Facility: Wolf Creek Date of Examination: Aug.- Sept. 2011

Examination Level: RO ☒ SRO ☒ Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations R.A.1.a	N, R	R.A.1.a Refuel/ Reduced Inventory: Perform the time to core uncovery estimation using the OFN EJ-015, LOSS OF RHR COOLING, step 31. Requires use of Figures 5 (time to boil) and 6 (time to uncovery). 2.1.25 Ability to interpret reference materials, such as graphs, curves tables, etc. (CFR 41.10/43.5/45.12 RO = 3.9 SRO = 4.2)
S.A.1.a	M, R	S.A.1.a Review/Approve/Evaluate the Reactor Operator's completed manual calculation of RTP; STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER. Requires discovery of errors made by Reactor Operator. 2.1.20 Ability to interpret and execute procedure steps. (CFR 41.10/43.5/45.12 RO = 4.6 SRO = 4.6)
Conduct of Operations R A.1.b	N, R	R.A.1.b Determine the shutdown margin using STS RE-004, SHUTDOWN MARGIN DETERINATION, Attachment A, Shutdown Margin Calculation Short form. 2.1.37 Knowledge of procedures, guidelines, or limitations associated with reactivity management (CFR 41.1/43.6/45.6 RO = 4.3 SRO = 4.6)
S.A.1.b	N, R	S.A.1.b Review/Approve/Verify the Reactor Operator's completed manual calculation of the shutdown margin per STS RE-004, SHUTDOWN MARGIN DETERINATION, Attachment A, Shutdown Margin Calculation Short form. 2.1.37 Knowledge of procedures, guidelines, or limitations associated with reactivity management (CFR 41.1/43.6/45.6 RO = 4.3 SRO = 4.6)

Equipment Control R.A.2 S.A.2	N, R N, R	R.A.2 Complete STS AL-211, TURB DRIVEN AUX FDWTR SYS FLOW PATH VERIFICATION & INSERVICE CHEC VALVE TEST, Attachment A Data Sheet. 2.2.12, Knowledge of surveillance procedures (CFR 41.10/45.13 RO = 3.7 SRO = 4.1) S.A.2 Review/Approve/Evaluate the Reactor Operator's completed STS EF-100A, ESW SYSTEM INSERVICE PUMP A & ESW A DISCHARGE CHECK VALVE TEST, Attachment A Data Sheet. 2.2.12, Knowledge of surveillance procedures (CFR 41.10/45.13 RO = 3.7 SRO = 4.1)
Radiation Control S.A.3	N, R	S.A.3 The Containment Purge permit that was in progress was stopped. Determine/Authorize the restart for the Containment Purge Permit. (AP 07B-001, Radioactive Releases, see section 6.2.4.6) 2.3.6 Ability to approve release permits (CFR 41.13/43.4/45.9 RO = 2.0 SRO = 3.8) and/or 2.3.11 Ability to control radiation releases (CFR 41.11/43.4/45.10 RO = 3.8 SRO = 4.3)

Emergency Procedures/Plan R.A.4	N, R	R.A.4 Determine percentage of Control Room annunciator loss using OFN PK-029, LOSS OF NON-VITAL 125VDC BUS PK01, PK02, PK03, PK04, AND ANNUNCIATORS. 2.4.32 Knowledge of operator response to loss of all annunciators. (CFR 41.10/43.5/45.13 RO = 3.6 SRO = 4.0)
S.A.4	D, R	S.A.4 (In the classroom setting) Determine the E-Plan classification and Protective action recommendations, if any. 2.4.41 Knowledge of the emergency action level thresholds and classifications. (CFR 41.10/43.5/45.11 RO = 2.9 SRO = 4.6) and 2.4.44 Knowledge of emergency plan protective action recommendations. (CFR 41.10/41.12/43.5/45.11 RO = 2.4 SRO = 4.4)

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:

(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Evaluate Time To Core Boiling And Complete Core Uncovery	JPM No.:	R.A.1.a
K/A Reference:	2.1.25		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing: Classroom							
Simulated Performance:				Actual Performance:		x	
	Classroom	x	Simulator		Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	Plant is in MODE 5 six (6) days after shutdown from full power EOL for a refueling outage. The unit is in Reduced Inventory. All RHR cooling was lost 10 minutes ago at 0700.
Task Standard:	Upon completion the Candidate will estimate time to boil, onset to boiling and core uncovery using Figures 5 AND 6 per step 31 of OFN EJ-015, LOSS OF RHR COOLING. o Time to Boil is 27 ± 1 minute from 0700 hours OR Candidate may report 17 ± 1 minutes remain to time to boil. o Time to Onset of Core Uncovery 105 minutes ± 1 minute OR Candidate may report ~95 ± 1 minutes remain to onset of core uncovery. o Time to Complete Core Uncovery 223 minutes ± 2 minutes OR Candidate may report ~213 ± 2 minutes remain until complete core uncovery.
Required Materials:	OFN EJ-015 Figure 5 and Figure 6
General References:	OFN EJ-015, LOSS OF RHR COOLING
Handouts:	OFN EJ-015 Figure 5 and Figure 6
Initiating Cue:	The CRS directs you to estimate time to boil, onset of core uncovery and complete core uncovery per step 31 of OFN EJ-015, LOSS OF RHR COOLING.

Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	No
Validation Time:	15 minutes

*	**Performance Step: 1**	Estimate time to boil using Figure 5
	Standard:	Using the graph estimated time to boil is approx. 27 minutes (Acceptable range 26 to 28 minutes) OR Candidate may report that 17 $\pm$ 1 minutes remain.
	Comment:	**Step 31. b.** Examiner NOTE: To correctly perform candidate must use the "Vessel Capable Of Being Pressurized" line on figure 5

*	**Performance Step: 2**	Estimate time to onset of core uncovery using Figure 6
	Standard:	Using the graph estimated time to uncovery is approx. 105 minutes. (Acceptable range is 104 minutes to 106 minutes.) OR Candidate may report that ~95 $\pm$ 1 minutes remain.
	Comment:	**Step 31. c.** Examiner NOTE: To correctly perform candidate must use the "Onset Of Core Uncovery" line on figure 6

*	**Performance Step: 3**	Estimate time to complete core uncovery using Figure 6
	Standard:	Using the graph estimated time to uncovery is approx. 223 minutes. (Acceptable range is 221 minutes to 225 minutes.) OR Candidate may report that ~213 $\pm$ 2 minutes remain.
	Comment:	**Step 31.d** Examiner NOTE: To correctly perform candidate must use the "Complete Core Uncovery" line on figure 6

Terminating Cue: **JPM is complete**

Job Performance Measure No.:	R.A.1.a.
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	Plant is in MODE 5 six (6) days after shutdown from full power EOL for a refueling outage. The unit is in Reduced Inventory. All RHR cooling was lost 10 minutes ago at 0700.

INITIATING CUE:	The CRS directs you to estimate time to boil, onset of core uncovery and complete core uncovery per step 31 of OFN EJ-015, LOSS OF RHR COOLING.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Determine Shutdown Margin Using STS RE-004, SHUTDOWN MARGIN CALCUALTION	JPM No.:	R.A.1.b
K/A Reference:	2.1.37		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing: Classroom							
Simulated Performance:				Actual Performance:		x	
	Classroom	x	Simulator		Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	Plant tripped 3 hours ago after 120 days of full power operation. All systems functioned as designed. Core Burnup is 1000 MWD/MTU. Current boron concentration is 1440 ppm. The date is August 25. Current time is 1000 hrs. Plant is stable at 557.4°F using steam dumps.
Task Standard:	Candidate performed Shutdown Margin Attachment A and determined Shutdown Margin is NOT met.
Required Materials:	Attachment A, SHUTDOWN MARGIN CALCULATION SHORT FORM of STS RE-004, SHUTDOWN MARGIN DETERMINATION Calculator WCRX-23 Rev. 27, CONTROL ROOM OPERATING CURVES AND TABLES REFERENCE MANUAL
General References:	WCRX-23 CONTROL ROOM OPERATING CURVES AND TABLES REFERENCE MANUAL STS RE-004, SHUTDOWN MARGIN DETERMINATION
Handouts:	STS RE-004, SHUTDOWN MARGIN DETERMINATION WCRX-23 CONTROL ROOM OPERATING CURVES AND TABLES REFERENCE MANUAL

Initiating Cue:	CRS directs you to perform Attachment A, SHUTDOWN MARGIN CALCULATION SHORT FORM of STS RE-004, SHUTDOWN MARGIN DETERMINATION. Use references provided. Notify the CRS of results when Attachment A is complete.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	No
Validation Time:	30 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Step A.1.1 Current Date/Time
	Standard:	Candidate entered date and time from initial conditions.
	Comment:	**Step A.1.1**

	Performance Step: 2	Step A.1.2 Shutdown Date/Time
	Standard:	Candidate entered Shutdown date and time from initial conditions.
	Comment:	Examiner NOTE: Step A.1.2 is used in step A.2.4 to determine how long the margin calculation is accurate.

	Performance Step: 3	Step A.1.3 Core Average Burnup
	Standard:	Candidate entered Burnup MWD/MTU from initial conditions.
	Comment:	Examiner NOTE: Step A.1.3 determines the MINIMUM boron concentration for the given burnup in A.2.1.

	Performance Step: 4	Step A.1.4 Current Core Average Temperature
	Standard:	Candidate entered RCS Average temperature from initial conditions.
	Comment:	Examiner NOTE: Step A.1.4 determines what boron concentration is needed for a given RCS density (see A.2.1).

	Performance Step: 5	Step A.1.5 Current boron concentration
	Standard:	Candidate entered concentration from initial conditions.
	Comment:	Examiner NOTE: Step A.1.5 determines if current concentration and required concentration meet shutdown margin requirements.

*	**Performance Step: 6**	Step A.1.6 Boron-10 Correction Factor
	Standard:	Candidate entered Correction Factor 0.991 from page 5.8 WCRX-23 for 1000 MWD/MTU
	Comment:	Examiner NOTE: Step A.1.6 is used to determine minimum boron concentration for shutdown margin (see A.2.3).

*	**Performance Step: 7**	Step A.2.1 Minimum Boron Concentration
	Standard:	Candidate entered concentration from WCRX-23 page 7.1 for 1000 MWD/MTU of 1770 ppm
	Comment:	Examiner NOTE: Step A.2.1 is the required minimum concentration with no adjustments.

*	**Performance Step: 8**	Step A.2.2 Apply Xenon Credit
	Standard:	Candidate entered Xenon credit because both conditions: Reactor operated 72 hours continuously prior to trip and present time is within 20 hours from time of trip, are met. Candidate uses 300 ppm credit from page 7.1 of WCRX-23.
	Comment:	Examiner NOTE: Step A.2.2 provides a credit for xenon reactivity addition to the core for shutdown margin determination.

*	**Performance Step: 9**	Step A.2.3 Minimum Boron Concentration
	Standard:	Candidate determined 1483 ppm boron concentration by calculating: minimum concentration minus the xenon credit plus the current boron concentration times one minus the boron correction factor.
	Comment:	Examiner NOTE: Step A.2.3 determines the required concentration to meet shutdown margin all rods in at NOT/NOP.

*	**Performance Step: 10**	Step A.2.4 Determine time and date Shutdown Margin is Accurate.
	Standard:	Candidate entered 0300 for 20 hours from time of Shutdown and 8/26 as the date.
	Comment:	Examiner NOTE: A.2.4 determines how long the Shutdown margin calculation is accurate for current conditions held constant.

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*	**Performance Step: 11**	Step A.3.1 Shutdown Margin Determination
	Standard:	Candidate answered “No” to question. Candidate recommended to CRS to either borate the RCS or perform a long form calculation using Attachment B.
	Comment:	Examiner NOTE: A.3.1 determines if the current boron concentration is equal to or greater than that required to meet shutdown margin.

Terminating Cue:	**Attachment A is complete; Shutdown margin is NOT MET.**

Job Performance Measure No.:	R.A.1.b
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	Plant tripped 3 hours ago after 120 days of full power operation. All systems functioned as designed. Core Burnup is 1000 MWD/MTU. Current boron concentration is 1440 ppm. The date is August 25. Current time is 1000 hrs. Plant is stable at 557.4°F using steam dumps.

INITIATING CUE:	CRS directs you to perform Attachment A, SHUTDOWN MARGIN CALCULATION SHORT FORM of STS RE-004, SHUTDOWN MARGIN DETERMINATION. Use the references provided. Notify the CRS of results when Attachment A is complete.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Complete STS AL-211, TURB DRIVEN AUX FDWTR SYS FLOW PATH VERIFICATION & INSERVICE CHECK VALVE TEST	JPM No.:	R.A.2
K/A Reference:	2.2.12		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:		x	
	Classroom	x	Simulator		Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	The following conditions exist: • Unit in MODE 1 at 88% RTP • No equipment is Out of Service • CRS and BOP have been performing STS AL-211, TURB DRIVEN AUX FDWTR SYS FLOW PATH VERIFICATION & INSERVICE CHECK VALVE TEST • The BOP has been called away for a random Fitness for Duty assessment. • The BOP failure to document SAT/UNSAT at each step will be addressed using a Condition Report.
Task Standard:	Upon completion of this JPM, the Candidate determined pump vibration for PIV – V2 has exceeded the MAXIMUM ACCEPTABLE limit. The Required Action 1 is to inform the SM/CRS that the TDAFW pump has failed the surveillance test and is inoperable. Corrective action must be initiated.
Required Materials:	STS AL-211, TURB DRIVEN AUX FDWTR SYS FLOW PATH VERIFICATION & INSERVICE CHECK VALVE TEST, Calculator
General References:	STS AL-211, TURB DRIVEN AUX FDWTR SYS FLOW PATH VERIFICATION & INSERVICE CHECK VALVE TEST

Handouts:	Partially completed STS AL-211, TURB DRIVEN AUX FDWTR SYS FLOW PATH VERIFICATION & INSERVICE CHECK VALVE TEST
Initiating Cue:	The CRS directs you to complete the STS to determine pump Operability status. Data required are documented in the procedure at the applicable steps. Report to CRS Operability Status of completed Surveillance (Sat or Unsat) and any Required Actions if applicable.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	No
Validation Time:	25 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Determine TDAFP seal leakage.
	Standard:	Candidate reviewed the seal leakoff values and determined leakage was acceptable (circled S in Sat/Unsat column).
	Comment:	**Step 8.1.19** Examiner NOTE: Candidate determined pump seal leakage within acceptable range.

	Performance Step: 2	Verify TDAFP parameters are SAT.
	Standard:	Using Attachment A data sheet: Candidate verified pump dynamic suction pressure is SAT (circled S in Sat/Unsat column). Candidate verified pump speed is SAT (circled S in Sat/Unsat column).
	Comment:	**Step 8.1.20**

*	**Performance Step: 3**	Determine Pump Operability using vibration data.
	Standard:	Using Attachment A Candidate verified V2 is above the MAXIMUM ACCEPTABLE and informed the CRS: • Required Action 1 – notify SM/CRS that the TDAFW pump has failed the surveillance and is inoperable; initiate corrective action.
	Comment:	**Step 8.1.21** Examiner NOTE: Candidate determined pump operability is in question based on exceeding the MAXIMUM ACCEPTABLE on Pump Inboard Vertical (PIV) V-2.

	Performance Step: 4	Determine AFW Flow is SAT.
	Standard:	Using Attachment A: Candidate verified AFW flow values recorded on Attachment A to all four SGs were within acceptable range (circled S in Sat/Unsat column). Candidate verified total AFW flow recorded on Attachment A was within acceptable range (circled S in Sat/Unsat column).
	Comment:	**Step 8.1.22**

	Performance Step: 5	Verify TDAFP speed is SAT.
	Standard:	Candidate verified speed recorded on Attachment A is within acceptable limits (circled S in Sat/Unsat column).
	Comment:	**Step 8.1.25**

	Performance Step: 6	Verify Total Flow is SAT.
	Standard:	Candidate verified flow recorded on Attachment A was within the acceptable limits (circled S in Sat/Unsat column).
	Comment:	**Step 8.1.26**

*	**Performance Step: 7**	Calculate TDAFP and record on Attachment A.
	Standard:	Candidate used Attachment A to find discharge pressure of 1462 and dynamic suction pressure of 12.8 and calculated the differential at 1449.2 psid.
	Comment:	**Step 9.8.1** Examiner NOTE: Candidate used Attachment A to find P2 pressure and subtract P1 pressure to determine pump psid.

	Performance Step: 8	Record calculated DP on Attachment A and verify SAT.
	Standard:	Candidate recorded 1449.2 on Attachment A at step 9.8.2 slot. Candidate determined psid within acceptable range and circled SAT
	Comment:	**Step 9.8.2**

Terminating Cue: **Pump is NOT verified Operable.**

VERIFICATION OF COMPLETION

Job Performance Measure No.:	R.A.2
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	The following conditions exist: • Unit in MODE 1 at 88% RTP • No equipment is Out of Service • CRS and BOP have been performing STS AL-211, TURB DRIVEN AUX FDWTR SYS FLOW PATH VERIFICATION & INSERVICE CHECK VALVE TEST • The BOP has been called away for a random Fitness for Duty assessment. • The BOP failure to document SAT/UNSAT at each step will be addressed using a Condition Report.

INITIATING CUE:	The CRS directs you to complete the STS to determine pump Operability status. Data required are documented in the procedure at the applicable steps. Report to CRS Operability Status of completed Surveillance (Sat or Unsat) and any Required Actions if applicable.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Determine power supply RK045B lost and percentage of affected annunciators	JPM No.:	R.A.4
K/A Reference:	2.4.32		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:		x	
	Classroom	x	Simulator		Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	Given the following conditions: • Plant is 97% RTP and stable • Multiple alarms have actuated • CRS enters OFN PK-029, LOSS OF NON VITAL 125 VDC BUS PK01, PK02, PK03, PK04, AND ANNUNCIATORS • NPIS is not available
Task Standard:	Candidate determined RK045B (PK5222) is the affected power supply and 9.7% of Annunciators were lost.
Required Materials:	OFN PK-029, LOSS OF NON VITAL 125 VDC BUS PK01, PK02, PK03, PK04, AND ANNUNCIATORS
General References:	OFN PK-029, LOSS OF NON VITAL 125 VDC BUS PK01, PK02, PK03, PK04, AND ANNUNCIATORS
Handouts:	OFN PK-029, LOSS OF NON VITAL 125 VDC BUS PK01, PK02, PK03, PK04, AND ANNUNCIATORS Color screen shots of selected Main Control Board (MCB) panels in alarm.

Initiating Cue:	Using OFN PK-029, LOSS OF NON VITAL 125 VDC BUS PK01, PK02, PK03, PK04, AND ANNUNCIATORS, Attachment L, AFFECTED ANNUNCIATOR WINDOWS, the CRS directs you to: 1) Determine the affected power supply, and 2) The total percentage of annunciation that has been lost.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	No
Validation Time:	25 minutes

(Denote Critical Steps with an asterisk)

*	**Performance Step: 1**	Determine from annunciators LIT a RK045B power supply failure.
	Standard:	Candidate used MCB panel screen shots and Attachment L pages 20, 21, and 22 to determine RK045B power supply failure. The Candidate may report that PK5222 has failed – this is acceptable.
	Comment:	Examiner NOTES: Step L.1 States RK045A/B have no NPIS indication; candidate must use the affected window drawings to determine which power supply is lost. Step L.3 Determines affected annunciators using the attachment. Step L.3.1 Compare lit annunciators with annunciators shown on associated attachment.

*	**Performance Step: 2**	Determine percentage of lost annunciators
	Standard:	Candidate determined RK045B (PK5222) lost power and uses Table at step L.2 to determine 9.7% of annunciators are affected.
	Comment:	Examiner NOTE: L.2 has three tables, the last table states the % of annunciation affected for RK045B.

Terminating Cue:	**RK045B (PK5222) power supply is lost and 9.7% of annunciation is affected.**

VERIFICATION OF COMPLETION

Job Performance Measure No.:	R.A.4
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	Given the following conditions: • Plant is 97% RTP and stable • Multiple alarms have actuated • CRS enters OFN PK-029, LOSS OF NON VITAL 125 VDC BUS PK01, PK02, PK03, PK04, AND ANNUNCIATORS • NPIS is not available

INITIATING CUE:	Using OFN PK-029, LOSS OF NON VITAL 125 VDC BUS PK01, PK02, PK03, PK04, AND ANNUNCIATORS, Attachment L, AFFECTED ANNUNCIATOR WINDOWS, the CRS directs you to: 1) Determine the affected power supply, and 2) The total percentage of annunciation that has been lost.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Evaluate the Reactor Operator's completed manual calculation of reactor thermal power per STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER	JPM No.:	S.A.1.a
K/A Reference:	2.1.20		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:		x	
	Classroom	x	Simulator		Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are the Control Room Supervisor. The Reactor Operator (RO) reports that the power calculation between STS SE-001, POWER RANGE ADJUSTMENT TO CALORIMETRIC and STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER, do not agree within $\pm$ 1% as required per step 8.9.2.3. STS SE-001, POWER RANGE ADJUSTMENT TO CALORIMETRIC, calculated results are 97.1%. Feedwater temperature is 430°F. A personal computer is not available.

Task Standard:	Upon completion of the JPM: SRO discovered the following errors: 1. Attachment B, CALORIMETRIC DATA COLLECTION: Average SG Pressure of 950.56 psig instead of 965.26 psia 2. Attachment C, FEEDWATER CALORIMETRIC CALCULATION: • C.4: Incorrect Power because the RO used the Total Average Feedwater flow instead of the Compensated Feedwater flow and an incorrect Heat Transfer and SGBD Correction factor. SRO disapproved STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER
Required Materials:	Scratch paper, calculator, partially completed STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER
General References:	STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER
Handouts:	Partially completed STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER
Initiating Cue:	Evaluate the RO's performance of STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER, Attachment B, CALORIMETRIC DATA COLLECTION, and Attachment C, FEEDWATER CALORIMETRIC CALCULATION. Evaluate the RO's work and approve or disapprove the results. Circle your response: Approve or Disapprove the results. If there are any errors, list the errors.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	No
Validation Time:	30 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Obtain partially completed STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER, Attachments B, Calorimetric Data Collection, Attachment C, Feedwater Calorimetric Calculation and Attachment E, Calorimetric Comparison and NIS Power Range Adjustment
	Standard:	Candidate received procedure and attachments.
	Comment:	

	Performance Step: 2	Using Attachment B, Calorimetric Data Collection, page 1 of 2, candidate evaluates RO work: Total Average Feedwater flow ≅ 15.02E6 lbm/hr
	Standard:	Using Attachment B, Calorimetric Data Collection, page 1 of 2, candidate calculated Total Average Feedwater flow ≅ 15.02E6 lbm/hr
	Comment:	**Step 8.3 and 8.4**

	Performance Step: 3	Using Attachment B, Calorimetric Data Collection, page 2 of 2, candidate evaluates RO work: Average Feedwater temperature ≅ 432.5°F
	Standard:	Using Attachment B, Calorimetric Data Collection, page 2 of 2, candidate calculated Average Feedwater temperature ≅ 432.5°F
	Comment:	**Step 8.3 and 8.4**

*	**Performance Step: 4**	Using Attachment B, Calorimetric Data Collection, page 2 of 2, candidate evaluates RO work: RO calculation was 950.56 psig. Average SG Pressure Total Average ≅ 965.26 psia
	Standard:	Using Attachment B, Calorimetric Data Collection, page 2 of 2, candidate calculated Average SG Pressure Total Average as ≅ 965.26 psia. Candidate discovered RO error (950.56 psig vice 965.26 psia).
	Comment:	This is an RO error discovery point. RO used 950 psig in subsequent calculations. **Step 8.3 and 8.4**

	Performance Step: 5	Using Attachment B, Calorimetric Data Collection, page 2 of 2, candidate evaluates RO work: Average SG Blowdown ≅ 126.33 Klbm/hr
	Standard:	Using Attachment B, Calorimetric Data Collection, page 2 of 2, candidate calculated Average SG Blowdown ≅ 126.33 Klbm/hr
	Comment:	**Step 8.3 and 8.4**

	Performance Step: 6	Using Attachment B, Calorimetric Data Collection, page 2 of 2, candidate evaluates RO work: Average Indicated Power per Quadrant N-41 ≅ 97.2 N-42 ≅ 96.6 N-43 ≅ 96.9 N-44 ≅ 97.7
	Standard:	Using Attachment B, Calorimetric Data Collection, page 2 of 2, candidate calculated Average Indicated Power per Quadrant as N-41 ≅ 97.2 N-42 ≅ 96.6 N-43 ≅ 96.9 N-44 ≅ 97.7
	Comment:	**Step 8.3 and 8.4**

	Performance Step: 7	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1 candidate evaluates RO work: Feedwater Density
	Standard:	Using Attachment F, Density of Compressed Water at 1042.6 psia, candidate determined Feedwater Density ≅ 52.521 lbm/cu.ft. for a temperature of 432.5°F.
	Comment:	**Step 8.7 – Recall no personal computer is available; Attachment C was performed using data collected and calculated from Attachment B.** **See Attachment C, step C.1.1 and Attachment F**

	Performance Step: 8	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1 candidate evaluates RO work: Density Correction Factor (DCF)
	Standard:	Using Attachment C, Feedwater Calorimetric Calculation, candidate calculated DCF ≅ 1.006 DCF = $(52.521 \div 51.913)^{1/2}$
	Comment:	**See Attachment C, step C.1.2**

	Performance Step: 9	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1 candidate evaluates RO work: Compensated Feedwater flow
	Standard:	Using Attachment C, Feedwater Calorimetric Calculation, candidate calculated Compensated Feedwater flow ≅ 15.11E6 15.02E6 x 1.006 ≅ 15.11E6
	Comment:	**See Attachment C, step C.1.3**

*	**Performance Step: 10**	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1 and Attachment G, Properties of Saturated Steam/Water, candidate evaluates RO work: Steam Enthalpy (hg) and Latent Heat of Vaporization (hfg)
	Standard:	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1 and Attachment G, Properties of Saturated Steam/Water, candidate determined Steam Enthalpy (hg) ≅ 1194.2 Latent Heat of Vaporization (hfg) ≅ 657.05 Candidate discovered RO error: RO determined Steam Enthalpy and Latent Heat of Vaporization using 950 psig instead of 965 psia.
	Comment:	This is an RO error discovery point. **See Attachment C, step C.2.1**

*	**Performance Step: 11**	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1 and Attachment H, Properties of Compressed Water, candidate evaluates RO work: Feedwater Enthalpy (hFW)
	Standard:	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1 and Attachment H, Properties of Compressed Water, candidate determined Feedwater Enthalpy (hFW) ≅ 411.2 Candidate discovered RO error: The RO has continued using 950 psig instead of 965 psia. The hFW at 950 psig ≅ 410.6.
	Comment:	This is an RO error discovery point. **See Attachment C, step C.2.2**

*	**Performance Step: 12**	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1, candidate evaluates RO work: Heat Transfer (H)
	Standard:	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1, candidate determined Heat Transfer (H) hg – hFW = H 1194.2 – 411.2 ≅ 783 Candidate discovered RO error: The RO used an incorrect set of values (hg and hFW) to calculate Heat Transfer. The values were based on 950 psig.
	Comment:	This is an RO error discovery point. **See Attachment C, step C.2.3**

*	**Performance Step: 13**	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1, candidate evaluates RO work: Steam Generator Blowdown (SGBD) Correction
	Standard:	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1, candidate determined SGBD Correction ≅ 0.682% ((Avg SGBD rate) x (hfg) x (100)) ÷ 12.166E9 = SGBD correction (126.33 x 1000 x 657.05 x 100) ÷ 12.166E9 ≅ 0.682% Candidate discovered RO error: The RO used an incorrect hfg (based on 950 psig) to calculate the SGDB correction factor.
	Comment:	This is an RO error discovery point. **See Attachment C, step C.3**

*	**Performance Step: 14**	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1, candidate evaluates RO work: Power calculation
	Standard:	Using Attachment C, Feedwater Calorimetric Calculation, page 1 of 1, candidate determined: Power (((Comp FW Flow) x (H) x (100)) ÷ 12.166E9) – RCP heat – SGBD corr = Power ((15.11E6 x 783 x100) ÷ 12.166E9) – 0.415% – 0.682% ≅ 96.2% power SRO calculates a Power of 96.2% - which is within the Acceptable Range for the surveillance. Candidate discovered RO error: In the Power calculation, The RO did not use Compensated Feedwater flow, the Heat Transfer was incorrect and the SGBD correction was incorrect. All of these errors culminated in an erroneous Power Calculation.
	Comment:	This is an RO error discovery point. **See Attachment C, step C.4**

*	**Performance Step: 15**	Does not approve RO's performance of STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER.
	Standard:	SRO discovered the following errors: Attachment B, CALORIMETRIC DATA COLLECTION: Average SG Pressure of 950.56 psig instead of 965.26 psia Attachment C, FEEDWATER CALORIMETRIC CALCULATION: • C.4: Incorrect Power because the RO used the Total Average Feedwater flow instead of the Compensated Feedwater flow and an incorrect Heat Transfer and SGBD Correction factor. SRO disapproved STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER
	Comment:	

Terminating Cue:	**JPM complete**

VERIFICATION OF COMPLETION

Job Performance Measure No.:	S.A.1.a
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are the Control Room Supervisor. The Reactor Operator (RO) reports that the power calculation between STS SE-001, POWER RANGE ADJUSTMENT TO CALORIMETRIC and STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER, do not agree within ± 1% as required per step 8.9.2.3. STS SE-001, POWER RANGE ADJUSTMENT TO CALORIMETRIC, calculated results are 97.1%. Feedwater temperature is 430°F. A personal computer is not available.

INITIATING CUE:	Evaluate the RO's performance of STS SE-002, MANUAL CALCULATION OF REACTOR THERMAL POWER, Attachment B, CALORIMETRIC DATA COLLECTION, and Attachment C, FEEDWATER CALORIMETRIC CALCULATION. Evaluate the RO's work and approve or disapprove the results.

Circle your response: Approve or Disapprove the results.

If there are any errors, list the errors.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Approve a completed manual calculation of shutdown margin per STS RE-004, SHUTDOWN MARGIN DETERMINATION	JPM No.:	S.A.1.b
K/A Reference:	2.1.37		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:		x	
	Classroom	x	Simulator		Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are the Control Room Supervisor (CRS). Plant conditions are: • Plant had been operating for 325 days at 100% • Shutdown occurred on 8-29-11 at 0800 hours • Currently: 8-29-11 at 1000 hours • MODE 3, 557°F • All control and shutdown rods are inserted • Core average burnup is 20143 MWD/MTU • Current boron is 490 ppm
Task Standard:	Upon completion, the candidate disapproved the RO's shutdown margin calculation and recommendation. Shutdown margin is met and an Immediate Boration was not required. The candidate discovered the following errors: 1. At step A.2.1, the RO used an incorrect temperature column and determined an incorrect minimum boron concentration. 2. At step A.2.3, the RO incorrectly calculated minimum boron concentration. 3. At step A.2.4, the RO used the incorrect date & time when calculating the Shutdown Margin accuracy length of time. 4. At step A.3.1, the RO determined that the Shutdown Margin was not met and an Immediate Boration was required. This is incorrect. Shutdown Margin is met (490 ppm boron $\geq$ 219 ppm boron) and an Immediate Boration is not required.

Required Materials:	Completed Attachment A, SHUTDOWN MARGIN CALCULATION SHORT FORM, from STS RE-004, SHUTDOWN MARGIN DETERMINATION, CONTROL ROOM OPERATING CURVES AND TABLES REFERENCE MANUAL, Cycle 18, WCRX-23 rev 27, calculator
General References:	STS RE-004, SHUTDOWN MARGIN DETERMINATION, and CONTROL ROOM OPERATING CURVES AND TABLES REFERENCE MANUAL, Cycle 18, WCRX-23
Handouts:	Completed Attachment A, SHUTDOWN MARGIN CALCULATION SHORT FORM, from STS RE-004, SHUTDOWN MARGIN DETERMINATION, CONTROL ROOM OPERATING CURVES AND TABLES REFERENCE MANUAL, Cycle 18, WCRX-23
Initiating Cue:	The Reactor Operator (RO) has completed Attachment A, SHUTDOWN MARGIN CALCULATION SHORT FORM. The RO reports that shutdown margin is not met and an Immediate boration is required. Perform the verification and approve or disapprove the RO's results. Show all work. Circle your response: Approve or Disapprove the results. If there are any errors, list the errors.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	No
Validation Time:	20 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Candidate receives handout materials to perform verification of shutdown margin.
	Standard:	Candidate received RO's completed Attachment A, SHUTDOWN MARGIN CALCULATION SHORT FORM, from STS RE-004, SHUTDOWN MARGIN DETERMINATION and CONTROL ROOM OPERATING CURVES AND TABLES REFERENCE MANUAL, Cycle 18, WCRX-23.
	Comment:	**Step 8.2.9**

	Performance Step: 2	Candidate verifies Current Date/Time
	Standard:	Candidate verified Current Date/Time written on Attachment A was correct. Current Date/Time: 8-29-11 1000 hours (see Initial Conditions)
	Comment:	**Step A.1.1**

	Performance Step: 3	Candidate verifies Shutdown Date/Time
	Standard:	Candidate verified Shutdown Date/Time written on Attachment A was correct. Current Date/Time: 8-29-11 0800 hours (see Initial Conditions)
	Comment:	**Step A.1.2**

	Performance Step: 4	Candidate verifies Core Average Burnup
	Standard:	Candidate verified Core Average Burnup written on Attachment A was correct. Core Average Burnup: 20143 MWD/MTU (see Initial Conditions)
	Comment:	**Step A.1.3**

	Performance Step: 5	Candidate verifies Current Core Average Temperature
	Standard:	Candidate verified Current Core Average Temperature written on Attachment A was correct. Current Core Average Temperature: 557°F (see Initial Conditions)
	Comment:	**Step A.1.4**

	Performance Step: 6	Candidate verifies Current Boron Concentration
	Standard:	Candidate verified Current Boron Concentration written on Attachment A was correct. Current Boron Concentration: 490 ppm boron (see Initial Conditions)
	Comment:	**Step A.1.5**

	Performance Step: 7	Candidate verifies Boron-10 Correction Factor
	Standard:	Candidate verified Boron-10 Correction Factor written on Attachment A was correct. Boron-10 Correction Factor: 0.927 (see Curve Book, Table on page #5.8)
	Comment:	**Step A.1.6**

*	**Performance Step: 8**	Candidate verifies Minimum Boron Concentration
	Standard:	Candidate determined RO's Minimum Boron Concentration at A.2.1 was incorrect (805 ppm boron). Candidate determined correct Minimum Boron Concentration was 483 ppm boron by using Curve Book page #7.1 (Burnup and temperature).
	Comment:	**Step A.2.1**

	Performance Step: 9	Candidate verifies Xenon credit.
	Standard:	Candidate verified Xenon credit by using Curve Book page #4.13. Xenon credit = 300 ppm
	Comment:	**Step A.2.2**

*	**Performance Step: 10**	Candidate verifies Minimum Boron Concentration calculation.
	Standard:	Candidate determined RO's Minimum Boron Concentration calculation was incorrect. RO's work: 805 – 300 + [490 x (1 – 0.927)] = 541 ppm boron Candidate's work: 483 – 300 + [490 x (1 - 0.927)] = 219 ppm boron
	Comment:	**Step A.2.3**

*	**Performance Step: 11**	Candidate verifies length of time shutdown margin will be accurate.
	Standard:	Candidate determined RO's Date and Time for shutdown margin accuracy was incorrect. (RO used the Current Date and Time instead of the Shutdown Date and Time) RO's work: 8-29-11 and 1000 hours plus twenty hours → 8-30-11 and 0600 hours Candidate's work: 8-29-11 and 0800 hours plus twenty hours → 8-30-11 and 0400 hours
	Comment:	**Step A.2.4**

*	**Performance Step: 12**	Candidate verifies RO's shutdown margin determination (is the Current Boron Concentration greater than or equal to the Minimum Boron Concentration?)
	Standard:	Candidate determined RO's shutdown margin determination and Immediate Boration recommendation was incorrect. RO's work: 490 ppm boron current $<$ 541 ppm boron minimum; Shutdown Margin not met box was checked and an Immediate Boration was required. Candidate's work: 490 ppm boron current $\geq$ 219 ppm boron minimum; Shutdown Margin was met and no Immediate Boration was required.
	Comment:	**Step A.3.1**

Terminating Cue:	**JPM complete**

VERIFICATION OF COMPLETION

Job Performance Measure No.:	S.A.1.b
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are the Control Room Supervisor (CRS). Plant conditions are: • Plant had been operating for 325 days at 100% • Shutdown occurred on 8-29-11 at 0800 hours • Currently: 8-29-11 at 1000 hours • MODE 3, 557°F • All control and shutdown rods are inserted • Core average burnup is 20143 MWD/MTU • Current boron is 490 ppm

INITIATING CUE:	The Reactor Operator (RO) has completed Attachment A, SHUTDOWN MARGIN CALCULATION SHORT FORM. The RO reports that shutdown margin is not met and an Immediate boration is required. Perform the verification and approve or disapprove the RO's results. Show all work.

Circle your response: Approve or Disapprove the results.

If there are any errors, list the errors.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Review and Approve completed Attachment A Data Sheet of STS EF-100A, ESW SYSTEM INSERVICE PUMP A & ESW A DISCHARGE CHECK VALVE TEST	JPM No.:	S.A.2
K/A Reference:	2.2.12		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:		x	
	Classroom	x	Simulator		Plant		

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:	You are the Control Room Supervisor (CRS).
Task Standard:	Upon completion, the candidate discovered three Reactor Operator errors on Attachment A, Test Data. 1. At 8.1.23, Train A flow (EF FI-53) is UNSAT. 7.0 E6 lbm/hr < 7.1 E6 lbm/hr minimum acceptable. Required action 1 (surveillance is failed, ESW A is inoperable, corrective action initiated) 2. At 8.1.24, Major Outboard Southwest (MOS) is UNSAT. 0.4311 in/sec > 0.4296 in/sec (maximum acceptable). Required action 1 and 3 (surveillance is failed, ESW A is inoperable, corrective action initiated; Support Eng contacted for further evaluation) NOTE: The UNSAT may not be circled per Required Action 3 direction. 3. At 9.15.2, Calculated pump dP is SAT. 145.8 psid > 145.5 psid.
Required Materials:	Completed STS EF-100A, ESW SYSTEM INSERVICE PUMP A & ESW A DISCHARGE CHECK VALVE TEST and Attachment A Test Data, calculator

General References:	STS EF-100A, ESW SYSTEM INSERVICE PUMP A & ESW A DISCHARGE CHECK VALVE TEST
Handouts:	Completed STS EF-100A, ESW SYSTEM INSERVICE PUMP A & ESW A DISCHARGE CHECK VALVE TEST and Attachment A Test Data
Initiating Cue:	The Reactor Operator (RO) has completed Attachment A Test Data for surveillance STS EF-100A, ESW SYSTEM INSERVICE PUMP A & ESW A DISCHARGE CHECK VALVE TEST. The RO reports the surveillance is potentially UNSAT per step 9.15.2. Perform a review of the surveillance and Test Data and approve or disapprove the RO's results. 1. Circle your response: Approve or Disapprove the results. 2. If there are any errors, list the errors.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	No
Validation Time:	30 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Candidate receives handout materials to perform review of surveillance.
	Standard:	Candidate received completed STS EF-100A, ESW SYSTEM INSERVICE PUMP A & ESW A DISCHARGE CHECK VALVE TEST and Attachment A Test Data
	Comment:	

	Performance Step: 2	Candidate verifies Lake Level on Attachment A.
	Standard:	Candidate verified Lake level on Attachment A – SAT 1087.7 ft
	Comment:	**Step 8.1.2.3**

	Performance Step: 3	Candidate verifies calculation (converting Lake Level to an ESW Pump Suction Lift Pressure).
	Standard:	Candidate verified calculation (converting Lake Level to an ESW Pump Suction Lift Pressure) – SAT 6.81 psig
	Comment:	**Step 8.1.3**

	Performance Step: 4	Candidate verifies Suction Lift Pressure transferred to Attachment A
	Standard:	Candidate verified Suction Lift Pressure transferred to Attachment A – SAT 6.81 psig
	Comment:	**Step 8.1.3.1**

	Performance Step: 5	Candidate verifies ESW Pump A differential pressure calculation.
	Standard:	Candidate verified ESW Pump A differential pressure calculation. 6.81 psig + 139 psig = 145.81 psig
	Comment:	**Step 8.1.20.c**

	Performance Step: 6	Candidate verifies Discharge pressures and Pressure difference on Attachment A.
	Standard:	Candidate verified Discharge pressures and Pressure difference Attachment A - SAT. EF PI-11 $\rightarrow$ 139 psig EF PI-1 $\rightarrow$ 135 psig Pressure difference $\rightarrow$ 4 psig - SAT
	Comment:	**Step 8.1.22**

*	**Performance Step: 7**	Candidate verifies Train A Flow as indicated on EF FI-53 on Attachment A.
	Standard:	Candidate verified Train A Flow = 7.0E6 lbm/hr – UNSAT 7.0 E6 lbm/hr $<$ 7.1 E6 lbm/hr minimum acceptable Required action 1 (surveillance is failed, ESW A is inoperable, corrective action initiated)
	Comment:	This is an RO error discovery point. **Step 8.1.23**

*	**Performance Step: 8**	Candidate verifies Pump Vibration Amplitudes on Test Data sheet.
	Standard:	Candidate verified Pump Vibration Amplitudes on Test Data sheet. Candidate discovered Major Outboard Southwest (MOS) is UNSAT. 0.4311 in/sec > 0.4296 in/sec (maximum acceptable). Required action 1 and 3 (surveillance is failed, ESW A is inoperable, corrective action initiated; Support Eng contacted for further evaluation)
	Comment:	This is an RO error discovery point. **Step 8.1.24**

	Performance Step: 9	Candidate verifies ESW Pump dP calculation.
	Standard:	Candidate verified calculation. 6.81 psid + 139 psid = 145.8 psig
	Comment:	**Step 9.15.1**

*	**Performance Step: 10**	Candidate verifies ESW Pump dP calculation on Test Data sheet.
	Standard:	Candidate verified ESW Pump dP calculation on Test Data sheet – SAT (6.81 + 139 = 145.81 psid) 145.8 psid > 145.5 psid Candidate circled S (SAT)
	Comment:	This is an RO error discovery point. **Step 9.15.2**

Terminating Cue:	**JPM is complete**

Job Performance Measure No.:	S.A.2
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are the Control Room Supervisor (CRS).

INITIATING CUE:	The Reactor Operator (RO) has completed Attachment A Test Data for surveillance STS EF-100A, ESW SYSTEM INSERVICE PUMP A & ESW A DISCHARGE CHECK VALVE TEST. The RO reports the surveillance is potentially UNSAT per step 9.15.2. Perform a review of the surveillance and Test Data and approve or disapprove the RO's results. 1. Circle your response: Approve or Disapprove the results. 2. If there are any errors, list the errors.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Authorize the restart of a Containment Purge Permit	JPM No.:	S.A.3
K/A Reference:	2.3.6		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:		x	
	Classroom	x	Simulator		Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are the Control Room Supervisor. A Containment Purge Permit was performed on 8-28-11 at 62% power. A second Containment Purge has been requested to support a Containment Entry on 8-30-11 at 0000 hours. Current conditions: 50% power; Dayshift on 8-29-11 RM-11 Data: GT RE-31, Containment Atmosphere Containment Particulate Channel, GTP311: 6.55E-016 μCi/cc Containment Iodine Channel, GTI312: 3.12E-015 μCi/cc Containment Noble Gas Channel, GTG313: 2.25E-06 μCi/cc GT RE-32, Containment Atmosphere Containment Particulate Channel, GTP321: 6.33E-012 μCi/cc Containment Iodine Channel, GTI322: 2.12E-013 μCi/cc Containment Noble Gas Channel, GTG323: 2.19E-06 μCi/cc
Task Standard:	Upon completion of the JPM, the candidate determined the following: 1. Yes, the radioactivity in Containment was within the restart limits of the Containment Purge Permit. WHY: The Containment atmospheric Noble Gas concentration did not increase by more than 10% from the original sample. 2. Yes, this Containment Purge permit can be used for the scheduled entry. WHY: The Containment Purge Permit will not expire before the scheduled Containment entry.

Required Materials:	Completed APF 07B-001-09-08, CONTAINMENT PURGE PERMIT, calculator
General References:	AP 07B-001, RADIOACTIVE RELEASES, APF 07B-001-09-08, CONTAINMENT PURGE PERMIT, AI 07B-024 INSTRUCTIONS FOR CONTAINMENT PURGE PERMITS
Handouts:	Completed APF 07B-001-09-08, CONTAINMENT PURGE PERMIT
Initiating Cue:	Determine the following: 1. Is the radioactivity in Containment within the restart limits of the Containment Purge Permit? Yes or No, Explain your answer. 2. Can this Containment Purge Permit be used to support the scheduled Containment Entry? Yes or No, Explain your answer.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	No
Validation Time:	10 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Candidate receives a completed Containment Purge Permit and calculator.
	Standard:	Candidate received a completed Containment Purge Permit and calculator.
	Comment:	**Candidate used current revision of AP 07B-001 located in room 235.**

*	**Performance Step: 2**	Candidate determines if the radioactivity in Containment is within the restart limits.
	Standard:	Candidate determined radioactivity in Containment was within AP 07B-001 restart limits. From Initial Conditions: Containment Noble Gas Channel, GTG313: 2.25E-06 μCi/cc 2.25E-06 μCi/cc < 2.52E-06 μCi/cc or Containment Noble Gas Channel, GTG323: 2.19E-06 μCi/cc 2.19E-06 μCi/cc < 4.62E-06μCi/cc Therefore atmospheric noble gas concentration did not increase by more than 10% from the original sample.
	Comment:	**Step 6.2.4.6**

*	**Performance Step: 3**	Candidate determines whether or not this Containment Purge Permit can be used to support the scheduled Containment Entry.
	Standard:	Candidate determined expiration date. From Initial Conditions: Unit is in MODE 1. Scheduled Containment entry: 8-30-11 at 0000 hours Permit expiration date: 8-30-11 at 0930 hours The current Containment Purge Permit is still valid.
	Comment:	**Step 6.2.4.4**

Terminating Cue:	**JPM complete.**

VERIFICATION OF COMPLETION

Job Performance Measure No.:	S.A.3
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are the Control Room Supervisor. A Containment Purge Permit was performed on 8-28-11 at 62% power. A second Containment Purge has been requested to support a Containment Entry on 8-30-11 at 0000 hours. Current conditions: 50% power; Dayshift on 8-29-11 RM-11 Data: GT RE-31, Containment Atmosphere Containment Particulate Channel, GTP311: 6.55E-016 μCi/cc Containment Iodine Channel, GTI312: 3.12E-015 μCi/cc Containment Noble Gas Channel, GTG313: 2.25E-06 μCi/cc GT RE-32, Containment Atmosphere Containment Particulate Channel, GTP321: 6.33E-012 μCi/cc Containment Iodine Channel, GTI322: 2.12E-013 μCi/cc Containment Noble Gas Channel, GTG323: 2.19E-06 μCi/cc

INITIATING CUE:	Determine the following: 1. Is the radioactivity in Containment within the restart limits of the Containment Purge Permit? Yes or No. Explain your answer. 2. Can this Containment Purge Permit be used to support the scheduled Containment Entry? Yes or No. Explain your answer.

Use the following to document answers:

1. Is the radioactivity in Containment within the restart limits of the Containment Purge Permit?
.

2. Can this Containment Purge Permit be used to support the scheduled Containment Entry?

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Classify an Event Using the Emergency Plan and make Protective Action Recommendations	JPM No.:	S.A.4
K/A Reference:	2.4.41 / 2.4.44		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:		x	
	Classroom	x	Simulator		Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are the Shift Manager. The following initial plant conditions exist: • Plant tripped on Loss Of Off-site Power • SYS OPS reports power will be restored in three hours • Area rad monitor R39, CTMT RX SEAL TABLE indicates increasing radiation • Containment pressure is 10 psig • EMG E-0, REACTOR TRIP OR SAFETY INJECTION was entered Subsequently: • Conditions degraded over the next 93 minutes to EMG FR-C2, RESPONSE TO DEGRADED CORE COOLING CONDITIONS, entry • RVLIS level is 40% and decreasing • "B" SG is faulted inside CTMT and indicates 9% WR level and decreasing • At step 14, **Depressurize All Intact S/Gs To 160 PSIG,** "C" SG level was noted as increasing in an uncontrolled manner • RCS pressure is 1600 psig and decreasing • "B" SIP is the only ECCS pump operating (with 250 gpm flow) • GT RR-60, CTMT RAD RECORDER, is 3.0 X 10^1 R/hr and stable • All other indications are stable

Task Standard:	Upon completion, the candidate correctly classified Site Area Emergency on Steam Generator Tube Failure tree, blocks 1, 2, 3, 4, 6, 7, and 8, determined a Protective Action Recommendation to evacuate John Redmond Reservoir (JRR) and Coffey County Lake (CCL) and completed the Immediate Notification form, sections 3, 4, 5 and 8.
Required Materials:	APF 06-002-01, EMERGENCY ACTION LEVELS EPP 06-006, PROTECTIVE ACTION RECOMMENDATIONS EPF 06-007-01, WOLF CREEK GENERATING STATION EMERGECNY NOTIFICATION
General References:	APF 06-002-01, EMERGENCY ACTION LEVELS EPP 06-006, PROTECTIVE ACTION RECOMMENDATIONS EPF 06-007-01, WOLF CREEK GENERATING STATION EMERGECNY NOTIFICATION
Handouts:	APF 06-002-01, EMERGENCY ACTION LEVELS EPP 06-006, PROTECTIVE ACTION RECOMMENDATIONS EPF 06-007-01, WOLF CREEK GENERATING STATION EMERGECNY NOTIFICATION
Initiating Cue:	This is a 15 minute Time Critical JPM. When you have read and understood the Initial Conditions inform the Examiner. Time Zero (0) starts upon notification to the Examiner. Classify the event based on conditions at this time and determine protective action recommendations, if any, and enter the required data on the Immediate Notification form. Form EPF 06-007-01 required data to be completed are sections 3, 4, 5, and 8 on the Immediate Notification form.
Time Critical Task: (Yes or No)	Yes
Alternate Success Path: (Yes or No)	No
Validation Time:	15 minutes

(Denote Critical Steps with an asterisk)

Start Time: _____

*	**Performance Step: 1**	Using the Emergency Action Level flowchart, diagnose plant conditions and classify the event.
	Standard:	EAL-1 – No Action this Category EAL-2 – SGTR: 1, 2, 3, 4, 6, 7, and 8 → Site Area Emergency (SAE) EAL-3 – LRCB: 1, 2, 3, 4, 8 → Site Area Emergency EAL-4 – MSLB: 1, 2, 3, 9, 10, 11, 12 → Site Area Emergency EAL-5 – FEF: 1, 2, 3, 5 → Site Area Emergency EAL-6 – LEP/AC: 1, 2, 5 → Notification of Unusual Event EAL-7 - No Action this Category EAL-8 - No Action this Category EAL-9 - No Action this Category EAL-10 - No Action this Category EAL-11 - No Action this Category EAL-12 - No Action this Category EAL-13 - No Action this Category Candidate classified the event: EAL-2 – SGTR: 1, 2, 3, 4, 6, 7, and 8 → Site Area Emergency (SAE)
	Comment:	

*	**Performance Step: 2**	Using EPP 06-006, PROTECTIVE ACTION RECOMMENDATIONS, determine any Protective Action Recommendations.
	Standard:	From Attachment A, PROTECTIVE ACTION RECOMMENDATION CHART, candidate determined a Protective Action Recommendation to evacuate John Redmond Reservoir (JRR) and Coffey County Lake (CCL).
	Comment:	**Attachment A, Note A.**

*	**Performance Step: 3**	Completes the required sections of the Emergency Notification form.
	Standard:	Candidate completed the required data on the Immediate Notification form. Section 3: Type: Immediate Section 4: Emergency Classification: correct date, time candidate classified and SAE Section 5: Reason for Classification: 2-SGTF, EAL Flowpath: 1, 2, 3, 4, 6, 7, and 8 Section 8: Protective Action Recommendation: Evacuate CCL and JRR
	Comment:	

End Time: _____

Terminating Cue:	**JPM complete when candidate determines EAL classification, protective action recommendations, if any, and completes required data on Immediate Notification form.**

Job Performance Measure No.:	S.A.4					
Examinee's Name:						
Examiner's Name:						
Date Performed:						
Facility Evaluator:						
Number of Attempts:						
Time to Complete:						
Question Documentation:						
Question:						
Response:						
Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are the Shift Manager. The following initial plant conditions exist: • Plant tripped on Loss Of Off-site Power • SYS OPS reports power will be restored in three hours • Area rad monitor R39, CTMT RX SEAL TABLE indicates increasing radiation • Containment pressure is 10 psig • EMG E-0, REACTOR TRIP OR SAFETY INJECTION was entered Subsequently: • Conditions degraded over the next 93 minutes to EMG FR-C2, RESPONSE TO DEGRADED CORE COOLING CONDITIONS, entry • RVLIS level is 40% and decreasing • "B" SG is faulted inside CTMT and indicates 9% WR level and decreasing • At step 14, **Depressurize All Intact S/Gs To 160 PSIG,** "C" SG level was noted as increasing in an uncontrolled manner • RCS pressure is 1600 psig and decreasing • "B" SIP is the only ECCS pump operating (with 250 gpm flow) • GT RR-60, CTMT RAD RECORDER, is 3.0 X 10^1 R/hr and stable • All other indications are stable

INITIATING CUE:	This is a 15 minute Time Critical JPM. When you have read and understood the Initial Conditions inform the Examiner. Time Zero (0) starts upon notification to the Examiner. Classify the event based on conditions at this time and determine protective action recommendations, if any, and enter the required data on the Immediate Notification form. Form EPF 06-007-01 required data to be completed are sections 3, 4, 5, and 8 on the Immediate Notification form.

Facility: Wolf Creek	Date of Examination: Aug. –Sept. 2011
Examination Level: RO ☒ SRO ☒	Operating Test Number:

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

Bolded is an Alternate Success Path JPM.

System / JPM Title	Type Code*	Safety Function
a. S1: 001 – Control Rod Drive System Perform the actions of STS SF-001, CONTROL AND SHUTDOWN ROD OPERABILITY VERIFICATION, for Control Bank A. 001 2.2.12 Knowledge of surveillance procedures. (3.7/4.1) RO/SRO-I	N, S	1
b. S2: 013 – Engineered Safety Features Actuation System (ESFAS) **Perform actions to ensure CRVIS actuation using ALR 00-062D, FBIS and ALR 00-063A, CRVIS.** **PRA: ESFAS is a Risk Significant System at Wolf Creek.** **013 A4.01 Ability to manually operate and/or monitor in the control room ESFAS-initiated equipment which fails to actuate. (4.5/4.8)** **RO/SRO-I/SRO-U**	**N, EN, A, S**	**2**

c. S3: 006 - Emergency Core Cooling System (ECCS) **Perform actions to increase level in an Accumulator using a Safety Injection Pump per procedure SYS EP-200, SAFETY INJECTION ACCUMULATOR OPERATIONS (see sections 6.1, 6.2, 6.3 or 6.4), however, gas voiding is diagnosed due to SIP oscillations and OFN BG-045, GAS BINDING OF CCPS OR SI PUMPS, is entered and performed.** **SOER 97-1, Potential Loss of High Pressure Injection and Charging Capability from Gas Intrusion** **006 A2.04 Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (2) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: improper discharge pressure. (3.4/3.8)** **006 A2.05 Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS; and (2) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: improper amperage to the pump motor. (3.4/3.5)** **006 A4.01 Ability to manually operate and/or monitor in the control room: pumps. (4.1/3.9)** **RO/SRO-I/SRO-U**	**D, A, S**	**3**
d. S4: 041 – Steam Dump System and Turbine Bypass Control Perform actions to establish a maximum rate cooldown using the ARV's per EMG E-3, STEAM GENERATOR TUBE RUPTURE. 041 A4.06 Ability to manually operate and/or monitor in the control room: Atmospheric relief valve controllers. (2.9/3.1) RO/SRO-I	M, L, S	4S

e. S5: 003 – Reactor Coolant Pumps System **Align alternate seal injection and place excess letdown into service per OFN KA-019, LOSS OF INSTRUMENT AIR.** **003 A4.01 Ability to manually operate and/or monitor in the control room: Seal injection (3.3/3.2)** **RO/SRO-I/SRO-U**	**N, L, A, S**	**4P**
f. S6: 103 – Containment Systems Perform actions to startup the Containment Purge System per SYS GT-120, CONTAINMENT MINI PURGE SYSTEM OPERATIONS, sections 6.1 and 6.2. 103 A1.01 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the containment system controls including: Containment pressure, temperature, and humidity. (3.7/4.1) RO	D, S	5
g. S7: 015 – Nuclear Instrumentation Perform actions to bypass a failed Power Range nuclear instrumentation channel using OFN SB-008, INSTRUMENT MALFUNCTIONS, Attachment R (see step R4). 015 A4.03 Ability to manually operate and/or monitor in the control room: Trip bypasses. (3.8/3.9) RO/SRO-I	D, S	7

h. S8: 008 - Component Cooling Water System (CCW) **Perform actions of ALR 00-052A, CCW TO RCP FLOW LO, to respond to a loss of a CCW pump.** **A4.01 Ability to operate and/or monitor in the control room: CCW indications and controls. (3.3/3.1)** **A2.01 Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS, and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of a CCW pump. (3.3/3.6)** **PRA: Component Cooling Water is a Risk Significant System at Wolf Creek.** **RO/SRO-I**	**M, A, S**	**8**
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. P1: 004 – Chemical and Volume Control System **Perform local actions to borate the Reactor Coolant System. (See OFN BG-009, EMERGENCY BORATION, Attachment A, Establishing Alternate Boration Flowpath.)** **004 A2.14 Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations. (3.8/3.9)** **APE 024 AA1.04 Ability to operate and/or monitor the following as they apply to Emergency Boration: Manual boration valve. (3.6/3.7)** **RO/SRO-I/SRO-U**	**D, A, R, E**	**1**

j. P2: 061 – Auxiliary/Emergency Feedwater System Perform actions of STN FC-002, AUX FEEDWATER TURBINE OVERSPEED TEST section 8.1.6. 061 2.1.20 Ability to interpret and execute procedure steps. (4.4/4.6)) PRA: Auxiliary Feedwater (AL) is a Risk Significant System at Wolf Creek. RO/SRO-I	N	4S
k. P3: 064 – Emergency Diesel Generators **Perform actions of ALR 00-020D, DG NE01 TROUBLE alarm. Local alarm response procedure ALR 501, STANDBY DIESEL ENGINE SYSTEM CONTROL PANEL KJ-121, Attachment A, Fuel Oil Press Low and Attachment C, Fuel Strain Diff Press High, are performed.** **064 K1.03 Knowledge of the physical connections and/or cause-effect relationship between the ED/G system and the following systems: Diesel fuel oil supply system. (3.6/4.0)** **PRA: Diesel Fuel Oil (JE) is a Risk Significant System at Wolf Creek.** **RO/SRO-I/SRO-U**	**D, A**	**6**
All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
* Type Codes	Criteria for RO / SRO-I / SRO-U	

(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Perform local actions to borate the Reactor Coolant System.	JPM No.:	P1
K/A Reference:	004 A2.14 and APE 024 AA1.04		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:	x			Actual Performance:			
	Classroom		Simulator		Plant	x	

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are the Auxiliary Building Operator. A Reactor trip has recently occurred from 100% power.
Task Standard:	Upon completion of this JPM, the Candidate will have locally established emergency boration by opening BG HV-8104, Immediate Borate Valve to Charging Pump Suction, and verified greater than 30 gpm flow on BG FI-183B, Emergency Boration Flow Indicator.
Required Materials:	OFN BG-009, EMERGENCY BORATION, Attachment A, Establishing Alternate Boration Flowpath, Personal Protective Equipment
General References:	OFN BG-009, EMERGENCY BORATION, Attachment A, Establishing Alternate Boration Flowpath
Handouts:	OFN BG-009, EMERGENCY BORATION, Attachment A, Establishing Alternate Boration Flowpath
Initiating Cue:	The Control Room Supervisor informs you that OFN BG-009, EMERGENCY BORATION, Attachment A, is being performed and that BG FCV-110A, Boric Acid Blending Tee Inlet Isolation Valve, will not open from the Control Room at step A2. The CRS directs you to locally perform actions to establish Emergency Boration. **DO NOT OPERATE ANY EQUIPMENT IN THE PLANT.**

Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	Yes
Validation Time:	20 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Open Boric Acid Blending Tee Inlet Isolation Valve. o BG HIS-110A Fail open valve:
	Standard:	Candidate went to the "A" Safety Injection pump room on the 1974' level of the Aux. Bldg, and located valve BG HV-110A and its air isolations.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step A.2**

	Performance Step: 2	a. Locally isolate instrument air to valve.
	Standard:	Candidate closed instrument air isolation ball valves to the valve positioner by turning the handles perpendicular to the airline. o BG FCV-110A (V1) o BG FCV-110A (V2)
	Cue:	Cue: Valves are closed.
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step A.2 RNOa** NOTE: Both handles are perpendicular to isolate airlines.

	Performance Step: 3	b. Locally vent air pressure from valve.
	Standard:	Candidate vented air by opening regulator air petcock located at the bottom of the air regulator in a counter-clockwise direction.
	Cue:	After Candidate described venting and expected responses: "No air is heard venting from regulator. BG FCV-110A stem did not move. Valve remains in as found condition."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step A.2 RNOb** **This is the Alternate Path Step**

	Performance Step: 4	c. IF valve can NOT be opened, THEN go to step A8.
	Standard:	Candidate determined the valve cannot be locally opened by failing air and proceeded to step A8.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step A.2 RNOc**

	Performance Step: 5	Establish Manual Emergency Boration:
	Standard:	Candidate completed step A.8.a.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**A.8** High Level Step

*	**Performance Step: 6**	a. (ρ) Locally open Emergency Boration Valve, BG HV-8104
	Standard:	Candidate located BG HV-8104 near BG-FCV-110A, in the "A" Safety Injection pump room. Candidate described: a. Engaging the manual operator by pulling down on the declutch lever. b. Turning the handwheel counter-clockwise until the clutch key is engaged. c. Releasing the declutch lever. d. Turning the handwheel in the counter-clockwise direction e. The handwheel stops turning. f. Valve stem Indication of valve full open.
	Cue:	Cues (if necessary): a. "Declutch lever is pulled down." b. "Handwheel rotated counter-clockwise until clutch key engaged." c. "Declutch lever released." d. "Handwheel is rotating in the counter-clockwise direction, stem is rising." e. "Handwheel stops turning." f. "Valve stem indicates full up."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**A.8.a** NOTE: This is a reactivity step. Handwheel will stop turning in the counter-clockwise direction when the valve is full open. The candidate may describe taking the valve off the back seat by rotating the handwheel in the clockwise direction a partial turn.

	Performance Step: 7	b. Check Emergency Boration flow – GREATER THAN 30 GPM o BG FI-183A
	Standard:	Candidate contacted the Control Room to inform them BG HV-8104 is OPEN and for the Control Room to check flow on BG FI-183A.
	Cue:	After simulated Control Room contact by Gai-tronics: "BG FI-183A is erratic, check your local flow indicator BG FI-183B, Emergency Borate Flow meter and report."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**A.8.b**

*	**Performance Step: 8**	Candidate checks local flow indicator BG FI-183B for flow.
	Standard:	Candidate located local flow indicator BG FI-183B in 1974' Auxiliary Building hallway and described the expected reading was greater than 30 gpm.
	Cue:	When meter is located and expected indication is described: "Meter is reading here." (See NOTE) NOTE: Using a pointer indicate where the needle on the meter is located for the reading greater than 30 gpm less than 110 gpm. Examiner should hold their pointer steady at 90 gpm.
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step A.8.b** Candidate may simulate contact with the Control Room with local reading.

	Performance Step: 9	Return to procedure, step 2
	Standard:	
	Cue:	Candidate has completed JPM.
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**A.8.c**

Terminating Cue: **JPM is complete when candidate completes step A.8. Candidate has opened BG-8104 and determined flow is ≥30 gpm.**

VERIFICATION OF COMPLETION

Job Performance Measure No.:	P1
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:	You are the Auxiliary Building operator. A Reactor trip has recently occurred from 100% power.

INITIATING CUE:	The Control Room Supervisor informs you that OFN BG-009, EMERGENCY BORATION, Attachment A, is being performed and that BG FCV-110A, Boric Acid Blending Tee Inlet Isolation Valve, will not open from the Control Room at step A2. The CRS directs you to locally perform actions to establish Emergency Boration. **DO NOT OPERATE ANY EQUIPMENT IN THE PLANT.**

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Perform the local trip and reset of the TDAFW Pump per STN FC-002 AUX FEEDWATER TURBINE OVERSPEED TEST, section 8.1.6	JPM No.:	P2
K/A Reference:	061 2.1.20		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:	x			Actual Performance:			
	Classroom		Simulator		Plant	x	

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	Unit is in MODE 3. You are a spare Operator assisting the Balance of Plant Operator in performance of STN FC-002, AUX FEEDWATER TURBINE OVERSPEED TEST.
Task Standard:	Upon completion the Candidate tripped and reset the Auxiliary Feedwater Pump Turbine Mechanical Trip Mechanism and successfully performed the tappet nut drop test. (Steps 8.1.6.3 through 8.1.6.7)
Required Materials:	STN FC-002, AUX FEEDWATER TURBINE OVERSPEED TEST, Personal Protective Equipment
General References:	STN FC-002 AUX FEEDWATER TURBINE OVERSPEED TEST
Handouts:	Field copy STN FC-002 AUX FEEDWATER TURBINE OVERSPEED TEST
Initiating Cue:	All procedure Prerequisites are met. The Reactor Operator directs you to perform steps 8.1.6.3 to 8.1.7, Pre-Start Trip Check. **DO NOT OPERATE ANY EQUIPMENT IN THE PLANT.**
Time Critical Task: (Yes or No)	No

Alternate Success Path: (Yes or No)	No
Validation Time:	22 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Candidate receives procedure and reviews procedure.
	Standard:	Candidate received procedure and reviewed procedure.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.1.6.3**

*	**Performance Step: 2**	3. Locally, manually open FC HV-312, AFP TURB MECH TRIP/THROT VLV fully and observe for turbine rotation.
	Standard:	Candidate located and opened FC HV-312: 1. Candidate described pulling down the valve operator declutch lever. 2. Candidate described rotating the handwheel in a clockwise manner. 3. Candidate described the trip/latch pawl engagement as the stem traveled downward. 4. Candidate described rotating the handwheel in a counter-clockwise manner. 5. Candidate described indications of valve fully open. Candidate observed for turbine rotation.
	Cue:	If necessary: 1. "Declutch lever pulled down." 2. "Handwheel is rotating clockwise." 3. "Trip Latch Pawl is engaged." 4. "Handwheel is rotating in the counter-clockwise direction." 5. "Valve stem is rising. Upper limit switch is contacted. " After valve is described as open: "No turbine rotation is occurring."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.1.6.3** CAUTION prior to step: Initial turbine rotation could occur due to steam trapped between FC-V004 and FC HV-312. Examiner NOTE: If Candidate does NOT go in closed direction first the trip/latch will not engage and the valve will not open.

*	**Performance Step: 3**	4. Trip FC HV-312, by depressing the manual trip lever.
	Standard:	Candidate simulated depressing manual trip lever located on top of the turbine housing.
	Cue:	"Trip linkage moved toward you."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.1.6.4**

*	**Performance Step: 4**	5. Close AFP TURB MECH TRIP/THROT VLV. o FC HIS-312A
	Standard:	Candidate simulated contact to Control Room to close FC HV-312A.
	Cue:	When Control Room contacted: "FC HIS-312A, AFP TURB MECH TRIP/THROT VLV, is CLOSED"
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.1.6.5**

*	**Performance Step: 5**	6. Perform tappet nut drop test, by lifting tappet nut and letting it fall while ensuring smooth movement.
	Standard:	1) Candidate located the tappet nut at the trip lever. 2) Candidate described moving the spring loaded emergency connecting rod toward the trip/throttle valve to allow free movement of tappet nut. 3) Candidate described lifting the tappet nut and releasing. 4) Candidate described smooth operation of the tappet nut.
	Cue:	After the candidate described movement of tappet nut drop test: "Tappet nut operated smoothly."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.1.6.6** NOTES prior to procedure step 8.1.6.6: • The spring loaded emergency connecting rod must be moved toward the Trip/Throttle Valve and held to keep the mechanical trip mechanism from interfering with the tappet nut drop test. • Stem movement of FC HV-312 must stop prior to proceeding with this procedure [3.2.3] • The following step resets limit switch LS-5, which will allow turbine operation.

*	**Performance Step: 6**	7. Reset Mechanical Trip Mechanism, by moving spring-loaded emergency connecting rod toward trip throttle valve with just enough force to overcome spring tension, release the connecting rod.
	Standard:	1. Candidate described moving the spring loaded emergency connecting rod toward the trip/throttle valve. 2. Candidate described the tappet nut falling into place with the washer flat side against the trip lever. 3. Candidate described the trip lever rising slightly. 4. Candidate described releasing the connecting rod and the rod resting against the opposing flat of the tappet nut.
	Cue:	After Candidate resets trip linkage: "Head lever is seated against tappet."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.1.6.7** CAUTION prior to step 8.1.6.7: LS-5 limit switch actuator arm may slide under the roller plate if the connecting rod is moved too far toward the AFP Turbine Trip/Throttle Valve.

	Performance Step: 7	7.a Verify the following: • Tappet nut full down and flat side against the lever (refer to Operator Aid 96-14). • Ann. 00-129C, TD AFP OVSP TRIP not lit • Red light FC ZL-312DA, AFP TURB MECH TRIP not lit
	Standard:	Candidate verified 1. Candidate referred to Operator Aid – Candidate checked tappet nut was full down and flat side was against the head lever. 2. Candidate simulated contact to Control Room and verified window 129C was not lit. 3. Candidate contacted Control Room and verified FC ZL-312DA was not lit.
	Cue:	1.: Tappet nut is full down and flat side is against the head lever 2.: Annunciator 129C, TD AFP OVSP TRIP is NOT LIT 3.: Red light FC ZL-312DA, AFP TURB MECH TRIP is NOT LIT
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.1.6.7a** Operator Aid 96-14 is located on South wall. **NOTE: JPM is terminated at examiner's discretion at this step.**

	Performance Step: 8	Section 8.1, Pre-test Alignment and Actions for mechanical trip test and reset complete.
	Standard:	Candidate completed steps 8.1.6.3 to 8.1.6.7 successfully.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.1.7**

Terminating Cue: **JPM is complete when candidate completes Step 8.1.6.7.**

VERIFICATION OF COMPLETION

Job Performance Measure No.:	P2					
Examinee's Name:						
Examiner's Name:						
Date Performed:						
Facility Evaluator:						
Number of Attempts:						
Time to Complete:						
Question Documentation:						
Question:						
Response:						
Result:		SAT			UNSAT	

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:	Unit is in MODE 3. You are a spare Operator assisting the Balance of Plant Operator in performance of STN FC-002, AUX FEEDWATER TURBINE OVERSPEED TEST.

INITIATING CUE:	All procedure Prerequisites are met. The Reactor Operator directs you to perform steps 8.1.6.3 to 8.1.7, Pre-Start Trip Check. **DO NOT OPERATE ANY EQUIPMENT IN THE PLANT.**

Facility: Wolf Creek Task No.: N/A

Task Title: Respond to Emergency Diesel Generator alarm JPM No.: P3

K/A Reference: 064 K1.03

Examinee:		NRC Examiner:	
Facility Evaluator:		Date:	
Method of testing:			
Simulated Performance:	x	Actual Performance:	
Classroom		Simulator		Plant	x		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are a spare Operator. The plant is stable at 100% power. STS KJ-005A, MANUAL/AUTO START, SYNC & LOADING OF EDG NE01 is in progress. Control Room has received Annunciator 20D, DG NE01 TROUBLE.
Task Standard:	Upon completion of this JPM the Candidate performed actions to correct a high strainer d/p by shifting fuel oil strainers per ALR 501, STANDBY DIESEL ENGINE SYSTEM CONTROL PANEL KJ-121.
Required Materials:	ALR 501, STANDBY DIESEL ENGINE SYSTEM CONTROL PANEL KJ-121, Personal Protective Equipment
General References:	ALR 501, STANDBY DIESEL ENGINE SYSTEM CONTROL PANEL KJ-121
Handouts:	ALR 501, STANDBY DIESEL ENGINE SYSTEM CONTROL PANEL KJ-121
Initiating Cue:	The Control Room Supervisor directs you to investigate and correct the alarm condition. **DO NOT OPERATE ANY EQUIPMENT IN THE PLANT.**
Time Critical Task: (Yes or No)	No

Alternate Success Path: (Yes or No)	Yes
Validation Time:	20 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Candidate locates alarm panel KJ-121 in Emergency Diesel Generator (EDG) room A, northeast side. Candidate checks local alarm panel KJ-121.
	Standard:	1. Candidate located alarm panel KJ-121 in Emergency Diesel Generator (EDG) room A, northeast side. 2. Candidate described checking and acknowledging local alarm panel KJ-121.
	Cue:	2. After candidate described checking KJ-121 panel alarms: "Annunciators Column One Row One (1A) and Column One Row Three (1C) are locked in alarm."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	

	Performance Step: 2	Candidate enters ALR 501. Determine Attachments For Lit Annunciators From Table Below:
	Standard:	1. Candidate located Alarm response procedure 2. Candidate used the Table to determine Attachment A for alarm window FUEL OIL PRESS. LOW lit Annunciator.
	Cue:	1. When local ALR is located hand the Candidate a copy of ALR 501 Attachment 501-01A.
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**ALR 501 Step 1** **Candidate retrieves ALR 501 book. Examiner gives a copy of attachment 501-01A (YELLOW) after attachment properly identified.**

	Performance Step: 3	Check Fuel Oil Pressure From Fuel Filter – LESS THAN 10 PSIG • KJ PI-13 Black Needle
	Standard:	Candidate located and checked pressure gauge KJ PI-13 Black needle on KJ-121 Panel.
	Cue:	After the candidate described checking the pressure gauge: "Black Needle indicates 6 psig."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**ALR 501 Att. A step A1** NOTE: The Black needle is the "FROM" pressure and the Red needle is the "TO" pressure.

	Performance Step: 4	Check Fuel Oil Filter Differential Pressure – LESS THAN 15 PSID • KJ PI-13
	Standard:	Candidate located and checked pressure gauge KJ PI-13 Red Needle on KJ-121 Panel and determined the delta between the Black needle and the Red needle. After cue Candidate determined fuel oil dP is 2 psid. 8 – 6 = 2 psid
	Cue:	After the candidate described checking the pressure gauge: "Red needle indicates 8 psig."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**ALR 501 Att. A step A2** NOTE: The Black needle is the "FROM" pressure and the Red needle is the "TO" pressure.

*	**Performance Step: 5**	Check Fuel Oil Strainer Differential Pressure – LESS THAN 2 PSID • KJ PDI-10
	Standard:	1. Candidate located and checked differential pressure gauge KJ PDI-10. 2. Candidate realized 4.5 psid exceeded 2 psid limit. 3. Candidate Performed RNO.
	Cue:	1. After the candidate located & described check of differential pressure gauge: Examiner points to 4.5 psid
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**ALR 501 Att. A step A3 (Alternate Success Path step)** Examiner NOTE: The dP gauge is under the Fuel Oil Strainers, on the southeast side of the engine.

	Performance Step: 6	Candidate transitions to Attachment C, FUEL STRAIN. DIFF. PRESS. HIGH
	Standard:	Candidate transitioned to Attachment C, FUEL STRAIN. DIFF. PRESS. HIGH
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**ALR 501 Attachment C** Examiner NOTE: Once determined Examiner hands Candidate Attachment 501-01C (attachment is BLUE).

	Performance Step: 7	Check Fuel Oil Strainer Differential Pressure – GREATER THAN 2 PSID • KJ PDI-10
	Standard:	Candidate recalled differential pressure gauge KJ PDI-10 at 4.5 psid. Procedure: Candidate realized 4.5 psid exceeded 2 psid limit.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**ALR 501 Att. C step C1** The dP gauge is under the Fuel Oil Strainers, on the southeast side of the engine.

*	**Performance Step: 8**	Shift to Backup Fuel Oil Basket Strainer: • KJBS01A
	Standard:	Candidate located handwheel basket strainer KJBS01A. Candidate shifted to backup strainer: 1. Simulated rotating the handwheel in the direction towards the strainer being placed in service. 2. Candidate described the stem and position indicator movement. 3. Candidate described arrow on stem indicating KJBS01A strainer was “In Use.”
	Cue:	After candidate describes shifting the strainer: “Position arrow pointing to strainer just placed in service.” If asked: “KJ PDI-10 indicates 0.5 psid, alarms are clear.”
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**ALR 501 Att. C step C2** Examiner NOTE: The handwheel will only turn in one direction when movement is attempted. Therefore the only way a Candidate will know which direction is to actually reposition the valve.

	Performance Step: 9	Inform The Control Room That The Fuel Oil Strainers Have Been Shifted
	Standard:	Candidate located nearest Gaitronics and simulated a call to the Control Room informing them the fuel oil strainers were shifted per ALR 501 Attachment C.
	Cue:	After candidate describes actions to Control Room: "Understand backup strainer in service, the CRS will initiate a Condition Report, and Maintenance will be contacted."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**ALR 501 Att. C step C3**

Terminating Cue: **JPM is complete when Candidate placed the backup strainer in service.**

VERIFICATION OF COMPLETION

Job Performance Measure No.:	P3
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are a spare Operator. The plant is stable at 100% power. STS KJ-005A, MANUAL/AUTO START, SYNC & LOADING OF EDG NE01 is in progress. Control Room has received Annunciator 20D, DG NE01 TROUBLE.

INITIATING CUE:	The Control Room Supervisor directs you to investigate and correct the alarm condition. **DO NOT OPERATE ANY EQUIPMENT IN THE PLANT.**

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Perform STS SF-001 CONTROL AND SHUTDOWN ROD OPERABILITIY VERIFICATION for the Control Bank A	JPM No.:	S1
K/A Reference:	001 2.2.12		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:	x		
	Classroom		Simulator	x	Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are the Reactor Operator. The plant is in MODE 1, steady state conditions. Tavg and Tref are within 1.5°F. No Load changes are planned. The Reactor Makeup System is in AUTO. There is no testing or maintenance being performed on the Rod Control System. Reliable communications are established and I&C personnel have been briefed and are stationed at the Rod Control Power Cabinets. No fuel conditioning limits. All Prerequisites for STS SF-001, CONTROL AND SHUTDOWN ROD OPERABILITIY VERIFICATION have been met.
Task Standard:	Upon completion of the JPM, the candidate has exercised Control Bank A ten steps (ten steps inserted and ten withdrawn ±2 steps) using steps 8.2 through 8.10 of STS SF-001, CONTROL AND SHUTDOWN ROD OPERABILITIY VERIFICATION.
Required Materials:	STS SF-001, CONTROL AND SHUTDOWN ROD OPERABILITIY VERIFICATION Simulator setup: IC 311; Run JPM S3 first then do JPM S1 NOTE: IC 311 is IC 30 Ensure the Reactor Makeup System is in AUTO. Ensure Tavg and Tref are within 1.5°F. Display TOC RBU on NPIS Display 1 or 2 (RL04)

General References:	STS SF-001, CONTROL AND SHUTDOWN ROD OPERABILITIY VERIFICATION
Handouts:	STS SF-001, CONTROL AND SHUTDOWN ROD OPERABILITIY VERIFICATION
Initiating Cue:	The Control Room Supervisor directs you to perform steps 8.2 through 8.10 of STS SF-001, CONTROL AND SHUTDOWN ROD OPERABILITIY VERIFICATION for Control Bank A (CBA). Step 8.1 has been performed.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	No
Validation Time:	20 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Candidate receives procedure and reviews procedure.
	Standard:	Candidate received and reviewed procedure.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**STS SF-001, CONTROL AND SHUTDOWN ROD OPERABILITIY VERIFICATION** NOTE prior to step 8.1: Annunciators 00-079C, RPI DEV OR PR TILT, and 00-081D, ROD BANK LO LIMIT are expected during performance of this test.

*	**Performance Step: 2**	Place SE HS-9, ROD BANK AUTO/MAN SEL to the bank to be tested.
	Standard:	Candidate placed SE HS-9, ROD BANK AUTO/MAN SEL to CBA position.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.2**

	Performance Step: 3	Have I&C locally verify that the rod bank selected by SE HS-9 is lined up properly by light indication on the associated cabinet. Refer to Attachment A, VERIFICATION OF LIGHT INDICATION for proper indication.
	Standard:	1. Candidate contacted I&C. (Cue 1, if needed) 2. I&C verified proper light indication for CBA. 3. Candidate initialed Attachment A that correct group lamp was illuminated on the associated Rod Control Power Cabinet
	Cue:	Cue 1: After candidate contacts I&C: “On Power Cabinet Sierra Foxtrot 110 Charlie Lima slash Foxtrot Lima the Alpha lamp is illuminated.”
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.3** using Attachment A step A.2 for CBA, SF110CL/FL - A lamp is lit.

	Performance Step: 4	Record the Initial Step Counter and Digital RPI Indications for the bank being tested on Attachment B, ROD OPERABILITY VERIFICATION DATA SHEET.
	Standard:	Candidate recorded current Step Counter and Digital RPI values for Control Bank A group 1 and Group 2 on Attachment B, ROD OPERABILITY VERIFICATION DATA SHEET (page 2 of 3). Candidate wrote: • Step Counter position - 227 • Digital RPI Indications - 228
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.4** Candidate recorded 228 steps for rods H-6 and H-10 for Group 1 and 228 steps for F-8 and K-8 for Group 2.

	Performance Step: 5	Monitor rod speed indication on SC SI-412, ROD SPEED, while inserting or withdrawing rods.
	Standard:	Candidate monitored rod speed indication on SC SI-412, ROD SPEED, while inserting or withdrawing rods.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.5** Rod speed will indicate 48 Steps/Min

	Performance Step: 6	Insert selected bank rods, at the desired rate, as follows:
	Standard:	Candidate performed steps 8.6.1 through 8.6.4
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.6 is a reactivity step.** **NOTES prior to step 8.6:** • **Rod movement should be made with due consideration of differential rod worth and the effects of temperature.** • **For rods in the full out position, the reactivity insertion is bounded by a differential rod worth of 6 pcm/step** **CAUTIONs prior to step 8.6:** • **Rod speed is 64 steps per minute for Shutdown Rods and 48 steps per minute for Control Rods.** • **Rod speed indication is not available for shutdown banks C, D, and E.** • **The amount of time that rods exceed the physical insertion limits specified in the CORE OPERATING LIMITS REPORT (COLR) should be minimized.**

	Performance Step: 7	Adjust turbine load as necessary, to maintain Tavg within 1°F of Tref.
	Standard:	
	Cue:	"Turbine load adjustments will be made by the BOP."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.6.1** Booth operator will ensure Tavg remains within 1°F of Tref.

*	**Performance Step: 8**	Using SF HS-2, MAN ROD CTRL move rods IN, until the selected step counters indicate a change of 10 steps.
	Standard:	Candidate monitored Control Bank A step counters and inserted Control Bank A 10 steps $\pm$ 2 steps.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.6.2** Candidate may check rod speed prior to moving rods. Annunciators 00-079C, RPI DEV OR PR TILT and 00-081D, ROD BANK LO LIMIT are expected alarms.

	Performance Step: 9	Record rod speed on ATTACHMENT B, ROD OPERABILITY VERIFICATION DATA SHEET.
	Standard:	Candidate recorded 48 on the “IN” block on ATTACHMENT B, ROD OPERABILITY VERIFICATION DATA SHEET (page 2 of 3).
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.6.3**

	Performance Step: 10	Record inserted rod positions on ATTACHMENT B, ROD OPERABILITY VERIFICATION DATA SHEET.
	Standard:	Candidate recorded 217 for Control Bank A Group 1 and Group 2 rod positions for Step Counters and 216 for rods H-6, H-10, F-8, and K-8 in the “INSERTED” column on ATTACHMENT B, ROD OPERABILITY VERIFICATION DATA SHEET (page 2 of 3).
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.6.4**

	Performance Step: 11	IF the NPIS Computer is available, THEN verify the computer points listed below for all rod groups agree with the associated group step counter.
	Standard:	NPIS is available. Candidate checked RBU on NPIS Display to verify rod group agreement with the associated step counter.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.7** Examiner NOTE: All listed points in the procedure are found on Turn On Code screen "RBU" displayed currently on RL04 terminals Display 1 or Display 2. Examiner NOTE: Step 8.8 "Withdraw selected bank rods, at the desired rate, as follows:" is performed using performance steps 12 through 18 (starting at 8.8.1 in procedure).

	Performance Step: 12	Adjust turbine load as necessary, to maintain Tavg within 1°F of Tref.
	Standard:	
	Cue:	"Turbine load adjustments will be made by the BOP."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.8.1** Booth operator will ensure Tavg within 1°F of Tref.

*	**Performance Step: 13**	Using SF HS-2, MAN ROD CTRL, move rods OUT, until the selected step counters indicate the position recorded in step 8.4.
	Standard:	Candidate monitored rod speed and withdrew CBA until the step counters indicated 227 steps $\pm$ 2 steps.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.8.2** Annunciators 00-079C, RPI DEV OR PR TILT and 00-081D, ROD BANK LO LIMIT clear.

	Performance Step: 14	IF the Rods are withdrawn greater than 231 steps, THEN perform ATTACHMENT C, OVERSTEP RECOVERY, prior to selecting new bank.
	Standard:	Candidate recognized rods were not withdrawn greater than 231 steps – Step 8.8.3 was not applicable.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.8.3**

	Performance Step: 15	IF a control bank is restored to 222 steps AND 00-081D, ROD BANK LO LIMIT did NOT clear, THEN withdraw the bank a maximum of two additional steps to clear the alarm.
	Standard:	Candidate announced 00-081D, ROD BANK LO LIMIT clear and recognized Step 8.8.4 was not applicable.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.8.4**

	Performance Step: 16	IF the rods are withdrawn to a step greater than the position recorded in step 8.4 and 231 steps has NOT been exceeded, THEN step rods in to obtain the required position.
	Standard:	Candidate withdrew rods to position recorded in step 8.4, and recognized step 8.8.5 was not applicable. OR IF candidate withdrew rods greater than recorded position at step 8.4 AND less than 231 steps: Then candidate stepped the rods IN to obtain 227 steps recorded in step 8.4.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.8.5** Examiner NOTE: Rods can be at 229 steps requiring rod IN motion.

	Performance Step: 17	Record rod speed on ATTACHMENT B, ROD OPERABILITY VERIFICATION DATA SHEET.
	Standard:	Candidate wrote 48 in the “OUT” block for Control Bank A Group 1 and Group 2 on ATTACHMENT B, ROD OPERABILITY VERIFICATION DATA SHEET (page 2 of 3).
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.8.6**

	Performance Step: 18	Record final rod positions on ATTACHMENT B, ROD OPERABILITY VERIFICATION DATA SHEET.
	Standard:	Candidate recorded 227 steps for Step Counters Group 1 and group 2 and 228 steps for Digital RPI H-6, H-10, F-8 and K-8 in the “FINAL” column on ATTACHMENT B, ROD OPERABILITY VERIFICATION DATA SHEET (page 2 of 3).
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.8.7**

	Performance Step: 19	IF the NPIS Computer is available, THEN verify the computer points listed below for all rod groups agree with the associated group step counter.
	Standard:	Candidate recalled Initial Condition statement: NPIS is unavailable.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.9**

	Performance Step: 20	Initial and date the appropriate bank on ATTACHMENT B, ROD OPERABILITY VERIFICATION DATA SHEET.
	Standard:	Candidate initialed and dated the appropriate blocks for Control Bank A Group 1 and Group 2 on ATTACHMENT B, ROD OPERABILITY VERIFICATION DATA SHEET.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.10**

	Performance Step: 21	Using SE HS-9, ROD BANK AUTO/MAN SEL select an unexercised rod bank and repeat steps 8.3 through 8.10, until all rod banks not fully inserted in the core have been tested.
	Standard:	
	Cue:	"That completes this JPM."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 8.11**

Terminating Cue: **JPM is complete after candidate inserted and withdrew Control Bank A ten steps.**

VERIFICATION OF COMPLETION

Job Performance Measure No.:	S1
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are the Reactor Operator. The plant is in MODE 1, steady state conditions. Tavg and Tref are within 1.5°F. No Load changes are planned. The Reactor Makeup System is in AUTO. There is no testing or maintenance being performed on the Rod Control System. Reliable communications are established and I&C personnel have been briefed and are stationed at the Rod Control Power Cabinets. No fuel conditioning limits. All Prerequisites for STS SF-001, CONTROL AND SHUTDOWN ROD OPERABILITIY VERIFICATION have been met.

INITIATING CUE:	The Control Room Supervisor directs you to perform steps 8.2 through 8.10 of STS SF-001, CONTROL AND SHUTDOWN ROD OPERABILITIY VERIFICATION for Control Bank A (CBA). Step 8.1 has been performed.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Perform actions to ensure CRVIS actuation using ALR 00-062D FBIS	JPM No.:	S2
K/A Reference:	013 A4.01		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:		x	
	Classroom		Simulator	x	Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are the Reactor Operator. The plant has experienced a spurious FBIS and CRVIS.
Task Standard:	Upon completion the candidate started Control Room A/C Unit 4B GK HIS-40 and Control Room Filtration Fan 3A GK HIS-19. Candidate checked dampers to and from Units 4B and 3A properly aligned.
Required Materials:	ALR 00-062D, FBIS ALR 00-063A, CRVIS Simulator setup: IC 315 NOTE: IC 315 already includes CRVIS and FBIS actuation. IC 315 already includes malfunctions: Defeat auto actuations for Yellow train: IMF mSA27GK11A IMF mSA27GK11B Defeat auto actuations for Red train: IMF mSA27GK05
General References:	ALR 00-062D, FBIS ALR 00-063A, CRVIS
Handouts:	ALR 00-062D, FBIS ALR 00-063A, CRVIS

Initiating Cue:	The Control Room Supervisor directs you to perform ALR 00-063A, CRVIS.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	Yes
Validation Time:	10 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Candidate receives ALR 00-063A, CRVIS
	Standard:	Candidate received and reviewed ALR 00-063A, CRVIS.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	

	Performance Step: 2	Check EMGs – NOT IN EFFECT
	Standard:	Candidate checked: a. Unit at power b. GEN 00-004 Power Operations – IN EFFECT
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 1**

	Performance Step: 3	Check Annunciator 00-063C, CTRL RM CL2 CRVIS - CLEAR
	Standard:	Candidate observed alarm window 063C – NOT LIT
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 2**

	Performance Step: 4	Check Annunciator 00-063B, CTRL RM RAD HI CRVIS - CLEAR
	Standard:	Candidate checked alarm window 063B – NOT LIT
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 3**

	Performance Step: 5	Check Annunciator 00-059D, CPIS - CLEAR
	Standard:	Candidate checked alarm window 059D – NOT LIT
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 4**

	Performance Step: 6	Check Annunciator 00-062D, FBIS - CLEAR
	Standard:	Candidate checked alarm window 062D – LIT a. Candidate performed the RNO – Go to ALR 00-062D, FBIS Step 1
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 5** Examiner NOTE: Once the Candidate determines ALR 00-062D is to be performed, handout to Candidate the Alarm Response Procedure ALR 00-062D.

	Performance Step: 7	Candidate receives ALR 00-062D, FBIS
	Standard:	Candidate received and reviewed ALR 00-062D, FBIS
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	

	Performance Step: 8	Verify Both Trains Of Control Room Ventilation Isolation: a. Check ESFAS Status Panel CRVIS Section – ALL WHITE LIGHTS LIT o Red Train o Yellow Train
	Standard:	Candidate checked SA 066-X Red Train All White Lights – LIT; NO • CTRL ROOM FILTRATION FAN CGK03A • CTRL RM FLTR SYS INLET DMPR • CTR RM FLTR DISCH DMPR • CTRL RM RECIRC DMPR • CTRL RM A/C UNIT DISCH DMPR Candidate checked SA 066-Y Yellow Train All White Lights – LIT; NO • CTRL RM A/C UNIT SGK04B • CTRL RM A/C UNIT B DMPR GKHZ40A • CTR RM A/C UNIT B DMPR GKHZ40B Candidate performed the RNO 1.a
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 1** **Alternate Success Path step** Examiner NOTE: The Candidate will manipulate only 2 components on Panel RP068.

*	**Performance Step: 9**	Perform the following: 1) IF any CRVIS component NOT properly aligned, THEN manually align associated component.
	Standard:	Candidate noted components not LIT on both status panels and proceeded to RP-068 Panel in the back of the Control Room (Simulator) and performed the following on RED TRAIN: 1. Candidate started Control Room Filtration Fan (Red Train) by placing GK HIS-19 J-handle to RUN and observed RUN Red light – LIT and Green light - EXTINGUISHED 2. Candidate observed GK HIS-19 INLET DAMPER – Red light – LIT and Green light - EXTINGUISHED 3. Candidate observed GK ZL-19B Red light - LIT and Green light - EXTINGUISHED 4. Candidate observed GK ZL-19C Red light - LIT and Green light - EXTINGUISHED 5. Candidate observed GK ZL-19D Red light - LIT and Green light - EXTINGUISHED
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 1.a RNO** Examiner Note: Trains separated for performance standards. Examiner Note**: Candidate may check Status panel SA 066-X at this time to verify all white lights lit**

*	**Performance Step: 10**	Perform the following: IF any CRVIS component NOT properly aligned, THEN manually align associated component.
	Standard:	Candidate noted components not LIT on both status panels and proceeded to RP-068 Panel in the back of the Control Room (Simulator) and performed the following on YELLOW TRAIN: 1. Candidate started Control Room A/C Unit 4B by placing handswitch GK HIS-40, CTRL RM A/C UNIT 4B FAN & DAMPER, to RUN and observed RUN Red light - LIT and Green light - EXTINGUISHED 2. Candidate observed SUPPLY DAMPER on handswitch Red light - LIT and Green light - EXTINGUISHED 3. Candidate observed CTRL RM A/C UNIT 4B DAMPER, limit lights – Red light – LIT, and Green light - EXTINGUISHED
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 1.a RNO** Examiner Note: Trains separated for performance standards. Candidate may check Status panel SA 066-Y at this time to verify all white lights lit

	Performance Step: 11	JPM is complete
	Standard:	Candidate completed actions to align CRVIS.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	

Terminating Cue: **JPM complete when Candidate completes step 1.a RNO of ALR 00-062D, FBIS, ensuring all components of CRVIS have actuated.**

VERIFICATION OF COMPLETION

Job Performance Measure No.:	S2
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are the Reactor Operator. The plant has experienced a spurious FBIS and CRVIS.

INITIATING CUE:	The Control Room Supervisor directs you to perform ALR 00-063A, CRVIS.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Diagnose and Mitigate Safety Injection Pump Gas Voiding using OFN BG-045, GAS BINDING OF CCPS OR SI PUMPS	JPM No.:	S3
K/A Reference:	006 A2.04, 006 A2.05, 006 A4.01		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:	x		
	Classroom		Simulator	x	Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are the Reactor Operator. The plant is stable in MODE 1. Accumulator "C" level is 50% due to Chemistry sampling.
Task Standard:	Upon completion of this JPM, the candidate has diagnosed SI Pump B gas binding and secured the pump.
Required Materials:	SYS EP-200, SAFETY INJECTION ACCUMULATOR OPERATIONS, OFN BG-045, GAS BINDING OF CCPS OR SI PUMPS

General References:	SYS EP-200, SAFETY INJECTION ACCUMULATOR OPERATIONS, OFN BG-045, GAS BINDING OF CCPS OR SI PUMPS Booth setup: IC 311 -- JPM S3 and JPM S1 use the same IC. Run JPM S3 first then do JPM S1. NOTE: IC 311 is IC 30 Ensure: EJ HIS-8890A is closed. Enter: set asisal(3)=52275 Enter this file: S1 and S3 ; Disch press oscillates {x17i112r} IOR P17010A f:705 r:1 d:1 {x17i112r} IOR P17011A f:1805 r:1 d:1 {nemp01b & hwx17d113m < 0.041} IOR P17011A f:1805 r:1 {nemp01b & hwx17d113m > 0.9} IOR P17011A f:0 r:1 ; Disch flow oscillates {nemp01b & hwx17d114m < 0.01} IOR P17010A f:705 r:1 {nemp01b & hwx17d114m < 0.01} IRF rEM01B f:5 r:1 {nemp01b & hwx17d114m > 0.6} IOR P17010A f:0 r:1 {nemp01b & hwx17d114m > 0.6} IRF rEM01B f:0 r:1 ; Pump amps oscillate {nemp01b & hwx17d114m < 0.01} ICM trEMIIN018 t:3 f:0 r:1 {nemp01b & hwx17d114m > 0.4} ICM trEMIIN018 t:3 f:508 r:1 ; Pump in PTL {!nemp01b} COR {!nemp01b} DCM trEMIIN018 {!nemp01b} IRF rEM01B f:69.38 r:1 Booth: Verify Per SYS EP-200 Prereq 5.4: IC 311 – ensure CCW B for SIP B is running Per SYS EP-200 Prereq 5.8: ensure trend for EP Accumulator pressure and level on NPIS available (EP1) Display TOC EM1 on separate screen on RL020
Handouts:	Partially completed SYS EP-200, SAFETY INJECTION ACCUMULATOR OPERATIONS, OFN BG-045, GAS BINDING OF CCPS OR SI PUMPS
Initiating Cue:	The Control Room Supervisor provides you the following brief: • You are to use Safety Injection Pump B to increase Safety Injection Accumulator "C" level to ≅ 58% using section 6.1 of SYS EP-200, SAFETY INJECTION ACCUMULATOR OPERATIONS. • Safety Injection Pump discharge relief valves are expected to lift on pump start. • Depressurizing the RHR header is not necessary. • Procedure prerequisites have been completed. • NPIS Turn On Code EM1 has all available SIP display points

Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	Yes
Validation Time:	20 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Candidate receives and reviews SYS EP-200, SAFETY INJECTION ACCUMULATOR OPERATIONS
	Standard:	Candidate received and reviewed SYS EP-200, SAFETY INJECTION ACCUMULATOR OPERATIONS
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	

	Performance Step: 2	IF Accumulator level is less than 45% AND Accumulator pressure is greater than 619 psig, THEN adjust Accumulator pressure to less than 619 psig, using section 6.7, Decreasing Accum Pressure.
	Standard:	Candidate recognized this step is not applicable.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**SYS EP-200 section 6.1 step 6.1.1**

	Performance Step: 3	Record RCS pressure read on any of the following indicators:
	Standard:	Candidate located indicators on Panel RL002. Candidate recorded one RCS pressure from: * BB PI-455A * BB PI-456 * BB PI-457 * BB PI-458
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.2**

	Performance Step: 4	IF desired, THEN depressurize RHR header, as follows
	Standard:	Candidate referred to Initiating Cue.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.3** NOTE prior to step: Depressurizing the RHR header should reduce back pressure on check valves EP-8818A, B, C and D, allowing the check valves to seat while the SI Pump is running. This step should be performed at SM/CRS discretion and system engineering should be contacted. Depressurization is not required for this JPM.

	Performance Step: 5	IF using SI Pump A to fill Accumulators, THEN perform the following
	Standard:	Candidate recognized this step is not applicable, Initiating Cue stated to use SI Pump B to fill the Accumulator.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.4**

	Performance Step: 6	Ensure SI PUMP B RECIRC TO RWST is open • EM HIS 8814B – OPEN
	Standard:	Candidate checked EM HIS-8814B OPEN (Red Light LIT).
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.5.1** Examiner NOTE: Performance steps 6 through step 11 satisfy procedure step 6.1.5, “IF using SI Pump B to fill Accumulators, THEN perform the following:”

	Performance Step: 7	Ensure SI PUMPS RECIRC TO RWST is open • BN HIS-8813 - OPEN
	Standard:	Candidate checked BN HIS-8813 was OPEN (Red Light LIT).
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.5.2**

*	**Performance Step: 8**	IF SI Pump Discharge Relief valves are expected to lift on pump start, THEN close SI PUMP B DISCH TO COLD LEG INJ. • EM HIS-8821B - CLOSED
	Standard:	Candidate notified CRS of NOTE referring to TS 3.5.2 entry. (See Cue) Candidate depressed EM HIS-8821B CLOSE pushbutton. Candidate checked EM HIS-8821B Green Light was LIT and the Red Light EXTINGUISHED.
	Cue:	After candidate notified CRS of TS 3.5.2 reference: “CRS and STA will refer to Technical Specification 3.5.2.”
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.5.3** NOTE prior to step: Closing EM HIS-8821B, SI PUMP B DISCH TO COLD LEG INJ causes the SI Pump B C/L Injection path to be inoperable, refer to Technical Specification 3.5.2.

	Performance Step: 9	Ensure NPIS computer trend has been started to monitor proper pump operation and system response. These points should include amps, suction pressure, discharge pressure, flow and any other available points.
	Standard:	Candidate used NPIS TOC EM1 to display desired points and started point trending.
	Cue:	If Candidate starts a computer search for suction pressure, etc. “All available computer points are displayed on NPIS EM1 screen”
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.5.4**

*	**Performance Step: 10**	Start SI PUMP B. • EM HIS-5 – NORMAL AFTER RUN
	Standard:	Candidate manipulated J-handle switch EM HIS-5 on RL017 Panel to the right (RUN). Candidate verified Red Light – LIT, (Green Light – EXTINGUISHED)
	Cue:	Cue if Building Watch contacted for pre-start pump checks: "Pre-start pump checks are SAT."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.5.5** Examiner NOTE: Candidate may elect to stop the pump after start prior to any other actions or reporting to CRS based on gas binding/cavitation indications: pressure, flow, and amps oscillating. Pump gas binding/cavitation occurs after pump start. Candidate may skip to Performance Step 12 or 13.

	Performance Step: 11	If closed to prevent discharge relief valve lift, THEN open SI PUMP B DISCH TO COLD LEG INJ. • EM HIS-8821B – OPEN
	Standard:	Candidate on RL017 Panel depressed EM HIS-8821B OPEN pushbutton. Candidate checked the Red Light was LIT and the Green Light EXTINGUISHED.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.5.6**

	Performance Step: 12	On RL017 SI Pump B pressure and flow begin oscillating: • EM PI-923 DISCH PRESS • EM FI-922 DISCH FLOW • NPIS trends on EM1 oscillating
	Standard:	**RO** Candidate: • Candidate reported indications of gas binding or cavitation in SI Pump B. **SRO** Candidate: • Candidate identified indications of gas binding or cavitation in SI Pump B. • Candidate identified or entered OFN BG-045, GAS BINDING OF CCPS OR SI PUMPS.
	Cue:	Local Operator reports: "Loud noise from the pump like pumping gravel." **RO Candidates** may report the indications to the CRS. "Understand erratic pump indications, Perform OFN BG-045, GAS BINDING OF CCPS OR SI PUMPS" **SRO Candidates -** After candidate identifies oscillating SI Pump B indications: "What procedure guidance is provided for the indications observed?"
	Score: SAT or UNSAT	SAT or UNSAT **Examiner NOTE: If SRO candidates do not know OFN BG-045 entry required the JPM is terminated.**
	Comment:	Examiner NOTE: CRS direction to perform OFN BG-045, GAS BINDING OF CCPS OR SI PUMPS for RO's is consistent with license expectations. SRO Candidates identify procedure flowpath to be consistent with license expectations. **Alternate Success Path step**

*	**Performance Step: 13**	Candidate directed to or enters OFN BG-045, GAS BINDING OF CCPS OR SI PUMPS
	Standard:	Candidate received OFN BG-045, GAS BINDING OF CCPS OR SI PUMPS
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	Examiner NOTE: SRO Candidates may enter procedure directly.

	Performance Step: 14	Check Charging Pump Affected
	Standard:	Candidate checked CCP NOT affected – performed RNO: Go to step 12
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**OFN BG-045 step 1**

*	**Performance Step: 15**	Stop The Affected SI Pump and Place In PTL * EM HIS-4 For Pump A – PTL * EM HIS-5 For Pump B – PTL
	Standard:	Candidate stopped affected pump with EM HIS-5 J-handle rotated left to STOP. Candidate checked Green light - LIT Candidate checked Red Light - EXTINGUISHED Candidate placed EM HIS-5 For Pump B – PTL (Candidate manipulated J-handle switch EM HIS-5 to the full left and raise (PTL). Handle remained pointed at PTL.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**OFN BG-045 step 12**

	Performance Step: 16	Check SI Flow Required: * Any SI actuation setpoint exceeded * RCS Subcooling – LES THAN 30°F [45°F] * PZR Level – LESS THAN 6% [33%]
	Standard:	Candidate checked: * Any SI actuation setpoint exceeded -- NO * RCS Subcooling – LESS THAN 30°F [45°F] -- NO * PZR Level – LESS THAN 6% [33%] – NO Candidate performed RNO: Go to step 15
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**OFN BG-045 step 13** Examiner NOTE: SI actuation setpoints/ Subcooling/ PZR level: RCS pressure is greater than 1830 psig No SG pressure is less than or equal to 615 psig Containment pressure is less than 3.5 psig RCS subcooling is greater than 30°F PZR level is greater than 6%

	Performance Step: 17	Check No Signs Of Mechanical Damage To Affected SI Pump • Dispatch operator to perform visual inspection of SI Pump.
	Standard:	Candidate contacted Aux Building Watch to perform a visual inspection of SI Pump B.
	Cue:	After candidate contacted Building Watch: "I will perform a visual inspection of SI Pump B. No obvious signs of mechanical damage."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**OFN BG-045 step 15** Examiner NOTE: The candidate may perform this action through the Control Room Supervisor.

	Performance Step: 18	Check Suction Path From RWST. * Ensure suction path to SI pump A • EM HIS-8923A – OPEN * BN HIS-8806A – OPEN * BN HIS-8806B – OPEN - OR - * Ensure suction path to SI pump B • EM HIS-8923B – OPEN * BN HIS-8806B – OPEN * BN HIS-8806A - OPEN
	Standard:	Candidate performed checks for SI Pump B • Candidate checked on RL017 Panel EM HIS-8923B Red Light LIT Green Light EXTINGUISHED. * Candidate checked on RL017 Panel BN HIS-8806B Red Light LIT Green Light EXTINGUISHED. * Candidate checked on RL017 Panel BN HIS-8806A Red Light LIT Green Light EXTINGUISHED.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**OFN BG-045 step 16** **Note:** Either BN HIS-8806B or BN HIS-8806A open satisfies the step but Candidate may check both.

	Performance Step: 19	Vent Affected SI Pump And/Or SI Piping, Using ATTACHMENT B, VENTING SAFETY INJECTION PUMPS, As Directed By The SM/CRS
	Standard:	Candidate notified SM/CRS to vent affected SI Pump and Piping.
	Cue:	After candidate informs SM/CRS to vent affected SI Pump and Piping: JPM is concluded.
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**OFN BG-045 step 17**

Terminating Cue: **The JPM is complete when candidate informs SM/CRS to vent affected SI Pump and Piping.**

VERIFICATION OF COMPLETION

Job Performance Measure No.:	S3
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are the Reactor Operator. The plant is stable in MODE 1. Accumulator “C” level is 50% due to Chemistry sampling.

INITIATING CUE:	The Control Room Supervisor provides you the following brief: • You are to use Safety Injection Pump B to increase Safety Injection Accumulator "C" level to ≅ 58% using section 6.1 of SYS EP-200, SAFETY INJECTION ACCUMULATOR OPERATIONS. • Safety Injection Pump discharge relief valves are expected to lift on pump start. • Depressurizing the RHR header is not necessary. • Procedure prerequisites have been completed. • NPIS Turn On Code EM1 has all available SIP display points

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Perform actions to establish a maximum rate cooldown using the ARV's per EMG E-3, STEAM GENERATOR TUBE RUPTURE	JPM No.:	S4
K/A Reference:	041 A4.06		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:		x	
	Classroom		Simulator	x	Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	Plant was at full power with TDAFP tagged out when a SG Tube Rupture occurred on D SG. The crew is performing actions in EMG E-3, STEAM GENERATOR TUBE RUPTURE.
Task Standard:	Upon completion of this JPM, the candidate performed a maximum rate cooldown – using Steam Generator Atmospheric Relief Valves • AB PIC-1A, SG A STEAM DUMP TO ATMS CTRL • AB PIC-2A, SG B STEAM DUMP TO ATMS CTRL • AB PIC-3A, SG C STEAM DUMP TO ATMS CTRL

Required Materials:	EMG E-3, STEAM GENERATOR TUBE RUPTURE Sim setup: IC 321 – Start and complete JPM S4 prior to JPM S8 NOTE: IC 321 includes TDAFW pump tagged out, MSIVs closed and CCW "D" (for JPM S8) tagged out. Place ORANGE ISOLATED mag tags next to the following valves on RL005: AL HIS-32A AL HIS-33A AL HIS-36A AB HIS-6A AB HIS-5A Place a TEST/CAUTION tag on FC HIS-312A. Adjust SG D ARV to 1160 psig. Place a FUB on RL006 next to SG D placard. Verify steps 1-10 of EMG E-3 are completed. FREEZE simulator – go to RUN at cue from Examiner.
General References:	EMG E-3, STEAM GENERATOR TUBE RUPTURE.
Handouts:	EMG E-3, STEAM GENERATOR TUBE RUPTURE.
Initiating Cue:	The CRS directs you to complete steps 11 through 16 of EMG E-3, STEAM GENERATOR TUBE RUPTURE.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	No
Validation Time:	20 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Candidate receives and reviews EMG E-3, STEAM GENERATOR TUBE RUPTURE.
	Standard:	Candidate received and reviewed EMG E-3, STEAM GENERATOR TUBE RUPTURE
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	

	Performance Step: 2	Check If Low Steam Line SI Should Be Blocked: a. Check RCS pressure – LESS THAN 1970 PSIG • P-11 light - LIT b. Block low steamline pressure SI • SB HS-9 • SB HS-10
	Standard:	Candidate checked P-11 light – LIT on SB069 Partial Trip Status Permis/Bloc Panel – if NO, Candidate performs the RNO (a) as a continuous action and continues with step 12 If YES, Candidate performed the following: Candidate depressed SB HS-9 on RL02 Candidate depressed SB HS-10 on RL02 Candidate checked STM LINE SI TRN A BLOC – LIT on SB069 Candidate checked STM LINE SI TRN B BLOC – LIT on SB069
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 11** Examiner NOTE: Step 12 RNO a: When RCS pressure is less than 1970, then the Candidate should block Low Steam line SI using SB HS-9 and 10.

	Performance Step: 3	Determine target plant conditions from the table below.
	Standard:	Ruptured SG should be between 1100 and 1199 psig. Target conditions should be: • 508°F Core Exit TC and • 717 psig using the ARV on intact S/G's for ruptured "D" S/G pressure equal to 1150 psig.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 12** Examiner NOTE: Depending on the ruptured S/G pressure, target values may be different than those in the standard.

	Performance Step: 4	Determine Method Used To Cooldown RCS At Maximum Rate: • Check Steam Dumps - AVAILABLE
	Standard:	Candidate checked MSIVs OPEN - NO. Candidate performed RNO – Went to step 15.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 13** Examiner NOTE: RCPs are not running. Caution prior to step 13: If RCP's are NOT running, the cooldown and depressurization steps may cause a red or orange path condition on the integrity status tree for the ruptured loop. Step 52 shall be completed before reevaluating the red or orange path condition and transition to EMG FR-P1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITIONS, if required. Note: After operator initiated RCS cooldown has been started, RCP trip criteria no longer applies.

*	**Performance Step: 5**	Initiate RCS Cooldown Using ARV's or TDAFP: a. Check Intact S/G(s) – AVAILABLE 1) Dump steam at maximum rate: * Set intact S/G ARV controllers to target intact S/G pressure * Use intact S/G ARVs in manual * Operate turbine driven AFW pump at maximum load
	Standard:	• Candidate checked ARV controllers in AUTO: * AB PIC-1A SG A STEAM DUMP TO ATMS CTRL * AB PIC-2A SG B STEAM DUMP TO ATMS CTRL * AB PIC-3A SG C STEAM DUMP TO ATMS CTRL • Candidate used thumbwheel to reduce controller pressure setting between the 700 and 720 psig increments on: * AB PIC-1A SG A STEAM DUMP TO ATMS CTRL * AB PIC-2A SG B STEAM DUMP TO ATMS CTRL * AB PIC-3A SG C STEAM DUMP TO ATMS CTRL
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 15** Examiner NOTE: Acceptable to depress the MAN button ARV controllers and fully open ARVs using the joystick. The candidate must stop the cooldown below S/G pressure AND RCS Target temperature if this method is used.

	Performance Step: 6	Maintain Maximum Rate Cooldown: a. Check Steam Dumps – AVAILABLE; NO, Perform RNO
	Standard:	Candidate performed RNO: • Candidate checked ARVs initially full open and then throttling closed as target SG pressure and RCS temperature is approached in AUTOMATIC or that maximum rate was achieved in MANUAL and stops steaming below target SG pressure and RCS target temperature. • Candidate informed the CRS maximum rate cooldown in progress
	Cue:	Once the cooldown has been established: "Understand Max Rate Cooldown in progress."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 16** Examiner NOTE: Once the maximum rate cooldown is started RCS pressure will decrease; the Candidate should return to step 11 and block low steamline SI if not previously performed when RCS pressure is less than 1970 psig.

Terminating Cue: **JPM is terminated when candidate establishes the cooldown by opening the intact S/G ARVs.**

VERIFICATION OF COMPLETION

Job Performance Measure No.:	S4
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	Plant was at full power with TDAFP tagged out when a SG Tube Rupture occurred on D SG. The crew is performing actions in EMG E-3, STEAM GENERATOR TUBE RUPTURE.

INITIATING CUE:	The CRS directs you to complete steps 11 through 16 of EMG E-3, STEAM GENERATOR TUBE RUPTURE.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Align Alternate Seal Injection and Place Excess Letdown Into Service Per OFN KA-019, Loss Of Instrument Air	JPM No.:	S5
K/A Reference:	003 A4.01		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:		X	
	Classroom		Simulator	X	Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are the Reactor Operator. The plant is at ~62% power. An air leak downstream of KA-V584, TURB BLDG INSTRUMENT AIR HDR TO AUX BLDG ISO, has caused valves in the Auxiliary and Containment buildings to fail. The CRS has entered OFN KA-019 LOSS OF INSTRUMENT AIR.
Task Standard:	Upon completion of this JPM, the candidate aligned alternate RCP seal injection flow and stabilized Pressurizer level with excess letdown.
Required Materials:	OFN KA-019, LOSS OF INSTRUMENT AIR, step 5. Simulator set-up: IC 322. Run JPM S5 concurrent with S7 NOTE: IC 322 includes the Aux. Building Instrument Air leak at 2000 scfm and the NI43 high failure for JPM S7. Click Action Button then select AutoAct Defeat: • Insert mEG14A • Insert mEG14C Ensure BLUE placard on CCP A handswitch. FREEZE until Examiner cues to go to RUN.
General References:	OFN KA-019, LOSS OF INSTRUMENT AIR

Handouts:	OFN KA-019, LOSS OF INSTRUMENT AIR, step 5
Initiating Cue:	The CRS directs you to perform step 5 of OFN KA-019, LOSS OF INSTRUMENT AIR.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	Yes
Validation Time:	20 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Candidate receives and reviews OFN KA-019, LOSS OF INSTRUMENT AIR, step 5.
	Standard:	Candidate received and reviewed OFN KA-019, LOSS OF INSTRUMENT AIR, step 5.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	

	Performance Step: 2	Check PZR Level – STABLE USING NORMAL CHARGING AND LETDOWN
	Standard:	Candidate checked BG FI-121A, CHG HDR FLOW, at maximum flow. Candidate checked BG FI-132 LTDN HX OUTLET flow at 0 gpm. Candidate checked BB LR-459, PZR PROGRAM LEV RECORDER trend is INCREASING above program. Candidate performed the RNO.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	Step 5 **Alternate Success step**

*	**Performance Step: 3**	Stabilize PZR level as follows: a. Ensure a CCW pump is running in the train containing the CCP with the discharge valve closed.
	Standard:	Candidate on RL019 started either A or C CCW pump using handswitch: * EG HIS-21 * EG HIS-23
	Cue:	If Candidate requests which pump to start: "Start A CCW Pump."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 5 RNO a.** Examiner NOTE: CCW pumps will not auto start

*	**Performance Step: 4**	b. Start standby CCP with discharge valve closed.
	Standard:	Candidate on RL001started A CCP using BG HIS-1A.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 5 RNO b.** Examiner NOTE: The A CCP Handswitch will have a blue placard over the J-handle identifying the discharge valve is closed.

*	**Performance Step: 5**	c. Establish seal injection through alternate seal injection line. * BG HIS-8357A for CCP A * BG HIS-8357B for CCP B
	Standard:	Candidate on RL001 throttled open BG HIS-8357A by holding the OPEN pushbutton until seal injection flow increased on BG FI-215A and BG FI-215B CHG PUMP TO RCP SEAL FLOW, meters.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 5 RNO c.** Examiner NOTE: Both meters will indicate increased seal flow. An increase of 5 GPM or more is sufficient indication of the flowpath.

*	**Performance Step: 6**	d. Stop previously running charging pump
	Standard:	Candidate turned J-handle on BG HIS-3 to STOP – Green light – LIT, Red light - EXTINGUISHED
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 5 RNO d.** Candidate may increase or adjust seal injection flow to approximately 32 gpm after NCP is secured.

*	**Performance Step: 7**	e. Establish excess letdown: 1) Open EXCESS Letdown Heat Exchanger Outlet Isolation To PRT valves * BB HIS-8157A * BB HIS-8157B
	Standard:	Candidate on RL001 pushed and **held** BB HIS-8157A until Red light – LIT and Green light – EXTINGUISHED - AND/OR - Candidate on RL001 pushed and **held** BB HIS-8157B until Red light – LIT and Green light – EXTINGUISHED
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 5 RNO e.1** Examiner NOTE: Either valve open or both satisfy step.

*	**Performance Step: 8**	2) IF aligning train A valves THEN open the following: a) BG HIS-8153A b) BG HIS-8154A
	Standard:	Candidate on RL001 pushed BG HIS-8154A OPEN pushbutton to the latch position – Red light – LIT, Green light – EXTINGUISHED Candidate on RL001 pushed BG HIS-8153A OPEN pushbutton to the latch position – Red light – LIT, Green light – EXTINGUISHED
	Cue:	If asked by Candidate for desired train: "Align Alpha Train."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step RNO e.2** Examiner NOTE: **Only one train of excess letdown is aligned.** Either train aligned satisfies a Critical Task of this JPM.

*	**Performance Step: 9**	3) IF aligning train B valves THEN open the following: a) BG HIS-8153B b) BG HIS-8154B
	Standard:	Candidate on RL001 pushed BG HIS-8154A OPEN pushbutton to the latch position – Red light – LIT, Green light – EXTINGUISHED Candidate on RL001 pushed BG HIS-8153B OPEN pushbutton to the latch position – Red light – LIT, Green light – EXTINGUISHED
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 5 RNO e.3** Examiner NOTE: Only one train of excess letdown is aligned.

*	**Performance Step: 10**	4) Adjust Excess Letdown Heat Exchanger Outlet Isolation Valves as necessary to control excess letdown flow. * BB HIS-8157A * BB HIS-8157B
	Standard:	Candidate adjusted BB HIS-8157A and/or BB HIS-8157B until approximately 20 gpm observed on BG FI-138A and BG FI-138B, EXCESS LTDN HX TO PRT, meters.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 5 RNO e. 4** Examiner NOTE: When Excess Letdown to PRT valves are open the indicated flow is NOT cumulative on both BG FI-138A/B since both indicators share the same flow orifice 20 GPM on both is 20 GPM total flow.

*	**Performance Step: 11**	f. Balance excess letdown and seal injection flows.
	Standard:	Candidate adjusted BG HIS-8357A until BG FI-215A/B read approximately 32 gpm. Candidate verified excess letdown flow on BG FI-138A/B at approximately 20 gpm. Candidate verified PZR level trend stabilizing using NPIS and/or PZR LEV RECORDER.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 5 RNO f.** Examiner NOTE: To meet the intent of the JPM PZR level should be stable or stabilizing. Examiner NOTE: JPM may be terminated when RCP seal injection and excess letdown are in service.

Terminating Cue:	When alternate seal injection and excess letdown are in service, JPM is complete.

VERIFICATION OF COMPLETION

Job Performance Measure No.:	S5
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are the Reactor Operator. The plant is at ~62% power. An air leak downstream of KA-V584, TURB BLDG INSTRUMENT AIR HDR TO AUX BLDG ISO, has caused valves in the Auxiliary and Containment buildings to fail. The CRS has entered OFN KA-019 LOSS OF INSTRUMENT AIR.

INITIATING CUE:	The CRS directs you to perform step 5 of OFN KA-019, LOSS OF INSTRUMENT AIR.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Startup the Containment Mini-Purge System per SYS GT-120, CONTAINMENT MINI PURGE SYSTEM OPERATIONS	JPM No.:	S6
K/A Reference:	103 A1.01		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:	x		
	Classroom		Simulator	x	Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are the Reactor Operator. The plant is at ~62% power. Containment pressure is at 27 INWC. A Containment entry is planned for later in the shift. Outside temperature is 70°F. A Gaseous Release Permit (GRP) for a Containment Purge has been issued by Chemistry. Prerequisites of SYS GT-120, CONTAINMENT MINI PURGE SYSTEM OPERATIONS are complete.
Task Standard:	Upon completion of the JPM, the candidate completed sections 6.1, Startup Of CTMT Mini Purge Exhaust and 6.2, Startup Of CTMT Mini Purge Supply.
Required Materials:	Partially completed SYS GT-120, CONTAINMENT MINI PURGE SYSTEM OPERATIONS Simulator set-up: IC 33 Depressurization may require time compression.
General References:	SYS GT-120, CONTAINMENT MINI PURGE SYSTEM OPERATIONS
Handouts:	Partially completed SYS GT-120, CONTAINMENT MINI PURGE SYSTEM OPERATIONS, and GRP 2011-1234 for Containment Purge.

Initiating Cue:	The CRS directs you to perform SYS GT-120, CONTAINMENT MINI PURGE SYSTEM OPERATIONS sections 6.1 to depressurize the Containment and 6.2 to place Mini-Purge Supply into service.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	No
Validation Time:	20 minutes

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Candidate receives and reviews SYS GT-120, CONTAINMENT MINI PURGE OPERATIONS
	Standard:	Candidate received and reviewed SYS GT-120, CONTAINMENT MINI PURGE OPERATIONS
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	

	Performance Step: 2	Record the time/date Purge must be initiated from the permit.
	Standard:	From the Special Instructions section of the GRP, the candidate recorded the INITIATE RELEASE PRIOR to Time and Date from the permit.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.1**

*	**Performance Step: 3**	Perform the following CTMT Purge Damper lineup: 1. Open CTMT PURGE DAMPER. (D012) • GT HIS-29 - OPEN 2. Open CTMT PURGE EXH DAMPER. (D011) • GT HIS-28 - OPEN 3. Open CTMT MINI PURGE EXH OUTER CTMT ISO. • GT HIS-12 – OPEN 4. Record Time/Date Dampers Opened.
	Standard:	Candidate on RL020 performed the following actions: 1. Open CTMT PURGE DAMPER. (D012) • GT HIS-29 – Depressed and **held** OPEN pushbutton until the Green light was EXTINGUISHED and the Red Light was LIT. 2. Open CTMT PURGE EXH DAMPER. (D011) • GT HIS-28 – Depressed and **held** OPEN pushbutton until the Green light was EXTINGUISHED and the Red Light was LIT. 3. Open CTMT MINI PURGE EXH OUTER CTMT ISO. • GT HIS-12 – Depressed and **held** OPEN pushbutton until the Green light was EXTINGUISHED and the Red Light was LIT. 4. Recorded time/date dampers opened.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.2**

*	**Performance Step: 4**	Start CTMT MINI PURGE EXH FAN & DAMPER and verify its discharge damper (D005) opens. • GT HIS-20 – NORMAL AFTER RUN and • GT HZ-20 – OPEN
	Standard:	Candidate on RL020 started CTMT MINI PURGE EXH FAN and verified the discharge damper open • GT HIS-20 – J-handle manipulated to the RIGHT (RUN position) and released. Green Light EXTINGUISHED and Red Light LIT. • Candidate checked GT HZ-20 – Damper open: Green Light EXTINGUISHED and Red Light LIT.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**STEP 6.1.3** NOTE prior to step 6.1.3: Prior to CTMT pressure decreasing to less than –5.5 inches water (-0.2 psig), ensure the CTMT Mini Purge Exhaust Fan is stopped.

*	**Performance Step: 5**	Open CTMT MINI PURGE EXH INNER CTMT ISO and record time/date opened. • GT HIS-11 – OPEN • Time/Date Opened
	Standard:	Candidate on RL020 Panel: • Depressed and **held** GT HIS-11 OPEN pushbutton until the Green light was EXTINGUISHED and the Red Light was LIT. • Candidate recorded time and date OPENED
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.4** Examiner NOTE: Time Compression Cue – SEE NEXT PAGE

	Performance Step: 6	Section 6.1, Startup Of CTMT Mini Purge Exhaust, complete.
	Standard:	Candidate initialed and dated Step 6.1.5, Section 6.1, Startup Of CTMT Mini Purge Exhaust, complete.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.1.5**

	Performance Step: 7	Section 6.1, Startup Of CTMT Mini Purge Exhaust has been completed.
	Standard:	Candidate completed section 6.1.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.2.1**

EXAMINER NOTE:
TIME COMPRESSION CUE: When time after Performance Step 5 goes past 5 minutes**:** "NPIS point GTP0040 indicates 1.5 inches of water".

*	**Performance Step: 8**	When CTMT pressure is less than two inches water, then perform the following: 1. Open CTMT MINI PURGE SPLY/EXH DAMPERS. (D016 and D015) • GT HIS-41 – OPEN 2. Open CTMT PURGE SYS AIR SPLY DAMPER. (D009) • GT HIS-26 – OPEN 3. Open CTMT PURGE SYS AIR SPLY DAMPER. (D010) • GT HIS-27 – OPEN 4. Open CTMT MINI PURGE AIR SPLY CTMT ISO. • GT HIS-4 – OPEN 5. Recorded Time/Date Opened
	Standard:	Candidate on RL020 performed the following actions after CUE: 1. OPENED CTMT MINI PURGE SPLY/EXH DAMPERS. (D016 and D015) • GT HIS-41 – Depressed and **held** OPEN pushbutton until the Green light was EXTINGUISHED and the Red Light was LIT. 1. OPENED CTMT PURGE SYS AIR SPLY DAMPER. (D009) • GT HIS-26 – Depressed and **held** OPEN pushbutton until the Green light was EXTINGUISHED and the Red Light was LIT. 2. OPENED CTMT PURGE SYS AIR SPLY DAMPER. (D010) • GT HIS-27 – Depressed and **held** OPEN pushbutton until the Green light was EXTINGUISHED and the Red Light was LIT.) 3. OPENED CTMT MINI PURGE AIR SPLY CTMT ISO. • GT HIS-4 – Depressed and **held** OPEN pushbutton until the Green light was EXTINGUISHED and the Red Light was LIT. 4. Record Time/Date Opened
	Cue:	**TIME COMPRESSION CUE:** When time after Performance Step 5 goes past 5 minutes**:** "NPIS point GTP0040 indicates 1.5 inches of water."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.2.2**

*	**Performance Step: 9**	Start CTMT MINI PURGE AIR SPLY UNIT. • GT HIS-23 – NORMAL-AFTER-RUN
	Standard:	Candidate on RL020 started CTMT MINI PURGE AIR SPLY UNIT. • GT HIS-23 – J-handle manipulated to the RIGHT (RUN position) and released. Green Light EXTINGUISHED and Red Light LIT.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.2.3**

*	**Performance Step: 10**	Open CTMT MINI PURGE AIR SPLY CTMT ISO damper and record time/date opened. • GT HIS-5 – OPEN • Time/Date Opened
	Standard:	Candidate on RL020 opened CTMT MINI PURGE AIR SPLY CTMT ISO damper and recorded time/date opened. • GT HIS-5 – Depressed and **held** OPEN pushbutton until the Green light was EXTINGUISHED and the Red Light was LIT. • Recorded time and date opened
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6.2.4**

Terminating Cue:	Candidate performing sections 6.1, Startup pf CTMT Mini Purge Exhaust and 6.2, Startup Of CTMT Mini Purge Supply, completes the JPM.

VERIFICATION OF COMPLETION

Job Performance Measure No.:	S6
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are the Reactor Operator. The plant is at ~62% power. Containment pressure is at 27 INWC. A Containment entry is planned for later in the shift. Outside temperature is 70°F. A Gaseous Release Permit (GRP) for a Containment Purge has been issued by Chemistry. Prerequisites of SYS GT-120, CONTAINMENT MINI PURGE SYSTEM OPERATIONS are complete.

INITIATING CUE:	The CRS directs you to perform SYS GT-120, CONTAINMENT MINI PURGE SYSTEM OPERATIONS sections 6.1 to depressurize the Containment and 6.2 to place Mini-Purge Supply into service.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Bypass a failed Power Range nuclear instrumentation channel	JPM No.:	S7
K/A Reference:	015 A4.03		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:		x	
	Classroom		Simulator	x	Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are the Balance of Plant Operator. The plant is at ~62% power. Rod Control is in MANUAL. Power Range instrument NI-43 has failed high. The crew is performing the steps of OFN SB-008, Attachment R. Attachment R has been performed up through and including step R3.
Task Standard:	Upon completion of this JPM, the Operator will have placed failed Power Range NI-43 channel in bypass.
Required Materials:	OFN SB-008, INSTRUMENT MALFUNCTIONS, ATTACHMENT R, POWER RANGE NEUTRON FLUX CHANNEL MALFUNCTION Simulator setup: IC 322 – Run JPM S7 concurrent with JPM S5. NOTE: IC 322 has the NI43 failure and the Instrument Air malfunction built into the IC. Ensure Rod Control is in MANUAL. Place a FUB on NI43. Verify bistable PR HI FLUX NC43U/K is illuminated, and alarms 078A and 083C are illuminated. Built into IC 322 is file: ;Fail NI-43 high IMF mSE03C f:120 FREEZE until Examiner cues to go to RUN.

General References:	OFN SB-008, INSTRUMENT MALFUNCTIONS, ATTACHMENT R, POWER RANGE NEUTRON FLUX CHANNEL MALFUNCTION
Handouts:	OFN SB-008, INSTRUMENT MALFUNCTIONS, ATTACHMENT R, POWER RANGE NEUTRON FLUX CHANNEL MALFUNCTION, step R4
Initiating Cue:	The Control Room Supervisor directs you to perform step R4 to bypass the failed power range flux channel.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	No
Validation Time:	10 minute

	Performance Step: 1	Candidate receives and reviews OFN SB-008, INSTRUMENT MALFUNCTIONS, ATTACHMENT R, POWER RANGE NEUTRON FLUX CHANNEL MALFUNCTION, step R4
	Standard:	Candidate received and reviewed OFN SB-008, INSTRUMENT MALFUNCTIONS, ATTACHMENT R, POWER RANGE NEUTRON FLUX CHANNEL MALFUNCTION, step R4
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step R4**

*	**Performance Step: 2**	Bypass failed PR flux channel: a. At the Detector Current Comparator Drawer (N50), perform the following 1. Turn the Upper Section switch to the failed power range flux channel. 2. Turn the Lower Section switch to the failed power range flux channel. 3. Turn the Power Mismatch Bypass switch to the failed power range flux channel 4. Turn the Rod Stop Bypass switch to the failed power range flux channel.
	Standard:	Candidate on NI Racks Detector Current Comparator Drawer (N50) performed the following: 1. Rotated Upper Section knob right to PRN 43. When Upper Section knob was rotated, the CHANNELS DEFEAT Light ILLUMINATED. 2. Rotated Lower Section knob right to PRN43. When Lower Section switch was rotated, the CHANNELS DEFEAT Light ILLUMINATED. 3. Rotated the right hand Power Mismatch Bypass knob right to PR N43. 4. Rotated right hand Rod Stop Bypass knob right to PR N43.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT

	Comment:	**Step R4a** Examiner NOTE: After Rod Stop Bypass switch is rotated, N-43 BYP C-2 OVER-PWR ROD STOP (3 down 3 across) lamp of Misc Bistable Panel SC066W on RL024 ILLUMINATED. MCB alarms clear (audible) when the last knob is turned.

*	**Performance Step: 3**	Bypass failed PR flux channel: b. At the Comparator and Rate Drawer (N37/N46), perform the following: 1. Turn the Comparator Channel Defeat switch to the failed power range channel.
	Standard:	Candidate at Comparator and Rate Drawer (N37/N46) below the Detector Current Comparator Drawer (N50): 1. Candidate rotated Comparator Channel Defeat knob from NORMAL right to N43. When Comparator Channel Defeat switch was rotated, COMPARATOR DEFEAT light above knob ILLUMINATED.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step R4b** Examiner NOTE: Main Control Board 078A, PR CHANNEL DEV, CLEARED.

Terminating Cue:	The JPM is complete when the candidate is finished bypassing N43 at the Detector Current Comparator Drawer.

VERIFICATION OF COMPLETION

Job Performance Measure No.:	S7
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are the Balance of Plant Operator. The plant is at ~62% power. Rod Control is in MANUAL. Power Range instrument NI-43 has failed high. The crew is performing the steps of OFN SB-008, Attachment R. Attachment R has been performed up through and including step R3.

INITIATING CUE:	The Control Room Supervisor directs you to perform step R4 to bypass the failed power range flux channel.

Facility:	Wolf Creek	Task No.:	N/A
Task Title:	Respond to a loss of a Component Cooling Water pump using ALR 00-052A, CCW TO RCP FLOW LO	JPM No.:	S8
K/A Reference:	008 K3.03, A4.01, A2.01		

Examinee:				NRC Examiner:			
Facility Evaluator:				Date:			
Method of testing:							
Simulated Performance:				Actual Performance:		x	
	Classroom		Simulator	x	Plant		

READ TO THE EXAMINEE	
I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.	
Initial Conditions:	You are the Reactor Operator. The plant is in MODE 3 following a Safety Injection. The “B” CCW pump has tripped. “D” CCW pump is tagged out. Main Control Board alarm 052A, CCW TO RCP FLOW LO, has just annunciated.
Task Standard:	Upon completion of this JPM, the Candidate stopped all RCPs, and restored from a loss of CCW to the Service Loop.

Required Materials:	ALR 00-052A , CCW TO RCP FLOW LO Simulator set up: IC 321. Run file S8. Ensure JPM S4 has been completed PRIOR to inserting Key 1 for JPM S8 NOTE: IC 321 has CCW "D" pump breaker racked down. Place CCW D pump in PTL and place a Test/Caution Tag on handswitch for CCW D. FREEZE simulator – go to RUN at cue from Examiner. NOTE: File S8 includes: ;File S8 ;S8 ;CCW pump B is tripped ;EGHV058 fails closed ICM bkrDPEG01B t:1 d:0 k:1 ICM movEGHV0058 t:2 d:0 k:1 BOOTH: when S4 complete, and at Examiner cue, Insert Key 1 for S8. Ensure EG HV-58 is closed. FREEZE. Go to RUN after Examiner cue.
General References:	ALR 00-052A, CCW TO RCP FLOW LO
Handouts:	ALR 00-052A, CCW TO RCP FLOW LO
Initiating Cue:	The Control Room Supervisor directs you to perform ALR 00-052A, CCW TO RCP FLOW LO.
Time Critical Task: (Yes or No)	No
Alternate Success Path: (Yes or No)	Yes
Validation Time:	12 minutes

	Performance Step: 1	Candidate receives and reviews ALR 00-052A, CCW TO RCP FLOW LO.
	Standard:	Candidate received and reviewed ALR 00-052A, CCW TO RCP FLOW LO.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	Examiner NOTE: Cue booth after EG HIS-58 indicates CLOSED.

	Performance Step: 2	Check CCW To RCS Flow – LESS THAN 1.25 X10^6 LBM/HR • EG FI-128 • EG FI-129
	Standard:	Candidate on RL020 determined that flow is zero.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 1**

	Performance Step: 3	Check If CCW Flow To RCS Required: * RCS Temperature – GREATER THAN 200°F or * Any Reactor Coolant Pump - RUNNING
	Standard:	Candidate determined: * RCS temperature > 200°F: Candidate may use H/C LEGS WR TEMP meters on RL022 Panel or NPIS Display 1 on RL022 Panel * Candidate checked on RL021 Panel all RCPs RUNNING; Handswitch – Red Light LIT; ammeters - in GREEN BAND and RL022 flow indicators (3 per loop) approximately 100%
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 2** Candidate may turn on NPIS BB3 to monitor RCP parameters at this time. Temperatures will be increasing.

	Performance Step: 4	Check Containment Isolation Phase B – NOT ACTUATED
	Standard:	Candidate checked Main Control Board alarm 059B, CISB, alarm NOT illuminated and/or ESFAS status panels SA066Y or SA066X, CTMT ISO SYS PHASE B sections, NOT illuminated.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 3** Candidate may verify CTMT pressure using meter on RL018 Panel (GN PR-934, CTMT ATMS PRESS)

	Performance Step: 5	Monitor RCP Motor Temperatures Using NPIS Computer: a. Check RCP Motor Bearing Temperatures – LESS THAN 195°F • Turn On Code BB3 b. Check RCP Motor Stator Winding Temperatures – LESS THAN 299°F • Turn On Code BB3
	Standard:	Candidate used NPIS computer to display Turn On Code BB3. Candidate checked: a. RCP Motor Bearing Temperatures – LESS THAN 195°F; NO, Perform RNO (see Performance Step 6) b. RCP Motor Stator Winding Temperatures – LESS THAN 299°F; Yes, and increasing
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 4** Examiner NOTE: Term “Monitor” makes this a Continuous Action step. Examiner NOTE: Candidate may continue in procedure until RCP parameters are exceeded. Examiner NOTE: BB3 will indicate RCP motor bearing temperatures greater than 195°F. **Alternate Success Path step**

*	**Performance Step: 6**	Candidate performs Step 4 RNOa a. Perform the following: 1) If reactor is critical, then manually trip reactor and stabilize the plant using EMGs, while continuing with this procedure. 2) Stop all RCPs
	Standard:	Candidate performed the following: 1) Determined reactor was not critical. 2) Stopped all RCPs: • Manipulating J-handle on BB HIS-37, RCP A, to the left (STOP) and observed Red Light EXTINGUISH and Green Light LIT. • Manipulating J-handle on BB HIS-38, RCP B, to the left (STOP) and observed Red Light EXTINGUISH and Green Light LIT. • Manipulating J-handle on BB HIS-39, RCP C, to the left (STOP) and observed Red Light EXTINGUISH and Green Light LIT. • Manipulating J-handle on BB HIS-40, RCP D, to the left (STOP) and observed Red Light EXTINGUISH and Green Light LIT.
	Cue:	Cue if CRS informed: "Understand stopping RCPs."
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 4RNOa** Examiner NOTE: Candidate should inform CRS of stopping the RCPs. Candidate should make a plant announcement prior to securing the RCPs. Candidate should use diverse indications of decreasing AMPs, and decreasing LOOP FLOW to verify pump is stopped.

	Performance Step: 7	Check CCW Pumps In Train Supplying Service Loop – BOTH RUNNING
	Standard:	Candidate on RL019 checked CCW B tripped. Candidate found CCW D in PTL and tagged out. Candidate transitioned to RNO column: Perform the following:
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 5**

	Performance Step: 8	Step 5RNO: Perform the following: a. Start standby CCW Pump in train supplying service loop.
	Standard:	Candidate determined CCW D Pump is unavailable.
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 5RNOa**

*	**Performance Step: 9**	IF a CCW Pump in train aligned to the service loop can NOT be started, THEN ensure alternate train CCW Pump is operating and shift service loop to alternate CCW train: 1. Open service loop CCW supply and return valves for train not supplying service loop. ∗ EG ZL-15 AND EG ZL-53 For Train A • EG HS-15 (2 valves w/one switch) 2. Close service loop CCW supply and return valves for train previously supplying service loop. ∗ EG ZL-16 AND EG ZL-54 For Train B • EG HS-16 (2 valves w/one switch)
	Standard:	Candidate checked one CCW pump running: ∗ EG HIS-21 for CCW A pump – Red Light LIT 1. Candidate on RL019 depressed EG HS-15 OPEN pushbutton: Green Lights LIT and Red Lights LIT then Green Lights EXTINGUISHED (EG ZL-15 AND EG ZL-53 Train A) 2. Candidate on RL019 depressed EG HS-16 CLOSE pushbutton: Red Lights LIT and Green Lights LIT then Red Lights EXTINGUISHED. (EG ZL-16 AND EG ZL-54)
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 5RNOb** Examiner NOTE: Annunciator 51F CCW SPLY RTN VLVS MISALIGN alarm is expected after EG HS-15 is pushed. Examiner NOTE: Annunciator 51F CCW SPLY RTN VLVS MISALIGN alarm should clear when EG ZL16 and EG ZL-54 are GREEN

	Performance Step: 10	Ensure CCW Containment Isolation Valves – OPEN
		• CCW From RCS Outer Containment Isolation Valve – OPEN
		  • EG HIS-59
		• CCW From RCS Inner Containment Isolation Valve – OPEN
		  • EG HIS-60
		• CCW To RCS Outer Containment Isolation Valve – OPEN
		  • EG HIS-58
		  • EG HIS-71

	Standard:	Candidate on RL019 performed the following: • Checked EG HIS-59 – OPEN: Red Light LIT - YES • Checked EG HIS-60 – OPEN: Red Light LIT - YES • Checked EG HIS-58 – OPEN: Green Light LIT – NO • Checked EG HIS-71 – OPEN: Red Light LIT - YES Candidate depressed OPEN pushbutton on EG HIS-58 – Green light remains LIT Candidate transitioned to Step 6 RNO
	Cue:	
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6** Examiner NOTE: The OPEN pushbutton for EG HIS-58 will not work. **Alternate Success Path step**

*	**Performance Step: 11**	If any valve can NOT be opened, THEN perform the following: a. Verify unaffected bypass valves are closed. • EG HIS-127 For EG HIS-58 • EG HIS-131 For EG HIS-59 • EG HIS-130 For EG HIS-60 • EG HIS-126 For EG HIS-71 b. Open associated bypass valve. • EG HIS-127 For EG HIS-58 • EG HIS-131 For EG HIS-59 • EG HIS-130 For EG HIS-60 • EG HIS-126 For EG HIS-71 c. Refer to Tech. Spec 3.6.3
	Standard:	a. Candidate on RL020 checked unaffected bypass valves were closed: • EG HIS-131 – CLOSED: Green Light LIT • EG HIS-130 – CLOSED: Green Light LIT • EG HIS-126 – CLOSED: Green Light LIT b. Candidate on RL020 performed the following: • Depressed EG HIS-127A NON-ISO button, White Light LIT and button latched down (not a written procedure direction but required to open EG HV-127) • Depressed EG HIS-127 – OPEN button. Red Light LIT and Green Light EXTINGUISHED
	Cue:	If notified that dedicated Operator is required: “Understand to post dedicated Operator.” If notified about T.S. 3.6.3 entry: “CRS will refer to Tech Specs.”
	Score: SAT or UNSAT	SAT or UNSAT
	Comment:	**Step 6RNO** Examiner NOTE: Candidate may depress the ISO pushbutton to release the Non-Iso latch after EG HV-127 is OPEN.

Performance Step: 12	Check CCW To RCS Flow – GREATER THAN 1.25 x 10^6 LBM/HR • EG FI-128 • EG FI-129
Standard:	Candidate on RL020 checked flow GREATER THAN 1.25 x 10^6 LBM/HR.
Cue:	JPM complete when candidate verified flow requirement MET.
Score: SAT or UNSAT	SAT or UNSAT
Comment:	**Step 7**

Terminating Cue: **JPM complete when candidate verified CCW to RCS flow requirement met.**

Job Performance Measure No.:	S8
Examinee's Name:	
Examiner's Name:	
Date Performed:	
Facility Evaluator:	
Number of Attempts:	
Time to Complete:	
Question Documentation:	
Question:	
Response:	

Result:		SAT			UNSAT	

Examiner's Signature:		Date:	

INITIAL CONDITIONS:	You are the Reactor Operator. The plant is in MODE 3 following a Safety Injection. The “B” CCW pump has tripped. “D” CCW pump is tagged out. Main Control Board alarm 052A, CCW TO RCP FLOW LO, has just annunciated.

INITIATING CUE:	The Control Room Supervisor directs you to perform ALR 00-052A, CCW TO RCP FLOW LO.

Facility: ___Wolf Creek_____ Scenario No.: ___1_____ Op-Test No.: _____

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: MOL, 100%

Turnover: Red train CCW (pumps A/C secured due to leakage). TS 3.7.7 Cond A entered (72 hrs to restore). Welding on CCW A Surge tank outlet. Expected return in 24 hours. TS 3.5.2 Cond A entered (72 hrs to restore). (ESFAS alarms are illuminated). Red train ECCS pumps are DNO'd or have a TEST/CAUTION (TC) tag and pumps are in Pull-to-Lock (PTL). This includes: CCW "A" (DNO), CCW "C" (DNO), CCP "A" (TC), SIP "A" (TC) and RHR "A" (TC). DNO tags are on EG HV-11 and 13, EG HIS-1 and EG ZL-15 and 53. Perform a power reduction and turbine load decrease to 900 MWE NET using OFN MA-038, RAPID PLANT SHUTDOWN at a rate of 1%/minute.

Event No.	Malf. No.	Event Type*	Event Description
1		R – ATC, SRO N - BOP	The Crew commences a power decrease and turbine load reduction to 900 MWE NET (945 MWE GROSS) per OFN MA-038, RAPID PLANT SHUTDOWN at a rate of 1%/minute.
2	mAB01D2	I – BOP, SRO	Steam Generator "D" pressure channel AB PT-545 fails low TS determined & entered. TS 3.3.2, Table 3.3.2-1, Fu 1e and 4e. Cond A (Immediately) and Cond D (72 hrs to trip bistables) are entered.
3	mBB21B	I – ATC, SRO	Pressurizer pressure channel BB PI-456 fails high TS determined & entered. TS 3.3.1, Table 3.3.1-1, Fu 6, 8.a and 8.b. Cond A (Immediately), Cond E (72 hrs to trip bistables) and Cond M (72 hrs to trip bistables) are entered. TS 3.3.2, Table 3.3.2-1, Fu 1.d, 3.a.3, 5.d, 6.e and 8.b. Cond A (Immediately) and Cond D (72 hrs to trip bistables), and Cond L (1 hr to verify interlock (P-11)).
4	mBB06C	M - CREW	Large Break LOCA: cold leg break on Loop "C"
5	mEJ13B	C - ATC, SRO	Post trip malfunction #1: Autostart failure of RHR "B" pump. Manual start is available.
6	mSA27EC02	C – ATC, SRO	Post trip malfunction #2: Auto closure of EC HIS-12, SFP HX B CCW OUTLET VLV, failure to close. Manual closure available.

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

Scenario summary:

The unit is at 100% power, middle of life. Turnover items include CCW pumps “A” and “C” (Red train) are secured due to leakage. Welding on CCW “A” Surge tank outlet is ongoing. Technical Specification 3.7.7 Condition A was entered (72 hrs to restore). Expected return to service is 24 hours. Red train ECCS pumps are DNO’d or have a TEST/CAUTION (TC) tag and pumps are in Pull-to-Lock (PTL). This includes: CCW “A” (DNO), CCW “C” (DNO), CCP “A” (TC), SIP “A” (TC) and RHR “A” (TC). DNO tags are on EG HV-11 and 13, EG HIS-1 and EG ZL-15 and 53.

Topeka Dispatch/System Operator called to inform Wolf Creek that 345-50 KV Benton line will be removed from service in 20 minutes for four hours. Directive #300 was performed. Per Directive #300 Wolf Creek will be divorced from the Athens line (also opening 69-14 Breaker). Reduce power and decrease turbine load to less than 900 MWE NET.

The Call Superintendent has directed the crew to use OFN MA-038, RAPID PLANT SHUTDOWN to maneuver the unit at a rate of 1%/minute.

Event 1: The Crew commences a power reduction and turbine load reduction to 900 MWE NET (945 MWE GROSS) per OFN MA-038, RAPID PLANT SHUTDOWN at a rate of 1%/minute.

Event 2: Steam Generator “D” pressure channel AB PT-545 fails low. Meter indications change, and Main Control Board alarms annunciate. ALRs 00-111C, SG D FLOW MISMATCH or 00-111B SG D LEV DEV, may be entered and performed. OFN SB-008, INSTRUMENT MALFUNCTIONS, is entered and Attachment C performed. These procedures diagnose and mitigate the instrument failure.

The Control Room Supervisor determines Technical Specifications.

Event 3: Pressurizer (PZR) pressure channel BB PI-456 fails high. The PZR spray valves close, meter indications change and various Main Control Board alarms annunciate. ALRs 00-034B, PZR PRESS HI, 00-034C, PZR PORV BLOCK; 00-034E, PRT PRESS HI; 00-035B, PORV OPEN; 00-035D, PZR PORV DISCH TEMP HI; 00-083C, RX PARTIAL TRIP annunciate. OFN SB-008, INSTRUMENT MALFUNCTIONS, is entered and Attachment K performed. These procedures diagnose and mitigate the instrument failure.

The Control Room Supervisor determines Technical Specifications.

Event 4: The Main Event is a Large Break Loss of Coolant Accident.
Diagnostics include: PZR level decreases and RCS pressure decreases. OFN BB-007, SG/RCS LEAKAGE HIGH, may be entered & performed. A Reactor trip and Safety Injection occur. EMG E-0, REACTOR TRIP OR SAFETY INJECTION, is entered & performed.

RCP’s are tripped per EMG E-0 Foldout page criteria.

EMG-E-1, LOSS OF REACTOR OR SECONDARY COOLANT is entered & performed.

Eventually 36% Refueling Water Storage Tank (RWST) level is achieved and Main Control Board alarm ALR 00-047C, RWST LEV LOLO 1 AUTO XFR actuates. ALR 00-047C directs performance of EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION.

The crew transitions to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION. The procedure is performed through step 10 to establish cold leg recirculation/ECCS recirculation.

Post trip malfunctions:
Event 5: Autostart failure of RHR “B” pump. Manual start is available. This component failure is procedurally addressed in Attachment F of EMG E-0, REACTOR TRIP OR SAFETY INJECTION. However, the pump can be started after the Immediate Actions of EMG E-0, REACTOR TRIP OR SAFETY INJECTION, are performed and concurrence of the CRS is obtained.

Event 6: Auto closure of EC HIS-12, SFP HX B CCW OUTLET VLV, fails to close. Manual closure is available. This component failure is procedurally addressed in EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, at step 3.

Scenario Critical Tasks (CT):
Event 2: CT: take manual control, select alternate controlling channel prior to actuation of the Reactor Protection System

Event 4: CT: using EMG ES-12, steps 1 through 10, transfer to cold leg recirculation to establish ECCS recirculation

Event 5: CT: start RHR “B” pump, as this is the only low head injection pump available for decay heat removal for a Large Break LOCA.

Probabilistic Risk Analysis for this scenario includes:

Core Damage Frequency by Initiating Event

Initiating Event	Initiating Event Frequency (/yr)	Core Damage Frequency (/yr)	CDF Percent Contribution
Loss of Offsite Power	2.88E-02	6.59E-06	36.51%
Small LOCA	3.00E-03	5.35E-06	29.63%
Interfacing Systems LOCA		1.93E-06	10.69%
Very Small LOCA	6.20E-03	1.27E-06	7.03%
Transients With Power Conversion Systems Available	1.05E+00	9.88E-07	5.47%
Steam Generator Tube Rupture	3.67E-03	8.77E-07	4.86%
Reactor Vessel Failure	3.00E-07	3.00E-07	1.66%
Steamline Break	1.13E-02	1.88E-07	1.04%
Transients Without Power Conversion Systems Available	1.15E-01	1.71E-07	0.95%
Medium LOCA	6.10E-05	1.46E-07	0.81%
Loss of All Service Water	6.86E-06	8.30E-08	0.46%
Loss of Component Cooling Water	2.14E-04	5.79E-08	0.32%
Loss of Vital DC Bus NK04	2.64E-03	4.32E-08	0.24%
Large LOCA	7.20E-06	2.80E-08	0.16%
Feedwater Line Break	3.17E-03	2.06E-08	0.11%
Loss of Vital DC Bus NK01	2.64E-03	1.12E-08	0.06%

Top Risk Significant Systems

EF	Essential Service Water
KJ/NE	Onsite Emergency Power
EG	Component Cooling Water
AL	Aux Feedwater
EJ	Residual Heat Removal
JE	Diesel Fuel Oil
NB	Lower Medium Voltage
NK	125 V DC
BB	Reactor Coolant System
GM	Diesel Building HVAC
GD	ESW HVAC
GL	Aux Building HVAC
BN	Refueling Water Storage Tank
SA/SB	ESFAS/Reactor Protection

Technical Specifications exercised:

Event 2: TS determined & entered. TS 3.3.2, Table 3.3.2-1, Fu 1e and 4e. Cond A (Immediately) and Cond D (72 hrs to trip bistables) are entered.

Event 3: TS determined & entered. TS 3.3.1, Table 3.3.1-1, Fu 6, 8.a and 8.b. Cond A (Immediately), Cond E (72 hrs to trip bistables) and Cond M (72 hrs to trip bistables) are entered.

TS 3.3.2, Table 3.3.2-1, Fu 1.d, 3.a.3, 5.d, 6.e and 8.b. Cond A (Immediately) and Cond D (72 hrs to trip bistables), and Cond L (1 hr to verify interlock (P-11)).

Op-Test No.: _____ Scenario No.: 1 Event No.: 1 Page 1 of 33

Event Description: The Crew commences a power decrease and turbine load reduction to 900 MWE NET (945 MWE GROSS) per OFN MA-038, RAPID PLANT SHUTDOWN.

Time	Position	Applicant's Actions or Behavior
Booth cue: Setup scenario and simulator. Insert KEY 1 for Event 1 at direction of Lead Examiner (Key 1 has a 20-minute delay). Scenario (Event 1) begins with a power reduction and turbine load decrease (to 900 MWE NET) using OFN MA-038, RAPID PLANT SHUTDOWN.		
	CREW	Commences a turbine load reduction to 900 MWE NET (945 MWE GROSS) per OFN MA-038, RAPID PLANT SHUTDOWN.
	CRS	**ENTER** and **DIRECT** OFN MA-038, RAPID PLANT SHUTDOWN
Procedure CAUTION: Fast unloading rates may result in increased turbine vibration. Procedure NOTES: o Foldout page shall be monitored throughout this procedure. o Steps 1 through 5 may be performed in any order. o Load reduction at greater than 5%/minute will arm condenser steam dumps.		
	CREW	1. Determine turbine unloading method to be used: a. Check desired unloading rate – LESS THAN OR EQUAL TO 5% MINUTE b. Check automatic turbine unloading desired o Go to step 2
Procedure NOTE: When reducing load with Decrease Loading Rate in, the difference between load set and actual load should be less than 200 MW. Prior to depressing the Hold or Off pushbuttons or establishing Load Limit control, ensure the At Set Load light is on to prevent an uncontrolled load decrease.		

Op-Test No.: _____ Scenario No.: 1 Event No.: 1 Page 2 of 33

Event Description: OFN MA-038, RAPID PLANT SHUTDOWN

Time	Position	Applicant's Actions or Behavior
	CRS, BOP	2. (ρ) Reduce turbine load in automatic: a. Slowly decrease Load Set MW until AT SET LOAD light is on and LOAD LIMIT LIMITING light extinguishes. b. Raise Load Limit pot slightly. c. Set Loading/Unloading Rate Limit to desired value and adjust, as necessary during load decrease to maintain desired rate. d. Select Decrease Loading Rate – ON e. Decrease Load Set MW toward desired load. f. Continue with step 4 of this procedure while reducing turbine load.
	CRS, BOP	3. (ρ) Reduce turbine load manually: a. Reduce turbine load using either of the following: * Load Limit Set potentiometer OR * Standby Load Limit Set potentiometer b. Maintain desired turbine unloading rate. c. Continue with this procedure while reducing turbine load.
	CRS, RO	4. (ρ) Borate RCS and adjust control rods, as necessary, to maintain the following: o Target Tavg/Tref temperature error between 0°F and +5°F o Control rods above the rod insertion limits
	RO	5. Energize PZR backup heaters o BB HIS-51A o BB HIS-52A

Op-Test No.: _____ Scenario No.: 1 Event No.: 1 Page 3 of 33

Event Description: OFN MA-038, RAPID PLANT SHUTDOWN

Time	Position	Applicant's Actions or Behavior
	RO	6. Check PZR PORVs: a. RCS pressure – LESS THAN 2335 PSIG b. PZR PORVs – CLOSED o BB HIS-455A o BB HIS-456A c. RCS pressure – GREATER THAN 2185 PSIG d. Porv Block valves – OPEN o BB HIS-8000A o BB HIS-8000B
	RO	7. Check PZR pressure – STABLE AT OR TRENDING TO 2235 PSIG
	RO	8. Check PZR level – STABLE AT OR TRENDING TO PROGRAM LEVEL
	BOP	9. Check S/G levels – CONTROLLING BETWEEN 45% AND 55%
	CRS	10. Check reactor power – LESS THAN 60%; No, Perform RNO 10RNO. Perform the following: a. If final desired power is greater than or equal to 60%, then go to step 38. b. If final desired power is less than 60%, then do not continue until reactor power is less than 60%

Event termination: Lead Examiner proceeds with next event when the Examiners have determined they have seen enough of the reactivity (and normal) evolution.

Booth cue: Insert KEY 2 for Event 2 at direction of Lead Examiner.

Op-Test No.: ____ Scenario No.: 1 Event No.: 2 Page 4 of 33

Event Description: Steam Generator "D" pressure channel AB PT-545 fails low

CT success: BOP takes manual control, selects alternate controlling channel prior to actuation of the Reactor Protection System

Time	Position	Applicant's Actions or Behavior
Booth cue: At Lead Examiner cue, insert KEY 2 for second event. Diagnostics: Steam Generator "D" pressure channel AB PT-545 fails low. Meter AB PI-545A, SG D PRESS, fails low. Meter AB FI-543A, SG D STEAM FLOW, fails low. Main Control Board (MCB) alarms 00-111C, SG D FLOW MISMATCH and/or 00-111B SG D LEV DEV annunciate.		
	CREW	Identifies and diagnoses SG "D" pressure channel AB PT-545 low failure.
	CRS	**ENTER** and **DIRECT** ALR 00-111B, SG D LEV DEV
Procedure NOTE: Steps 1 through 3 are Memory Action steps.		
	BOP	1. Check SG D controlling level channel: * 5% greater than program level or * 5% less than program level
	BOP	2. Check instruments – operating properly o SG D controlling level channel – WITHIN 6% OF REMAINING SG D NARROW RANGE LEVEL CHANNELS * AE LI-549 * AE LI-554 o SG D controlling channel steam pressure – WITHIN 100 PSIG OF REMAINING CHANNELS – NO; perform RNO * AB PI-544A * AB PI-545A 2RNO: Perform the following **(CT – performs RNO2a, b and c)** a. Place FRV controller AE FK-540 in MANUAL b. ADJUST FRV controller AE FK-540, as necessary, to establish Steam Generator level at program value c. SELECT alternate channel for control * AB FS-542C for steam flow: selected to F542 channel

Op-Test No.: ____ Scenario No.: 1 Event No.: 2 Page 5 of 33

Event Description: Steam Generator "D" pressure channel AB PT-545 fails low

Time	Position	Applicant's Actions or Behavior
	BOP	d. Return FRV controller AE FK-540 to AUTOMATIC (may be delayed until at 50% program or alarm is cleared)
	CRS	e. Go to OFN SB-008, INSTRUMENT MALFUNCTIONS
Examiner NOTE: If the Crew performed the ALR, it will impact how OFN SB-008 is implemented. All appropriate OFN SB-008 steps are included for this event.		
	CRS	**ENTER** and **DIRECT** OFN SB-008, INSTRUMENT MALFUNCTIONS
Procedure NOTE: Steps 1 through 8 can be performed in any order.		
	CRS	1. Check if secondary system instrument channel is malfunctioning: a. Determine appropriate attachment for malfunctioning channel from table below: Attachment C is determined and entered SG Pressure (AB) P-545 Attachment C b. Go to appropriate attachment for malfunctioning secondary system channel.
	CRS	OFN SB-008, Attachment C, SG PRESSURE CHANNEL MALFUNCTION
Procedure CAUTION: SG steam pressure is an input to the thermal power program. A failed steam pressure channel could cause the thermal power program to be inaccurate. Procedure NOTE: Steps C1 through C4 are Memory Action steps.		
	BOP	C1. Identify failed instrument channel: o Compare SG pressure indications to confirm SG pressure channel failure: o AB PI-544A for SG D o AB PI-545A for SG D o AB PI-546A for SG D

Op-Test No.: ____ Scenario No.: 1 Event No.: 2 Page 6 of 33

Event Description: Steam Generator "D" pressure channel AB PT-545 fails low

CT success: BOP takes manual control, selects alternate controlling channel prior to actuation of the Reactor Protection System

Time	Position	Applicant's Actions or Behavior
	BOP	C2. Check if failed SG pressure channel used for feedwater control: a. Identify steam flow channel compensated by failed pressure channel from table below: SG D P-544/P-545 F-542/F-543 b. Check steam flow channel associated with failed steam pressure channel selected on SG STEAM FLOW CHANNEL SEL switch; if NO, Perform RNO RNO b: Go to step C7 Examiner NOTE: Steps C3, C4, C5 and C6 are bypassed if ALR 00-111B was performed earlier.
	BOP	C3. Place affected SG MFW REG VLV CTRL – in MANUAL **(CT – perform C3, C4 and C5)** * AE FK-540
	BOP	C4. ADJUST affected SG MFW REG VLV CTRL, as necessary, to establish steam generator level at program: **(CT – perform C3, C4 and C5)** * AE FK-540
	BOP	C5. SELECT alternate steam flow channel on SG STEAM FLOW CHANNEL SEL switch: **(CT – perform C3, C4 and C5)** o AB FS-542C (selected to F542 channel)
	BOP	C6. Restore affected SG MFW REG VLV CTRL to - AUTO

Op-Test No.: _____ Scenario No.: 1 Event No.: 2 Page 7 of 33

Event Description: Steam Generator "D" pressure channel AB PT-545 fails low

Time	Position	Applicant's Actions or Behavior
	CRS	C7. Monitor the following Technical Specifications LCOs and comply with Action Statements, as appropriate: o 3.3.2, ESFAS, Table 3.3.2-1, Fu 1.e and 4.e o 3.3.4, Remote Shutdown Instrumentation, Table 3.3.4-1, Fu 7 o 3.3.3, Post Accident Monitoring Instrumentation, Table 3.3.3-1, Fu 8 o 3.3.6, Containment Purge Isolation Instrumentation o 3.3.7, CREVS **CRS determines: TS 3.3.2, Table 3.3.2-1, Fu 1e and 4e. Cond A (Immediately) and Cond D (72 hrs to trip bistables) are entered.**

Booth cues: If contacted as WWM and/or Call Supt.: acknowledge plant status. If contacted as INC: acknowledge request.

Event termination: When Technical Specifications are determined and/or at Lead Examiner's discretion, event is terminated.

Booth operator inserts KEY 3 for event three at Lead Examiner's direction.

Op-Test No.: ____ Scenario No.: 1 Event No.: 3 Page 8 of 33

Event Description: Pressurizer pressure channel BB PI-456 fails high

Time	Position	Applicant's Actions or Behavior
Booth cue: Insert KEY 3 for event three at Lead Examiner's direction. Diagnostics: Pressurizer pressure channel BB PI-456 fails high. Meter PRESSURIZER PRESSURE BB PI-456 fails high. PZR Spray valves BB ZL-455B and BB ZL-455C indicate closing. MCB alarms 00-034B, PZR PRESS HI, 00-034C, PZR PORV BLOCK; 00-034E, PRT PRESS HI; 00-035B, PORV OPEN; 00-035D, PZR PORV DISCH TEMP HI; 00-083C, RX PARTIAL TRIP annunciate.		
	CREW	Identifies and diagnoses Pressurizer pressure channel BB PI-456 high failure. Examiner NOTE: PORV BB HIS-456A will open and close.
	CRS	**ENTER** and **DIRECT** OFN SB-008, INSTRUMENT MALFUNCTIONS
Procedure NOTE: Steps 1 through 8 can be performed in any order.		
	RO	2. Check if reactor coolant system instrument channel or controller is malfunctioning a. Determine appropriate attachment for malfunction channel or controller from table below: PZR Pressure (BB) P-456 Attachment K b. Go to appropriate attachment for malfunctioning reactor coolant system channel or controller.
	CRS, RO	OFN SB-008, Attachment K, PZR Pressure Malfunction
Procedure NOTE: Steps K1 through K3 are Memory Action steps		
	RO	K1. Identify failed instrument channel: a. Compare PZR pressure indications to confirm pressure channel failure: o BB PI-455A o BB PI-456 o BB PI-457 o BB PI-458

Op-Test No.: _____ Scenario No.: 1 Event No.: 3 Page 9 of 33

Event Description: Pressurizer pressure channel BB PI-456 fails high

Time	Position	Applicant's Actions or Behavior
	RO	K2. Check failed PZR pressure channel selected on PZR PRESS CTRL SEL switch. o BB PK-455K
	RO	K3. Place PZR PRESS MASTER CTRL in manual and control pressure. o BB PK-455A
	RO	K4. Select alternate PZR pressure channel on PZR PRESS CTRL SEL switch o BB PS-455F
	SRO, RO	K5. Take the following actions, as appropriate to stop pressure control transient: a. Check PZR spray valves – RESPONDING CORRECTLY b. Check PZR control heaters – OPERABLE c. Ensure PZR PORV – CLOSED o BB HIS-455A o BB HIS-456A
	RO	K6. Return PZR pressure control to automatic: o Spray valves o Control heaters o Backup heaters o Open PORV block valves o PZR pressure control

Op-Test No.: ____ Scenario No.: 1 Event No.: 3 Page 10 of 33

Event Description: Pressurizer pressure channel BB PI-456 fails high

Time	Position	Applicant's Actions or Behavior
	RO	K7. Monitor PZR pressure response to ensure proper control
	RO	K8. Check failed pressure channel not selected on PZR PRESS RECORD SEL o BB PS-455G
	RO	K9. Check failed pressure channel not selected on OP DT/OP DT LOOP RECORD SEL switch o SC TS-411
	CRS	K10. Monitor the following Technical Specification LCOs and comply with Action Statements, as appropriate: o 3.3.1, RTS INSTRUMENTATION, Table 3.3.1-1 Fu 6 and 8 o 3.3.2, ESFAS INSTRUMETATION, Table 3.3.2-1, Fu 1.d, 3.a.3, 5.d, 6.e and 8.b o 3.3.4, REMOTE SHUTDOWN INSTRUMENTATION, Table 3.3.4-1, Fu 3 o 3.3.6, CONTAINMENT PURGE ISOLATION INSTRUMENTATION o 3.3.7, CREVS ACTUATION INSTRUMENTATION **CRS determines: TS 3.3.1, Table 3.3.1-1, Fu 6, 8a and 8b. Cond A (Immediately), Cond E (72 hrs to trip bistables) and Cond M (72 hrs to trip bistables) are entered.** **TS 3.3.2, Table 3.3.2-1, Fu 1.d, 3.a.3, 5.d, 6.e and 8.b. Cond A (Immediately) and Cond D (72 hrs to trip bistables), and Cond L (1 hr to verify interlock (P-11)).**

Booth cues: If contacted as WWM and/or Call Supt.: acknowledge plant status. If contacted as INC: acknowledge request.

Event termination: When Technical Specifications are determined and/or at Lead Examiner's discretion, event is terminated.

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page 11 of 33

Event Description: Large Break Loss of Coolant Accident

Time	Position	Applicant's Actions or Behavior
Booth cue: At Lead Examiner direction, insert KEY 4 for event 4.		
Diagnostics: PZR level decreases and RCS pressure decreases. CTMT humidity increases.		
	CRS	**ENTER** and **DIRECT** OFN BB-007, RCS LEAKAGE HIGH (if time before automatic Reactor trip and Safety Injection allows)
	CRS	1. Check plant in Mode 1, 2, or 3 with Accumulator outlet valves open
	RO	2. Check PZR level – GREATER THAN 6%
	RO	3. Check PZR level – GREATER THAN 17%
	RO	4. Check PZR level – STABLE OR INCREASING; No - Perform RNO RNO: If PZR level is less than program level, then perform the following: a. Establish maximum required charging flow from one pump b. If PZR level can NOT be maintained, then perform the following: 1) Close Letdown Orifice Isolation Valves to establish stable PZR level o BG HIS-8149AA o BG HIS-8149BA o BG HIS-8149CA 2) Close RCS Letdown to Regen HX isolation valves o BG HIS-459 o BG HIS-460

Op-Test No.: ____ Scenario No.: 1 Event No.: 4 Page 12 of 33

Event Description: Large Break Loss of Coolant Accident

CT success: start RHR "B" pump (EJ HIS-2 to RUN), as this is the only low head injection pump available for decay heat removal for a Large Break LOCA

Time	Position	Applicant's Actions or Behavior
	CRS, RO	Foldout page criteria #1 SI Actuation criteria: If any condition listed occurs, then trip the reactor, actuate SI, and go to EMG E-0, REACTOR TRIP OR SAFETY INJECTION step 1. * Both the following conditions exist: o Reactor is tripped AND o RCS subcooling based on subcooling monitor – LESS THAN 30° OR * PZR pressure – CANNOT BE MAINTAINED OR * PZR level – CANNOT BE MAINTAINED OR * All of the following conditions exits: o Normal charging is maximized from one pump AND o Letdown is isolated AND o PZR level is decreasing
	CREW	Either the automatic Reactor trip and Safety Injection occur OR the CRS directs a manual Reactor trip and Safety Injection signal actuation.
	CRS	**ENTER** and **DIRECT** EMG E-0, REACTOR TRIP OR SAFETY INJECTION
	RO, BOP	Perform Immediate Actions of EMG E-0, REACTOR TRIP OR SAFETY INJECTION and report results to CRS
Examiner NOTE: Steps 1-4 are Immediate Action steps performed from memory. Usually the RO performs steps 1, 3 and 4, the while BOP performs step 2.		
	RO	The RO reports the "B" RHR pump did not start. As it is the ONLY low head injection pump available for decay heat removal, the CRS directs the RO to start the pump. **(CT - RHR PUMP B, EJ HIS-2 to RUN)** Examiner NOTE: this pump may be started during the performance of Attachment F.

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page 13 of 33

Event Description: Large Break Loss of Coolant Accident

Time	Position	Applicant's Actions or Behavior
	CREW	When RCS pressure is less than 1400 psig, RCPs are tripped per Foldout page criteria #1: RCP Trip Criteria If all conditions listed below occur, then trip all RCPs o RCS pressure - < 1400 psig o CCPs or SI pumps – AT LEAST ONE RUNNING o Operator controlled cooldown – NOT IN PROGRESS
	RO	1. Verify Reactor trip a. Check rod bottom lights – LIT b. Ensure reactor trip breakers and bypass breakers – OPEN o SB ZL-1 o SB ZL-2 o SB ZL-3 o SB ZL-4 c. Check intermediate range neutron flux – DECREASING o SE NI-35B [GAMMA METRICS] o SE NI-36B [GAMMA METRICS]
	BOP	2. Verify turbine trip a. Check the following: * Main Stop valves – ALL CLOSED OR * Turbine Auto Stop bistable lights – AT LEAST TWO LIT
	RO	3. Check AC Emergency Busses – AT LEAST ONE ENERGIZED * NB01 – ENERGIZED * NB02 - ENERGIZED

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page 14 of 33

Event Description: Large Break Loss of Coolant Accident

Time	Position	Applicant's Actions or Behavior
	RO	4. Check if Safety Injection is actuated: a. Check any indication SI is actuated – LIT * Annun. 00-030A NF039A LOCA SEQ ACTUATED – LIT * Annun. 00-031A NF039B LOCA SEQ ACTUATED – LIT * ESFAS status panel SIS section – ANY WHITE LIGHTS LIT * Partial trip status Permissive/Block status panel – SI RED LIGHT LIT b. Check both trains of SI actuated o Ann 00-030A NF039A LOCA SEQ ACTUATED – LIT o Ann 00-031A NF039B LOCA SEQ ACTUATED – LIT
	RO	5. Check if SI is required: * SI was manually actuated AND was required * RCS pressure is currently or has been – LESS THAN OR EQUAL TO 1830 PSIG * Any SG press is currently or has been – LESS THAN OR EQUAL TO 615 PSIG * Containment press is currently or has been – GREATER THAN OR EQUAL TO 3.5 PSIG * RCS subcooling is currently or has been – LESS THAN 30°F [45°F] * PZR level is currently or has been – LESS THAN 6% [33%]
	BOP	6. Check Main Generator Breakers and Exciter Breaker – OPEN o MA ZL-3A o MA ZL-4A o MB ZL-2

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page 15 of 33

Event Description: Large Break Loss of Coolant Accident

Time	Position	Applicant's Actions or Behavior
	RO/BOP	7. Verify Automatic Actions using Attachment F, AUTOMATIC SIGNAL VERIFICATION Examiner NOTE: Attachment F procedure steps see page 20
	BOP	8. Check total AFW flow - >270,000 lbm/hr
	BOP	9. Check RCS cold leg temperatures * Stable at or trending to 557°F for condenser steam dumps; No, perform RNO * Stable at or trending to 561°F for SG ARVs; NO perform RNO 9RNO: a. If temperature is less than setpoint and decreasing, then perform the following: 1) Stop dumping steam 2) If any MSIV is open, then close Main Turbine Stop and Control Valves Startup Drains. o AC HIS-134 3) If cooldown continues, then control total feed flow to limit RCS cooldown. Maintain total feed flow > 270,000 lbm/hr until narrow range level greater than 6% [29%] in at least one SG. 4) If cooldown continues due to excessive steam flow, then isolate main steamlines by depressing both MS ISO VLV ALL CLOSE pushbuttons o AB HS-79 o AB HS-80 b. If temperature is greater than setpoint and increasing, then perform one of the following: * Dump steam to condenser * Dump steam using SG ARVs

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page 16 of 33

Event Description: Large Break Loss of Coolant Accident

Time	Position	Applicant's Actions or Behavior
	BOP	10. Establish SG pressure control a. Check condenser – AVAILABLE; No Perform RNO o C-9 LIT o MSIV – OPEN; NO o Circulating water pumps – RUNNING 10RNOa. Perform the following 1) Use the SG ARVs 2) Go to step 11
	RO	11. Check PZR PORVs a. Check PZR PORVs – CLOSED o BB HIS-455A o BB HIS-456A b. Power to block valves – AVAILABLE o BB HIS-8000A o BB HIS-8000B c. RCS pressure – LESS THAN 2185 PSIG
	RO	12. Check normal PZR Spray valves – CLOSED o BB ZL-455B o BB ZL-455C

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page 17 of 33

Event Description: Large Break Loss of Coolant Accident

Time	Position	Applicant's Actions or Behavior
	RO	13. Check PZR Safety valves – CLOSED o BB ZL-8010A o BB ZL-8010B o BB ZL-8010C
	RO	14. Check if RCPs should be stopped: a. Check RCPs – ANY RUNNING; No Perform RNO 14RNOa. Go to step 15
	CRS	15. Direct Operator to monitor Critical Safety Functions using EMG F-0, CRITICAL SAFETY FUNCTION STATUS TRESES (CSFST). Examiner NOTE: Surrogate STA performs this activity and reports results to the CRS.
	RO	16. Check if SGs are not faulted: a. Check pressures in all SG – o NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER o NO SG COMPLETELY DEPRESSURIZED
	RO	17. Check if SG tubes are intact: * Direct Health Physics to survey steam lines in Area 5 of the Aux. Building. * Condenser air discharge radiation – NORMAL BEFORE DISCHARGE (GEG 925) * SG blowdown and sample radiation – NORMAL BEFORE ISOLATION (BML 256, SJL 026)

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page 18 of 33

Event Description: Large Break Loss of Coolant Accident

Time	Position	Applicant's Actions or Behavior
	RO	Step 17 cont. * Turbine driven auxiliary feedwater pump exhaust radiation – NORMAL (FCT 381) * SG steamline radiation – NORMAL o ABS 114 for SG A o ABS 113 for SG B o ABS 112 for SG C o ABS 111 for SG D
	BOP	18. Check SG levels – INCREASING IN A CONTROLLED MANNER o Narrow range o Wide range
	RO	19. Check if RCS in intact in Containment: a. Containment radiation – NORMAL BEFORE ISOLATION o GTP 311 o GTI 312 o GTG 313 o GTP 321 o GTI 322 o GTG 323 o GTA 591 o GTA 601

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page 19 of 33

Event Description: Large Break Loss of Coolant Accident

Time	Position	Applicant's Actions or Behavior
	RO	Step 19 cont. b. Containment pressure – NORMAL o GN PI-934 o GN PI-935 o GN PI-936 o GN PI-937 o GT PDI-40 o GN PR-934 c. Containment sump level – NORMAL; No, Perform RNO o EJ LI-7 o EJ LI-8 o EJ LR-6 o LF LI-9 o LF LI-10 19RNO: Perform the following: 1. Ensure BIT inlet and outlet valves are open: o EM HIS-8803A o EM HIS-8803B o EM HIS-8801A o EM HIS-8801B 2. Go to EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1
	CRS	**LEAD** a transition brief prior to directing actions of EMG E-1. Examiner NOTE: see page 24 for EMG E-1.

Op-Test No.: ____ Scenario No.: 1 Event No.: 5 Page 20 of 33

Event Description: Large Break Loss of Coolant Accident
EMG E-0 Attachment F, AUTOMATIC SIGNAL VERIFICATION
CT success: start RHR "B" pump, as this is the only low head injection pump available for decay heat removal for a Large Break LOCA

Time	Position	Applicant's Actions or Behavior
	RO/BOP	F1. Verify Feedwater Isolation a. Main feedwater pumps - TRIPPED b. Main feedwater reg valves – CLOSED c. Main feedwater reg bypass valves – CLOSED d. Main feedwater isolation valves – CLOSED e. Main feedwater chemical injection valves – CLOSED f. Check ESFAS status panel SGBSIS section – ALL WHITE LIGHTS LIT
	RO/BOP	F2. Verify Containment Isolation Phase A a. Check ESFAS status panel CISA section – ALL WHITE LIGHTS LIT
	RO/BOP	F3. Verify AFW pumps running: a. Check motor driven AFW pumps – BOTH RUNNING b. Check turbine driven AFW pump - RUNNING
	RO/BOP	F4. Verify ECCS pumps running a. Check CCPs – BOTH RUNNING b. Check SI pumps- BOTH RUNNING c. Check RHR pumps – BOTH RUNNING; No – Perform RNO F4 RNO c. Manually start pumps. o EJ HIS-1 o **EJ HIS-2 for RHR B** **CT success - RHR B must be started as it is the only available low head injection pump for decay heat removal**

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page 21 of 33

Event Description: Large Break Loss of Coolant Accident
EMG E-0 Attachment F, AUTOMATIC SIGNAL VERIFICATION

Time	Position	Applicant's Actions or Behavior
	RO/BOP	F5. Verify CCW alignment: a. Check CCW pumps – ONE RUNNING IN EACH TRAIN b. Check one pair of CCW service loop Supply and Return valves for an operating CCW pump - OPEN
	RO/BOP	F6. Check ESW pumps – BOTH RUNNING
	RO/BOP	F7. Check Containment Fan Coolers – RUNNING IN SLOW SPEED
	RO/BOP	F8. Verify Containment Purge Isolation: a. Check ESFAS status panel CPIS section – ALL WHITE LIGHTS LIT
	RO/BOP	F9. Verify both trains of Control Room Ventilation Isolation: a. Check ESFAS status panel CRVIS section – ALL WHITE LIGHTS LIT b. Ensure Control Room outer door - CLOSED
	RO/BOP	F10. Verify Main Steamline Isolation not required: a. Check Containment pressure – HAS REMAINED LESS THAN 17 PSIG (GN PR-934) b. Check either condition below – SATISFIED * Low steamline pressure SI – NOT BLOCKED AND steamline pressure – HAS REMAINED GREATER THAN 615 PSIG or * Low steamline pressure SI – NOT BLOCKED AND steamline pressure – HAS REMAINED LESS THAN 100 PSI/50 SEC

Op-Test No.: ____ Scenario No.: 1 Event No.: 4 Page 22 of 33

Event Description: Large Break Loss of Coolant Accident
EMG E-0 Attachment F, AUTOMATIC SIGNAL VERIFICATION

Time	Position	Applicant's Actions or Behavior
	RO/BOP	F11. Verify Containment Spray not required: a. Containment pressure – HAS REMAINED LESS THAN 27 PSIG: No, Perform RNO o Ann 00-059A, CSAS – NOT LIT o Ann 00-059B, CISB – NOT LIT o GN PR-934 F11 RNO: Perform the following: 1. Stop all RCPs 2. If Containment Spray has NOT actuated, then manually actuate Containment Spray 1. Check ESFAS status panel CSAS section – ALL WHITE LIGHTS LIT 2. If any CSAS component NOT properly aligned, then manually align associated component 3. Check ESFAS status panel CISB section – ALL WHITE LIGHTS LIT 4. If any CISB valve not closed, then manually close valve. If valve(s) can not be closed, then manually or locally isolate affected Containment penetration. Refer to ATTACHMENT E, VALVES CLOSED BY CONTAINMENT ISOLATION SIGNAL PHASE B
	RO/BOP	F12. Verify ECCS flow: a. Check CCP to BIT flow meters – FLOW INDICATED b. Check RCS pressure – LESS THAN 1700 PSIG c. Check SI pump discharge flow meters – FLOW INDICATED d. Check RCS pressure – LESS THAN 325 PSIG; no, Perform RNO F12RNOd: Go to Step F13

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page 23 of 33

Event Description: Large Break Loss of Coolant Accident
EMG E-0 Attachment F, AUTOMATIC SIGNAL VERIFICATION

Time	Position	Applicant's Actions or Behavior
	RO/BOP	F13. Verify AFW valves – PROPERLY ALIGNED: a. Check ESFAS status panel AFAS section – ALL WHITE LIGHTS LIT b. Check white train ESFAS status panel AFAS section – ALL WHITE LIGHTS LIT
	RO/BOP	F14. Verify SI valves – PROPERLY ALIGNED a. Check ESFAS status panel SIS section – SYSTEM LEVEL WHITE LIGHTS ALL LIT
	RO/BOP	F15. Check if NCP should be stopped: a. CCPs – ANY RUNNING b. Stop NCP o BG HIS-3
	RO/BOP	F16. Return to procedure and step in effect.

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Event Description: Large Break Loss of Coolant Accident
EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT

Time	Position	Applicant's Actions or Behavior
	CRS	**ENTER** and **DIRECT** EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT
Examiner NOTE: Refueling Water Storage Tank (RWST) level has been decreasing. Eventually Annunciator 00-047D, RWST LEV LOLO 1 AUTO XFR actuates. This ALR directs the transition to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION. The CRS may enter EMG ES-12 directly. See page 30.		
	RO	1. Check if RCPs should be stopped: a. Check RCPs – ANY RUNNING; No Perform RNO 1RNOa. Go to step 2
	RO	2. Check if SGs are not faulted: a. Check pressures in all SG – o NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER o NO SG COMPLETELY DEPRESSURIZED
	BOP	3. Check intact SG levels: a. Check narrow range level in at least one SG – GREATER THAN 6% [29%]; No, Perform RNO b. Check feed flow to maintain narrow range level in all SGs between 6% [29%] and 50% 3RNOa. Maintain total feed flow greater than 270,000 lbm/hr until narrow range level greater than 6% [29%] in at least one SG

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Event Description: Large Break Loss of Coolant Accident
EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT

Time	Position	Applicant's Actions or Behavior
	RO	4. Reset SI o SB HS-42A o SB HS-43A
	RO/BOP	5. Reset Containment Isolation Phase A and Phase B o SB HS-56 for phase A o SB HS-53 for phase A o SB HS-55 for phase B o SB HS-52 for phase B
	RO/BOP	6. Determine Secondary radiation levels: a. Direct HP to survey steamlines in Area 5 of Aux Bldg b. Check SG sampling - ISOLATED c. Ensure SI - RESET d. Check INST AIR PRESS GREATER THAN 105 PSIG o KA PI-40 e. Open CCW to Radwaste System Isolation valves; No, Perform RNO o EG HS-69 o EG HS-70 6RNOe. Go to step 7
Booth cue: If called as Health Physics: acknowledge survey steam line request.		

Op-Test No.: ____ Scenario No.: 1 Event No.: 4 Page 26 of 33

Event Description: Large Break Loss of Coolant Accident
EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT

Time	Position	Applicant's Actions or Behavior
	RO/BOP	7. Check Secondary radiation - NORMAL a. Condenser air discharge radiation (GEG 925) – NORMAL BEFORE ISOLATION b. SG blowdown radiation (BML 256) – NORMAL BEFORE ISOLATION c. SG sample radiation (SJL 026 or sample results) - NORMAL d. Turbine driven auxiliary feedwater pump exhaust radiation (FCT 381) - NORMAL e. SG steam line radiation - NORMAL o ABS 114 for SG A o ABS 113 for SG B o ABS 112 for SG C o ABS 111 for SG D o Local surveys
Booth cue: If called as Health Physics: acknowledge local survey request.		
	RO	8. Check PZR PORVs and Block valves: a. Power to block valves - AVAILABLE o BB HIS-8000A o BB HIS-8000B b. PZR PORVs - CLOSED o BB HIS-455A o BB HIS-456A c. RCS pressure – LESS THAN 2135 PSIG

Op-Test No.: ____ Scenario No.: 1 Event No.: 4 Page 27 of 33

Event Description: Large Break Loss of Coolant Accident
EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT

Time	Position	Applicant's Actions or Behavior
	BOP	9. Verify Instrument Air alignment: a. Ensure at least one ESW TRN TO AIR COMPRESSOR valve – OPEN * EF HIS-43 * EF HIS-44 b. Check AIR COMPRESSOR BRKR RESET switch associated with open ESW valve – CLOSED; if NO, Perform RNO * KA HIS-2C * KA HIS-3C 9RNOb Reset and close AIR COMPRESSOR BRKR RESET switch * KA HIS-2C * KA HIS-3C c. Check INST AIR PRESS – GREATER THAN 105 PSIG o KA PI-40 d. Check PZR PRESS MASTER CTRL output – LESS THAN 50% o BB PK-455A e. Check neither ESW TO AIR COMPRESSOR valve – LOCALLY OPENED o EF HV-33 o EF HV-44 f. Open INST AIR SPLY CTMT ISO VLV o KA HIS-29
	RO	10. Check if ECCS flow should be reduced: a. RCS subcooling – GREATER THAN 30°F [45°F] b. Secondary heat sink: * Total feed flow To intact SGs – GREATER THAN 270,000 LBM/HR Or

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page 28 of 33

Event Description: Large Break Loss of Coolant Accident
EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>RO</td><td>Step 10.cont
* Narrow range level in at least one intact SG – GREATER THAN 6%
c. RCS pressure – STABLE OR INCREASING; No, Perform RNO

10RNOc Go to step 11</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td>RO</td><td>11. Check if Containment Spray should be stopped:
a. Check spray pumps – ANY RUNNING
b. Determine number of spray pumps required from table: Table has been modified
<table>
<tr><th>CTMT Pressure</th><th>Fan coolers running in Emergency Mode</th><th>Spray pumps required</th></tr>
<tr><td rowspan="2">Between 3 psig – 60 psig and DECREASING</td><td>Less than 2</td><td>2</td></tr>
<tr><td>2 or more</td><td>1</td></tr>
<tr><td>Less than 3 psig</td><td>--</td><td>0</td></tr>
</table>
c. Check running spray pumps – EQUAL TO NUMBER REQUIRED, No, Perform RNO

RNOc. Perform the following:
1. Reset containment spray signal
o SB HS-51
o SB HS-54
2. Stop spray pumps as necessary to establish required number of running spray pumps.
* EN HIS-3
* EN HIS-9
3. Monitor spray pump AND containment fan cooler status to ensure requirements of the table are maintained.</td></tr>
</table>

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Event Description: Large Break Loss of Coolant Accident
EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT

Time	Position	Applicant's Actions or Behavior
Examiner NOTE: Containment Spray pumps may be running. If No, perform the RNO: 11RNOa. OBSERVE CAUTION PRIOR TO STEP 12 and go to step 12		
	RO	12. Check is RHR pumps should be stopped: a. Check RNR pumps- ANY RUNNING b. Check RCS pressure: 1) Pressure – GREATER THAN 325 PSIG; No, Perform RNO 12RNOb. Go to step 14
	RO	14. Check if Diesel Generators should be stopped: a. Check NB01 – ENERGIZED BY OFFSITE POWER b. Depress START/RESET pushbutton for diesel generator NE01 o KJ HS-8A c. Depress STOP pushbutton for diesel generator NE01 o KJ HS-8A d. Check NB02 – ENERGIZED BY OFFSITE POWER e. Depress START/RESET pushbutton for diesel generator NE02 o KJ HS-108A f. Depress STOP pushbutton for diesel generator NE02 o KJ HS-108A g. Place all previously running diesels in standby using SYS KJ-121, DIESEL GENERATOR NE01 AND NE02 LINEUP FOR AUTOMATIC OPERATION, while continuing with this procedure.

Op-Test No.: ____ Scenario No.: 1 Event No.: 4 Page 30 of 33

Event Description: Large Break Loss of Coolant Accident
EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION
CT success: using EMG ES-12, steps 1 through 10, transfer to cold leg recirculation to establish ECCS Recirculation; EC HIS-12 failure to CLOSE during ES-12 performance is discovered

Time	Position	Applicant's Actions or Behavior
Booth cue: Respond as Building watch to place NE01 and NE02 in standby. Insert KEY 6 to place NE01 in standby. Insert KEY 7 to place NE02 in standby. Report to Control Room when actions are completed. Examiner NOTE: Refueling Water Storage Tank (RWST) level has been decreasing. Eventually Annunciator 00-047D, RWST LEV LOLO 1 AUTO XFR actuates. This ALR directs the transition to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION. The CRS may enter EMG ES-12 directly. Examiner NOTE: Per Turnover ECCS Red train pumps are in PTL (no CCW for Red train pumps). Expectation is to perform alignment steps as written, pump operation is limited by CCW availability.		
	CRS	MAY refer to ALR 00-047D, RWST LEV LOLO 1 AUTO XFR 1. Check RWST level – LESS THAN 36% o BN LI-930 o BN LI-931 o BN LI-932 o BN LI-933
	CRS	2. Check EMGs – NOT IN EFFECT; No, Perform RNO a. Initiate transfer to cold leg recirc as required by EMGs. Refer to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION. b. Return to procedure and step in effect.
Examiner NOTE: No transition brief occurs. The CRS and a board operator (RO) perform EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION. The remaining board operator (BOP) monitors the plant.		
	CRS	**ENTER** and **DIRECT** EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION

Op-Test No.: ____ Scenario No.: 1 Event No.: 6 Page 31 of 33

Event Description: Large Break Loss of Coolant Accident
EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION
Event 6: EC HIS-12 failure to CLOSE during EMG ES-12 performance is discovered. SUCCESS: depress CLOSE pushbutton EC HIS-12

Time	Position	Applicant's Actions or Behavior
	RO	1. Reset all SI signals: o SB HS-42A for SIS o SB HS-43A for SIS o SB HIS-62 for RWST switchover o SB HIS-63 for RWST switchover
	RO	2. Verify CCW flow to RHR heat exchangers: a. Check at least one Red train CCW pump – RUNNING (NO – see below) * CCW pump A or CCW pump C b. Check at least one Yellow train CCW pump - RUNNING * CCW pump B or CCW pump D c. Ensure both CCW to RHR heat exchanger valves - OPEN o EG HIS-101 o EG HIS-102 Examiner NOTE: Red train CCW not available – Crew will not start the CCW pumps per the RNO actions.
	RO	3. Ensure both CCW from Spent Fuel Pool heat exchangers - CLOSED o EC HIS-11 - CLOSED o EC HIS-12 – OPEN, depresses CLOSE pushbutton on EC HIS-12. Red light extinguishes and Green light illuminates.
	RO	4. Verify Red train RWST switchover has occurred: a. Check Containment Recirc Sump to RHR pump A suction - OPEN o EJ HIS-8811A b. Check RWST to RHR pump A suction - CLOSED o BN HIS-8812A

Op-Test No.: ____ Scenario No.: 1 Event No.: 4 Page 32 of 33

Event Description: Large Break Loss of Coolant Accident
EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION

Time	Position	Applicant's Actions or Behavior
	RO	5. Verify Yellow train RWST switchover has occurred: a. Check Containment Recirc Sump to RHR pump B suction - OPEN o EJ HIS-8811B b. Check RWST to RHR pump B suction - CLOSED o BN HIS-8812B
	RO	6. Check RHR pumps – BOTH RUNNING; No, Perform RNO o EJ HIS-1 o EJ HIS-2 6RNO: Perform the following: a. Manually start RHR pumps with suction aligned to the containment sump b. If neither RHR pump can be started, then observe NOTE prior to step 11 and go to step 11.
Examiner NOTE: Per turnover EJ HIS-2 (RHR B) is the only pump available.		
Booth cue: If called about RHR pump A clearance removal – acknowledge request.		
	RO	7. Close both RHR train hot leg recirc valves o EJ HIS-8716A o EJ HIS-8716B
	RO	8. Isolate SI pump miniflow to RWST: a. Check each SI pump injection flow – GREATER THAN 220 GPM o EM FI-918 AND o EM FI-922

Op-Test No.: ____ Scenario No.: 1 Event No.: 4 Page 33 of 33

Event Description: Large Break Loss of Coolant Accident
EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION

Time	Position	Applicant's Actions or Behavior
	RO	Step 8 cont. b. Close both SI pump recirc to RWST valves o EM HIS-8814A o EM HIS-8814B c. Ensure SI pump miniflow - ISOLATED * EM HIS-8814A and EM HIS-8814B – BOTH CLOSED or * BN HIS-8813 - CLOSED
	RO	9. Align CCP and SI pump suctions to RHR pump discharge: a. Open both RHR to CCP and SI pump suction valves o EJ HIS-8804A, RHR to Charging pumps o EJ HIS-8804B, RHR to SI pump B suction b. Open both CVCS to SI pump suction valves o EM HIS-8807A o EM HIS-8807B
	RO	10. Isolate RWST from Charging and SI pumps a. Close both RWST to SI pump suction valves o BN HIS-8806A o BN HIS-8806B b. Close both CCP suction from RWST valves o BN HIS-112D o BN HIS-112E

Event termination: At the completion of step 10, the last critical task is completed. The scenario may be terminated at the discretion of the Lead Examiner.

Booth operator "Freeze" simulator at direction of Lead Examiner.

Facility: _____Wolf Creek_____ Scenario No.: ____2____ Op-Test No.: _____

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: Middle Of Life, ~74%

Turnover: Monitor MFP "B" vibration. Started the downpower and are currently on HOLD at ~74% waiting an Engineering Evaluation. Annunciator 00-058B, VCT VLV NOT IN VCT POS, due to recent 200-gallon dilution to hold power. Diluting ~100 gallons every 10-15 minutes. No equipment is out of service.

Event No.	Malf. No.	Event Type*	Event Description
1	mBB01E	I – ATC, SRO	Loop "A," BB TI-411, Tcold fails high TS determined and entered. TS 3.3.1, Table 3.3.1-1, Fu 6 and 7, Cond A (Immediately) and Cond E (72 hrs to trip bistables)
2	mAE15C 4	I – BOP, SRO	Steam Generator "C" controlling level channel AE LI-553 failure high TS determined and entered. TS 3.3.1, Table 3.3.1-1, Fu 14, Cond A (Immediately) and Cond E (72 hrs to trip bistables) TS 3.3.2, Table 3.3.2-1, Fu 5.c and 6.d, Cond A (Immediately), Cond I (72 hrs to trip bistable) and Cond D (72 hrs to trip bistable)
3	msovBB PCV455 A	C – ATC, SRO	PORV BB PCV-455A fails to 25% open due to control circuitry problems, PZR pressure begins to decrease TS determined and entered. TS 3.4.11 Cond. B.1 (1 hour close seal valve) and B.2 (1 hour to de-energize seal valve) and B.3 (72 hours to repair PORV)
4	mAB03A	M – CREW	Steam line break inside Containment (Steam Generator "A") Adverse Containment
5	mSNF01 A	C – ATC, SRO	Malfunction post Reactor Trip and Safety Injection: LOCA Sequencer "A" failure at five second time.
6	mNF01A	C – BOP, SRO	Malfunction post Reactor Trip and Safety Injection: Main Generator and Exciter breakers fail to automatically trip.

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

Scenario Summary:
The unit is at ~74% power, middle of life. Monitor MFP "B" vibration. Started the downpower and are currently on HOLD at ~74% waiting an Engineering Evaluation. Annunciator 00-058B, VCT VLV NOT IN VCT POS, due to recent 200-gallon dilution to hold power. Diluting ~100 gallons every 10-15 minutes. No equipment is out of service.

Event 1: RCS Loop "A" BB TI-411 Tcold fails high. Meter indication changes and the Control Rods insert – the Reactor Operator (RO) places control rods in MANUAL, stopping the insertion. Many Main Control Board alarms annunciate: 00-065C, 00-065E, 00-066B, 00-067D, 00-068D, 00-069D, 00-082B and 00-083C. OFN SB-008, INSTRUMENT MALFUNCTIONS, is entered and Attachment L performed. This procedure will diagnose and mitigate the instrument failure.

The Control Room Supervisor determines Technical Specifications.

Event 2: Steam Generator "C" controlling level channel AE LI-553 fails high. Meter indications change and Main Control Board alarms, 00-110A, SG C LEV HI/LO and 00-110B, SG C LEV DEV, annunciate. ALR 00-110A, SG C LEV HI/LO, or 00-110B, SG C LEV DEV, may be entered and performed. OFN SB-008, INSTRUMENT MALFUNCTIONS, is entered and Attachment F is performed. These procedures diagnose and mitigate the instrument failure.

The Control Room Supervisor determines Technical Specifications.

Event 3: Pressurizer Pilot Operated Relief Valve (PORV) BB PCV-455A fails to 25% open due to control circuitry problems. Diagnostic parameters include dual indication on hand indicating switch BB HIS-455A, and alarms 00-035B, PORV OPEN, 00-035C, PZR SFTY DISCH TEMP HI, 00-035D, PZR PORV DISCH TEMP HI, 00-034E, PRT PRESS HI annunciating. ALR 00-035B may be entered and performed to close the PZR Seal Iso Valve using BB HIS-8000A. This action mitigates the event.

The Control Room Supervisor determines Technical Specifications.

Event 4: The Main Event is a Steam line break inside Containment (Steam Generator "A"). Diagnostic parameters include Secondary steam flow to feed flow meters mismatch, increasing SG steam flow, Containment pressure and humidity while it decreases Main Turbine load and RCS pressure and temperature. OFN AB-041, STEAMLINE OR FEEDLINE LEAK may be entered. A Reactor trip and Safety Injection occurs. EMG E-0, REACTOR TRIP OR SAFETY INJECTION, is entered and performed. The faulted SG is identified and isolated (EMG E-0 foldout page criteria). Adverse Containment is identified and setpoints for various parameters are used. The Crew transitions to EMG E-2, FAULTED STEAM GENERATOR ISOLATION.

Eventually the Crew transitions to EMG ES-03, SI TERMINATION, to mitigate PZR overfill and RCS high pressure.

Post trip malfunctions:

1. Event 5: LOCA Sequencer "A" failure at five second time interval frame. This component failure requires the Crew to start ECCS equipment per EMG E-0 Attachment F.
2. Event 6: Main Generator and Exciter breakers fail to automatically trip. This component failure requires the BOP to "permit" MA HS-5, SWYD 345-50/60 MAN TRIP PERMIT switch, BEFORE opening the breakers per EMG step 6RNO. (NOTE: MA HS-5, SWYD 345-50/60 MAN TRIP PERMIT is a new switch added to Panel RL005 during Refuel 18).

Scenario Critical Tasks (CT)
Event 1: CT – place rods to manual prior to actuation of the Reactor Protection System

Event 2 - CT – take manual control, select alternate controlling channel prior to actuation of the Reactor Protection System

Event 4 - CT – isolate the faulted Steam Generator before an Orange path integrity challenge develops

Probabilistic Risk Analysis for this scenario includes:

Core Damage Frequency by Initiating Event

Initiating Event	Initiating Event Frequency (/yr)	Core Damage Frequency (/yr)	CDF Percent Contribution
Loss of Offsite Power	2.88E-02	6.59E-06	36.51%
Small LOCA	3.00E-03	5.35E-06	29.63%
Interfacing Systems LOCA		1.93E-06	10.69%
Very Small LOCA	6.20E-03	1.27E-06	7.03%
Transients With Power Conversion Systems Available	1.05E+00	9.88E-07	5.47%
Steam Generator Tube Rupture	3.67E-03	8.77E-07	4.86%
Reactor Vessel Failure	3.00E-07	3.00E-07	1.66%
Steamline Break	1.13E-02	1.88E-07	1.04%
Transients Without Power Conversion Systems Available	1.15E-01	1.71E-07	0.95%
Medium LOCA	6.10E-05	1.46E-07	0.81%
Loss of All Service Water	6.86E-06	8.30E-08	0.46%
Loss of Component Cooling Water	2.14E-04	5.79E-08	0.32%
Loss of Vital DC Bus NK04	2.64E-03	4.32E-08	0.24%
Large LOCA	7.20E-06	2.80E-08	0.16%
Feedwater Line Break	3.17E-03	2.06E-08	0.11%
Loss of Vital DC Bus NK01	2.64E-03	1.12E-08	0.06%

Technical Specifications exercised:

Event 1 - TS determined and entered. TS 3.3.1, Table 3.3.1-1, Fu 6 and 7, Cond A (Immediately) and Cond E (72 hrs to trip bistables)

Event 2 - TS determined and entered. TS 3.3.1, Table 3.3.1-1, Fu 14, Cond A (Immediately) and Cond E (72 hrs to trip bistables)

TS 3.3.2, Table 3.3.2-1, Fu 5.c and 6.d, Cond A (Immediately), Cond I (72 hrs to trip bistable) and Cond D (72 hrs to trip bistable)

Event 3 – TS determined and entered. TS 3.4.11 Cond. B.1 (1 hour close seal valve) and B.2 (1 hour to de-energize seal valve) and B.3 (72 hours to repair PORV)

Op-Test No.: ____ Scenario No.: 2 Event No.: 1 Page 1 of 30

Event Description: Loop "A," BB TI-411, Tcold fails high

CT success – place rods to manual prior to actuation of the Reactor Protection System

Time	Position	Applicant's Actions or Behavior
BOOTH: Set up scenario and simulator. At Lead Examiner cue, insert KEY 1 for first event. Diagnostics: RCS Loop "A," BB TI-411, Tcold fails high. Meter BB TI-411A, ΔT fails low, BB TI-412, Tavg, fails high. Control Rods insert. Main Control Board alarms include: 00-065C, 00-065E, 00-066B, 00-067D, 00-068D and 00-069D annunciate.		
	CREW	Identifies and diagnoses Loop "A," BB TI-411, Tcold fails high.
	CRS	**ENTER** and **DIRECT** OFN SB-008, INSTRUMENT MALFUNCTIONS
Procedure NOTE: Steps 1 through 8 can be performed in any order.		
	CRS, RO	2. Check if reactor coolant system instrument channel or controller is malfunctioning a. Determine appropriate attachment for malfunction channel or controller from table below: RCS Temperature (BB) T-411 Attachment L b. Go to appropriate attachment for malfunctioning reactor coolant system channel or controller.
	CRS, RO	OFN SB-008, Attachment L, NARROW RANGE RTD MALFUNCTION
Procedure NOTE: Steps L1 through L2 are Memory Action steps		
	BOP	L1. Check load rejection – NOT ON PROGRESS o Generator Load MW – STABLE o Generator Load SET MW - STABLE
	RO	L2. Switch ROD BANK AUTO/MAN SEL switch to – MANUAL **(CT)** o SE HS-9 **CT success – place rods to manual prior to actuation of the Reactor Protection System**

Op-Test No.: ____ Scenario No.: 2 Event No.: 1 Page 2 of 30

Event Description: Loop "A," BB TI-411, Tcold fails high

Time	Position	Applicant's Actions or Behavior
	BOP	L3. Check steam dumps: a. Check STEAM DUMP SEL switch – IN TAVG MODE (AB US-500Z) b. Check steam dumps - CLOSED
	RO	L4. Identify failed instrument channel: Loop 1 Function Indication 1 ΔT BB TI-411A Tavg BB TI-412
	RO	L5. Remove failed temperature channel from Tavg and ΔT auctioneering circuits, using DELTA T DEFEAT and ROD CTRL TAVG INPUT CHANNEL DEFEAT switches: o BB TS-411F o BB TS-412T
	RO	L6. Check (Tavg/Tref) error signal within 1°F; if No, Perform RNO L6RNO. (ρ) Manually adjust control rod position to maintain Tavg within 1°F of Tref
Examiner NOTE: The CRS may elect to restore control rods to their previous position before directing ROD BANK AUTO/MAN SEL switch to AUTO in step L7.		

Op-Test No.: ____ Scenario No.: 2 Event No.: 1 Page 3 of 30

Event Description: Loop "A," BB TI-411, Tcold fails high

Time	Position	Applicant's Actions or Behavior
	RO	L7. Check ROD BANK AUTO/MAN SEL switch in AUTO; No, Perform RNO o SE HS-9 L7RNO (ρ) When Tavg is within 1°F of Tref, then place ROD BANK AUTO/MAN SEL switch in AUTO
	RO	L8. Monitor Rod Control System response to ensure proper control
	BOP	L9. Check C-7 Loss of Load interlock – NOT LIT
	BOP	L10. Check STEAM DUMP BYPASS INTERLOCK switches in – ON o AB HS-63 o AB HS-64
	BOP	L11. Monitor Steam Dump Control System to ensure proper operation
	RO	L12. Check failed temperature channel not selected on OP DT/OT DT LOOP RECORD SEL; if No, Perform RNO o SC TS-411E L12RNO. Select alternate temperature channel for input to recorder.
	CRS	Monitor the following Technical Specification LCOs and comply with Action Statements, as appropriate: o 3.3.1, RTS INSTRUMENTATION, Table 3.3.1-1, Fu 6 and 7 **CRS determines TS: TS 3.3.1, Table 3.3.1-1, Fu 6 and 7, Cond A (Immediately) and Cond E (72 hrs to trip bistables)**

Booth cues: If contacted as WWM or Call Supt.: acknowledge plant status.

Event termination: When Technical Specifications are determined and/or at Lead Examiner's discretion, event is terminated. Booth operator inserts KEY 2 for event two at Lead Examiner's discretion.

Op-Test No.: ____ Scenario No.: 2 Event No.: 2 Page 4 of 30

Event Description: Steam Generator "C" controlling level channel AE LI-553 failure high

CT success – take manual control, select alternate controlling channel prior to actuation of the Reactor Protection System

Time	Position	Applicant's Actions or Behavior
Booth operator inserts KEY 2 for event two at Lead Examiner's discretion. Diagnostics: Steam Generator "C" controlling level channel AE LI-553 fails high. Meter SG C LEV AE LI-553 fails high. MFRV for Steam Generator "C" begins to close. Main Control Board alarms 00-110A, SG C LEV HI/LO, 00-110B, SG C LEV DEV and 00-110C SG FLOW MISMATCH annunciate.		
	CREW	Identifies and diagnoses Steam Generator "C" controlling level channel AE LI-553 failure high
	CRS	May **ENTER** and **DIRECT** ALR 00-110A SG C LEV HI/LO
Procedure NOTE: Steps 1 through 3 are Memory Action Steps		
	BOP	1. Check SG C controlling level channel: * Less than 30% or * Greater than 70%
	BOP	2. Check for instrument failure a. Check SG C controlling level channel – WITHIN 7% OF REMAINING SG C LEVEL CHANNELS; No, Perform RNO * AE LI-539 * AE LI-553 2RNO: Perform the following: 1. Place Feedwater Reg Valve (FRV) in MANUAL **(CT – perform 2RNO1)** * AE FK-530 2. Adjust FRV, as necessary, to establish SG level at program value **(CT - perform 2RNO2)** * AE FK-530 3. Select alternate channel for control (**CT - perform 2RNO3)** o AE LS-539C Examiner NOTE: BOP selects L539 using switch AE LS-539C

Op-Test No.: ____ Scenario No.: 2 Event No.: 2 Page 5 of 30

Event Description: Steam Generator "C" controlling level channel AE LI-553 failure high

CT success – take manual control, select alternate controlling channel prior to actuation of the Reactor Protection System

Time	Position	Applicant's Actions or Behavior
	BOP	Step 2RNO cont 4. Return FRV to AUTOMATIC * AE FK-530 5. Go to OFN SB-008, INSTRUMENT MALFUNCTIONS **CT success – take manual control, select alternate controlling channel prior to actuation of the Reactor Protection System** Examiner NOTE: BOP actions include taking FRV to manual and adjusting FRV to match steam flow and feed flow - Selecting an alternate channel will occur at the procedure step by direction of CRS.
	CRS	**ENTER** and **DIRECT** OFN SB-008, INSTRUMENT MALFUNCTIONS
Procedure NOTE: Steps 1 through 8 can be performed in any order.		
	CRS	1. Check if secondary system instrument channel is malfunctioning: a. Determine appropriate attachment for malfunctioning channel from table below: Attachment C is determined and entered SG Level (AE) Control Channel L-553 Attachment F b. Go to appropriate attachment for malfunctioning secondary system channel. Examiner NOTE: If ALR 110A is entered first, the procedure flowpath in OFN SB-008 is different than if OFN SB-008 is entered first. All the OFN SB-008 Attachment F procedure steps are included regardless of which procedure is entered first.
	CRS	OFN SB-008, Attachment F, SG LEVEL CHANNEL MALFUNCTION
Procedure NOTE: Steps F1 through F4 are Memory Action steps.		
	BOP	F1. Identify failed narrow range SG level instrument channel: Compare narrow range SG level indications to confirm a narrow range SG level channel failure: Examiner NOTE: See next page for Table.

Op-Test No.: ____ Scenario No.: 2 Event No.: 2 Page 6 of 30

Event Description: Steam Generator "C" controlling level channel AE LI-553 failure high

CT success – take manual control, select alternate controlling channel prior to actuation of the Reactor Protection System

Time	Position	Applicant's Actions or Behavior
	BOP	Step F1 cont. SG / INDICATION / FUNCTION C / AE LI-537 / Indication AE LI-538 / Indication AE LI-549 / Control AE LI-553 / Control
	BOP	F2. Check failed SG level channel selected on SG LEV CHANNEL SEL switch; if NO, Perform RNO * AE LS-539C F2RNO: Go to step 7 Examiner NOTE: RNO (Go to step 7) is used if ALR 110A entered first.
	BOP	F3. Place affected SG MFW REG VLV CTRL – IN MANUAL **(CT – perform F3)** * AE FK-540
	BOP	F4. Adjust affected SG MFW REG VLV CTRL, as necessary, to establish Steam generator level at program: **(CT – perform F4)** * AE FK-540
	BOP	F5. Select alternate SG level channel on SG LEV CHANNEL SEL switch: **(CT – perform F5)** * AE LS-539C Examiner NOTE: BOP selects L539 using switch AE LS-539C **CT success – take manual control, select alternate controlling channel prior to actuation of the Reactor Protection System**
	BOP	F6. Restore affected SG MFW REG VLV CTRL to – AUTO (AE FK-540)

Op-Test No.: _____ Scenario No.: 2 Event No.: 2 Page 7 of 30

Event Description: Steam Generator "C" controlling level channel AE LI-553 failure high

Time	Position	Applicant's Actions or Behavior
	CRS	F7. Monitor the following Technical Specifications for LCOs and comply with Action Statements, as appropriate: o 3.3.1, RTS INSTRUMENTATION, Table 3.3.1-1, Fu 14 o 3.3.2, ESFAS INSTRUMENTATION, Table 3.3.2-1, Fu 5.c and 6.d o 3.3.4, REMOTE SHUTDOWN INSTRUMENTATION, Table 3.3.4-1, Fu 8 o 3.3.3, ACCIDENT MONITORING INSTRUMENTATION, Fu 13 **CRS determines: TS 3.3.1, Table 3.3.1-1, Fu 14, Cond A (Immediately) and Cond E (72 hrs to trip bistables)** **TS 3.3.2, Table 3.3.2-1, Fu 5.c and 6.d, Cond A (Immediately), Cond I (72 hrs to trip bistable) and Cond D (72 hrs to trip bistable)**

Booth cues: If contacted as Call Supt.: acknowledge plant status. If contacted as INC: acknowledge request.

Event termination: When Technical Specifications are determined and/or at Lead Examiner's discretion, event is terminated.

Booth operator inserts KEY 3 for event 3 at Lead Examiner's discretion.

Op-Test No.: ____ Scenario No.: 2 Event No.: 3 Page 8 of 30

Event Description: PORV BB PCV-455A fails to 25% open due to control circuitry problems, PZR pressure begins to decrease

Time	Position	Applicant's Actions or Behavior
Booth cue: Insert KEY 3 for event 3 at Lead Examiner's discretion. Diagnostics: RCS pressure decreases. Dual indication on hand indicating switch BB HIS-455A. Main Control Board alarms 00-035B, PORV OPEN, 00-035C, PZR SFTY DISCH TEMP HI, 00-035D, PZR PORV DISCH TEMP HI, 00-034C, PZR PORV BLOCK and 00-034E, PRT PRESS HI annunciate		
	CREW	Identifies and diagnoses PORV BB PCV-455A has dual indication and is OPEN.
	CRS	**ENTER** and **DIRECT** ALR 00-035B, PORV OPEN
Procedure NOTE: Step 1 is a Memory Action step		
	RO	1. Check if PZR PORVs should be closed when NOT in Cold Overpressure Protection: a. Check Cold Overpressure System – NOT IN SERVICE o BLOCK/ARM switches in BLOCK o BB HS-8000A o BB HS-8000B b. Check PZR pressure – LESS THAN 2310 PSIG c. Close affected PZR PORVs; if NO, Perform RNO * BB HIS-455A * BB HIS-456A 1RNOc: If affected PORV(s) will not closed, then close associated PORV block valve. * BB HIS-8000A for BB HV-455A * BB HIS-8000B for BB HV-456A Examiner NOTE: BB HIS-455A is ISOLATED by board operator action.

Op-Test No.: ____ Scenario No.: 2 Event No.: 3 Page 9 of 30

Event Description: PORV BB PCV-455A fails to 25% open due to control circuitry problems, PZR pressure begins to decrease

Time	Position	Applicant's Actions or Behavior
	CRS	2. Check if PZR PORVs should be closed when in Cold Overpressure Protection: a. Check Cold Overpressure protection – IN SERVICE; No, Perform RNO 2RNOa. Go to step 3
	RO	3. Verify PZR PORVs – AT LEAST ONE OPENED a. Check PZR PORV discharge temperature – GREATER THAN NORMAL o BB TI-463
	CRS	4. Refer to Technical Specifications 3.4.11 and 3.4.12 **CRS determines TS: TS 3.4.11 Cond. B.1 (1 hour close seal valve) and B.2 (1 hour to de-energize seal valve) and B.3 (72 hours to repair PORV)**
Examiner NOTE: NG001BBR3 is the breaker to de-energize the Block valve (BB HV-8000A).		
Booth cues: If contacted as Building Watch to remove power from Block valve, acknowledge request, insert KEY 5 and report to Control Room when action complete. NG001BBR3 is the breaker to de-energize the Block valve (BB HV-8000A).		
Booth cues: If contacted as WWM, Shift Manager or Call Supt.: acknowledge plant status. If contacted as INC: acknowledge request. If contacted as Maintenance, acknowledge request.		
Event termination: When Technical Specifications are determined and/or at Lead Examiner's discretion, event is terminated. Booth operator inserts KEY 4 for event four at Lead Examiner's discretion.		

Op-Test No.: _____ Scenario No.: 2 Event No.: 4 Page 10 of 30

Event Description: Steam line break inside Containment (Steam Generator "A")

Time	Position	Applicant's Actions or Behavior
Booth operator inserts KEY 4 for event four at Lead Examiner's discretion. Diagnostics for Steam Line break inside Containment: Secondary steam flow to feed flow meters mismatch, increasing SG steam flow, increasing Containment pressure and humidity. Main Turbine load decreases and RCS pressure and temperature decreasing.		
	CREW	Identify and diagnose a secondary coolant failure – steam line break inside Containment
	CRS	May **ENTER** and **DIRECT** OFN AB-041, STEAMLINE OR FEEDLINE LEAK
	CRS	Based on plant conditions, **DIRECT** a Reactor Trip and Safety Injection Signal actuation, and **DIRECT** performance of Immediate Actions per EMG E-0, REACTOR TRIP OR SAFETY INJECTION Examiner NOTE: an automatic Reactor trip and Safety Injection may occur.
	RO	Perform Reactor Trip and Safety Injection Signal actuation at direction of CRS using o SB HS-1, REACTOR TRIP MAN ACTUATION to TRIP position o SB HS-27, SI MAN ACTUATION to ACTUATE position o SB HS-28, SI MAN ACTUATION to ACTUATE position
	RO, BOP	Perform Immediate Actions of EMG E-0, REACTOR TRIP OR SAFETY INJECTION and report results to CRS Examiner NOTE: Steps 1-4 are Immediate Action steps performed from memory. Usually the RO performs steps 1, 3 and 4, the while BOP performs step 2.

Op-Test No.: _____ Scenario No.: 2 Event No.: 4 Page 11 of 30

Event Description: Steam line break inside Containment

Time	Position	Applicant's Actions or Behavior
	CRS, RO	The RO reports many ECCS equipment did not start from the LOCA sequencer. CRS directs that the equipment will be started using Attachment F of EMG E-0. Examiner NOTE: The CRS may direct the RO to start ESW and /or CCW pumps now, then use Attachment F for the remaining equipment.
	CRS, BOP	The BOP reports Main Generator and Exciter Breaker did not trip. CRS directs that the equipment will be placed in its correct state using EMG E-0.
	RO	1. Verify Reactor trip a. Check rod bottom lights – LIT b. Ensure reactor trip breakers and bypass breakers – OPEN o SB ZL-1 o SB ZL-2 o SB ZL-3 o SB ZL-4 c. Check intermediate range neutron flux – DECREASING o SE NI-35B [GAMMA METRICS] o SE NI-36B [GAMMA METRICS]
	BOP	2. Verify turbine trip a. Check the following: * Main Stop valves – ALL CLOSED OR * Turbine Auto Stop bistable lights – AT LEAST TWO LIT
	RO	3. Check AC Emergency Busses – AT LEAST ONE ENERGIZED * NB01 – ENERGIZED * NB02 - ENERGIZED

Op-Test No.: _____ Scenario No.: 2 Event No.: 4 Page 12 of 30

Event Description: Steam line break inside Containment

CT success – isolate the faulted Steam Generator before an Orange path integrity challenge develops

Time	Position	Applicant's Actions or Behavior
	RO	4. Check if Safety Injection is actuated: a. Check any indication SI is actuated – LIT * Annun. 00-030A NF039A LOCA SEQ ACTUATED – LIT * Annun. 00-031A NF039B LOCA SEQ ACTUATED – LIT * ESFAS status panel SIS section – ANY WHITE LIGHTS LIT * Partial trip status Permissive/Block status panel – SI RED LIGHT LIT b. Check both trains of SI actuated o Ann 00-030A NF039A LOCA SEQ ACTUATED – LIT o Ann 00-031A NF039B LOCA SEQ ACTUATED – LIT
	CREW	Identified SG A as the faulted Steam Generator.
	CRS, BOP	EMG E-0 Foldout Page Criteria #3, FAULTED SG ISOLATION CRITERIA: If any SG pressure decreasing in an uncontrolled manner OR any SG completely depressurized, then the following may be performed: a. Close main steam isolation valves b. Isolate feed flow to faulted SG(s) c. Maintain total feed flow greater than 270,000 lbm/hr until narrow range level in at least one SG is greater than 6% [29%] **CT success– isolate the faulted Steam Generator before an Orange path integrity challenge develops** a. Depresses AB HS-79, MS ISO VLVS and AB HS-80, MS ISO VLVS (ALL CLOSE) **(CT action by BOP)** b. Takes AL HK-8A, SG A TD AFP AFW REG VLV CTRL and AL HK-7A, SG A MD AFP AFW REG VLV CTRL to zero output. Flow meter AL FI-2A, AFW TO SG A FLOW, decreases to zero. **(CT action by BOP)** c. May adjust SG B, C and D MD and TD AFW REG VLV controllers to maintain a total feed flow greater than 270,000 lbm/hr until narrow range level in at least one SG is greater than 6% [29%]

Op-Test No.: _____ Scenario No.: 2 Event No.: 6 Page 13 of 30

Event Description: Steam line break inside Containment

Event 6: Main Generator and Exciter breakers fail to automatically trip. Success: EMG E-0 step 6RNO

Time	Position	Applicant's Actions or Behavior
	RO	5. Check if SI is required: * SI was manually actuated AND was required * RCS pressure is currently or has been – LESS THAN OR EQUAL TO 1830 PSIG * Any SG press is currently or has been – LESS THAN OR EQUAL TO 615 PSIG * Containment press is currently or has been – GREATER THAN OR EQUAL TO 3.5 PSIG * RCS subcooling is currently or has been – LESS THAN 30°F [45°F] * PZR level is currently or has been – LESS THAN 6% [33%]
	BOP	6. Check Main Generator Breakers and Exciter Breaker – OPEN; No, Perform RNO o MA ZL-3A o MA ZL-4A o MB ZL-2 RNO Step 6: When time since turbine trip is greater than 30 seconds and all steam is secured to the turbine then perform the following: a. Place SWYD 345-50/60 MAN TRIP PERMIT switch to PERMIT o MA HS-5 b. Open main generator and exciter breakers 1) MA HS-3 2) MA HS-4 3) MB HS-2
	RO/BOP	7. Verify Automatic Actions using Attachment F, AUTOMATIC SIGNAL VERIFICATION Examiner NOTE: Attachment F procedure steps see page 18

Op-Test No.: _____ Scenario No.: 2 Event No.: 4 Page 14 of 30

Event Description: Steam line break inside Containment

Time	Position	Applicant's Actions or Behavior
	BOP	8. Check total AFW flow - >270,000 lbm/hr
	BOP	9. Check RCS cold leg temperatures * Stable at or trending to 557°F for condenser steam dumps * Stable at or trending to 561°F for SG ARVs; No, perform RNO 9RNO: a. If temperature is less than setpoint and decreasing, then perform the following: 1) Stop dumping steam 2) If any MSIV is open, then close Main Turbine Stop and Control Valves Startup Drains. o AC HIS-134 3) If cooldown continues, then control total feed flow to limit RCS cooldown. Maintain total feed flow > 270,000 lbm/hr until narrow range level greater than 6% [29%] in at least one SG. 4) If cooldown continues due to excessive steam flow, then isolate main steamlines by depressing both MS ISO VLV ALL CLOSE pushbuttons o AB HS-79 o AB HS-80 b. If temperature is greater than setpoint and increasing, then perform one of the following: * Dump steam to condenser * Dump steam using SG ARVs

Op-Test No.: ____ Scenario No.: 2 Event No.: 4 Page 15 of 30

Event Description: Steam line break inside Containment

Time	Position	Applicant's Actions or Behavior
	BOP	10. Establish SG pressure control a. Check condenser – AVAILABLE; No Perform RNO o C-9 LIT o MSIV – OPEN; NO o Circulating water pumps – RUNNING 10RNOa. Perform the following 1) Use the SG ARVs 2) Go to step 11
	RO	11. Check PZR PORVs a. Check PZR PORVs – CLOSED o BB HIS-455A (recall dual indication, Block valve is closed) o BB HIS-456A b. Power to block valves – AVAILABLE o BB HIS-8000A – power removed earlier (RNO action restores power) o BB HIS-8000B c. RCS pressure – LESS THAN 2185 PSIG
Examiner NOTE: Per earlier TS action, power was removed from Block valve BB HIS-8000A.		
Booth cue: If contacted as Building Watch to restore power to de-energized Block valve, acknowledge request, delete the remote (see Key 5). Report to Control Room when action complete.		

Op-Test No.: _____ Scenario No.: 2 Event No.: 4 Page 16 of 30

Event Description: Steam line break inside Containment

Time	Position	Applicant's Actions or Behavior
	RO	12. Check normal PZR Spray valves – CLOSED o BB ZL-455B o BB ZL-455C
	RO	13. Check PZR Safety valves – CLOSED o BB ZL-8010A o BB ZL-8010B o BB ZL-8010C
	RO	14. Check if RCPs should be stopped: a. Check RCP's – ANY RUNNING b. Check RCS pressure – LESS THAN 1400 PSIG; No, Perform RNO 14RNOb. Go to step 15
	CRS	15. Direct Operator to monitor Critical Safety Functions using EMG F-0, CRITICAL SAFETY FUNCTION STATUS TREES (CSFST). Examiner NOTE: Surrogate STA performs this activity and reports results to the CRS.
	RO	16. Check if SGs are not faulted:; No, Perform RNO, SG A is Faulted a. Check pressures in all SG – o NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER o NO SG COMPLETELY DEPRESSURIZED No, Perform RNO – see next page

Op-Test No.: _____ Scenario No.: 2 Event No.: 4 Page 17 of 30

Event Description: Steam line break inside Containment

Time	Position	Applicant's Actions or Behavior
	RO	16RNO cont. a. Perform the following: 1) Ensure BIT inlet and outlet valves are OPEN o EM HIS-8803A o EM HIS-8803B o EM HIS-8801A o EM HIS-8801B 2) Go to EMG E-2, FAULTED STEAM GENERATOR ISOLATION, step 11
	CRS	**LEAD** a transition brief prior to directing actions of EMG E-2. Examiner NOTE: See page 23 for EMG E-2.

Op-Test No.: ____ Scenario No.: 2 Event No.: 5 Page 18 of 30

Event Description: LOCA Sequencer "A" failure at five second time interval frame

EMG E-0 Attachment F, AUTOMATIC SIGNAL VERIFICATION

Time	Position	Applicant's Actions or Behavior
	RO/BOP	F1. Verify Feedwater Isolation a. Main feedwater pumps - TRIPPED b. Main feedwater reg valves – CLOSED b. Main feedwater reg bypass valves – CLOSED c. Main feedwater isolation valves – CLOSED d. Main feedwater chemical injection valves – CLOSED e. Check ESFAS status panel SGBSIS section – ALL WHITE LIGHTS LIT
	RO/BOP	F2. Verify Containment Isolation Phase A a. a. Check ESFAS status panel CISA section – ALL WHITE LIGHTS LIT
	RO/BOP	F3. Verify AFW pumps running: a. Check motor driven AFW pumps – BOTH RUNNING; No, Perform RNO b. Check turbine driven AFW pump - RUNNING F3RNOa. Manually start pumps. o AL HIS-22A (start MD AFP A)
	RO/BOP	F4. Verify ECCS pumps running a. Check CCPs – BOTH RUNNING b. Check SI pumps- BOTH RUNNING c. Check RHR pumps – BOTH RUNNING; No – Perform RNO F4RNOc: Manually start pump o EJ HIS-1 (RHR PUMP A)

Op-Test No.: ____ Scenario No.: 2 Event No.: 5 Page 19 of 30

Event Description: LOCA Sequencer "A" failure at five second time interval frame

EMG E-0 Attachment F, AUTOMATIC SIGNAL VERIFICATION

Time	Position	Applicant's Actions or Behavior
	RO/BOP	F5. Verify CCW alignment: a. Check CCW pumps – ONE RUNNING IN EACH TRAIN b. Check one pair of CCW service loop Supply and Return valves for an operating CCW pump - OPEN
	RO/BOP	F6. Check ESW pumps – BOTH RUNNING; No, Perform RNO F6RNOa. Manually start pumps. o EF HIS-55A (ESW PUMP A) Examiner NOTE: "A" ESW pump may have been started at the direction of the CRS once the Immediate Actions of EMG E-0 were complete.
	RO/BOP	F7. Check Containment Fan Coolers – RUNNING IN SLOW SPEED; No, Perform RNO F7RNO Perform the following a. Place Containment Cooler Fan speed selector switches in SLOW (only Red train listed) o GN HS-5 for cooler 1A o GN HS-13 for cooler 1C b. Manually start Containment Cooler Fans. o GN HIS-5 for cooler 1A o GN HIS-13 for cooer 1C

Op-Test No.: ____ Scenario No.: 2 Event No.: 5 Page 20 of 30

Event Description: LOCA Sequencer "A" failure at five second time interval frame

EMG E-0 Attachment F, AUTOMATIC SIGNAL VERIFICATION

Time	Position	Applicant's Actions or Behavior
	RO/BOP	F8. Verify Containment Purge Isolation: a. Check ESFAS status panel CPIS section – ALL WHITE LIGHTS LIT
	RO/BOP	F9. Verify both trains of Control Room Ventilation Isolation: a. Check ESFAS status panel CRVIS section – ALL WHITE LIGHTS LIT b. Ensure Control Room outer door - CLOSED
	RO/BOP	F10. Verify Main Steamline Isolation not required: a. Check Containment pressure – HAS REMAINED LESS THAN 17 PSIG (GN PR-934) b. Check either condition below – SATISFIED * Low steamline pressure SI – NOT BLOCKED AND steamline pressure – HAS REMAINED GREATER THAN 615 PSIG or * Low steamline pressure SI – NOT BLOCKED AND steamline pressure – HAS REMAINED LESS THAN 100 PSI/50 SEC
	RO/BOP	F11. Verify Containment Spray not required: a. Containment pressure – HAS REMAINED LESS THAN 27 PSIG; No, Perform RNO o Ann 00-059A, CSAS – NOT LIT o Ann 00-059B, CISB – NOT LIT o GN PR-934 F11RNO: Perform the following: 1. Stop all RCPs 2. If Containment Spray has NOT actuated, then manually actuate Containment Spray

Op-Test No.: ____ Scenario No.: 2 Event No.: 5 Page 21 of 30

Event Description: LOCA Sequencer "A" failure at five second time interval frame

EMG E-0 Attachment F, AUTOMATIC SIGNAL VERIFICATION

Time	Position	Applicant's Actions or Behavior
	RO/BOP	F11 RNO cont. 3. Check ESFAS status panel CSAS section – ALL WHITE LIGHTS LIT 4. If any CSAS component NOT properly aligned, then manually align associated component 5. Check ESFAS status panel CISB section – ALL WHITE LIGHTS LIT 6. If any CISB valve not closed, then manually close valve. If valve(s) can not be closed, then manually or locally isolate affected Containment penetration. Refer to ATTACHMENT E, VALVES CLOSED BY CONTAINMENT ISOLATION SIGNAL PHASE B
	RO/BOP	F12. Verify ECCS flow: a. Check CCP to BIT flow meters – FLOW INDICATED b. Check RCS pressure – LESS THAN 1700 PSIG; No, Perform RNO F12RNOb. Go to step F13
	RO/BOP	F13. Verify AFW valves – PROPERLY ALIGNED: a. Check ESFAS status panel AFAS section – ALL WHITE LIGHTS LIT b. Check white train ESFAS status panel AFAS section – ALL WHITE LIGHTS LIT
	RO/BOP	F14. Verify SI valves – PROPERLY ALIGNED a. Check ESFAS status panel SIS section – SYSTEM LEVEL WHITE LIGHTS ALL LIT

Op-Test No.: _____ Scenario No.: 2 Event No.: 5 Page 22 of 30

Event Description: LOCA Sequencer "A" failure at five second time interval frame

EMG E-0 Attachment F, AUTOMATIC SIGNAL VERIFICATION

Time	Position	Applicant's Actions or Behavior
	RO/BOP	F15. Check if NCP should be stopped: a. CCPs – ANY RUNNING b. Stop NCP o BG HIS-3
	RO/BOP	F16. Return to procedure and step in effect.

Op-Test No.: _____ Scenario No.: 2 Event No.: 4 Page 23 of 30

Event Description: Steam line break inside Containment

EMG E-2 FAULTED STEAM GENERATOR ISOLATION

Time	Position	Applicant's Actions or Behavior
	CRS	**LEAD** a transition brief prior to directing actions of EMG E-2.
	CRS	**ENTER** and **DIRECT** EMG E-2 FAULTED STEAM GENERATOR ISOLATION
	BOP	1. Check steamlines on all SGs - ISOLATED a. Ensure Main Steamline Isolation Valve(s) - CLOSED o AB HIS-14 for SG A o AB HIS-17 for SG B o AB HIS-20 for SG C o AB HIS-11 for SG D b. Ensure Main Steamline Isolation Bypass Valves - CLOSED o AB ZL-15A for SG A o AB ZL-18A for SG B o AB ZL-21A for SG C o AB ZL-12A for SG D c. Ensure Main Steamline Low Point Drain Valve(s) - CLOSED o AB HIS-9 for SG A o AB HIS-8 for SG B o AB HIS-7 for SG C o AB HIS-10 for SG D
	CRS	2. Check if limitations for fault in Area 5 are required: a. Check if steam is issuing from vent openings at 2000 foot elevation on south end of Turbine Building; No, Perform RNO 2RNOa. Go to step 3

Op-Test No.: _____ Scenario No.: 2 Event No.: 4 Page 24 of 30

Event Description: Steam line break inside Containment

EMG E-2 FAULTED STEAM GENERATOR ISOLATION

CT success – isolate the faulted Steam Generator before an Orange path integrity challenge develops

Time	Position	Applicant's Actions or Behavior
Booth cue: If contacted as Building Watch at EMG E-2 step 2, report that no steam is issuing from the Area 5 vent openings.		
	BOP	3. Check if any SG is not faulted: a. Check pressure in all SG: * ANY SG PRESSURE STABLE OR * ANY SG PRESSURE INCREASING Examiner NOTE: SG B, C, and D pressure are stable for plant conditions. Crew should not transition to EMG C-21, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS.
	BOP	4. Identify faulted SGs: a. Check pressure in all SGs: * ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER OR * ANY SG COMPLETELY DEPRESSURIZED Examiner NOTE: SG A should be completely depressurized and previously identified as the faulted SG.
	BOP	5. Isolate faulted SG's: **(CT success – performed earlier per Foldout criteria of EMG E-0)** a. Close AFW flow control valves to faulted SGs **(BOP CT action)** * AL HK-8A and AL HK-7A for SG A b. Locally close steam supply to Turbine Driven AFW pump from faulted SG; step not applicable c. Ensure SG ARV on faulted SG - CLOSED * AB PIC-1A for SG A Examiner NOTE: SG A was identified and isolated in EMG E-0.

Op-Test No.: _____ Scenario No.: 2 Event No.: 4 Page 25 of 30

Event Description: Steam line break inside Containment

EMG E-2 FAULTED STEAM GENERATOR ISOLATION

Time	Position	Applicant's Actions or Behavior
	BOP	6. Verify feedline isolated on faulted SG: a. Main feedwater reg valve - CLOSED * AE ZL-510 for SG A b. Main feedwater reg bypass valve - CLOSED * AE ZL-550 for SG A c. Main feedwater isolation valve - CLOSED * AE HIS-39 for SG A d. Main feedwater chemical injection valve - CLOSED * AE HIS-43 for SG A
	BOP	7. Verify Blowdown and Sampling isolated on faulted SG: a. SG blowdown Containment isolation valves - CLOSED * BM HIS-1A for SG A b. SG upper sample isolation valves - CLOSED * BM HIS-19 for SG A
Procedure CAUTION: If any PZR PORV opens because of high PZR pressure, the PORV shall be monitored to ensure it recloses after pressure decreases to less than 2235 psig.		
	RO	8. Check PZR PORVs and Block valves: a. Power to Block valves - AVAILABLE o BB HIS-8000A; No, this valve is de-energized. Perform RNO o BB HIS-8000B b. PZR PORVs - CLOSED o BB HIS-455A; No, dual indication, RNO – close Block valve o BB HIS-456A c. RCS pressure – LESS THAN 2185 PSIG

Op-Test No.: ____ Scenario No.: 2 Event No.: 4 Page 26 of 30

Event Description: Steam line break inside Containment

EMG E-2 FAULTED STEAM GENERATOR ISOLATION

Time	Position	Applicant's Actions or Behavior
	RO	8RNOa a. Restore power to block valves o NG001BBR3 for BB HV-8000A
Booth cue: If contacted as Building Watch to restore power to de-energized Block valve, acknowledge request, delete the remote (see Key 5). Report to Control Room when action complete.		
	BOP	9. Check if uncontrolled cooldown has stopped: a. Check RCS hot leg temperatures – STABLE OR DECREASING b. Control steam flow and feed flow as necessary, to maintain stable RCS hot leg temperatures
	CREW	10. Determine secondary radiation levels: a. Direct Health Physics to survey steamlines in area 5 of Aux Bldg. b. Check SG sampling - ISOLATED c. Ensure SI – RESET; No, Perform RNO 10RNOc: Reset SI d. Check INST AIR PRESS – GREATER THAN 105 PSIG o KA PI-40 e. Open CCW to Radwaste System isolation valves; No, Perform RNO o EG HS-69 o EG HS-70 10RNOe. Go to step 12.

Op-Test No.: ____ Scenario No.: 2 Event No.: 4 Page 27 of 30

Event Description: Steam line break inside Containment

EMG E-2 FAULTED STEAM GENERATOR ISOLATION

Time	Position	Applicant's Actions or Behavior
Booth cue: If contacted as HP: acknowledge request to survey steamlines in Area 5.		
	RO/BOP	12. Check if SG tubes are intact: a. Condenser air discharge radiation – NORMAL BEFORE ISOLATION o GEG 925 b. SG blowdown and sample radiation - NORMAL o BML 256 o SJL 026 o Sample results c. Turbine driven auxiliary feedwater pump exhaust radiation - NORMAL o FCT 381 d. SG steamline radiation - NORMAL o ABS 114 for SG A o ABS 113 for SG B o ABS 112 for SG C o ABS 111 for SG D o Local surveys e. SG narrow range levels – NO LEVEL INCREASING IN AN UNCONTROLLED MANNER
Booth cue: If contacted as Chemistry: acknowledge sampling request. If contacted as HP: acknowledge survey request.		

Op-Test No.: _____ Scenario No.: 2 Event No.: 4 Page 28 of 30

Event Description: Steam line break inside Containment

EMG E-2 FAULTED STEAM GENERATOR ISOLATION

Time	Position	Applicant's Actions or Behavior
	RO	13. Check if ECCS flow should be reduced: a. RCS subcooling – GREATER THAN 30°F [45°F] b. Secondary heat sink: * Total feed flow to intact SG – GREATER THAN 270,000 LBM/HR OR * Narrow range level in at least one intact SG – GREATER THAN 6% [29%] c. RCS pressure – STABLE OR INCREASING d. PZR level – GREATER THAN 6% [33%] e. Go to EMG ES-03, SI TERMINATION, step 1
	CRS	**LEAD** a transition brief prior to directing actions of EMG ES-03, SI TERMINATION.

Op-Test No.: _____ Scenario No.: 2 Event No.: 4 Page 29 of 30

Event Description: Steam line break inside Containment

EMG ES-03, SI TERMINATION

Time	Position	Applicant's Actions or Behavior
	CRS	**ENTER** and **DIRECT** EMG ES-03, SI TERMINATION
	RO	1. Reset SI o SB HS-42A o SB HS-43A
	RO/BOP	2. Reset Containment Isolation Phase A and B o SB HS-56 for phase A o SB HS-53 for phase A o SB HS-55 for phase B o SB HS-52 for phase B
	RO/BOP	3. Verify Instrument Air alignment a. Ensure at least one ESW TRAN TO AIR COMPRESSOR valve - OPEN * EF HIS-43 * EF HIS-44 b. Check AIR COMPRESSOR BRKR RESET switch associated with open ESW valve – CLOSED; if No Perform RNOb * KA HIS-2C * KA HIS-3C 3RNOb Reset and close AIR COMPRESSOR BRKR RESET switch c. Check INST AIR PRESS – GREATER THAN 105 PSIG o KA PI-40 d. Check PZR PRESS MASTER CTRL output – LESS THAN 50%; if No, Perform RNO d o BB PK-455A

Op-Test No.: ____ Scenario No.: 2 Event No.: 4 Page 30 of 30

Event Description: Steam line break inside Containment

EMG ES-03, SI TERMINATION

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Step 3RNOd cont. 3RNOd Perform the following: 1) Place PZR PRESS MASTER CTRL in manual (BB PK-455A) 2) Set PZR PRESS MASTER CTRL to less than 50% output signal 3) When instrument air has been established to Containment, then place PZR PRESS MASTER CTRL in AUTOMATIC e. Check neither ESW TO AIR COMPRESSOR valve – locally open o EF HV-43 o EF HV-44 f. Open INST AIR SPLY CTMT ISO VLV o KA HIS-29
	RO	4. Reduce charging flow: a. Check shutdown sequencers – NOT ACTUATED: o Annun. 00-018C, NF039A S/D SEQ ACTUATED – CLEAR o Annun. 00-021C, NF039B S/D SEQ ACTUATED – CLEAR b. Stop all but one CCP and place in standby * BG HIS-1A OR * BG HIS-2A
Event termination: Lead Examiner may terminate scenario when CCP is stopped. Booth operator "Freeze" simulator at direction of Lead Examiner.		

Facility: _____Wolf Creek_____ Scenario No.: ____3____ Op-Test No.: _____

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: BOL …~10% power

Turnover: Power ascension in progress, negative MTC. Perform step 6.40 through step 6.46 of GEN 00-003, HOT STANDBY TO MINIMUM LOAD. Use SYS AC-120, MAIN TURBINE GENERATOR STARTUP to synchronize the Main Generator to the grid. Increase power to ~15% immediately after synchronizing Main Turbine Generator to the grid.

Event No.	Malf. No.	Event Type*	Event Description
1		N - CREW	Per GEN 00-003, HOT STANDBY TO MINIMUM LOAD, from step 6.40 through step 6.46. Step 6.40 directs SYS AC-120, MAIN TURBINE GENERATOR STARTUP (synchronize Main Generator to grid). GEN 00-003 steps 6.41 through 6.46: valve alignments, increase turbine load using load potentiometer, verify Permissive states etc.
2	mNN02	C – CREW	Loss of NN02 (White train) TS determined and entered. TS 3.8.7, Cond A (restore to operable within twenty four hours) TS 3.8.9, Cond C (restore to operable status within two hours)
3	mAB07G	C – BOP, SRO	Atmospheric Relief Valve (ARV) “C” fails PARTIALLY open; manual control unavailable TS determined and entered. TS 3.7.4 Cond A (restore to operable within seven days)
4			Precursor: Seismic event → Main Feed Pump trip → Reactor trip
5	mSF17A mSF17B	M – CREW	Reactor fails to trip in automatic or manual. Anticipated Transient Without Trip (ATWT)
6	mAC02B	C – BOP, SRO	Post trip malfunction #1: Turbine will not manually trip.
7	p01024C	C – ATC, SRO	Post trip malfunction #2: BG HV-8104 does not open (see step 6 of EMG FR-S1) RNO performed: aligns RWST to charging pump suction

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

Scenario summary:

Unit is at ~ 10 % power, beginning of life. Power ascension in progress, negative MTC. Perform step 6.40 through step 6.46 of GEN 00-003, HOT STANDBY TO MINIMUM LOAD. Use SYS AC-120, MAIN TURBINE GENERATOR STARTUP to synchronize the Main Generator to the grid. Increase power to ~15% immediately after synchronizing Main Turbine Generator to the grid.

Event 1: The Crew, using GEN 00-003, HOT STANDBY TO MINIMUM LOAD, from step 6.40 through step 6.46 will synchronize Main Generator to the grid, verify valve alignments, increase turbine load using load potentiometer, and verify Permissive states etc.

Event 2: Loss of NN02 occurs. White train meter indications change and many Main Control Board alarms annunciate aid in diagnosing the component failure. The Crew may enter ALR 00-026A, NN02 INST BUS UV. The Crew enters OFN NN-021, LOSS OF VITAL 120VAC INSTRUMENT BUS, and performs Attachment B to restore power.

The Control Room Supervisor determines Technical Specifications.

Event 3: Atmospheric Relief Valve (ARV) "C" fails PARTIALLY open and manual control is unavailable. The Crew enters OFN AB-041, STEAMLINE OR FEEDLINE BREAK to mitigate the component failure. An Operator is dispatched to locally close the valve.

The Control Room Supervisor determines Technical Specifications.

Event 4: A Seismic event occurs. Main Control Board alarms 00-098D, OBE and 00-098E, SEISMIC RECORDER ON, annunciate. OFN SG-003, NATURAL EVENTS, is entered. The only running Main Feed Pump trips three minutes later. Main Control Board alarm 00-123A, MFP B TRIP, annunciates. The Crew determines a Reactor trip is necessary. A Reactor trip condition occurs; only the reactor fails to trip.

Event 5: The Main Event is an Anticipated Transient Without Trip (ATWT).

The Crew enters EMG E-0, REACTOR TRIP OR SAFETY INJECTION, and from step 1RNO transitions to EMG FR-S1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS.

Event 6: The turbine will not trip manually – the BOP must manually trip the turbine within thirty seconds to prevent an uncontrolled cooldown of the RCS due to steam flow that the turbine would require (2RNO EMG FR-S1 and EMG E-0).

Event 7: When aligning emergency boration, BG HV-8104 does not open. The ATC aligns Refueling Water Storage Tank to charging pump suction instead (6RNO of EMG FR-S1).

Successful mitigation strategy requires the Crew continues performance of EMG FR-S1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS.

Post trip malfunction:

1. Event 6: Post trip malfunction #1: The turbine will not trip manually. As part of Immediate Actions of EMG FR-S1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS, step 2RNO, the BOP must trip the turbine.
2. Event 7: Post trip malfunction #2: EMER BORATE TO CHG PUMP SUCT BG HIS-8104 does not open (see step 6 of EMG FR-S1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS). RNO performed: aligns RWST to charging pump suction.

Scenario Critical Tasks (CT):
Event 5: CT: Insert negative reactivity into the core by at least one of the following methods before the Steam Generators dry-out:

- De-energize the control rod drive MG sets
- Manually insert control rods

Event 6: CT: Manually trip the turbine to prevent an uncontrolled cooldown of the RCS due to steam flow that the turbine would require.

Probabilistic Risk Analysis for this scenario includes:

Core Damage Frequency by Event Tree

Event Tree	Core Damage Frequency (/yr)	Percent Contribution
Station Blackout	6.46E-06	35.79%
Small LOCA	5.35E-06	29.65%
Interfacing Systems LOCA	1.93E-06	10.68%
Very Small LOCA	1.27E-06	7.05%
Steam Generator Tube Rupture	8.77E-07	4.86%
Loss of Reactor Coolant Pump Seal Cooling Following a Transient Initiator	5.91E-07	3.28%
Transients With Power Conversion Systems Available	3.30E-07	1.83%
Reactor Vessel Failure	3.00E-07	1.66%
Steamline Break	1.88E-07	1.40%
Transients Without Power Conversion Systems Available	1.71E-07	0.95%
Medium LOCA	1.46E-07	0.81%
Loss of All Service Water	8.30E-08	0.46%
Anticipated Transient Without Scram	6.67E-08	0.37%
Loss of Component Cooling Water	5.79E-08	0.32%
Loss of Offsite Power	4.98E-08	0.28%
Loss of Reactor Coolant Pump Seal Cooling With At Least One CCW Train Available	5.03E-08	0.28%
Loss of Vital DC Bus NK04	4.32E-08	0.24%
Large LOCA	2.80E-08	0.16%
Feedwater Line Break	2.06E-08	0.11%
Stuck Open Pressurizer PORV Following a Transient Initiator	3.14E-08	0.17%
Loss of Vital DC Bus NK01	1.12E-08	0.06%

Technical Specifications exercised:

Event 2: TS determined and entered. TS 3.8.7, Cond A (restore to operable within twenty four hours)
TS 3.8.9, Cond C (restore to operable status within two hours)

Event 3: TS determined and entered. TS 3.7.4 Cond A (restore to operable within seven days)

Op-Test No.: ____ Scenario No.: 3 Event No.: 1 Page 1 of 37

Event Description: Using GEN 00-003, HOT STANDBY TO MINIMUM LOAD, from step 6.40 through step 6.46, the Crew will synchronize Main Generator to the grid. SYS AC-120, MAIN TURBINE GENERATOR STARTUP (section 6.4 synchronizes and loads Main Generator to grid)

Time	Position	Applicant's Actions or Behavior
	CREW	Using GEN 00-003, HOT STANDBY TO MINIMUM LOAD, from step 6.40 through step 6.46 the Crew will synchronize Main Generator to the grid. SYS AC-120, MAIN TURBINE GENERATOR STARTUP (section 6.4 synchronizes Main Generator to grid)
	CRS	**DIRECT** GEN 00-003, HOT STANDBY TO MINIMUM LOAD
	CREW	6.40 When reactor power is stable between 8% and 10%, then synchronize Main Generator to the grid, using TMP 10-023 or SYS AC-120, MAIN TURBINE GENERATOR STARTUP as applicable.
	CRS	**DIRECT** SYS AC-120, MAIN TURBINE GENERATOR STARTUP, section 6.4, Synchronizing Main Generator
	CRS	6.4.1 Meter and Relay personnel are prepared to enable distance relays 321-1/G, 321-2/G and 321-3/G, when Exciter Field Breaker is closed.
Booth cue: If contacted as Meter and Relay personnel, Meter and Relay personnel are prepared to enable relays.		
	CRS	6.4.2 Establish Main Generator field, as follows:
	CRS	6.4.2.1 Notify System Operations that the Generator is ready to be synchronized.
Booth cue: When contacted as System Operations: acknowledge report		

Op-Test No.: _____ Scenario No.: 3 Event No.: 1 Page 2 of 37

Event Description: SYS AC-120, MAIN TURBINE GENERATOR STARTUP (section 6.4 synchronizes and loads Main Generator to grid)

Time	Position	Applicant's Actions or Behavior
	CRS	6.4.2.2 Ensure POWER SYS STABILIZER MODE SEL switch is in normal unless System Operations directs otherwise. o MB HS-4 - NORMAL
Booth cue: If contacted as System Operations: NORMAL is fine.		
	BOP	6.4.2.3 Ensure Sync Check Relay Bypass switch in off position a. Ensure Sync Check Relay Bypass switch handle removed. o MA HS-7 – HANDLE REMOVED
	BOP	6.4.2.4 Place REG MODE TRANSFER switch in manual. o MB HS-3 - MANUAL
	BOP	6.4.2.5 Check the green light lit on the DC MAN VOLT REG. o MB ZL-5 – GREEN LIGHT LIT
	BOP	6.4.2.6 Verify Turbine speed – AT 1800 RPM
	BOP	6.4.2.7 Close EXCITER FIELD BKR o MB HS-2
	CRS/BOP	6.4.2.8 At panels MA104C/MA104B, ensure Meter and Relay personnel have enabled 321-1/G, 321-2/G & 321-3/G distance relays o Distance relays – ENABLED o Target/Auxiliary relays – DROP FLAGS RESET o 21XMA001 (MA104C) o 21XMA002 (MA104C)

Op-Test No.: _____ Scenario No.: 3 Event No.: 1 Page 3 of 37

Event Description: SYS AC-120, MAIN TURBINE GENERATOR STARTUP

Time	Position	Applicant's Actions or Behavior
	CRS/BOP	Step 6.4.2.8 cont. o 21XMA003 (MA104C) o 321/X (MA104B)
Booth cue: Respond as Meter & relay personnel: Distance relays ENABLED.		
	CRS	6.4.2.9 At panel MA104B, Main Generator System Relay Panel, ensure Reverse Power Relay 332/GX and Reverse Time Delay 362/G are reset. o 332/GX – RESET o 362/G - RESET
Booth cue: Respond as Meter & relay personnel: Relays are reset		
	BOP	6.4.2.10 Place MAIN GEN VOLTMETER 0 SEL switch in any position except off. o MA HS-1 – NOT IN OFF
	BOP	6.4.2.11 Adjust MB HS-5, DC MAN VOLT REG BKR, as necessary, to establish Main Generator voltage at 24.5 KV on all three phases o MB HS-5 – ADJUSTED, AS NECESSARY o MA EI-1 – AT 24.5 KV
	BOP	6.4.2.12 Adjust MB HS-6, AC AUTO VOLT REF BKR, as necessary, to zero Voltage Regulator Manual/Auto Signal Match o MB HS-6 – ADJUSTED, AS NECESSARY o MB EI-3 – 0 VOLTAGE MISMATCH

Op-Test No.: _____ Scenario No.: 3 Event No.: 1 Page 4 of 37

Event Description: SYS AC-120, MAIN TURBINE GENERATOR STARTUP

Time	Position	Applicant's Actions or Behavior
	BOP	6.4.2.13 Transfer RED MODE TRANSFER switch to auto o MB HS-3 – AUTO o MB ZL-3, REG MODE MAN/AUTO Red light - LIT
	CREW	6.4.2.14 Coordinate with System Engineering to perform applicable steps of ATL MB-001, ALTERREX VOLTAGE REGULATOR CALIBRATION
Booth cue: If contacted as System Eng. or RXE, acknowledge request.		
Procedure NOTE: 8% to 10% reactor power level is desired. This ensures an adequate number of Steam Dumps are open to support synchronizing Main Generator without all Steam Dumps going closed and requires minimal rod movement.		
	BOP	6.4.3 Synchronize Main Generator to grid, as follows:
	BOP	6.4.3.1 Ensure REVERSE POWER PERMISSIVE BYPASS SWITCH is in off. o MA HS-005 - OFF
	BOP	6.4.3.2 Adjust the load limit potentiometer to prevent excessive loading as follows: a. Lower the load limit potentiometer, by slowly turning it counterclockwise, until LOAD LIMITING light comes on. b. Increase the load limit potentiometer, by turning it clockwise four tenths of one turn (forty clicks)
	BOP	6.4.3.3 Select first switchyard breaker to be synchronized, using MA HS-2, BKR SEL switch * Breaker 1 – SELECTED OR * Breaker 2 - SELECTED

Op-Test No.: _____ Scenario No.: 3 Event No.: 1 Page 5 of 37

Event Description: SYS AC-120, MAIN TURBINE GENERATOR STARTUP

Time	Position	Applicant's Actions or Behavior
Procedure NOTE: Matching Generator transformer voltage with switchyard voltage must be as close as possible to avoid system upset.		
	BOP	6.4.3.4 Adjust MB HS-6, AC AUTO VOLT REG BKR, as necessary, to establish Generator Transformer Voltage between 1 KV and 2 KV higher than switchyard voltage o MA EI-8 For Transformer Voltage o MA EI-9 For Switchyard Voltage
Procedure NOTE: When adjusting Turbine speed at or near 1800 rpm, response to small changes may require between 15 seconds and 30 seconds to stabilize.		
	BOP	6.4.3.5 Adjust Main Generator speed for synchronizing, as follows: a. Adjust load set using INCREASE LOAD pushbutton or DECREASE LOAD pushbutton, as necessary, to rotate the Main Generator Synchroscope in the fast direction. o MA SI-6 b. Ensure rotation of the synchroscope is between 30 seconds and 90 seconds, by adjusting load set, as necessary. c. Check selected breaker Sync Check Permissive white light is lit only when the synchroscope pointer is in the up direction * MA ZL-2 – LIT * MA ZL-3 – LIT d. Ensure Generator transformer voltage is between 1 KV and 2 KV higher than switchyard voltage o MA EI-8 o MA EI-9

Op-Test No.: _____ Scenario No.: 3 Event No.: 1 Page 6 of 37

Event Description: SYS AC-120, MAIN TURBINE GENERATOR STARTUP

Time	Position	Applicant's Actions or Behavior
	BOP	6.4.3.6 When selected breaker Sync Check Permissive white light is lit for the selected breaker, then close selected breaker. * MA HS-3 – CLOSED OR * MA HS-4 - CLOSED
	BOP	6.4.3.7 Ensure selected switchyard breaker is closed * Breaker 1 – CLOSED * At RL006, MA ZL-3A * At RL014, 1ZL-SY010 * Breaker 2 – CLOSED * At RL006, MA ZL-4A * At RL014, 1ZL-SY011

Procedure NOTES:

- Once the initial 50 MWe to 100 MWe has been picked up using INCREASE LOAD, consideration should be given to swapping to load limit potentiometer control for increased plant stability.
- Computer point MAP0001 may update quicker and should be monitored in addition to the digital load MW meter.
- Operation of Main Turbine below 5% load is not recommended, due to the increased rates of moisture erosion of the latter stage buckets.
- Rapid temperature changes increase the likelihood of initiating a packing rub on monoblock rotors. Average temperature ramp rates of 125°F/hr for the LP rotors and 150°F/hr for the HP rotor are recommended.
- With exhaust hood temperature between 125°F and 175°F, the unit may be operated continuously but load should be increased slowly to avoid unnecessary thermal stress.

Op-Test No.: _____ Scenario No.: 3 Event No.: 1 Page 7 of 37

Event Description: SYS AC-120, MAIN TURBINE GENERATOR STARTUP

Time	Position	Applicant's Actions or Behavior
	BOP	6.4.4 Load Main Generator
	BOP	6.4.4.1 Press INCREASE LOAD pushbutton to increase Generator load between 50 megawatts and 100 megawatts, as soon as possible, to prevent Generator motoring and maintain load stability.
	BOP	6.4.4.2 Select Generator loading rate, as directed by the SM/CRS.
	BOP	6.4.4.3 If the "LOAD LIMITING" light comes on before achieving 50 Mwe, then increase the LOAD LIMIT SET potentiometer, by turning it clockwise to allow load increase to continue.
	BOP	6.4.4.4 If desired to transfer control to Load Limit Potentiometer, then perform the following: a. Slowly reduce Load Limit Potentiometer, until the Load Limit Limiting light has just lit. b. When Load Limit Limiting light is lit, then use Load Set Increase pushbutton to raise the setting of the Load Set above the setting of the Load Limit Potentiometer.
	BOP	6.4.4.5 If steam dumps remain open when 50 Mwe is achieved, then loading may continue until one of the following occurs: * Steam Dumps are closed or * 120 Mwe is achieved

Op-Test No.: _____ Scenario No.: 3 Event No.: 1 Page 8 of 37

Event Description: SYS AC-120, MAIN TURBINE GENERATOR STARTUP

Time	Position	Applicant's Actions or Behavior
	CRS	6.4.4.6 If exhaust hood bypass valve was opened during the performance of this procedure, then ensure exhaust hood temperatures remain between 100°F - 125°F, while closing TURBINE EXHAUST HOOD SPRAY VALVE AC FV-191 BYPASS. o AC-944 - CLOSED
Booth cue: If contacted as Building Watch to close AC-944 (not modeled); wait a few minutes and then report to Control Room that valve is closed		
	BOP	6.4.5 Close the other switchyard breaker:
	BOP	6.4.5.1 Select open switchyard breaker on MA HS-2, BKR SEL * Breaker 1 – SELECTED or * Breaker 2 - SELECTED
	BOP	6.4.5.2 Close selected switchyard breaker. * MA HS-3 – CLOSED or * MA HS-4 - CLOSED
	BOP	6.4.5.3 Ensure selected switchyard breaker closed * Breaker 1 – CLOSED * At RL006, MA ZL-3A * At RL014, 1ZL-SY010 * Breaker 2 – CLOSED * At RL006, MA ZL-4A * At RL014, 1ZL-SY011

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Event Description: GEN 00-003, HOT STANDBY TO MINIMUM LOAD

Time	Position	Applicant's Actions or Behavior
	BOP	6.4.5.4 Place BKR SEL switch in off position. o MA HS-2 - OFF
	BOP	6.4.6 Open Bus Duct Cooling Unit Heater breaker o PG1502 - OPEN
Booth cue: If contacted as Building watch to open breaker PG1502, Use Remote Function rPG33 to OPEN then report back to Control Room that the breaker is open.		
	BOP	6.4.7 At AC XX-1, EHC Panel, select, SLOW STARTING RATE
	BOP	6.4.8 Section 6.4, Synchronizing Main Generator complete
	CRS	**DIRECT** GEN 00-003, HOT STANDBY TO MINIMUM LOAD
	RO/BOP	6.40 Position the following valves: 6.40.1 Close MAIN STMLINES DRN TRAP BYPASS VLV o AB HIS-23 - CLOSED
	RO/BOP	6.40.2 Close MAIN TURN STOP AND CTRL VLVS SU DRNS o AC HIS-134 - CLOSED

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Event Description: GEN 00-003, HOT STANDBY TO MINIMUM LOAD

Time	Position	Applicant's Actions or Behavior
	RO/BOP	6.40.3 Ensure the following Turbine Extraction valves to High Pressure Feedwater heaters are open: o AF HIS-24, FW HP HTR 5A Extraction Vlvs – OPEN o AF HIS-64, FW HP HTR 5B Extraction Vlvs – OPEN o AF HS-12, FW HP HTR 6A Extraction Vlvs – OPEN o AF HS-44, FW HP HTR 6B Extraction Vlvs – OPEN o AF HS-7, FW HP HTR 7A Extraction Vlvs – OPEN o AF HS-58, FW HP HTR 7B Extraction Vlvs - OPEN
Procedure CAUTION: The rate of power increase shall be limited to the following: o Unit loading between 0 and 15 percent power shall be limited to 0.5% (rated) power per minute. o Unit loading between 15 and 40 percent power shall be limited to 5% (rated) power per minute or a maximum step change of 10% (rated) power. Procedure NOTES: o All individual indicated rod positions shall be within 12 steps of their group step counter demand position and shall be within the insertion, sequence and overlap limits specified in the COLR in accordance with TS 3.1.4, 3.1.5 and 3.1.6 o If steam flow oscillations are observed, manual control of Steam Dump Controllers may be required.		
	CRS	6.41 When Turbine load is being increased, then use the following techniques:
	NA – MTC is negative	6.41.1 If moderator temperature coefficient is positive the perform the following:
Procedure CAUTION: Increasing turbine load is a critical step and must be performed in a slow and deliberate manner, to maintain RCS pressure and temperature within DNB limits.		
	CRS	6.41.2 (ρ) If moderator temperature coefficient is negative or zero, then perform the following:

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Event Description: GEN 00-003, HOT STANDBY TO MINIMUM LOAD

Time	Position	Applicant's Actions or Behavior
Procedure NOTE: Selecting the lowest reading channel will provide more margin to the DNB limit.		
	RO	6.41.2.1 Ensure BB PS/455F, PRESSURIZER PRESSURE CONTROL switch is selected to the lowest reading channel.
	BOP	6.41.2.2 Perform Turbine load increase using load limit potentiometer in a slow controlled manner. When the Main Feed Reg valves have been placed inservice, then automatic turbine loading may be used.
	BOP	6.41.2.3 If the potentiometer is NOT available, then with Operations Management approval, control Turbine load using automatic turbine-generator loading selected to ½% per minute in a slow controlled manner.
	RO	6.41.2.4 When Steam Dumps are open, then adjust control rods as needed to maintain Tavg constant.
	RO	6.41.2.5 When Steam Dumps are closed, then adjust control rods, as necessary, to maintain Tavg within 1.5°F of Tref.
	BOP	6.42 (ρ) Increase reactor power, by increasing Turbine load using the technique selected in step 6.42 in a slow controlled manner, while continuing with this procedure.
	CRS	6.42.1 Make appropriate log entry to reflect the requirement to complete STS SE-001, POWER RANGE ADJSUTMENT TO CALORIMETRIC within 24 hours after power is greater than or equal to 15% to satisfy SR 3.3.1.2.
	CRS	6.43 When reactor power is greater than 10%, then perform the following:
Procedure NOTE: If P-10 fails to properly change state, refer to step 4.15.		

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Event Description: GEN 00-003, HOT STANDBY TO MINIMUM LOAD

Time	Position	Applicant's Actions or Behavior
	RO	6.43.1 Check P-10 permissive properly changes state, by observation of the following: 1. Bistable status lights lit. o SB069, 14 Down, 1 Across – LIT o SB069, 14 Down, 2 Across – LIT o SB069, 14 Down, 3 Across – LIT o SB069, 14 Down, 4 Across – LIT 2. Permissive status light lit. o SB069, 15 Down, 4 Across - LIT
	RO	6.43.2 Check Annunciator 00-077E, SR HI VOLT FAIL - CLEAR
	RO	6.43.3 Block intermediate range low power trips: 1. Depress both IR TRIP BLOC pushbuttons. o SE HS-4 – DEPRESSED o SE HS-7 – DEPRESSED 2. Ensure intermediate range reactor trips are blocked. o SB069, 13 Down, 1 Across – LIT o SB069, 13 Down, 2 Across - LIT

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Event Description: GEN 00-003, HOT STANDBY TO MINIMUM LOAD

Time	Position	Applicant's Actions or Behavior
	RO	6.43.4 Block power range low power trips: 1. Depress both PR LO ∅ Trip Bloc pushbuttons. o SE HS-3 – DEPRESSED o SE HS-6 – DEPRESSED 2. Ensure power range low setpoint reactor trips are blocked. o SB069, 13 Down, 3 Across – LIT o SB069, 13 Down, 4 Across - LIT
Procedure NOTE: When P-7 bistable is deenergized (P-7 permissive light energizes), the following reactor trips are automatically unblocked: o Pressurizer low pressure o Pressurizer high pressure o Loss of flow – two loop logic o RCP underfrequency o RCP undervoltage		
	RO	6.43.5 When P-10 permissive has changed state, then ensure that P-7 permissive light has energized. o SB069, 12 Down, 4 Across - LIT
	RO	6.43.6 Transfer NR-45 pen that is recording intermediate range to a delta flux channel.
	CRS	6.44 Align the Unit Auxiliary Transformer, by performing CKL MA-132, UNIT AUXILIARY TRANSFORMER XMA02 LINEUP FOR OPERATION
Booth cue: When contacted as Building Watch, acknowledge request.		
Event termination: When Main Generator is synced to the grid and reactor power has been raised, the Permissives verified, and at Lead Examiner direction, continue with the next event. Booth cue: Insert KEY 2 at Lead Examiner direction.		

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Event Description: Loss of NN02 (White train)

Time	Position	Applicant's Actions or Behavior
When Main Generator is synced to the grid and reactor power has been raised, the Permissives verified, and at Lead Examiner direction, continue with the next event.		
Booth: Insert KEY 2 for Event 2 at Lead Examiner discretion. Diagnostics: White train meter indications change and many Main Control Board alarms annunciate aid in diagnosing the component failure. MCB 00-026A, NN02 INSTR BUS UV annunciates.		
	CREW	Diagnoses an NN02 failure (white train) and selects out affected instruments.
	BOP	Selects alternate channel for: o SG C STEAM FLOW CHANNEL SEL, AB FS-532C (select F-532) o SG C LEV CHANNEL SEL, AE LS-539C (select L-539) o SG D STEAM FLOW CHANNEL SEL, AB FS-542C (select F-542) o SG D LEV CHANNEL SEL, AE LS-549C (select L-554)
	RO	Selects alternate channel for: o PZR PRESS CTRL SEL, BB PS-455F (MANUAL on controller, select P-455/P-458) o PZR LEV CTRL SEL, BB LS-459D (select L-459/L-461) Examiner NOTE: PZR Pressure Master Controller must be placed in MANUAL first.
	CRS	May **ENTER** and **DIRECT** ALR 00-026A, NN02 INSTR BUS UV
Procedure NOTES: o Steps 1 through 3 are Memory action steps. o Steps 1 through 3 may be done in any order.		

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Event Description: Loss of NN02 (White train)

Time	Position	Applicant's Actions or Behavior
	RO	1. Loss of NN02 with Control Rods inserting; No, Perform RNO 1RNO: Go to step 2
	BOP	2. Ensure SG control systems are using unaffected channels:

NN02 WHITE TRAIN				
SG	STEAM FLOW SELECTOR SWITCH	SELECT CHANNEL	SG LEVEL SELECTOR SWITCH	SELECT CHANNEL
SG A	AB FS-512C	F512	AE LS-519C	L551
SG B	AB FS-522C	F522	AE LS-529C	L529
SG C	AB FS-532C	F532	AE LS-539C	L539
SG D	AB FS-542C	F542	AE LS-549C	L554

	RO	3. Ensure PZR control signals are using unaffected channels: a. Check alternate channel selection required. b. Check Pressurizer pressure channel affected. c. Place Pressurizer Master Controller in manual. o BB PK-455A d. Select alternate channel, using table below:

AFFECTED BUS	PZR PRESSURE		PZR LEVEL	
	SWITCH	SELECT CHANNEL	SWITCH	SELECT CHANNEL
NN02 WHITE TRAIN	PS-455F	P455/ P458	LS-459D	L459/ L461

	RO	3e. cont. Return Pressurizer Master Controller to auto, as directed by CRS. o BB PK-455A

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Event Description: Loss of NN02 (White train)

Time	Position	Applicant's Actions or Behavior
	CRS	4. Dispatch Operator to NN02 instrument bus with Interlock Key to perform actions, as directed by SM or CRS.
Booth cue: If contacted as Building watch, acknowledge request.		
	CRS	5. Refer to Technical Specifications 3.8.9, 3.8.10, and 3.3.1. **CRS determines:** **TS 3.8.9, Cond C (restore to operable status within two hours)**
	CRS	When TS 3.3.1 identified, **DIRECT** RO or BOP to verify Protective Interlocks and Control Interlocks are in the correct state.
	CRS	6. Go to OFN NN-021, LOSS OF VITAL 120 VAC INSTRUMENT BUS, step 1
	CREW	ENTER OFN NN-021, LOSS OF VITAL 120 VAC INSTRUMENT BUS
	CRS	**ENTER** and **DIRECT** ENTER OFN NN-021, LOSS OF VITAL 120 VAC INSTRUMENT BUS
Examiner NOTE: CREW may enter OFN NN-021, LOSS OF VITAL 120 VAC INSTRUMENT BUS directly.		

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Event Description: Loss of NN02 (White train)

Time	Position	Applicant's Actions or Behavior
Procedure NOTES: o Steps 1 through 3 can be done in any order. o Steps 1 through 3 are Memory Action steps.		
	CRS, RO	1. Loss of NN01 or NN02 with control rods inserting; No, Perform RNO 1RNO: Go to step 2
	BOP	2. Ensure SG control systems are using unaffected channels:

NN02 WHITE TRAIN				
SG	STEAM FLOW SELECTOR SWITCH	SELECT CHANNEL	SG LEVEL SELECTOR SWITCH	SELECT CHANNEL
SG A	AB FS-512C	F512	AE LS-519C	L551
SG B	AB FS-522C	F522	AE LS-529C	L529
SG C	AB FS-532C	F532	AE LS-539C	L539
SG D	AB FS-542C	F542	AE LS-549C	L554

Examiner NOTE: this is only the NN02 selection

	RO	3. Ensure PZR control signals are using unaffected channels: a. Check alternate channel selection required. b. Check Pressurizer pressure channel affected. c. Place Pressurizer Master Controller in manual. o BB PK-455A c. Select alternate channel, using table below: (See next page)

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Event Description: Loss of NN02 (White train)

Time	Position	Applicant's Actions or Behavior

AFFECTED BUS	PZR PRESSURE		PZR LEVEL	
	SWITCH	SELECT CHANNEL	SWITCH	SELECT CHANNEL
NN02 WHITE TRAIN	PS-455F	P455/ P458	LS-459D	L459/ L461

Examiner NOTE: this is only the NN02 selection.

	RO	3e cont. Return Pressurizer Master Controller to auto, as directed by CRS. o BB PK-455A
	RO	4. (ρ) Check RWST switchover has occurred RNO: Go to step 6 * "A" Train swapped over. o BG HIS-112B – CLOSED o BN HIS-112D – OPEN or * "B" Train swapped over. o BG HIS-112C – CLOSED o BN HIS-112E – OPEN or
	RO	5. Isolate LTDN and establish minimum charging flow: a. Close letdown orifice isolation valves. o BG HIS-8149AA o BG HIS-8149BA o BG HIS-8149CA b. Close charging flow control valve. o BG HC-182

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Event Description: Loss of NN02 (White train)

Time	Position	Applicant's Actions or Behavior
	RO	Step 5 cont. c. Ensure CCP A, CCP B, or NCP – AT LEAST ONE RUNNING d. Establish 32 gpm seal injection flow o BG FCV-121 o BG FK-462
	CRS	6. Stabilize plant: a. Stop any plant operations requiring rod motion. b. (ρ) Adjust turbine load, as necessary, to maintain Tavg within 3°F of Tref.
	CRS	7. Dispatch operator to affected Instrument bus with Backup Breaker Interlock key
Booth Cue: Respond as Building watch when dispatched to Instrument bus.		
	CRS	8. Go to appropriate Attachment: o Loss of NN02, Attachment B
	CREW	Enter Attachment B, LOSS OF NN02
	CRS	**ENTER** and **DIRECT** Attachment B, LOSS OF VITAL INSTRUMENT BUS NN02

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Event Description: Loss of NN02 (White train)

Time	Position	Applicant's Actions or Behavior
	RO	B1. Defeat RCS temperature control for loop 2 a. Position Loop Tavg control signal to – T422 o BB TS-412T b. Position Loop ΔT control signal to – T421 o BB TS-411F
	BOP	B2. Ensure AC PT-505 selected. o AC PS-505Z
	BOP	B3. Lock SG B Atmospheric Relief Valve manual drive level in closed position. o AB PIC-2A
	CRS, RO	B4. Locally restore normal power to bus NN02: a. Check NN02 bus – NO APPARENT DAMAGE b. Check inverter NN12 output voltage – NORMAL; No, Perform RNO B4RNOb. Go to step B5
Booth Cues: When contacted as Building watch: B4 cue: NN02 has no apparent damage. NN12 output voltage is zero. Later: B5 cue: Understand, Close NG02AFF3 then report to Control Room the breaker is closed; White Light is LIT; I have the Kirk Key and will open NN0201 … and close Alternate Feed NN0202. MCB alarms will occur. Insert KEY 8 to realign power.		
	CRS, RO	B5. Align backup power to bus NN02 a. Close backup transformer XNN06 power supply breaker. o NG02AFF3 b. Verify Backup Power available white Light – LIT c. Open Normal feeder breaker o NN0201

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Event Description: Loss of NN02 (White train)

Time	Position	Applicant's Actions or Behavior
	CRS, RO	d. Close Alternate feeder breaker o NN0202 e. Refer to applicable Technical Specification: * 3.8.7, Inverters – Operating * 3.8.8, Inverters, Shutdown **CRS determines: TS 3.8.7, Cond A (restore to operable within twenty four hours)** **TS overall:** **TS 3.8.7, Cond A (restore to operable within twenty four hours)** **TS 3.8.9, Cond C (restore to operable status within two hours)**
	CRS	When TS 3.3.1 identified, **DIRECT** RO or BOP to verify Protective Interlocks and Control Interlocks are in the correct state.
	RO	B6. Establish 60 gpm charging flow, as directed by the CRS a. Check CCP A, CCP B or NCP – AT LEAST ONE RUNNING * BG HIS-1A * BG HIS- 2A * BH HIS-3 (NCP – should be running) b. Adjust CCP or NCP flow control valves and charging header back pressure control valve, as necessary to establish 60 gpm charging flow. * BG FK-121 (CCP) * BG FK-462 (NCP) * BG HC-182 (backpressure flow control)

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Event Description: Loss of NN02 (White train)

Time	Position	Applicant's Actions or Behavior
	RO	Step B6 cont. c. Adjust charging header flow control, as necessary, to establish between 8 gpm and 13 gpm seal injection flow to each RCP o BG HC-182
	RO	B7. Check if letdown can be established: a. PZR level – GREATER THAN 18% b. Establish normal letdown: 1. Open letdown system Containment isolation valves. o BG HIS-8152 o BG HIS-8160 2. Open RCS letdown to regenerative heat exchanger valves. o BG HIS-459 o BG HIS-460 3. Place letdown heat exchanger outlet pressure controller in manual and full open. o BG PK-131 4. Open orifice isolation valves, as necessary, to establish desired letdown flow. * BG HIS-8149AA * BG HIS-8149BA * BG HIS-8149CA 5. Adjust letdown heat exchanger outlet pressure controller, to maintain between 300-350 psig and place in automatic. o BG PK-131 6. Go to step B9

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Event Description: Loss of NN02 (White train)

Time	Position	Applicant's Actions or Behavior
	RO	B9. Adjust charging flow, as necessary, to maintain PZR level
	BOP	B10. Check SG level control: a. Check SG narrow range level – TRENDING TO PROGRAMMED LEVEL b. Check feedwater pump ΔP – AT PROGRAMMED VALUE
	RO	B11. Check if PZR variable heaters can be energized: a. PZR level – GREATER THAN 18% b. Reset and energize variable heaters. o BB HIS-50 c. Ensure PZR level – STABLE AT OR TRENDING TO PROGRAMMED VALUE
	RO	B12. Verify PZR pressure control established: a. Spray valves – MODULATE AS NECESSARY TO CONTROL PRESSURE b. PRZ pressure – STABLE c. PZR heaters – ENERGIZE AS NECESSARY TO CONTROL PRESSURE d. PZR PORVs – AT LEAST ONE AVAILABLE * BB HIS-455A * BB HIS-456A
	CRS	B13. Check NN02- DEENERGIZED; No, Perform RNO B13RNO. Go to step B15

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Event Description: Loss of NN02 (White train)

Time	Position	Applicant's Actions or Behavior
	BOP	B15. Check plant – IN MODE 1 OR 2 a. On Detector Current Comparator Drawer, place Rod Stop Bypass Switch in N42 position
	CRS	B16. Refer to OFN SB-008, INSTRUMENT MALFUNCTIONS, as necessary to address instrument malfunctions.
	RO	B17. Check for stable plant conditions: a. Check Tavg – WITHIN 1°F OF Tref b. Check PZR pressure – STABLE AT OR TRENDING TO 2235 PSIG c. Check PZR level – STABLE AT OR TRENDING TO PROGRAM VALUE B17RNOa if needed: (ρ) Adjust the following, as necessary, to maintain Tavg within 1°F of Tref: * Adjust turbine load * Adjust control rods * Adjust boron concentration
	CRS/RO	B18. Check Flux Distribution – WITHIN TECHNICAL SPECIFICATIONS LIMITS o 3.2.3 – AFD o 3.2.4 – QTPR Examiner NOTE: Neither TS are applicable as the unit is less than 50%.

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Event Description: Loss of NN02 (White train)

Time	Position	Applicant's Actions or Behavior
	CRS	B19. Check Protective Interlocks and Control Interlocks in correct state to meet Technical Specification 3.3.1 requirements
Event termination: When stable plant conditions are verified, the Lead Examiner may proceed to the next Event (three). (Note: none of the TS in steps B18 and B19 are applicable.) Booth cue: At Lead Examiner direction, insert KEY 3 for Event three.		
	CRS	When TS 3.3.1 identified, **DIRECT** RO or BOP to verify Protective Interlocks and Control Interlocks are in the correct state.
	CRS	B20. Check if plant shutdown/cooldown is required: a. Obtain SM permission to perform plant shutdown/cooldown B20RNOa. Go to step B21
Booth cue: when contacted as SM: plant shutdown/cooldown is not required.		
	CRS	B21. Check NN02 – DEENERGIZED; No, perform RNO B21RNO: Go to step B25

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Event Description: Atmospheric Relief Valve (ARV) "C" fails PARTIALLY open; manual control unavailable

Time	Position	Applicant's Actions or Behavior
Booth cue: Insert KEY 3 for Event 3 for Lead Examiner direction. Diagnostics: Dual indication on switch SG C STEAM DUMP TO ATMS AB ZL-3A. RCS temperature slowly decreasing. Booth cue if necessary: Site watch calls Control Room: I see steam issuing from an ARV silencer.		
	CREW	Identifies and Diagnoses ARV "C" is partially open.
	CRS	**DIRECT** closure of ARV "C" **Examiner NOTE: OFN AB-041 may not be entered by the CRS as event three occurs while the Crew is performing OFN NN-021. Also – the failure is mitigated by local operator action, not by Control Room operator action.** **AP 15C-003, PROCEDURE USER'S GUIDE FOR ABNORMAL PLANT CONDITIONS, step 6.1.7: Components not performing their intended function should be manually controlled.**
	BOP	Reports ARV "C" will not close.
	CREW	Dispatch Building Operator to locally isolate ARV "C" using AB-V029, SG C Atmospheric Relief Valve Iso
Booth cue: Respond to CR request as Building watch to close AB-V029. Insert KEY 9 to close AB-V029. When valve closed, report back to Control Room.		
	CREW	May enter OFN AB-041, STEAMLINE OR FEEDLINE LEAK
	CRS	**BRANCH or ENTER** OFN AB-041, STEAMLINE OR FEEDLINE LEAK

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Event Description: Atmospheric Relief Valve (ARV) "C" fails PARTIALLY open; manual control unavailable

Time	Position	Applicant's Actions or Behavior
	RO	1. Check Reactor power – LESS THAN 100% o SE NI-41B o SE NI-42B o SE NI-43B o SE NI-44B
	BOP	2. Check Steam Generator levels – STABLE OR TRENDING TO PROGRAM
	RO	3. Check Tref/Tavg deviation – LESS THAN 3°F o 00-065D – NOT LIT
	BOP	4. Check Condenser Hotwell level – STABLE OR INCREASING o AD LI-114
	BOP	5. Ensure SG ARV's are – CLOSED o AB PIC-1A for SG A (YES) o AB PIC-2A for SG B (YES) o AB PIC-3A for SG C (No, Perform RNO) o AB PIC-4A for SG D (YES) 5RNO Perform the following: a. If any valve can not be closed, then dispatch operator to locally isolate affected SG ARV * AB-V029 for SG C b. Refer to Tech Spec 3.7.4

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Event Description: Atmospheric Relief Valve (ARV) "C" fails PARTIALLY open; manual control unavailable

Time	Position	Applicant's Actions or Behavior
	CRS/BOP	Dispatch Building watch to locally isolate affected SG ARV – CLOSE AB-V029
Booth cue: Respond to CR request as Building watch to close AB-V029. Insert KEY 9 to close AB-V029. When valve closed, report back to Control Room.		
	CRS	Step 5RNOb cont. **CRS determines Technical Specification TS 3.7.4 Cond A (restore to operable within seven days).**
Event termination: When Technical Specification 3.7.4 Cond A is identified and the ARV is locally isolated, Lead Examiner may proceed to next event. Booth cue: Insert KEY 4 for Event four at Lead Examiner direction.		

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Event Description: Seismic event → Main Feed Pump trip → Reactor trip

Time	Position	Applicant's Actions or Behavior
Booth: Insert KEY 4 for Event four at Lead Examiner direction. (Seismic event → Main Feed Pump trip → Reactor trip) Diagnostics: Main Control Board alarms 00-098D, OBE and 00-098E, SEISMIC RECORDER ON, annunciate. Earthquake sound is heard. The only running Main Feed Pump trips (three minutes later). MCB alarm 00-123A, MFP B TRIP, annunciates.		
	CREW	Identifies a seismic event has occurred.
	CRS	**ENTER** and **DIRECT** OFN SG-003, NATURAL EVENTS
	CRS	1. Determine appropriate attachment for Natural Event from Table below: EVENT / ATTACHMENT EARTHQUAKE / A TORNADO / B FLOODING / C COOLING DAM FAILURE / D CRS transitions to ATTACHMENT A, EARTHQUAKE
	CRS	2. Go to appropriate Attachment for Natural Event
	CRS	**ENTER** and **DIRECT** ATTACHMENT A, EARTHQUAKE RESPONSE
	CRS	A1. Check earthquake magnitude – GREATER ENOUGH TO START SEISMIC RECORDER o Annun 00-098E, SEISMIC RECORDER ON – LIT o Earthquake effects – SEEN, FELT OR HEARD

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Event Description: Seismic event → Main Feed Pump trip → Reactor trip

Time	Position	Applicant's Actions or Behavior
Booth cue: If Building watch or Security contacted: earthquake was felt.		
	CREW	A2. Stabilize plant conditions: a. Stop all plant evolutions. b. Maintain steady state conditions. c. Ensure vital plant parameters – STABLE o Reactor power o RCS temperature o RCS flow o PZR pressure o PZR level o SG level o SG pressure o Turbine load
Examiner NOTE: Event 5 and diagnostics: Three minutes post Seismic event, the only running Main Feed Pump trips. MCB alarm 00-123A, MFP B TRIP, annunciates. An automatic reactor trip/turbine trip will not occur. The crew recognizes the loss of Main Feedwater will ultimately lead to LOLO Steam Generator Reactor trip (23.5%). Therefore the CRS may order the Reactor trip PRIOR to reaching the setpoint.		
	CREW	Identifies Main Feedwater Pump B has tripped.
	CREW	Determine reactor trip imminent.
	CRS	**ORDER** Reactor trip and performance of EMG E-0 Immediate Actions

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Event Description: Anticipated Transient Without Trip (ATWT)

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Identify and report that the Reactor did not trip RO – SB HS-1 – manipulated by RO and Reactor trip breakers do not open BOP – SB HS-42 – manipulated by BOP and Reactor trip breakers do not open
Diagnostics: DRPI displays all rods at current positions. Reactor trip and bypass breakers are closed.		
	CRS	**ENTER** and **DIRECT** EMG E-0, REACTOR TRIP OR SAFETY INJECTION
	RO	1. Verify Reactor Trip a. Check all rod bottom lights – LIT; No, Perform RNO 1RNO: Manually trip reactor. If reactor power is greater than or equal to 5% or intermediate range power is increasing, then perform the following: 1. Direct operator to monitor Critical Safety Functions using EMG F-0, CRITICAL SAFETY FUNCTION STATUS TREES (CSFST) 2. Go to EMG FR-S1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS
	CRS	**DIRECT** performance of Immediate Actions of EMG FR-S1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS
Examiner NOTE: Steps 1 and 2 of EMG FR-S1 are Immediate Action steps.		
	RO, BOP	Perform Immediate Action (step 1and step 1RNO) of EMG FR-S1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS 1. Verify reactor trip: a. Check all rod bottom lights – LIT; No, Perform RNO: 1RNO: Perform the following:

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Event Description: Anticipated Transient Without Trip (ATWT)

CT success: Insert negative reactivity into the core by at least one of the following methods before the Steam Generators dry-out:

- **De-energize the control rod drive MG sets**
- **Manually insert control rods**

Time	Position	Applicant's Actions or Behavior
	RO; BOP	Step 1RNOa cont.: Perform the following: 1. Manually trip reactor (RO and BOP performed) 2. If reactor will not trip, then perform the following: **a. Insert control rods in automatic or manual (CT RO action, Manual rods)** **b. Manually deenergize rod drive motor generators (CT BOP action post step 2 completion)** **1) Open the following breakers:** o **PG HIS-16** o **PG HIS-18** 2) If load center PG20 does not deenergize, then open 13.8 KV bus to XPG14 BKR PA0207 o PG HIS-3 3) Dispatch operator to locally open reactor trip breakers and bypass breakers (RO action) 4) When reactor trip and bypass breakers have been opened or all rod bottom lights are lit, the close the following breakers: (BOP action) o PG HIS-16 o PG HIS-18 5) Continue with step 2 of EMG FR-S1
CT is successfully completed when the control rods are fully inserted by either manual insertion or deenergized PG breakers, removing power from the rod control system.		
Booth cue: Respond as Building watch and locally open the reactor trip and bypass breakers. Insert KEY 10 to open the breakers. When complete, report back to the Control Room that the breakers are open.		

Op-Test No.: ____ Scenario No.: 3 Event No.: 6 Page 33 of 37

Event Description: The turbine will not trip manually

CT success: Manually trip the turbine to prevent an uncontrolled cooldown of the RCS due to steam flow that the turbine would require.

Time	Position	Applicant's Actions or Behavior
Examiner NOTE: The turbine will not trip. The BOP determines the turbine is not tripped while performing the Immediate Actions of EMG FR-S1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS. The BOP must trip the turbine per the RNO of EMG FR-S1, step 2. (The reactor trip signal should trip the turbine. However, the reactor trip signal did not occur, so the turbine did not receive its trip signal either.)		
Diagnostics: During the performance of EMG FR-S1 Immediate actions, the BOP determines the turbine did not trip (all four MAIN STOP valves remain open).		
	BOP	2. Verify Turbine trip: a. Check the following: * Main Stop valves – ALL CLOSED or; No; Stop valves are not closed; Perform RNO * Turbine Auto Stop bistable lights – AT LEAST TWO LIT; No, Perform RNO 2RNOa. Perform the following: 1) Manually trip the turbine (BOP depressed TRIP pushbutton on panel AC XX-1, MAIN TURB EHC OPER PANEL) – turbine does not trip 2) If turbine will not trip, then perform the following in any order: **(CT success actions follow)** * **(CT)** Manually runback turbine (LOAD LIMIT SET potentiometer dialed in the counterclockwise direction; Depressing the DECREASE LOAD pushbutton on the LOAD SELECTOR is also acceptable) or * **(CT)** Place EHC pumps in Pull-to-Lock o CH HIS-1A o CH HIS-1B or * Direct operator to locally trip turbine at front standard 3) If turbine can not be runback or tripped, then close main steam isolation valves and main steam bypass valves * AB HS-79 * AB HS-80

CT is successfully completed when BOP isolates steam to the main turbine -- Manually runback turbine using the potentiometer or by placing the EHC pumps in Pull-to-Lock, and possibly by an All Close of the MSIVs.

Op-Test No.: _____ Scenario No.: 3 Event No.: 5 Page 34 of 37

Event Description: Anticipated Transient Without Trip (ATWT)

Time	Position	Applicant's Actions or Behavior
	CRS	**ENTER** and **DIRECT** EMG FR-S1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS
	RO	1. Verify Reactor trip: a. Check all rod bottom lights – LIT; Originally No - Perform RNO – performed by RO and BOP; Currently – Yes, all rod bottom lights are LIT b. Currently, Yes – Waiting on Building Watch to open the breakers c. Check intermediate range neutron flux – DECREASING
	BOP	2. Verify Turbine trip a. Check the following: * Main Stop valves – ALL CLOSED or * Turbine Auto stop bistable lights – AT LEAST TWO LIT Originally – BOP had to manually trip the Main turbine by performance of the RNO; Currently the turbine is tripped – steam isolated from turbine.
	BOP	3. Check Main Generator Breakers and Exciter Breakers – OPEN o MA ZL-3A o MA ZL-4A o MA ZL-2

Op-Test No.: _____ Scenario No.: 3 Event No.: 7 Page 35 of 37

Event Description: Anticipated Transient Without Trip (ATWT)

Event 7: BG HV-8104 does not open, align RWST to charging pump suction

Time	Position	Applicant's Actions or Behavior
	BOP	4. Verify AFW pumps running: a. Check motor driven AFW pumps - BOTH RUNNING o AL HIS-22A o AL HIS-23A b. Check turbine driven AFW pump - RUNNING
	RO	5. Check SI – NOT IN PROGRESS o CCPs – ALIGNED FOR NORAL CHARGING o SI pumps – NONE RUNNING IN INJECTION MODE o RHR pumps - NONE RUNNING IN INJECTION MODE
	RO	6. Initiate Emergency Boration of RCS a. Ensure one of the following pumps is running: * BG HIS-1A for CCP A * BG HIS-2A for CCP B * BG HIS-3 for NCP b. Align boration flow path: 1) Ensure boric acid transfer pumps – AT LEAST ONE RUNNING * BG HIS-5A * BG HIS-6A 2) Open Emergency Borate to Charging Pump Suction valve o BG HIS-8104; No, Perform RNO 6RNOb2 Align RWST to charging pump suction: see next page

Op-Test No.: ____ Scenario No.: 3 Event No.: 7 Page 36 of 37

Event Description: Event 7: BG HV-8104 does not open, align RWST to charging pump suction. Step 6 RNO action

Time	Position	Applicant's Actions or Behavior
	RO	6RNOb2 cont. Align RWST to charging pump suction: a. Ensure charging pump suction from RWST – AT LEAST ONE OPEN * BN HIS-112D * BN HIS-112E b. Ensure VCT outlet valves – AT LEAST ONE CLOSED * BG HIS-112B * BG HIS-112C
	RO	7. Verify charging flow path: a. Ensure charging pumps to Regenerative Heat Exchanger Containment isolation valves - OPEN o BG HIS-8105 o BG HIS-8106 b. Ensure Regenerative Heat Exchanger to Loop cold leg valves – ONLY ONE OPEN * BG HIS-8146 for Loop 1 or * BG HIS-8147 for Loop 4 c. Adjust charging flow to maintain PZR level * BG FK-121 for CCP or * BG FK-462 for NCP d. Adjust charging header back pressure control as necessary to establish between 8 gpm and 13 gpm seal injection flow to each RCP o BG HC-182
	RO	8. Check Emergency Borate flow – GREATER THAN 30 GPM; No, Perform RNO o BG FI-183A

Op-Test No.: _____ Scenario No.: 3 Event No.: 5

Event Description: Anticipated Transient Without Trip (ATWT)

Time	Position	Applicant's Actions or Behavior
	RO	Step 8RNO Perform the following: a. Align RWST to charging pump suction: 1. Ensure charging pumps suction from RWST – AT LEAST ONE OPEN * BN HIS-112D * BN HIS-112E 2. Ensure VCT outlet valves – AT LEAST ONE CLOSED * BG HIS-112B * BG HIS-112C b. Ensure RWST flow through charging system – GREATER THAN 90 GPM * BG HIS-121A or * EM FI-917A or * EM FI-917B

Event termination: When Emergency Boration flow greater than 90 gpm has been verified or at Lead Examiner direction, terminate scenario.

Booth cue: Terminate scenario at Lead Examiner direction. "FREEZE"

ES-301 **FINAL Transient and Event Checklist** **Form ES-301-5**

Facility: Wolf Creek		Date of Exam: Aug – Sept 2011															
APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I ☐ SRO-U 1 ☒	RX	1					0							1	1	1	0
	NOR	0					0							0	1	1	1
	I/C	2356					26							6	4	4	2
	MAJ	4					4							2	2	2	1
	TS	23					0							2	0	2	2
RO ☐ SRO-I ☐ SRO-U 2 ☒	RX				0									0	1	1	0
	NOR				0									0	1	1	1
	I/C				12356									5	4	4	2
	MAJ				4									1	2	2	1
	TS				123									3	0	2	2
RO ☐ SRO-I ☐ SRO-U 3 ☒	RX			0				0						0	1	1	0
	NOR			1				1						2	1	1	1
	I/C			2				2367						5	4	4	2
	MAJ			4				5						2	2	2	1
	TS			0				23						2	0	2	2
RO ☐ SRO-I 1 ☒ SRO-U ☐	RX	1					0		0					1	1	1	0
	NOR	0					0		1					1	1	1	1
	I/C	2356					26		27					8	4	4	2
	MAJ	4					4		5					3	2	2	1
	TS	23					0		0					0	0	2	2

ES-301 **FINAL Transient and Event Checklist** **Form ES-301-5**

Facility: Wolf Creek		Date of Exam: Aug – Sept 2011															
APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I 2 ☒ SRO-U ☐	RX		1		0					0				1	1	1	0
	NOR		0		0					1				1	1	1	1
	I/C		356		1235 6					236				11	4	4	2
	MAJ		4		4					5				3	2	2	1
	TS		0		123					0				3	0	2	2
RO ☐ SRO-I 3 ☒ SRO-U ☐	RX			0		0		0						0	1	1	0
	NOR			1		0		1						2	1	1	1
	I/C			2		135		2367						8	4	4	2
	MAJ			4		4		5						3	2	2	1
	TS			0		0		23						2	0	2	2
RO ☐ SRO-I 4 ☒ SRO-U ☐	RX	1				0								1	1	1	0
	NOR	0				0								0	1	1	1
	I/C	2356				135								7	4	4	2
	MAJ	4				4								2	2	2	1
	TS	23				0								2	0	2	2
RO ☐ SRO-I 5 ☒ SRO-U ☐	RX		1		0									1	1	1	0
	NOR		0		0									0	1	1	1
	I/C		356		1235 6									8	4	4	2
	MAJ		4		4									2	2	2	1
	TS		0		123									3	0	2	2

Facility: Wolf Creek Date of Exam: Aug – Sept 2011 Operating Test No.:

APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO 1 ☒ SRO-I ☐ SRO-U ☐	RX		1				0		0					1	1	1	0
	NOR		0				0		1					1	1	1	1
	I/C		356				26		27					7	4	4	2
	MAJ		4				4		5					3	2	2	1
	TS		0				0		0					0	0	2	2
RO 2 ☒ SRO-I ☐ SRO-U ☐	RX			0		0				0				0	1	1	0
	NOR			1		0				1				2	1	1	1
	I/C			2		135				236				7	4	4	2
	MAJ			4		4				5				3	2	2	1
	TS			0		0				0				0	0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility: Wolf Creek Date of Examination: Fall 2011 Operating Test No.

Competencies	APPLICANTS															
	RO ☒ SRO-I ☐ SRO-U ☐				RO ☐ SRO-I ☒ SRO-U ☐				RO ☐ SRO-I ☐ SRO-U ☒				RO ☐ SRO-I ☐ SRO-U ☐			
	SCENARIO				SCENARIO				SCENARIO				SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Interpret/Diagnose Events and Conditions	2456	123456	23567	1234567	234	1234	235	12345	234	1234	235	12345				
Comply With and Use Procedures (1)	123456	123456	123567	1234567	1234	1234	1235	123457	1234	1234	1235	123457				
Operate Control Boards (2)	13456	12356	123567	1234567												
Communicate and Interact	1-6	1-6	1-7	1-7	1-6	1-6	1-7	1-7	1-6	1-6	1-7	1-7				
Demonstrate Supervisory Ability (3)					1234	1234	1235	12345	1234	1234	1235	12345				
Comply With and Use Tech. Specs. (3)					23	123	23	123	23	123	23	123				

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.