARPM High Flux Flow Biased scram setpoint is set non-conservatively high. What actions are required?

EXPECTED ANSWER:

-- Initiate insertion of operable control rods and complete insertion of all operable rods within 4 hours.

-- Place one RPS Trip system in "Trip" ("B" system already tripped), reduce power and place the Reactor Mode Switch in "Startup/Hot Standby" within 8 hours.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 212000K602 3.7/3.9

REFERENCES: Tech Spec 3.1 and Table 3.1.1., Amendment 61 & 94, Pages 21 - 24

JPM QUESTIONS

QUESTION NO: 2

The plant is shutdown for a refueling outage. The Refuel Interlock checks are in progress requiring the Reactor Mode Switch be placed in "Startup/Hot Standby". APRM power supply problems have resulted in the unavailability of the APRM High Flux Scram. What conditions must be met to complete the Refuel Interlock checks?

EXPECTED ANSWER:

-- The following trips must be "Operable": Reactor Mode Switch in "Shutdown", Manual Scram, High flux IRM scram, High Flux SRM scram in noncoincidence, SDV high water level scram and no more than two control rods can be withdrawn (rods that are withdrawn cannot be face adjacent or diagonally adjacent).

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 212000G2.2.26 2.5/3.7

REFERENCES: Tech Spec 3.1 and Table 3.1.1., Amendment 61 & 94, Pages 21 - 24

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Manually Open Containment Spray Valve
Failure Mode:	N/A
Reference:	OP 2124, "Residual Heat Removal System", Rev. 46
Task Number:	
Facility JPM #:	N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation _X_ Performance __ Discuss __

Setting: Classroom __ Simulator __ Plant _X_

Performance Expected Completion Time: 8 minutes

Evaluation Results:

Performance: PASS __ FAIL __ Time Required: ____

Prepared by: ____________________ 12/23/98
Operations Training Instructor — Date

Reviewed by: ____________________ 12-23-98
SRO Licensed/Certified Reviewer — Date

Approved by: ____________________ 12/23/98
Operations Training Supervisor — Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- A small break LOCA is in progress inside the Drywell.
- Torus Pressure is 9.5 psig.
- Drywell Pressure is 12 psig.
- EOP-3, "Primary Containment Control", has been entered for drywell pressure and temperature.
- RHR Pump "B" is being lined up for Drywell spray.
- The Outboard Drywell Spray valve, RHR-26B, has failed to open from the Control Room.

Initiating Cues: The SCRO directs you to open the Outboard Drywell Spray Valve, RHR-26B, inform the Control Room when the valve is open.

Task Standards: Drywell Spray Valve RHR-26B is opened in accordance with procedure OP 2124, Appendix E.

Required Materials: OP 2124, "Residual Heat Removal", Rev. 46, Appendix E

Simulator Setup: N/A

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OP 2124 and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	OP 2124 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	Inform operator Prerequisites are SAT.	
SAT/UNSAT	***Step 2:**	**Locate Outboard Drywell Spray Valve RHR-26B.**
	Standard:	Transits to Reactor Building 280' elevation and locates valve RHR-26B.
SAT/UNSAT	***Step 3:**	**Declutch the valve.**
	Standard:	Operator depresses the declutch lever on valve RHR-26B.
Interim Cue:	When valve operation simulated, inform operator declutch lever is depressed.	
SAT/UNSAT	***Step 4:**	**Open Drywell Spray Valve.**
	Standard:	Operator rotates the handwheel for RHR-26B in the counter clockwise direction
Interim Cue:	When valve operation simulated, inform operator the valve is opening freely; only moderate force is required to operate the valve.	
Interim Cue:	Inform operator the valve is fully open.	
SAT/UNSAT	**Step 5:**	**Notify the Control Room.**
	Standard:	Operator notifies the Control Room that RHR-26B is full open.
Interim Cue:	Acknowledge report as Control Room Operator.	

TIME FINISH: ____________

Terminating Cue: RHR-26B has been manually opened in accordance with procedure OP 2124, Appendix E, and the Control Room has been notified.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

What is the "operability" status of this valve after being opened? What must be done to make it "operable" once again? Include the documentation that must be completed for this valve.

EXPECTED ANSWER:

- -- Valve shall be declared "Inoperable"
- -- LCO would be "tracked" in the turnover logs (Per VYAPF 0152.02, Tech Spec Systems/Components Inoperable)
- -- Valve shall be electrically stroked at least one complete close/cycle and returned to the desired position
- -- Valve shall be declared "Operable"

ACTUAL ANSWER:

SAT ________ **UNSAT** ________

K/A NUMBER: 223001G2.2.22 3.4/4.1

REFERENCES: OT 3111, "High Drywell Pressure", Rev. 10, Section 6. Note, Page 2

VYAPF 0152.02, "Shift Turnover Logs - Tech Spec Systems/Components Inoperable", Rev. 21

JPM QUESTIONS

QUESTION NO: 2

Due to a small leak, drywell pressures/temperatures are slowly rising while at power. How would the location of the leak be determined? What drywell temperature and elevation is the operator cautioned regarding possible reactor water level indication errors?

EXPECTED ANSWER:

-- Performance of Drywell Temperature Profile Test, OP 4115, "Primary Containment Surveillance"
-- Temperatures above 215 degrees F below the 320 foot elevation.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 223001A210 3.6/3.8

REFERENCES: OT 3111, "High Drywell Pressure", Rev. 10, Section 5, Page 2

OP 4115, "Primary Containment Surveillance", Rev. 41, Section D & VYOPF 4115.05, Page 11

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Placing SDC Isolation Valve on Alternate Power
Failure Mode:	N/A
Reference:	OP 3126, "Shutdown Using Alternate Shutdown Methods", Rev. 15, Appendix F, "Instructions for RHR-18 Alternate Power Connection"
Task Number:	
Facility JPM #:	N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation _X_ Performance __ Discuss __

Setting: Classroom __ Simulator __ Plant _X_

Performance Expected Completion Time: 15 minutes

Evaluation Results:

Performance: PASS __ FAIL __ Time Required: ____

Prepared by: ____________________ 12/23/98
Operations Training Instructor — Date

Reviewed by: ____________________ 12-23-98
SRO Licensed/Certified Reviewer — Date

Approved by: ____________________ 12/23/98
Operations Training Supervisor — Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- The Main Control Room has just been evacuated.
- Power has been lost to MCC-8B due to a fire
- Alternate Shutdown Cooling is being lined up.

Initiating Cues: The SCRO directs you to lineup the alternate power supply for Shutdown Cooling Isolation Valve (V10-18) and supply power to the valve.

Task Standards: Power has been lined up to V10-18 from MCC-9B, in accordance with procedure OP 3126, Appendix F.

Required Materials: OP 3126, "Shutdown Using Alternate Shutdown Methods", Rev. 15, Appendix F, "Instructions for RHR-18 Alternate Power Connection"

Simulator Setup: N/A

Evaluation	Performance Steps
	TIME START: ____________
SAT/UNSAT	**Step 1: Obtain Procedure OP 3126, Appendix F, and review Admin Limits, Precautions, and Prerequisites.**
	Standard: OP 3126 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	Inform operator Prerequisites are SAT.
SAT/UNSAT	**Step 2: Verify the Standby Feeder Breaker is open.**
	Standard: At MCC-9B, cubicle 11KR, verifies the standby feeder breaker is open.
Interim Cue:	When breaker checked open, inform operator breaker is in Off, Down position
SAT/UNSAT	***Step 3: Open the breaker for V10-18.**
	Standard: At MCC-8B, cubicle 7F, opens breaker for V10-18.
Interim Cue:	When breaker simulated open, inform operator that the cub. 7F bkr. is in Off, Down position.
SAT/UNSAT	**Step 4: Locate the Feeder Cable from MCC-9B.**
	Standard: At MCC-8B, locates the feeder cable from MCC-9B in the junction box above MCC-8B.
Interim Cue:	When cable located, inform operator that the cable is in the junction box but is not installed. If checked, the other end of the cable is hooked to a spare breaker (Cubicle 11KR) in MCC-9B

SAT/UNSAT ***Step 5: Connect the Feeder Cable from MCC-9B.**

Standard: At MCC-8B, Cubicle 7F, connects the feeder cable from MCC-9B to the Load Side of the breaker.

Interim Cue: After connection simulated, inform the operator that the cable is connected to the load side (bottom) of breaker cubicle 7F.

SAT/UNSAT **Step 6: Verify Position of Appendix R Transfer Switches.**

Standard: Contacts SCRO RHR Alternate S/D panel, verifies the Appendix R Transfer Switches are in the Emergency Position.

Interim Cue: When contacted, inform operator all Appendix R Transfer Switches are in "Emergency"

SAT/UNSAT ***Step 7: Supply power to V10-18.**

Standard: At MCC-9B, cubicle 11KR, closes the standby feeder breaker to V10-18.

Interim Cue: When breaker simulated closed, inform the operator that the cubicle 11KR breaker is in the Up, On position

SAT/UNSAT **Step 8: Inform SCRO at RHR Alternate Shutdown Panel that V10-18 is powered and can be operated.**

Standard: Contacts SCRO, reports Appendix F is completed.

Interim Cue: Acknowledge report as SCRO

TIME FINISH: ____________

Terminating Cue: Power has been lined up to V10-18 from MCC-9B, in accordance with procedure OP 3126, Appendix F.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

The plant had been in Hot Shutdown with Shutdown Cooling in service. Following a trip of the running RHR Pump, forced circulation cannot be re-established. How can the operator determine if temperature stratification is occurring? Demonstrate how this is done. What would be the indications that stratification is occurring?

EXPECTED ANSWER:

- -- Temperature stratification may be detected by monitoring reactor vessel skin temperatures.
- -- Done by using TR 2-3-89 and TR 2-3-90.
- -- Wide variance in reactor vessel skin temperatures, location to location, top to bottom and around vessel circumference.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 295021A205 3.4/3.4

REFERENCES: ON 3156, "Loss Of Shutdown Cooling", Rev. 4, Section B.6, Page 4

JPM QUESTIONS

QUESTION NO: 2

The plant has had a loss of all means of Shutdown Cooling while in Cold Shutdown with the following conditions:

-- Temperature readings indicate a 1.5 degree F rise in reactor water temperature every 8 minutes
-- Current reactor temperature is 114 degrees F
-- The reactor vessel head is installed

Assuming no means of core cooling becomes available, when will the plant change modes?

EXPECTED ANSWER:

8 hours 42 minutes (+/- 5 minutes)

212 deg - 114 deg = 98 deg / 1.5 deg/8 min = 522.6 minutes / 60 min/hr = 8.71 hours = 8 hours 43 min

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 295021G2.1.22 2.8/3.3

REFERENCES: ON 3156, "Loss Of Shutdown Cooling", Rev. 4, Section B.7, Page 4

Tech Spec 1.0.V.1, Amendment 84, Page 3

RO UPMS

Facility: Vermont Yankee	**Date of Examination:** 01/25/99
Examination Level: RO	**Operating Test No:** #1

System / JPM Title / Type Codes*	Safety Function	Planned Follow-up Questions: K/A/G - Importance - Description
1. SDC/Restart SDC Following Short Term Shutdown/N,S,L	4	a. 205000K402 - 3.7/3.8 - SDC Isolation Switch operation
		b. 205000G2.4.48 - 3.5/3.8 - SDC flowpaths with idle recirc loop
2. PCIS/Group 5 Isolation Signal With Failure To Isolate/N, A,S	5	a. 223002K406 - 3.4/3.5 - PCIS vs other isolations, reset requirements
		b. 223002K607 - 3.2/3.3 - Reset MSIVs after loss of power to one solenoid
3. DG/Secure "A" DG From Op Readiness Demonstration - Monthly/D,S	6	a. 264000A201 - 3.5/3.6 - Logic print use to describe stopping DG from CR while loaded
		b. 264000G2.4.35 - 3.3/3.5 - Local actions for DG failure to start on a LNP
4. SBGT/Respond To Loss Of RB Vent W/ SGBT Failure/M,A,S	9	a. 261000A203 - 2.9/3.2 - Response to a high charcoal bed temperature
		b. 261000A401 - 3.2/4.0 - Purging via SBGT or RB Ventilation exhaust
5. Condensate/Emergency Fill The Main Condenser With Service Water/D,S	2	a. 256000G2.1.24 - 2.8/3.1 - SW Alternate Cooling vs condenser emergency fill
		b. 256000K604 - 2.8/2.8 - Loss of 4KV voltage protection affect on Condensate Pumps
6. RPS/Immediate Actions For Control Room Evacuation/N,S	7	a. 212000A212 - 4.0/4.1 - TSV input to RPS Logic
		b. 212000A412 - 3.9/3.9 - Half scrams vs SDV isolations
7. MHC/Perform Emergency Governor Test From CRP 9-7/D,S	3	a. 241000K413 - 2.9/3.0 - Prevention of turbine trip during testing
		b. 241000A107 - 3.8/3.7 - Bypass Jack operation while at power
8. SLC/Boron Injection Using CRD System From SLC Tank/N,P,R	1	a. 211000A10 - 4.0/4.1 - Flowpath SLC storage tank to reactor vessel for this lineup
		b. 211000G2.1.24 - 2.8/3.1 - How this lineup impacts CRD operation.
9. PCIS/Bypass PCIS Group I Isolation Signals/D,P	5	a. 223002K408 - 3.3/3.7 - One jumper not installed affect on isolation logic.
		b. 223001A302 - 3.5/3.5 - Separated MSIV disc, plant, PCIS, RPS response
10. RCIC/Operate RCIC From Alternate Shutdown Panel/M,P, R	2	a. 217000A301 - 3.5/3.5 - RCIC Min Flow Valve response at Alt Shutdown Panel
		b. 217000A207 - 3.1/3.1 - RCIC response to loss of oil pressure and why.

* 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

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Restart SDC following Short Term Shutdown
Failure Mode: N/A
Reference: OP 2124, "Residual Heat Removal System", Rev. 46
Task Number:
Facility JPM #: N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS __ FAIL __ Time Required: ____

Prepared by: ____________________ Operations Training Instructor — 12/23/98 Date

Reviewed by: ____________________ SRO Licensed/Certified Reviewer — 12-23-98 Date

Approved by: ____________________ Operations Training Supervisor — 12/23/98 Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- A Refuel Outage is in progress.
- A Core Offload has just been completed.
- The Reactor Water Cleanup is shutdown for outage work.
- Spent Fuel Pool temperature is 103 deg. F.
- The 'A' RHR Pump was secured from the Shutdown Cooling 15 minutes ago due to a scheduled evolution in the outage schedule.

Initiating Cues: The SCRO directs you to restart the 'A' RHR Pump in Shutdown Cooling IAW OP 2124, (Section N) and establish a flow of 6500 gpm.

Task Standards: The SDC Pump is restarted in accordance with procedure OP 2124, Section N.

Required Materials: OP 2124, "Residual Heat Removal", Rev. 46

Simulator Setup:
- Reactor Pressure below the Shutdown Cooling Isolation interlock.
- Reactor level >185 inches (or state a value in the initial conditions).
- Reactor temperature <190 deg. F (or state a value in the initial conditions).
- 'A' RHR Pump lined up in SDC and then secured per section N.1.

Evaluation | **Performance Steps**

TIME START: ____________

SAT/UNSAT

Step 1: Obtain Procedure OP 2124 and review Admin Limits, Precautions, and Prerequisites.

Standard: OP 2124 obtained, admin limits, precautions and prerequisites reviewed.

Interim Cue: Inform operator Prerequisites are SAT.

SAT/UNSAT

Step 2: Confirm RHR Outboard Injection Valve closed.

Standard: On CRP 9-3, observe RHR-27A closed, green light on, red light off

SAT/UNSAT

Step 3: Open the RHR Heat Exchanger Bypass Valve.

Standard: On CRP 9-3, open RHR-65A by placing the control switch to the Open position, observes red light on, green light off

SAT/UNSAT

Step 4: Control cooldown rate.

Standard: Upon RHR Pump start, adjusts the following valves as necessary to control cooldown rate:

- Hx Bypass RHR-65A(B)
- RHRSW Discharge RHR-87A(B)
- RHR Hx Inlet RHR-23A(B)

SAT/UNSAT

Step 5: Open the RHR Outboard Injection Valve.

Standard: On CRP 9-3, place the Control Switch for RHR-27A in the open Position for approximately one second and visually observe Red and Green light dual indication.

SAT/UNSAT

***Step 6: Start the 'A' RHR Pump.**

Standard: On CRP 9-3, place the Control Switch for the 'A' RHR pump to the Start position, observes red light on, green light off

SAT/UNSAT	***Step 7:**	**Establish SDC system flow rate.**
	Standard:	On CRP 9-3, throttle open the Outboard Injection Valve RHR-27A by taking the control switch to the Open position until a flow rate of >4100gpm is established
SAT/UNSAT	**Step 8:**	**Adjust RHR Service Water (RHRSW) discharge pressure.**
	Standard:	On CRP 9-3, throttle RHR-89A until RHRSW pressure is 20 psid above RHR pressure and RHRSW flow is less than or equal to 3050 gpm.

Interim Cue:	Inform operator that another operator will monitor cooldown from this point on.

TIME FINISH: ____________

Terminating Cue: The 'A' RHR Pump has been restarted in the SDC mode in accordance with procedure OP 2124, Section N.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

The RHR S/D Cooling Valves (RHR-17 & 18) Keylock Isolation Switch in the Radwaste Corridor has two positions, "Lockout" and "Open Permissive".

When is this switch is REQUIRED to be in "Lockout"? What is effect on the operation of Shutdown Cooling when it is in "Lockout"?

EXPECTED ANSWER:

-- When reactor pressure is greater than 100 psig
-- Prevents operation of the RHR Shutdown Cooling Isolation Valves (RHR-17 & 18) from the Main Control Room when at power (protects low pressure RHR piping), inadvertent operation during a fire (circuit failure), ensures that don't rely on SDC interlocks to keep valves closed if operated while at power

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 205000K402 3.7/3.8

REFERENCES: OP 2124, "Residual Heat Removal", Rev. 44, Section L.1, Page 29

JPM QUESTIONS

QUESTION NO: 2

Given that the "A" loop of RHR is in Shutdown Cooling with the suction from, and return to, the "A" Recirc Loop. The "B" Recirc loop is idle. Describe the Shutdown Cooling flowpath for this lineup? (A simple sketch may be useful.) While operating in this lineup, what prevents reverse flow through the "B" Recirc Loop Jet Pumps?

EXPECTED ANSWER:

-- Flowpath per P&ID G-191172 - From Recirc Pump suction through RHR Pump, RHR heat exchanger, back to discharge side of Recirc Pump, into jet pump rams to jet pump discharge, to lower vessel head region, up through the core and moisture separators to the core shroud annulus region into the Recirc Pump suction line (Candidate describes, preferably sketches this lineup, or traces flow path on P&IDs)

-- Reverse flow through idle Recirc loop jet pumps is prevented due to the high head loss presented by those pumps (easier for flow to go up through the core instead of the idle jet pumps)

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 205000G2.4.48 3.5/3.8

REFERENCES: P&ID G-191172

LOT-00-205, "Residual Heat Removal", Rev. 18, Section II.B.6.b.7), Page 17

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Group 5 Isolation Signal with a Failure of RCU to Isolate
Failure Mode:	CU-68 does not auto close on the isolation signal
Reference:	OP 2115, "Primary Containment", Rev. 40 & Operator Aid DP-0162
Task Number:	
Facility JPM #:	N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes __ No _X_

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 5 minutes

Evaluation Results:

Performance: PASS __ FAIL __ Time Required: ____

Prepared by:	[signature] Operations Training Instructor	12/23/98 Date
Reviewed by:	[signature] SRO Licensed/Certified Reviewer	12-23-98 Date
Approved by:	[signature] Operations Training Supervisor	12/23/98 Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- The plant is operating at power
- The RCU system had been in operation
- A Group 5 Containment isolation has occurred.

Initiating Cues: The SCRO directs you to backup the RCU System response to the Group 5 Containment Isolation.

Task Standards: The RCU System is isolated by observing CU-15 and 18 closed and manually closing CU-68. Also verify the running RWCU Pump trips.

Required Materials: OP 2115, "Primary Containment", Rev. 40 & Operator Aid DP-0162

Simulator Setup:
- IC-19
- RCU lined up for normal operation
- Insert Malfunction CU-05
- Override CU-68 open (Malfunction PC1CU68), allow it to close when the operator goes to "Close" on the control switch

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Refer to Operator Aid DP-0162.**
	Standard:	Reviews Operator Aid DP-0162
SAT/UNSAT	**Step 2:**	**Verify Reactor Outlet Valve isolated.**
	Standard:	Observe valve CU-15 closed. Green light on and Red light off.
SAT/UNSAT	**Step 3:**	**Verify Reactor Cleanup Inlet Valve isolated.**
	Standard:	Observe valve CU-18 closed. Green light on and Red light off.
SAT/UNSAT	***Step 4:**	**Recognize Reactor Cleanup Return Valve did not isolate, informs SCRO**
	Standard:	Recognizes valve CU-68 did not close, red light on, green light off, informs SCRO
Interim Cue:	Acknowledge report as SCRO.	
SAT/UNSAT	***Step 5:**	**Close Reactor Cleanup Return Valve.**
	Standard:	Places the control switch for CU-68 to the closed position and observes the valve go closed. Green light on and Red light off.
SAT/UNSAT	***Step 6:**	**Verify previously running RCU Pump tripped.**
	Standard:	Observes the previously running RCU Pump tripped. Green light on and Red light off.

TIME FINISH: ___________

Terminating Cue: The RCU System is isolated. CU-15, 18, and 68 are all closed. RCU Pump tripped.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: _1_

Assuming the cause of this isolation signal was a high temperature on the outlet of the non-regenerative heat exchanger (a non-PCIS isolation signal), how would the procedure to reset the isolation differ had it been caused by a PCIS isolation signal? What steps are necessary to reset the isolation? Assume the system isolated as designed.

EXPECTED ANSWER:

-- No difference in the effect on Reactor Water Cleanup and in the procedures to reset the isolation
-- Verify the initiating signal is clear, position the System Isolation Reset Switch to INBD then OUTBD.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 223002K406 3.4/3.5

REFERENCES: LOT-00-204, "Reactor Water Cleanup", Rev. 14, Section IV.B.1.f., Page 16

OP 2112, "Reactor Water Cleanup System", Rev. 28, Page 8

JPM QUESTIONS

QUESTION NO: 2

The plant was operating at 100% power when a reactor scram occurred. Electrical loads transferred to the Startup Transformer as required. During the transfer a voltage dip caused the Inboard Main Steam Isolation Valve (MSIV) AC solenoids to deenergize. What actions must be taken to reenergize these solenoids?

EXPECTED ANSWER:

Place the Group 1 Isolation Reset Switch to "INBD" and release.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 223002K607 3.2/3.3

REFERENCES: LOT-01-223, "Primary Containment Isolation System", Rev. 10, TP-10

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Secure From "A" Diesel Generator Operational Readiness Demonstration - Monthly
Failure Mode:	N/A
Reference:	OP 4126, "Diesel Generator Surveillance", Rev. 43
Task Number:	
Facility JPM #:	JPM-26402, Rev. 9, Updated to latest procedure Rev

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes __ No _X_

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation ___ Performance _X_ Discuss ___

Setting: Classroom ___ Simulator _X_ Plant ___

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: ____________

Prepared by:	Operations Training Instructor	12/23/98 Date
Reviewed by:	SRO Licensed/Certified Reviewer	12-23-98 Date
Approved by:	Operations Training Supervisor	12/23/98 Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: The "A" DG has been running for performance of the monthly operational readiness demo, paralleled to the Bus, for over eight hours; all surveillances are complete; "A" DG is ready be to secured.

Initiating Cues: The SCRO directs you to secure from Diesel Operational Readiness Demonstration Monthly Surveillance on the "A" DG per OP 4126.

Task Standards: "A" DG secured in accordance with OP 4126.

Required Materials: OP 4126, "Diesel Generator Surveillance", Rev. 43
VYOPF 4126.03 partially completed

Simulator Setup: Any IC. "A" DG running and loaded to 2500-2750 KW. Ensure droop set to 50 (IDA DGR02).

JPM Modification: N/A

Evaluation | **Performance Steps**

TIME START: ____________

SAT/UNSAT

Step 1: Obtain Procedure OP 4126, Section C.1 Step 36 and review Admin Limits, Precautions, and Prerequisites.

Standard: OP 4126, Section C.1 Step 36 obtained, admin limits, precautions and prerequisites reviewed.

Interim Cue:	If asked, all prerequisites have been met.

SAT/UNSAT

Step 2: Reduce generator load gradually to approximately 1200 - 1375 KV and Hold for 5 minutes

Standard: On CRP 9-8 horizontal panel, place the "A" diesel generator speed governor control switch to the lower position, on CRP 9-8 vertical panel, observe the "A" diesel generator KW meter lower to approximately 1200 - 1375 KW and held for 5 minutes.

Interim Cue:	If operator waits 5 minutes, inform operator that 5 minutes have elapsed (time compression).

SAT/UNSAT

***Step 3: Unload Generator to < 200 KW**

Standard: On CRP 9-8 horizontal panel, lowers generator load to less than 200 KW by placing the diesel generator speed governor control switch to lower, on CRP 9-8 vertical panel observes "A" DG KW meter indication for less than 200 KW

SAT/UNSAT

***Step 4: Open Generator Output Breaker**

Standard: On CRP 9-8 horizontal panel, places the "A" diesel generator output breaker control switch to the OPEN position.

SAT/UNSAT

Step 5: Verify the "A" Diesel Generator Output Breaker is Open

Standard: On CRP 9-8 horizontal panel, verifies the "A" DG output breaker is OPEN, green light on, red light off

SAT/UNSAT **Step 6: Run the DG unloaded for approximately one minute**

Standard: Monitors DG operation and runs unloaded for approximately one minute.

SAT/UNSAT **Step 7: Direct Aux Operator to locally reset the governor speed droop to "Zero"**

Standard: Directs Aux Operator to perform Step C.1.37.d of OP 4126

Interim Cue:	When directed, inform operator Step C.1.37.d of OP 4126 is complete

SAT/UNSAT **Step 8: Check Voltage and Frequency**

Standard: On CRP 9-8 vertical panel, verifies the voltage regulator maintaining the "A" DG voltage approximately 4160V and the governor maintaining frequency approximately 60 Hz

SAT/UNSAT **Step 9: Verify both Auto and Manual Voltage Regulators within Normal Range**

Standard: On CRP 9-8 horizontal panel, verifies the "A" DG auto and manual regulators are maintaining normal range (4000 - 4200V) as indicated by both white lights being ON for each regulator.

SAT/UNSAT **Step 10: Stop the "A" DG with Start/Stop Switch on CRP 9-8**

Standard: On CRP 9-8 horizontal panel, places the "A" DG start/stop switch to the STOP position.

SAT/UNSAT **Step 11: Verifies the "A" DG is stopped**

Standard: On CRP 9-8 horizontal panel, verifies the "A" DG is stopped by observing the start/stop control switch indicating lights, green light on, red light off

Interim Cue:	When/if requested, report as Aux Operator that the "A" DG has stopped

SAT/UNSAT	**Step 12:**	**Direct Aux Operator to complete "A" DG shutdown**
	Standard:	Directs Aux Operator to complete "A" DG shutdown starting with Step C.1.41.

Interim Cue:	When/if contacted, inform operator the Aux Operator will complete the shutdown procedure.

TIME FINISH: ____________

Terminating Cue: The "A" DG is secured IAW OP 4126

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

What would have happened if the "A" DG Start/Stop Switch on CRP 9-8 had been placed in "Stop" with load at 200 KW? Using appropriate logic drawings, show that this is an expected response.

EXPECTED ANSWER:

-- The Diesel Generator will continue to run loaded to 200 KW.
-- Per logic prints.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 264000A201 3.5/3.6

REFERENCES: LOT-00-264, "Emergency Diesel Generator", Rev. 16, Section I.B.1.f., Page 51

JPM QUESTIONS

QUESTION NO: 2

The "B" Emergency Diesel Generator failed to start on a valid Loss of Normal Power (LNP) signal. Assuming the cause of the failure to start is found and corrected, what are the MINIMUM actions required to allow the "B" DG to automatically start? Explain each step required.

EXPECTED ANSWER:

-- Place the Remote/At Engine control switch in "At Engine" to remove auto start capabilities, reset any lockout to clear trips, press the local Reset pushbutton on the engine instrument panel to reset the Shutdown Relay, wait 100 seconds for stopping relay to time out, place the Remote/At Engine control switch in "Remote" to enable auto start capabilities

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER:	264000G2.4.35 3.3/3.5
REFERENCES:	OP 4126, "Diesel Generator Surveillance", Rev. 43, Precaution 9, Page 6
	LOT-00-264, "Emergency Diesel Generator", Rev. 16, Section I.B.7, Pages 59 & 60

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Respond To Loss of Reactor Building Ventilation/SBGT Train Failure
Failure Mode:	SGT-2 & 3 failure to open on SBGT Train started
Reference:	OP 2116, Secondary Containment Integrity Control, Rev. 18
Task Number:	
Facility JPM #:	JPM-28801, Rev. 5, Modified

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes __ No _X_

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 8 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: ____________

Prepared by:	[signature] Operations Training Instructor	12/23/98 Date
Reviewed by:	[signature] SRO Licensed/Certified Reviewer	12-23-98 Date
Approved by:	[signature] Operations Training Supervisor	12/23/98 Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: The plant is operating at power. A loss of normal Reactor Building Ventilation has occurred due to both exhaust fans tripping. Electrical Maintenance is investigating and neither exhaust fan is available at this time.

Initiating Cues: The SCRO directs you to respond to the loss of Reactor Building HVAC IAW OP 2116 using the "B" SBGT train. Reactor Building Ventilation should remain isolated

Task Standards: SBGT "B" running and taking a suction on the Reactor Building after recognizing the failure of the SGT-2 and 3 to open.

Required Materials: OP 2116, Secondary Containment Integrity Control, Rev. 18
OP 2117, Standby Gas Treatment, Rev. 15

Simulator Setup: Any IC - have DW/Torus D/P on ERFIS Digital on CRP 9-6. Trip both Reactor Building Exhaust fans using malfunctions PCO2A and B. Override the SGT-2 & 3 and prevent them from opening on the first SBGT train started.

Meter for "B" - Analog Out 18A3M05 value "0"
SGT-2B light - Digital Out 18A20531 "On"
18A20532 "Off"
SGT-3B light - Digital Out 18A20521 "On"
18A20522 "Off"

JPM Modification: Made an alternate path JPM by failing the SGT-2B and 3B to open on the first train started.

Evaluation **Performance Steps**

TIME START: ____________

SAT/UNSAT **Step 1: Obtain Procedure OP 2116, Section G and review Admin Limits, Precautions, and Prerequisites.**

Standard: OP 2116 obtained, admin limits, precautions and prerequisites reviewed.

Interim Cue: If asked, all prerequisites have been met.

SAT/UNSAT ***Step 2: Close HVAC-9, 10, 11 & 12**

Standard: Places HVAC-9, 10, 11 & 12 to CLOSE, observes red light on, green light off for each valve on CRP 9-26

SAT/UNSAT **Step 3: Obtain Procedure OP 2117, Section B and review Admin Limits, Precautions, and Prerequisites**

Standard: OP 2117 obtained, admin limits, precautions and prerequisites reviewed.

SAT/UNSAT ***Step 4: Place SBGT Fan B, REF-2B to START**

Standard: Places SBGT "B" control switch to START, observes red light on, green light off for started fan on CRP 9-26

SAT/UNSAT ***Step 4: Recognize SGT-2B & SGT-3B failure to auto open, inform SCRO**

Standard: Recognizes SGT-2B & SGT-3B failure to auto open, may attempt to open the valves at that time, informs SCRO

Interim Cue: Acknowledge report as SCRO, direct attempt to open valves if not done already

SAT/UNSAT **Step 5: Attempt to open SGT-2B & SGT-3B, recognize failure to open, inform SCRO**

Standard: Recognizes SGT-2B & SGT-3B failure to open on CRP 9-26, informs SCRO

Interim Cue: Acknowledge report as SCRO, direct securing first Standby Gas Treatment train and starting the other

SAT/UNSAT	**Step 6:**	**Place SBGT Fan B, REF-2B to STOP**
	Standard:	Places SBGT "B" control switch to STOP, observes green light on, red light off for started fan on CRP 9-26
SAT/UNSAT	**Step 7:**	**Place SBGT Fan A, REF-2A to START**
	Standard:	Places SBGT "A" control switch to START, observes red light on, green light off for started fan on CRP 9-26
SAT/UNSAT	**Step 8:**	**Verify SGT-2A & SGT-3A open**
	Standard:	Checks valve positions, red lights on, green lights off on CRP 9-26
SAT/UNSAT	***Step 9:**	**Open valve SGT-1A**
	Standard:	Places SGT-1B control switch to OPEN, observes red light on, green light off on CRP 9-26
SAT/UNSAT	**Step 10:**	**Check valve SGT-4A closed**
	Standard:	Checks valve position, observes green light on, red light off
SAT/UNSAT	**Step 11:**	**Close/check closed valves SGT-2B and SGT-3B)**
	Standard:	Checks valve positions, observes green lights on, red lights off
SAT/UNSAT	**Step 12:**	**Verify actual flow between 1425 -1500 cfm**
	Standard:	Checks indicated flow and determines actual flow IAW Figures 1 & 2 of OP 4117 between 1425-1500 scfm
SAT/UNSAT	**Step 13:**	**Check that 9 KW duct heater SBGT-A ELECT HRT EUH-2 energized**
	Standard:	Checks heater energized, observes red light on, green light off on CRP 9-26
SAT/UNSAT	**Step 13:**	**Monitor Drywell-to-Torus DP**
	Standard:	Checks DP indication on ERFIS or panel and determines between 1.8 and 2.0 psid (OP 2115)

SAT/UNSAT	**Step 14:**	**Place RRUs on HVAC panel in MANUAL position as necessary**
	Standard:	Places RRUs 10, 11, 12 17A & B in MANUAL as necessary

Interim Cue:	Inform operator that another operator will complete the HVAC steps of OP 2116

TIME FINISH: ____________

Terminating Cue: Another operator will complete the HVAC steps of OP 2116.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

During a major loss of coolant accident with confirmed fuel failures, both trains of Standby Gas Treatment have started and are operating as designed. Due to the amount of Control Room activity, the SCRO does not order the "B" SBGT Train shutdown for 90 minutes after the accident. Once shutdown, how is this train protected from overheating from fission products trapped in the charcoal beds? Describe the lineup necessary to preclude overheating and identify what indications or alarms would prompt this action?.

EXPECTED ANSWER:

-- With the "A" SBGT Train operating, a flowpath is established through the "B" Train via SGT-4B and SGT-5. (The orifice upstream of SGT-4B limits flow to 250 scfm in this lineup.)
-- This lineup would be established by the operator per the alarm response procedures (9-3 R-7) on high temperature in the charcoal bed

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 261000A203 2.9/3.2

REFERENCES: Alarm Response Sheet 9-3 R-7, Rev. 3

LOT-00-261, "Standby Gas Treatment System", Rev. 19, Section V.C, Pages 23 & 24

JPM QUESTIONS

QUESTION NO: 2

Primary containment purge and vent valves are to be opened to de-inert the primary containment for a shutdown. What determines whether this venting can occur directly to the Reactor Building Ventilation Exhaust or should be via the Standby Gas Treatment system?

EXPECTED ANSWER:

Radiation Protection determination of the current levels of containment airborne radioactivity. If beyond limits (T.S. 3.8.L) shall purge via SBGT.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 261000A401 3.2/4.0

REFERENCES: Tech Spec 3.8.L, Amendment 151, Page 178

OP 2115, "Primary Containment", Rev. 28, Section C.1 Note, Page 13

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Lineup And Perform Emergency Fill Of The Main Condenser With Service Water
Failure Mode:	N/A
Reference:	RP 2170, "Condensate System", Rev. 19
Task Number:	
Facility JPM #:	JPM-20006, Rev. 5, Updated to latest procedure Rev

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes __ No _X_

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation ___ Performance _X_ Discuss ___

Setting: Classroom ___ Simulator _X_ Plant ___

Performance Expected Completion Time: 5 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: ____________

Prepared by:	Operations Training Instructor	12/23/98 Date
Reviewed by:	SRO Licensed/Certified Reviewer	12-23-98 Date
Approved by:	Operations Training Supervisor	12/23/98 Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: A loss of coolant accident has occurred with RCIC and HPCI not available.

Initiating Cues: The SCRO directs you to emergency fill the main condenser with Service Water.

Task Standards: Main condenser filling from Service Water.

Required Materials: RP 2170, "Condensate System", Section H, Rev. 19.

Simulator Setup: Any IC with LOCA inserted.

JPM Modification: N/A

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure RP 2170, and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	RP 2170 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	**Step 2:**	**Close the Drain, SW-56, between SW-55A and SW-55B**
	Standard:	Contacts Auxiliary Operator and directs performance of Step H.1 of RP 2170.
Interim Cue:	When contacted, inform operator that SW-56 has been closed	
	NOTE:	This step not required to be performed.
SAT/UNSAT	**Step 3:**	**Place a 4KV switchgear sync check handle in the control socket of SW-55B.**
	Standard:	4 KV switchgear Sync Check Handle from CRP 9-8 inserted into socket of SW-55B located on CRP 9-23.
SAT/UNSAT	***Step 4:**	**Open SW-55B.**
	Standard:	SW-55B opened by turning sync check handle to the right and releasing.
SAT/UNSAT	**Step 5:**	**Verify SW-55B Open.**
	Standard:	Verifies SW-55B Open, red light ON and green light OFF
SAT/UNSAT	**Step 6:**	**Place a 4KV switchgear sync check handle in the control socket of SW-55A.**
	Standard:	4 KV switchgear Sync Check Handle from CRP 9-8 inserted into socket of SW-55A located on CRP 9-23.

SAT/UNSAT	***Step 7:**	**Open SW-55A.**
	Standard:	SW-55A opened by turning sync check handle to the right and releasing.
SAT/UNSAT	**Step 8:**	**Verify SW-55A Open.**
	Standard:	Verifies SW-55A Open, red light ON and green light OFF
SAT/UNSAT	**Step 9:**	**Monitor hotwell level**
	Standard:	Verifies hotwell level rising.

Interim Cue:	When SW-55A and B open, inform operator that hotwell rising, and that another operator will continue monitoring level

TIME FINISH: ____________

Terminating Cue: Hotwell level increasing

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: _1_

Using the appropriate P&IDs, explain why this lineup cannot be accomplished with Service Water in the Alternate Cooling Mode of operation and the SW-20 valve closed.

EXPECTED ANSWER:

-- In the Alternate Cooling Mode of operation, a portion of the Service Water system needed to support selected heat loaded for long term cooling and shutdown following the loss of the Vernon Dam and Pond is provided cooling by the West Cooling Tower and basin. The remaining SW loads are manually isolated with SW-20. This includes the lines supplying the SW-55A and SW-55B valves.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 256000G2.1.24 2.8/3.1

REFERENCES: LOT-00-276, "Service Water", Rev. 14, Section IV.G.2 and TP-1, Pages 28 & 29

P&ID G-191159 Sheets 1 & 2

JPM QUESTIONS

QUESTION NO: 2

What will be the response of the "A" Condensate Pump if Bus 1 Feeder Breakers (Breaker 12 &13) are both open while operating at power? What is the purpose of this feature?

EXPECTED ANSWER:

-- The Condensate Pump will continue to run with lowering voltage but will not trip until bus voltage is less than 1000 VAC (or less than 70% voltage) and then a 2 minute time delay has expired at which time the breaker will open.
-- This helps bus voltage to rapidly decay before the breakers try to open under a load

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 256000K604 2.8/2.8

REFERENCES: LOT-01-262, "4 KV Electrical Distribution System", Rev. 15, Section II.E, Pages 17 & 18

LOT-00-256, "Condensate System", Rev. 17, Section IV.A.8.b, Page 23

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Immediate Actions for a Control Room Evacuation
Failure Mode: N/A
Reference: OP 3126, "Shutdown Using Alternate Shutdown Methods", Rev. 15
Task Number:
Facility JPM #: N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes __ No _X_

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 5 minutes

Evaluation Results:

Performance: PASS __ FAIL __ Time Required: ____

Prepared by: ____________________ Operations Training Instructor — 12/23/98 Date

Reviewed by: ____________________ SRO Licensed/Certified Reviewer — 12-23-98 Date

Approved by: ____________________ Operations Training Supervisor — 12/23/98 Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- The SCRO has determined that a Control Room evacuation is required.
- A Site Area Emergency has been declared and announced on the GAI-Tronics.
- Chemistry has been notified to make the Emergency Notifications.
- You are the only Control Room Operator available in the Control Room.

Initiating Cues: The SCRO directs you expedite taking the Immediate Actions for a Control Room evacuation and then leave immediately.

Task Standards: The Control Room is evacuated in accordance with procedure OP 3126, Section 3.

Required Materials: OP 3126, "Shutdown Using Alternate Shutdown Methods", Rev. 15

Simulator Setup: Any "at-power" IC

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OP 3126 and review.**
	Standard:	OP 3126 obtained.

NOTE: Immediate actions should normally be performed from memory.

SAT/UNSAT	***Step 2:**	**Manually scram the Reactor.**
	Standard:	Press both RPS Scram Pushbuttons.
SAT/UNSAT	***Step 3:**	**Trip the 'A' and 'B' Recirc Pumps.**
	Standard:	Place both Recirc Pump Drive Motor control switches to the Trip position.
SAT/UNSAT	***Step 4:**	**Close the MSIVs.**
	Standard:	Rotate each MSIV control switch (8) to the Closed position.
SAT/UNSAT	***Step 5:**	**Bypass ADS.**
	Standard:	Place the ADS Bypass control switch to the BYPASS Position.
SAT/UNSAT	***Step 6:**	**Place RHR "A" in Pull-to-Lock.**
	Standard:	Rotate the "A" RHR Pump control switch to the Pull to Lock Position.

SAT/UNSAT	***Step 7:**	**Place the HPCI Oil Pump in Pull-to-Lock.**
	Standard:	Rotate the "A" HPCI Oil Pump control switch to the Pull to Lock Position.
SAT/UNSAT	***Step 8:**	**Place the Reactor Feed Pumps in Pull-to-lock.**
	Standard:	Rotate each Reactor Feed Pump control switch to the Pull to Lock Position.
SAT/UNSAT	**Step 9:**	**Take the portable radios and exit the Control Room.**
	Standard:	Operator obtains the portable radios and exits the Control Room.

Interim Cue:	Inform operator that the portable radios have been obtained.

TIME FINISH: __________

Terminating Cue: The Control Room evacuation immediate actions have been completed in accordance with procedure OP 3126, Section 3.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

The plant is operating at 35% power with a trip inserted on RPS Subchannel "A1" due to a failed reactor pressure instrument. The #2 and #3 Turbine Stop Valves fail closed simultaneously. The plant continues operation at 35% power. Is EOP-2 entry required? Explain your answer.

EXPECTED ANSWER:

-- EOP-2 entry not required. No ATWS conditions exist.
-- TSV-2 and 3 closing do not cause a half scram on the "B" RPS Trip System.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 212000A212 4.0/4.1

REFERENCES: LOT-00-212, "Reactor Protection System", Rev. 17, TP-8

JPM QUESTIONS

QUESTION NO: 2

With the plant operating at 100% power, APRM Channel "B" fails full upscale. All expected automatic actions occur. What is the status of the Scram Discharge Volume Vent & Drain Valves for this failure? What is the difference if a manual half scram were inserted with the "B" Manual Scram pushbutton with the plant operating at 100% power. Explain your answer.

EXPECTED ANSWER:

-- The SDV Vent and Drain Valves remain open
-- SDV Vent and Drain Valves do not close on either an automatic or manual half scram.
-- The Scram Discharge Volume Vent & Drain Pilot Valve (31A & B) controls the air to all Vent & Drain Valves. Two solenoids in one body. Takes both de-energizing to position the pilot valve to vent the air.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 212000A412 3.9/3.9

REFERENCES: LOT-01-201, "Control Rod Drive Hydraulics", Rev. 15, Section III.J and TP-3, Page 29

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Perform The Emergency Governor Test From CRP 9-7
Failure Mode:	N/A
Reference:	OP 4160, "Turbine Generator Surveillance", Rev. 29
Task Number:	
Facility JPM #:	JPM-24501, Rev. 1, Updated to latest procedure Rev

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation __ Performance _X_ Discuss __

Setting: Classroom __ Simulator _X_ Plant __

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS ___ FAIL ___ Time Required: ____________

Prepared by:	[signature] Operations Training Instructor	12/23/98 Date
Reviewed by:	[signature] SRO Licensed/Certified Reviewer	12-23-98 Date
Approved by:	[signature] Operations Training Supervisor	12/23/98 Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Simulator** and you are to **perform** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: Plant is operating at power, normal turbine surveillances are being conducted.

Initiating Cues: The SCRO directs you perform the Emergency Governor Test from Control Room per OP 4160. (Provide VYOPF 4160.02 at this time). An Aux Operator is standing by at the turbine front standard in communication with the Control Room.

Task Standards: Emergency Governor tripped and reset per OP 4160.

Required Materials: OP 4160, "Turbine Generator Surveillance", Rev. 29

Simulator Setup: Any "at power" IC

JPM Modification: N/A

Evaluation	**Performance Steps**	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OP 4160, Section IV.D.1 and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	OP 4160 Section IV.D.1 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	***Step 2:**	**Pull EMERG GOVERNOR TRIP/TEST switch handle out.**
	Standard:	EMERG GOVERNOR TRIP/TEST handle on CRP 9-7 is pulled directly toward the operator.
SAT/UNSAT	**Step 3:**	**Verify Emergency Governor Lockout Indication Light comes on and stays on.**
	Standard:	Observes Red light to the left and above switch illuminates and stays on.
SAT/UNSAT	**Step 4:**	**Verify operator at the front standard has lockout indication.**
	Standard:	Contacts front standard operator for lockout condition at front standard.
Interim Cue:	When operator at CRP 9-7 has proper lockout indication, inform the operator that the front standard operator has lockout indication.	
SAT/UNSAT	***Step 5:**	**Turn switch to the TRIP position and hold.**
	Standard:	Switch is turned clockwise through RESET to TRIP and held.
SAT/UNSAT	**Step 6:**	**Verify Green trip light comes on and stays on while switch is held in TRIP position.**
	Standard:	Verifies green light directly above switch comes on and stays on.

SAT/UNSAT **Step 7: Verify RESET light goes out and stays out while switch is held in TRIP position.**

Standard: Verifies Red light above and to the right of switch goes out and stays out.

SAT/UNSAT **Step 8: Verify computer alarm typer prints, TURBINE TRIP - EMERG TRIP VALVE.**

Standard: Verify computer printout.

Interim Cue:	Since operator cannot leave panel to check alarm typer, if alarm typer prints EMERG TRIP VALVE TRIP inform operator as such.

SAT/UNSAT ***Step 9: Turn switch to RESET and hold.**

Standard: Switch is turned counter-clockwise to RESET position and held.

SAT/UNSAT **Step 10: Verify Green TRIP light goes out and stays out.**

Standard: Verifies that Green trip light goes out and remains out.

SAT/UNSAT **Step 11: Verify Red RESET light comes on and stays on.**

Standard: Operator verifies Red reset light comes on and remains on.

SAT/UNSAT **Step 12: Verify alarm typer prints TURBINE EMERG TRIP VALVE NORM.**

Standard: Verify computer printout.

Interim Cue:	Since operator cannot leave panel to verify computer printout if alarm typer prints TURBINE TRIP VALVE NORM, inform operator as such

SAT/UNSAT ***Step 13: Turn switch to vertical position.**

Standard: Switch turned counter-clockwise to the vertical position and not pushed in

SAT/UNSAT **Step 14: Verify Green TRIP light stays out.**

Standard: Verifies Green light remains off.

SAT/UNSAT **Step 15: Verify Red RESET light stays on.**

Standard: Operator verifies Red light remains on

SAT/UNSAT **Step 16: Verify alarm typer still indicates TURBINE EMERG TRIP VALVE NORM.**

Standard: Confirms alarm typer still indicates TURBINE EMERG TRIP VALVE NORM.

Interim Cue:	Since operator cannot leave the panel inform the operator that the typer still indicates TURBINE EMERG TRIP VALVE NORM

SAT/UNSAT **Step 17: Verify operator at the front standard has reset indication.**

Standard: Contacts front standard operator for status of reset indication at front standard.

Interim Cue:	If operator properly positions switch for reset light indication, inform the operator that the front standard operator has reset light indication

SAT/UNSAT ***Step 18: Push EMERG GOVERNOR TRIP/TEST switch to the normal position.**

Standard: Switch is pushed straight in.

SAT/UNSAT **Step 19: Verify Red LOCKOUT light goes out and stays out.**

Standard: Verifies Red light goes out and stays out.

SAT/UNSAT **Step 20: Verify operator at front standard observes the lockout is reset.**

Standard: Contacts front standard operator.

Interim Cue: When contacted, inform operator that the front standard operator has lockout reset.

SAT/UNSAT **Step 21: Record required data.**

Standard: Data recorded on VYOPF 4160.02

TIME FINISH: ____________

Terminating Cue: Emergency Governor tripped and reset per OP 4160.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: 1

During the performance of this test, what physically is preventing the turbine from tripping?

EXPECTED ANSWER:

The oil drain path from the Emergency Governor (Emergency Governor Trip/Test switch in Lockout) is blocked preventing a trip condition from draining the oil from the EG trip piston thus preventing the piston from lifting and tripping the trip lever,

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 241000K413 2.9/3.0

REFERENCES: LOT-00-249, "Mechanical Hydraulic Control System", Rev. 12, Section III.E.5.d.2).c), Page 23

JPM QUESTIONS

QUESTION NO: 2

With the plant operating at 100% power and 1000 psig, the Bypass Opening Jack switch shorts out to the "Raise" position resulting in the Bypass Valves opening. With no operator action, what is the expected MHC system response and the reason for that response?

EXPECTED ANSWER:

-- The control valves will open to the speed/load changer setting, then the bypass valves will open

-- The BPV Opening Jack going to raise initially sends the opening signal to the Control Valves until limited by the Control Valve Relay then the rising pressure signal will open the bypass valves. (The speed control signal and pressure signal are compared until the speed signal is limited by the Control Valve Relay at which time the pressure signal becomes controlling and opens the bypass valves.)

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 241000A107 3.8/3.7

REFERENCES: LOT-00-249, "Mechanical Hydraulic Control System", Rev. 12, Section III.E.4. and TP-2, Page 20

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Boron Injection Using the CRD System from the SLC Tank
Failure Mode:	N/A
Reference:	OE 3107, Appendix K, "Boron Injection Using CRD System from SLC Tank", Rev. 12
Task Number:	
Facility JPM #:	N/A

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes __ No _X_

Operator Performing Task: ______________________

Examiner: ______________________

Date of Evaluation: ______________

Method of Testing: Simulation _X_ Performance __ Discuss __

Setting: Classroom __ Simulator __ Plant _X_

Performance Expected Completion Time: 20 minutes

Evaluation Results:

Performance: PASS __ FAIL __ Time Required: ____

Prepared by: TB [signature] Operations Training Instructor — 12/23/98 Date

Reviewed by: [signature] SRO Licensed/Certified Reviewer — 12-23-98 Date

Approved by: [signature] Operations Training Supervisor — 12/23/98 Date

Directions:

Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions:
- An ATWS has occurred.
- The EOPs have been entered.
- The SLC Tank is available.
- CRD Pump "A" is in service and CRD Pump "B" is in standby.

Initiating Cues: The SCRO directs you to line up the CRD system for boron injection from the SLC Tank (IAW OE 3107, Appendix K). Inform the Control Room when the CRD Pumps can be started.

Task Standards: The SLC tank and CRD System are lined up to inject into the reactor vessel in accordance with procedure OP 3107, Appendix K.

Required Materials: OP 3107, Appendix K, "Boron Injection Using CRD System from SLC Tank", Rev. 12

Simulator Setup: N/A

Evaluation	**Performance Steps**	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OP 3107 Appendix K and review Prerequisites.**
	Standard:	OP 3107 obtained, prerequisites reviewed.
Interim Cue:	Inform operator Prerequisites are SAT.	
SAT/UNSAT	***Step 2:**	**Establish a flow path from the SLC Tank to the CRD Pumps.**
	Standard:	Route a hose from the SLC tank down the EOP SLC Pipe Chase On 318' elevation West, down through the EOP Pipe Chase on Elevations 303' and 280' and down through the equipment hatch on elevation 252' to the CRD Pumps.
Interim Cue:	As each step of hose routing is simulated, inform operator, hose has been routed.	
SAT/UNSAT	***Step 3:**	**Verify SLC Tank Drain Valve Closed.**
	Standard:	At the SLC Tank, verify SLC-23 closed.
Interim Cue:	When valve simulated checked, inform operator valve is fully clockwise	
SAT/UNSAT	***Step 4:**	**Remove Drain Valve Pipe Cap.**
	Standard:	At the SLC Tank, remove the pipe cap from the 1.5 inch tank drain.
Interim Cue:	As cap is simulated being removed, inform operator at each step of removal that step is completed.	

SAT/UNSAT ***Step 5: Connect a Drain Hose Adaptor.**

Standard: At the SLC Tank, connect a hose adaptor to the tank drain.

Interim Cue: As hose adapter is simulated being installed, inform operator at each step of installation that step is completed.

SAT/UNSAT ***Step 6: Connect the Suction Hose.**

Standard: At the SLC Tank, connect the CRD Pump suction hose to the SLC Tank drain line.

Interim Cue: As hose is simulated being installed, inform operator at each step of installation that step is completed.

SAT/UNSAT **Step 7: Place the SLC Tank Heater in service.**

Standard: On side of junction box, Rack 25-19 (RB 318'), place the SLC tank heater in service by rotating the control switch to the 'ON' position.

Interim Cue: When heaters simulated energized, inform operator heaters are on.

SAT/UNSAT ***Step 8: Verify DW Isolation to the CST Header Valve Closed.**

Standard: In the CRD pump room, verify DW-66 in the closed position.

Interim Cue: When valve simulated checked, inform operator valve is fully clockwise

SAT/UNSAT ***Step 9: Verify DW Isolation to the CST Header Valve Closed.**

Standard: In the CRD pump room, verify DW-65 in the closed position.

Interim Cue: When valve simulated checked, inform operator valve is fully clockwise

SAT/UNSAT ***Step 10: Remove the Check Valve Flange**

Standard: In the CRD pump (between DW-65 and 66), remove the top flange from check valve DW-67.

Interim Cue: As flange is simulated being removed, inform operator at each step of removal that step is completed.

SAT/UNSAT ***Step 11: Install a Mechanical Bypass Flange.**

Standard: In the CRD pump, install a mechanical bypass flange with a hose connection.

Interim Cue: As cap is simulated being installed, inform operator at each step of installation that step is completed.

SAT/UNSAT ***Step 12: Connect SLC Tank Hose.**

Standard: In the CRD pump, connect the SLC suction hose to the mechanical bypass Flange.

Interim Cue: As hose is simulated being installed, inform operator at each step of installation that step is completed.

SAT/UNSAT ***Step 13: Secure both CRD Pumps.**

Standard: Contact the Control Room and request both CRD Pumps be secured.

Interim Cue: When requested, inform operator that both CRD Pumps are secured.

SAT/UNSAT **Step 14: Verify both CRD Pumps secured.**

Standard: In the CRD pump, observe both CRD Pumps secured.

Interim Cue: When checked, inform operator that both pump are secured.

SAT/UNSAT ***Step 15: Close CST Suction Supply to the CRD Pumps.**

Standard: In the CRD pump, close valve CST-63C.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT ***Step 16: Open DW Isolation to CST Header Valve.**

Standard: In the CRD pump, open valve DW-66.

Interim Cue: When valve simulated opened, inform operator valve has been positioned fully counter-clockwise

SAT/UNSAT ***Step 17: Bypass the CRD Suction Filter.**

Standard: In the CRD pump, open CRD suction filter bypass valve CRD-158A or CRD-158B.

Interim Cue: When valve simulated opened, inform operator valve has been positioned fully counter-clockwise

NOTE: Either valve may be closed

SAT/UNSAT ***Step 18: Close the CRD Suction Filter Inlet Valve.**

Standard: In the CRD pump, close valve CRD-35A.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT ***Step 19: Close the CRD Suction Filter Inlet Valve.**

Standard: In the CRD pump, close valve CRD-35B.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT ***Step 20: Close CRD Pump Min Flow Valve.**

Standard: In the CRD pump, close valve CRD-37A.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT ***Step 21: Close CRD Pump Min Flow Valve.**

Standard: In the CRD pump, close valve CRD-37B.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT ***Step 22: Open the SLC Tank Drain Valve.**

Standard: AT the SLC Tank, open valve SLC-23.

Interim Cue: When valve simulated opened, inform operator valve has been positioned fully counter-clockwise

SAT/UNSAT ***Step 23: Vent the SLC to CRD Pump Suction Hose.**

Standard: In the CRD pump, open CRD Pump suction strainer drain valve CRD-151A(B) until no entrapped air is visible.

Interim Cue: When valve simulated opened, inform operator valve has been positioned counter-clockwise and that a steady stream of water has been obtained.

SAT/UNSAT ***Step 24: Close the Vent flow path**

Standard: In the CRD pump, close valve CRD-151A(B).

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT ***Step 25: Open CRD Pump Test Bypass Valve.**

Standard: At the CRD Flow Control Station, open valve CRD-40

Interim Cue: When valve simulated opened, inform operator valve has been positioned fully counter-clockwise

SAT/UNSAT ***Step 26: Open CRD Pump Test Bypass Valve.**

Standard: At the CRD Flow Control Station, open valve CRD-40A.

Interim Cue: When valve simulated opened, inform operator valve has been positioned fully counter-clockwise

SAT/UNSAT	***Step 27:**	**Close the CRD Drive Filter Inlet valve.**
	Standard:	At the CRD Flow Control Station, close valve CRD-42A.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT	***Step 28:**	**Close the CRD Drive Filter Inlet valve.**
	Standard:	At the CRD Flow Control Station, close valve CRD-42B.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT	***Step 29:**	**Close the CRD Cooling Water Pressure Control Station Discharge Valve.**
	Standard:	At the CRD Flow Control Station, close valve CRD-94.

Interim Cue: When valve simulated closed, inform operator valve has been positioned fully clockwise

SAT/UNSAT	**Step 30:**	**Start the CRD Pump(s).**
	Standard:	Contact the Control Room and report that the SLC Tank is lined up to the CRD System and the CRD Pumps may be started.

Interim Cue: Acknowledge report as the CRO, inform operator the "A" CRD Pump is being started.

TIME FINISH: ___________

Terminating Cue: The SLC Tank is lined up to the CRD System and ready for injection in accordance with procedure OP 3107, Appendix K.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: _1_

A hydraulic ATWS has occurred. RPS is currently reset and the Scram Discharge Volume is draining awaiting another manual scram attempt. With OE 3107, Appendix K completed, describe the injection flow path for SLC into the reactor vessel.

EXPECTED ANSWER:

From the discharge of the CRD pumps, SLC will bypass the entire CRD system and enter the reactor vessel via the Reactor Water Cleanup system return line.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 211000A109 4.0/4.1

REFERENCES: P&ID G-191170 and G-191171

JPM QUESTIONS

QUESTION NO: 2

Considering the multiple purposes of the Control Rod Drive Hydraulic system, how does this Appendix K lineup impact the ability of CRD to carry out its intended functions?

EXPECTED ANSWER:

With the CRD Pump Test Bypass Valves (CRD-40 and 40A) open and the Drive Water Filter Inlet Valves (CRD-42A and 42B) closed and CRD-94, normal CRD flow will be diverted resulting in a loss of Recirc Pump Seal purge, Reference Leg Keepfill, CRD cooling water, CRD drive water and CRD accumulator charging flow. (None of the CRD system operations associated with these flowpaths will be available.)

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 211000G2.1.24 2.8/3.1

REFERENCES: P&ID G-191170

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title: Bypassing Of PCIS Group I Isolation Signals
Failure Mode: N/A
Reference: OE 3107, Appendix P, "Bypassing Of PCIS Group I Isolation Signals", Rev. 12
Task Number:
Facility JPM #: JPM-20032, Rev. 8, Updated to latest procedure Rev

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes __ No _X_

Time Critical: Yes __ No _X_

Operator Performing Task: ____________________

Examiner: ____________________

Date of Evaluation: ____________

Method of Testing: Simulation _X_ Performance __ Discuss __

Setting: Classroom __ Simulator __ Plant _X_

Performance Expected Completion Time: 10 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: ____________

Prepared by: ____________________ 12/23/98
Operations Training Instructor — Date

Reviewed by: ____________________ 12-23-98
SRO Licensed/Certified Reviewer — Date

Approved by: ____________________ 12/23/98
Operations Training Supervisor — Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: A failure to scram has occurred. The SCRO has entered EOP-2, "ATWS-RPV Control". SLC is injecting and the main condenser is available with no indication of a steam leak or fuel failure. The MSIVs are open and EOP-2 directs performance of Appendix P of OE 3107. I&C assistance is NOT available.

Initiating Cues: The SCRO directs you to bypass Group I isolation signals per OE 3107 Appendix P.
NOTE:

DIRECT THE OPERATOR TO UTILIZE A FLASHLIGHT AS A POINTER WHEN INSIDE THE PANELS.

Task Standards: Group I isolation signals bypassed IAW OE 3107 Appendix P

Required Materials: EOP-2, "ATWS-RPV Control", Rev. Draft
OE 3107, Appendix P, Rev. 12
Flashlight or laser pointer
Banana to banana jumper wire

Simulator Setup: N/A

JPM Modification: Modified initial conditions to reflect EOP-2

Evaluation	Performance Steps	
	TIME START: ____________	
SAT/UNSAT	**Step 1:**	**Obtain Procedure OE 3107, Appendix P and review Admin Limits, Precautions, and Prerequisites.**
	Standard:	OP 3107 Appendix P obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.	
SAT/UNSAT	**Step 2:**	**Obtain the EOP toolbox or jumpers from the tool box**
	Standard:	Obtains the banana plug jumpers from the EOP tool box
Interim Cue:	When toolbox and appropriate jumpers located, inform operator they have jumpers in hand. DO NOT allow the operator to remove any items from the tool box.	
SAT/UNSAT	***Step 3:**	**In CRP 9-15 install a jumper from DD-20 to DD-19**
	Standard:	In the back of CRP 9-15, simulates installing a jumper from DD-20 to DD-19, located upper left side, from right-hand door. (Upper 1/4 of terminal strip)
Interim Cue:	When proper contacts located and proper installation technique simulated, inform operator the jumper is installed.	
SAT/UNSAT	***Step 4:**	**In CRP 9-15 install a jumper from BB-32 to BB-33**
	Standard:	In the back of CRP 9-15, simulates installing a jumper from BB-32 to BB-33, located upper right side, far left-hand door. (Upper 1/3 of terminal strip)
Interim Cue:	When proper contacts located and proper installation technique simulated, inform operator the jumper is installed.	

SAT/UNSAT ***Step 5: In CRP 9-17 install a jumper from DD-20 to DD-19**

Standard: In the back of CRP 9-17, simulates installing a jumper from DD-20 to DD-19, located upper left side, far right-hand door. (Upper 1/4 of terminal strip)

Interim Cue:	When proper contacts located and proper installation technique simulated, inform operator the jumper is installed.

SAT/UNSAT ***Step 6: In CRP 9-17 install a jumper from BB-20 to BB-19**

Standard: In the back of CRP 9-17, simulates installing a jumper from BB-20 to BB-19, located upper right side, far left-hand door. (Upper 1/4 of terminal strip)

Interim Cue:	When proper contacts located and proper installation technique simulated, inform operator the jumper is installed.

SAT/UNSAT **Step 7: Verify that the following isolation valves are OPEN, MS-80A, B, C, and D**

Standard: At CRP 9-3, operator verifies the Inboard MSIVs are OPEN:

____ MS-80A
____ MS-80B
____ MS-80C
____ MS-80D

Interim Cue:	When proper valves located, inform operator MS-80 A, B, C, D red lights on, green lights are off

SAT/UNSAT **Step 8:** **Verify that the following isolation valves are OPEN, MS-86A, B, C, and D**

Standard: At CRP 9-3, operator verifies the Outboard MSIVs are OPEN:

____ MS-86A
____ MS-86B
____ MS-86C
____ MS-86D

Interim Cue:	When proper valves located, inform operator MS-86 A, B, C, D red lights on, green lights are off

TIME FINISH: ____________

Terminating Cue: PCIS Group I isolation signals bypassed (jumpers installed)

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: _1_

If the jumper between terminal strip locations BB-32 and BB-33 in CRP 9-15 had NOT been installed (Step 1.a.2)) and reactor water level subsequently lowered to 75 inches, what would be the response of the MSIVs? Confirm your answer utilizing logic prints. Assume the other 3 jumpers were correctly installed.

EXPECTED ANSWER:

The MSIVs ~~should~~ remain open. Installing three jumpers should still defeat the needed “one-out-of-two-taken-twice” ~~logic~~ for an isolation.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER:	223002K408	3.3/3.7
REFERENCES:	PCIS Group 1 Isolation logic print, CWD 1100, 1101, 1102, 1103, 1108	

JPM QUESTIONS

QUESTION NO: 2

With the plant operating at 50% power a MSIV disk separates from the stem. The disk closes but the stem remains in position. What will be the expected plant response? Include plant parameters and the expected RPS and/or PCIS alarms and actions. What actions should be take upon diagnosis of this failure?

EXPECTED ANSWER:

-- Reactor pressure rise, reactor power rises, 3 steam line flows rise and failed MSIV line flow goes to "zero"
-- Should be no PCIS or RPS setpoints exceeded on a transient at this power level
-- Close both MSIVs in that line. (Primary Containment Integrity and RPS input)

Note: This is not clearly discussed in these technical specifications but the applicant should review these sections.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 223001A302 3.5/3.5

REFERENCES: OT 3116, "High Reactor Pressure", Rev. 6, Section FOA 3.

Tech Spec 3.1.A, 3.2.G & 3.7.D

VERMONT YANKEE NUCLEAR POWER CORPORATION
JOB PERFORMANCE MEASURE
WORKSHEET

Task Identification:

Title:	Operate RCIC From The Alternate Shutdown Panel
Failure Mode:	N/A
Reference:	OP 3126, Shutdown Using Alternate Shutdown Methods, Rev. 15.
Task Number:	
Facility JPM #:	JPM-21701, Rev. 8, Modified

Task Performance: AO/RO/SRO __ RO/SRO _X_ SRO Only __

Sequence Critical: Yes _X_ No __

Time Critical: Yes ___ No _X_

Operator Performing Task: ______________________________

Examiner: ____

Date of Evaluation: __________________

Method of Testing: Simulation _X_ Performance ___ Discuss ___

Setting: Classroom ___ Simulator ___ Plant _X_

Performance Expected Completion Time: 20 minutes

Evaluation Results:

Performance: PASS ____ FAIL ____ Time Required: _________________

Prepared by: ______________________________ 12/23/98
Operations Training Instructor — Date

Reviewed by: ______________________________ 12-23-98
SRO/Licensed/Certified Reviewer — Date

Approved by: ______________________________ 12/23/98
Operations Training Supervisor — Date

Directions: Discuss the information given on this page with the operator being evaluated. Allow time for him to ask questions before beginning performance of the task. As each performance step is performed, evaluate the performance of that step by circling either "Sat" or "Unsat". Comments are required for any "Unsat" classification. If a step is preceded by an asterisk (*), it is a critical step. If a critical step is skipped or performed unsatisfactorily, then the operator has failed the Job Performance Measure.

After providing the initiating cue, ask the operator "Do you understand the task?"

Read to the person being evaluated:

Before starting, I will explain the initial conditions, provide the initiating cues and answer any questions you have.

This JPM will be performed in the **Plant** and you are to **simulate** the actions.

You are requested to **"talk through"** the procedure, stating the parameters you are verifying or checking and the steps you are performing.

Inform me upon completion of this task.

Initial Conditions: The Control Room is inaccessible. All OP 3126 Immediate Actions have been completed prior to evacuating the Control Room. HPCI-24 is open. The reactor has been scrammed.

Initiating Cues: The SCRO has appointed you as Operator #3 and directs you to inject RCIC to raise reactor water level from the Alternate Shutdown Panel IAW OP 3126 (Appendix C). Inform the SCRO when you are injecting.

Task Standards: Reactor water level rising with RCIC injecting IAW OP 3126.

Required Materials: OP 3126, Shutdown Using Alternate Methods, Rev. 15

Simulator Setup: N/A

JPM Modification: Converted from simulator to in-plant JPM, condensed several steps, stopped JPM when operator reports injecting

Evaluation	**Performance Steps**
	TIME START: ____________
SAT/UNSAT	**Step 1:** **Obtain Procedure OP 3126, Appendix C and review Admin Limits, Precautions, and Prerequisites.**
	Standard: OP 3126 obtained, admin limits, precautions and prerequisites reviewed.
Interim Cue:	If asked, all prerequisites have been met.
SAT/UNSAT	**Step 2:** **Place MTS-13-2 to EMERGENCY**
	Standard: Simulates rotating MTS-13-2 switch counter-clockwise to EMERGENCY position
Interim Cue:	When simulated in EMERGENCY, inform operator switch is positioned counter-clockwise to EMERGENCY
SAT/UNSAT	***Step 3:** **Place both transfer switches on CP-82-3 to EMERGENCY**
	Standard: Simulates placing CP-82-3 transfer switches in EMERGENCY
Interim Cue:	When simulated in EMERGENCY, inform operator both transfer switches are positioned to EMERGENCY
SAT/UNSAT	**Step 4:** **Open RCIC-15 & 16**
	Standard: Simulates opening RCIC-15 & 16
Interim Cue:	When simulated open, inform operator that both valves indicate open.
SAT/UNSAT	**Step 5:** **In the HPCI Room, open the HPCI Aux Oil Pump ACB on DC-1B.**
	Standard: Simulates opening the HPCI Aux Oil Pump breaker
Interim Cue:	When simulated open, inform operator the breaker is open, down

SAT/UNSAT **Step 6:** **At RCIC Room SRV control panel (213' level), check SRV-71A & 71B control switches are in the close position**

Standard: Checks SRV switch positions

Interim Cue:	When checked, inform operator switches are both in closed position.

SAT/UNSAT **Step 7:** **At RCIC corner room (232' level), places the alternate shutdown transfer switch for SRV-71A and 71B to EMERGENCY.**

Standard: Simulates placing the transfer switch for SRV-71A and 71B to EMERGENCY.

Interim Cue:	When simulated in EMERGENCY, inform operator the switch is in EMERGENCY

SAT/UNSAT **Step 8:** **Place MTS-13-1 to EMERGENCY**

Standard: Simulates rotating MTS-13-1 switch counter-clockwise to EMERGENCY position

Interim Cue:	When simulated in EMERGENCY, inform operator switch is positioned counter-clockwise to EMERGENCY

SAT/UNSAT **+*Step 9:** **Place 3 transfer switches on RCIC shutdown panel (CP-82-1) to EMERGENCY in the following sequence: SS1178A, SS1178B, SS1178C.**

Standard: Simulates placing the three RCIC transfer switches in EMERGENCY in the proper sequence.

Interim Cue:	When simulated in EMERGENCY, inform operator the three switches are in EMERGENCY

SAT/UNSAT **Step 10:** **Close SRV control power knifeswitch in panel 1300BS11.**

Standard: Simulates closing the SRV control power knifeswitch.

Interim Cue:	When simulated closed, inform operator knifeswitch is closed.

SAT/UNSAT	**Step 11:**	**Replace RCIC shutdown panel fuses if necessary**
	Standard:	Checks RCIC indications on CP-82-1. Determines no fuse replacement necessary.
Interim Cue:	When/if checked, inform operator all indications on panel are normal.	
SAT/UNSAT	***Step 12:**	**Open RCIC-132, Cooling Water Valve**
	Standard:	Simulates placing RCIC-132 control switch to OPEN
Interim Cue:	When simulated open, inform operator valve is open, red light on, green light off	
SAT/UNSAT	**Step 13:**	**Open RCIC-18**
	Standard:	Simulates placing RCIC-18 control switch to OPEN
Interim Cue:	When simulated open, inform operator valve is open, red light on, green light off	
SAT/UNSAT	**Step 14:**	**Open RCIC-20**
	Standard:	Simulates placing RCIC-20 control switch to OPEN
Interim Cue:	When simulated open, inform operator valve is open, red light on, green light off	
SAT/UNSAT	**Step 15:**	**Open RCIC-21, Pump Discharge**
	Standard:	Simulates placing RCIC-21 control switch to OPEN
Interim Cue:	When simulated open, inform operator valve is open, red light on, green light off	
SAT/UNSAT	**Step 16:**	**Start the RCIC gland seal vacuum pump**
	Standard:	Simulates placing the RCIC gland seal vacuum pump switch to START
Interim Cue:	When simulated started, inform operator pump is running, red light on, green light off	

SAT/UNSAT	**Step 17:**	**Operate RCIC gland seal condensate pump as necessary to maintain level within the sightglass**
	Standard:	Monitors gland seal sightglass level and simulates operating the gland seal pump as required
Interim Cue:	When/if checked, inform operator level is just below mid-level in the sightglass	
SAT/UNSAT	***Step 18:**	**Set the RCIC potentiometer to zero by turning potentiometer counter-clockwise to the zero setting.**
	Standard:	Simulates rotating the RCIC potentiometer counter-clockwise to the zero setting.
Interim Cue:	When operation simulated , inform operator the potentiometer is at zero setting	
SAT/UNSAT	**Step 19:**	**Open RCIC-27, minimum flow and monitor CST and torus level**
	Standard:	Simulates placing RCIC-27 switch to OPEN, checks CST and torus levels
Interim Cue:	When simulated open, inform operator valve is open, red light on, green light off. When/if checked, inform operator CST and Torus levels are not noticeably changing	
SAT/UNSAT	***Step 20:**	**Start RCIC turbine by opening RCIC-131 and raising the RCIC potentiometer setting so turbine is accelerated to greater than 2000 rpm immediately**
	Standard:	Simulates placing RCIC-131 switch to OPEN and immediately rotates RCIC potentiometer clockwise to raise turbine speed, monitors turbine speed on CP-82-1
Interim Cue:	When simulated open, inform operator RCIC-131 is opening, red light on, green light off When potentiometer simulated raised, inform operator turbine speed rising, now at 2250 rpm.	

SAT/UNSAT **Step 21: Adjust RCIC potentiometer to obtain 400 gpm at less than 4500 rpm**

Standard: Simulates operating potentiometer clockwise to achieve 400 gpm at less than 4500 rpm. Flow is on DPIS-13-61 next to RCIC Alternate Shutdown Panel

Interim Cue: When potentiometer simulated operated, inform operator turbine speed and flow rising, now at 400 gpm and 4300 rpm. NOTE: If > 4300 rpm flow is > 400 gpm, if <4300 rpm flow is <400 gpm

SAT/UNSAT ***Step 22: Close RCIC -27 when flow is above 80 gpm**

Standard: Simulates placing RCIC-27 control switch in CLOSE when flow >80 gpm on DPIS-13-61

NOTE: Procedure assumes RCIC-27 auto closure. This will occur only with initiation signal present. So with no signal valve must be closed by the operator.

Interim Cue: When simulated closed, inform operator valve is closed, green light on, red light off

SAT/UNSAT **Step 23: Control water level between 137" and 167" by adjusting RCIC flow with the potentiometer, inform SCRO that RCIC is injecting**

Standard: Simulates adjusting flowrate with RCIC potentiometer. Informs SCRO that RCIC is injecting. Monitors LI-2-3-72C.

Interim Cue: When simulated injecting, inform operator that another operator will control level with RCIC.

TIME FINISH: ____________

Terminating Cue: Another operator will control level with RCIC.

Evaluators Comments:

JPM QUESTIONS

QUESTION NO: _1_

Would the expected response and/or operator action regarding the RCIC Minimum Flow Valve (RCIC-27) have been any different if reactor water level was 55 inches during this task? Using appropriate logic drawings, show that this is an expected response.

EXPECTED ANSWER:

-- If an initiation signal had been present, the RCIC-27 valve would have closed automatically at a flow of 80 gpm, no operator action required.
-- Per logic prints.

ACTUAL ANSWER:

SAT _______ **UNSAT** _______

K/A NUMBER: 217000A301 3.5/3.5

REFERENCES: CWD 193

JPM QUESTIONS

QUESTION NO: 2

RCIC is running and injecting at 400 gpm with speed control by the potentiometer at the Alternate Shutdown Panel. A failure of the RCIC shaft driven lube oil pump results in a total loss of oil pressure (reading 0 psig). What will be the expected response of RCIC to this failure? Explain your answer.

EXPECTED ANSWER:

-- The RCIC turbine will accelerate until it trips on mechanical overspeed.
-- The RCIC turbine governor is spring open, oil closed valve. A loss of oil pressure will result in the valve going full open resulting in an overspeed condition until stopped by the Turbine Trip/Throttle Valve closing on a mechanical overspeed condition.

ACTUAL ANSWER:

SAT _______ UNSAT _______

K/A NUMBER: 217000A207 3.1/3.1

REFERENCES: LOT-00-217, "Reactor Core Isolation Cooling", Rev. 16, Section III.C.2. & 3 and Section V.C.1, Pages 20 & 35
