

JOB PERFORMANCE MEASURE

ADMIN RO-1

JPM Number: ADMIN RO-1

Rev. 0

JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2

JPM Number: ADMIN RO-1

Task Title: Shutdown Safety Assessment Time to Core Boil

System: Administrative

Time Critical Task: Yes ☐ No ☒

Alternate Path: Yes ☐ No ☒

Validated Time (minutes): 20

Task No.(s): NUTIMS 119-01-044

K/A No. 039-A2.04 K/A Rating 3.4/3.7

Method of Testing:

Simulated Performance: ☒ Actual Performance: ☐

Location:

Classroom: ☒ Simulator: ☐ In-Plant: ☐

Task Standards: At the completion of this JPM the examinee has determined the appropriate RCS Time to Core Boil.

Required Materials (procedures, equipment): OU-M2-201, Shutdown Safety Assessment Checklist, Rev 9

General References: OU-M2-201, Shutdown Safety Assessment Checklist, Rev 9
JPM based on Bank JPM A1R Rev 1/1 (8/20/2012)

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, ALL critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	Not Applicable
Initial Conditions:	<ul style="list-style-type: none">• The plant is in MODE 5 on Day 21 of a scheduled 30 day refueling outage.• The core has been reloaded and a total of 72 spent fuel bundles were replaced in the vessel when the core was reloaded.• RCS temperature by T-351X is 110°F.• Train "A" is protected.• Preparations for "Vacuum Fill of the Reactor Coolant System" OP 2301G are underway.• RCS level is 14 inches above the Hot Leg centerline.
Initiating Cues:	The US has directed you to perform an RCS Time to Core Boil calculation per OU-M2-201, Section 3.2, Heatup Calculations.

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START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1 .	Examinee obtains a copy of OU-M2-201 "Shutdown Safety Assessment Checklist" and refers to section 3.2 "Heatup Calculations".	N/A	N	
Cue:				
Comments:	Examiner to provide copy of OU-M2-201 to examinee.			
2 .	NOTE	Examinee reads and acknowledges notes.	N	
Notes before Step 3.1			
Cue:				
Comments:				
3 .	Heatup Calculations	NA	N	
Step 3.2				
Cue:				
Comments:				
4 .	IF a Time to Core Boil determination is desired, THEN PERFORM the following: a. REFER to Attachment 2, Millstone Unit 2 RCS Time to Boil Calculation, and FOLLOW instructions. b. RECORD results on Attachment 2.	Examinee refers to Attachment and performs instructions	N	
Step 3.2.1				
Cue:				
Comments:				

5. Note before Att 2, Step 1	NOTE: RCS temperature should be obtained from RCS to SDC temperature, T-351X. Otherwise, unheated junction thermocouples or CETs may be used (if either is available). If RCS temperature is expected to increase, an RCS temperature of up to 5 °F greater than the current RCS temperature can be used to bound expected conditions.	Examinee reads and understands the NOTE. Examinee understands that the RCS temperature should be from T-351X.	N	
Cue:				
Comments:				
6. Att 2 Step 1	Record time after reactor shutdown (in days), current RCS temperature (°F) and RCS Water Level (Feet from reactor vessel flange).	Examinee refers to initial conditions and Attachment 2 notes to obtain values and records on Attachment 2: • Reactor shutdown in days = 21 days • Current RCS temperature = 110°F • RCS level = -6 feet	Y	
Cue:	Per notes on Table 2 of Attachment 2, the L-112 level above hot leg centerline should be based on the mid-loop reference point (-6.5 feet) and the more conservative value should be used. Since 14 inches above RCS hot leg centerline corresponds to a value between -5 and -6 feet (-5.33 feet) above the RV flange, the value of -6 feet should be used.			
Comments:				
7. Att 2 Step 2	Record RCS Heatup Rate from Table 1.	Examinee refers to Table 1. Examinee reads NOTE and uses the conservative value of 20 days to obtains a value of 2.393 °F/min and records the value on Attachment 2	Y	
Cue:				
Comments:				

8. Att 2 Step 3	Determine Core Condition Multiplier, MULT1 using one of the following and Record below: <ul style="list-style-type: none"> • Before Core Offload = 1.000 • Before Fuel Shuffle Complete = 1.000 • After start of Core Reload = 1.182 • After completion of Fuel Shuffle = 1.182 	Examinee determines from the initial conditions that the Core was Reloaded, uses MULT1 of 1.182 and records on Attachment 2.	Y	
Cue:				
Comments:				
9. Att 2 Step 4	Determine Water Level Multiplier, MULT2 using one of the following and Record below: <ul style="list-style-type: none"> • IF reactor vessel upper plenum <u>AND</u> steam generator U-tubes are not voided, MULT2 = 2.529 ("RCS Filled" condition at 7.64 feet) otherwise use MULT2 consistent with RCS level above mid loop reference point from Table 2. 	Examinee refers to initial conditions, determines RCS loops not filled and refers to Table 2 using RCS level determined previously at 14 inches above the Hot Leg centerline and obtains a MULT 2 of 1.019 and records on Attachment 2. Using the note about conservative values the examinee selects 6" above Hot Leg centerline (6" on RCS Wide Range LI-112). Uses 6 inches instead of 18 inches.	Y	
Cue:				
Comments:				
10. Att 2 Step 5	Calculate and record RCS Time to Boil.	$\text{RCS Time to Boil} = \text{MULT1} \times \text{MULT2} \times \{(212^{\circ}\text{F} - \text{RCS Temperature } (^{\circ}\text{F})) / \text{RCS Heatup Rate } (^{\circ}\text{F}/\text{min})\}$ Examinee performs calculations 51.3 min (50 to 52 minutes acceptable) $= 1.182 \times 1.019 \times \{(212^{\circ}\text{F} - 110^{\circ}\text{F}) / 2.393^{\circ}\text{F}/\text{min}\}$ And records on Attachment 2	Y	
Cue:				
Comments:				

Terminating Cue: When the time to boil has been calculated, the JPM is complete.

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STOP TIME: _____

VERIFICATION OF JPM COMPLETIONTitle: Shutdown Safety Assessment Time to Core Boil

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No XValidated Time (minutes): 20

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• The plant is in MODE 5 on Day 21 of a scheduled 30 day refueling outage.• The core has been reloaded and a total of 72 spent fuel bundles were replaced in the vessel when the core was reloaded.• RCS temperature by T-351X is 110°F.• Train "A" is protected.• Preparations for "Vacuum Fill of the Reactor Coolant System" OP 2301G are underway.• RCS level is 14 inches above the Hot Leg centerline.
Initiating Cues:	The US has directed you to perform an RCS Time to Core Boil calculation per OU-M2-201, Section 3.2, Heatup Calculations.

JOB PERFORMANCE MEASURE

Admin RO-2

JOB PERFORMANCE MEASURE WORKSHEETFacility: Millstone Unit 2JPM Number: Admin RO-2Task Title: Perform ECP Manual CalculationSystem: NATime Critical Task: Yes ☐ No ☒Alternate Path: Yes ☐ No ☒Validated Time (minutes): Task No.(s): NAK/A No. K/A System 001, A4.10: K/A Rating 3.5Method of Testing:Simulated Performance: Actual Performance: ☒Location:Classroom: ☒ Simulator: In-Plant:

Task Standards: The examinee will perform a manual ECP calculation and determine critical boron concentration of 1316 ± 5 ppm (1311 ppm to 1321 ppm).

Required Materials:
(procedures, equipment)

OP 2208, Reactivity Calculations, Rev. 015
ETE-MP-2014-1069, MS2 Cycle 23 Reactor Engineering Curve and Data Book, Rev. 000
ECP Reference Data Sheet, completed with current data
ECP Data and Analysis Sheet
OP 2208 Attachment 1 ECP Reference Data Sheet with the following information filled in:

OP 2208 Attachment 1 Filled-in Data	
up to an exposure of	5525 MWD/MTU
Date / Time	9/10/14 / 0800
Power	100 %
Tavg	572 °F
Burnup	4425 MWD/MTU

JOB PERFORMANCE MEASURE WORKSHEET

RCS Boron	957 ppm
Xenon	2.615 %
Samarium	0.780 %
Controlling Regulating Group	7 at 180 steps
Desired Critical Position	CEA Group 7 at 55 steps

General References:

OP 2208, Reactivity Calculations
ETE-MP-2014-1069, MS2 Cycle 23 Reactor Engineering Curve
and Data Book, Rev. 000

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****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.

Simulator Requirements:	none
Initial Conditions:	<ul style="list-style-type: none">• The plant tripped on 9/13/2014 at 0800• The estimated time of criticality is 9/19/2014 at 1400• CVBURNUP on the PPC is 4522 MWD/MTU• Current boron concentration is 1100 ppm• At the scheduled time of criticality, Tave will be 535°F• Desired critical position: CEA Group 7 at 55 steps
Initiating Cue:	You are the Unit Reactor Operator. The Unit Supervisor directs you to perform a manual ECP calculation. You are to prepare and complete the ECP Data and Analysis Sheet for approval.

START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1. OP 2208 Step 4.1.1	CHECK the following: <ul style="list-style-type: none"> Reactor Engineering Department has completed and provided critical position data on Attachment 1, "ECP Reference Data Sheet" Chemistry Department has been requested to sample and determine present RCS boron concentration 	Examinee requested information is on Attachment 1	N	
Cue:				
Comments:				
2. OP 2208 Note	All data is recorded and calculated on OP 2208-001, "ECP Data and Analysis Sheet.	Examinee reads the note and proceeds.	N	
Cue:				
Comments:				
3. OP 2208 Step 4.1.2	Refer to Attachment 1 and TRANSFER Reference Critical Data.	Examinee copies data from Attachment 1 to OP 2208-001.	N	
Cue:				
Comments:				
4. OP 2208 Step 4.1.3	Record the following Estimated Status at Criticality Data: <ul style="list-style-type: none"> Date and time RCP temperature (Tavg) 	Examinee records date, time and RCP temperature per the initial conditions given. <ul style="list-style-type: none"> 9/19/2014, 1400 535°F 	N	

Cue:				
Comments:				
5. OP 2208 Step 4.1.4	OBTAIN present burnup from one of the following and RECORD: <ul style="list-style-type: none"> • "CVBURNUP" (PPC) • Reactor Engineering Department 	Examinee obtains present burnup from initial conditions. 4522 MWD/MTU	N	
Cue:				
Comments:				
6. OP 2208 Step 4.1.5	Unless otherwise specified by Reactor Engineering Department, CHECK core burnup <i>change</i> from reference data specified on Attachment 1, to present burnup, does <i>not</i> exceed 1,000 MWD/MTU.	Examinee checks current burnup is less than 1000MWD/MTU from reference. Reference burnup is 4425MWD/MTU current burnup is 4522 MWD/MTU. $4522 - 4425 = 97$, which is <1000 .	N	
Cue:				
Comments:				
7. OP 2208 Step 4.1.6	When sample results are obtained, RECORD present boron concentration.	Examinee refers to initial conditions. Boron concentration is 1100 ppm.	N	
Cue:				
Comments:				
8. OP 2208 Note	The Desired Critical CEA Position should maintain a minimum rod insertion worth between 0.5% to 0.9% for "pull to critical"	Examinee reads note and continues.	N	
Cue:				
Comments:				
9. OP 2208 Step 4.1.7	Refer to Attachment 1 and RECORD Desired Critical CEA Position.	Examinee records desired CEA position as CEA group 7 at 55 steps.	N	

Cue:				
Comments:				
10. OP 2208 Step 4.1.8	DETERMINE Power Defect as follows: 1. RECORD Reference Critical Data power value. 2. Refer to RE Curve and Data Book and DETERMINE Power Defect at Reference Critical Data power value and Reference Burnup. 3. Record Power Defect.	Examinee uses Reference Critical Data power value of 100% and determines a Power Defect of 1.363 (Acceptance band 1.347 to 1.379)	Y	
Cue:				
Comments:				

11. OP 2208 Step 4.1.9	<p>DETERMINE Xenon Defect as follows:</p> <ol style="list-style-type: none">1. RECORD Reference Critical Data xenon worth.2. Refer to one of the following and DETERMINE estimated xenon worth at criticality:<ul style="list-style-type: none">• “Xenon-Samarium Post Trip Report” (printed automatically on Control room printer following reactor trip)• RE Curve and Data Book• “XENON-SAMARIUM DEMAND” program on PPC• Reactor Engineering Department3. IF any of the following conditions exist, REQUEST Reactor Engineering Department assistance to account for xenon reactivity worth inaccuracies:<ul style="list-style-type: none">• The plant was not at or near full power equilibrium prior to shutdown.• The predicted xenon reactivity worth at the estimated time of criticality is greater than 0.5% (500pcm)4. RECORD estimated xenon worth at criticality.5. CALCULATE Xenon Defect as follows and Record: <div><div>Reference</div><div>Critical Data - xenon</div><div>xenon worth</div></div><div><div>Estimated</div><div>xenon</div><div>worth</div></div><div>= Xenon</div><div>Defect</div>	<p>Examinee uses reference critical data xenon worth of 2.615.</p> <p>Examinee uses RE curve RE-C-01 to determine estimated xenon worth at criticality of 0.</p> <p>Examinee calculated xenon defect to be 2.615.</p>	Y	
Cue:				
Comments:				

<p>12.</p> <p>OP 2208 Step 4.1.10</p>	<p>DETERMINE Samarium Defect as follows:</p> <ol style="list-style-type: none"> 1. RECORD Reference Critical Data samarium worth. 2. Refer to one of the following and DETERMINE estimated samarium worth at criticality: <ul style="list-style-type: none"> • "Xenon-Samarium Post Trip Report" (printed automatically on Control Room printer following reactor trips) • RE Curve and Data Book • "XENON-SAMARIUM DEMAND" program on PPC • Reactor Engineering Department 3. RECORD estimated samarium worth at criticality 4. CALCULATE Samarium Defect as follows and RECORD: <div style="margin-left: 20px;"> <i>Reference</i> <i>Estimated</i> <i>Critical data</i> - <i>samarium</i> = <i>Samarium</i> <i>samarium</i> <i>worth</i> <i>Defect</i> <i>worth</i> </div> 	<p>Examinee records reference critical data samarium worth from Attachment 1.</p> <p>Examinee determines estimated samarium worth at criticality from RE-C-03 to be 1.131.</p> <p>$0.78 - 1.131 = -0.351$</p> <p>Examinee calculated Samarium Defect to be -0.351.</p> <p>(Acceptance band -0.359 to -0.343)</p>	<p>Y</p>	
Cue:	.			
Comments:				
<p>13.</p> <p>OP 2208 Step 4.1.11</p>	<p>Determine CEA Worth Defect as follows:</p> <ol style="list-style-type: none"> 1. Refer to RE Curve and Data Book and Determine CEA worth for the following and RECORD: <ul style="list-style-type: none"> • Reference Critical Data CE Position • Desired Critical CEA Position 2. CALCULATE CEA Worth Defect as follows and RECORD: <div style="margin-left: 20px;"> <i>Reference</i> <i>Desired</i> <i>Critical Data</i> - <i>Critical</i> = <i>CEA</i> <i>CEA Position</i> <i>CEA Position</i> <i>Worth</i> <i>worth</i> <i>worth</i> <i>Defect</i> </div> 	<p>Examinee obtains Reference Critical Data CEA Position worth from Attachment 1 as Gp 7 at 180 steps. Worth at this position is 0.</p> <p>Examinee determines desired critical position as Gp 7 at 55 steps. Worth at this position is 0.705.</p> <p>Examinee calculated CEA defect too be - 0.705.</p> <p>(Acceptance band -0.707 to -0.703)</p>	<p>Y</p>	

Cue:				
Comments:				
14. OP 2208 Step 4.1.12	DETERMINE Boron Defect as follows: 1. RECORD Reference Critical Data boron concentration 2. RECORD present boron concentration 3. Refer to RE Curve and Data Book and DETERMINE the Inverse Boron Worth as present burnup 4. RECORD Inverse Boron Worth 5. CALCULATE Boron Defect as follows and RECORD:	Examinee obtains Reference Critical Data boron concentration from attachment 1. 957 ppm Examinee obtains present boron concentration from initial conditions. 1100 ppm $957 - 1100 = -143$ Examinee determines inverse boron worth of 115.2 (Acceptance band 115.1 to 115.3 ppm). $-143 / 115.2 = -1.241$ (Acceptance band -1.242 to -1.240)	Y	
Cue:				
Comments:				
15. OP 2208 Step 4.1.13	DETERMINE Plutonium Buildup worth as follows: 1. Refer to RE Curve and Data Book and DETERMINE Plutonium Buildup worth at criticality 2. RECORD Plutonium Buildup worth at criticality	Examinee determines plutonium buildup worth at criticality from RE-E-04 to be 0.203. (Acceptance band 0.199 to 0.207)	Y	
Cue:				
Comments:				
16. OP 2208 Step 4.1.14	DETERMINE the sum of all defects as follows: 1. ENTER <i>all</i> previously calculated reactivity defects. 2. CALCULATE the sum of all reactivity defects and RECORD.	Examinee enters all previously calculated reactivity defects. Examinee calculates the sum of defects to be 1.872. (Acceptance band 1.853 to 1.894)	Y	
Cue:				

Comments:				
17. OP 2208 Step 4.1.15	<p>DETERMINE the Boron Equivalent of Defects as follows:</p> <p>1. RECORD the following:</p> <ul style="list-style-type: none"> Sum of defects Inverse Boron Worth at present burnup <p>2. CALCULATE Boron Equivalent of Defects as follows and RECORD:</p> $\begin{array}{rcl} \text{Sum of} & \text{Inverse Boron} & \text{Boron} \\ \text{Defects} & \times \text{Worth} & = \text{Equivalent} \\ & & \text{Of Defects} \end{array}$	<p>Examinee records the previously calculated sum of defects and inverse boron worth on OP 2208-001.</p> <p>Examinee calculates boron equivalent: $1.872 \times 115.2 = 215.654$</p> <p>(Acceptance band 213.280 to 220.685)</p>	Y	
Cue:				
Comments:				
18. OP 2208 NOTE	<p>There is a reactivity change due to fuel burnup. If the difference between present burnup and reference burnup is less 200 MWD/MTU this reactivity change does not need to be accounted for.</p>	Examinee reads note and continues.	N	
Cue:				
Comments:				

19. OP 2208 Step 4.1.16	<p>DETERMINE Boron Equivalent of Reactivity Change Due to Burnup as follows:</p> <ol style="list-style-type: none"> 1. IF the difference between present burnup and Reference Critical Data burnup is less than or equal to 200 MWD/MTU, RECORD "N/A" in this section and Go To step 4.1.17. 2. IF the difference between present burnup and Reference Critical Data burnup is greater than 200 MWD/MTU, Refer To RE Curve and Data Book and PERFORM the following: <ul style="list-style-type: none"> • DETERMINE the predicted critical boron concentration at present burnup and RECORD • DETERMINE the predicted critical boron concentration at Reference Critical Data burnup and RECORD. 3. CALCULATE Boron Equivalent of Reactivity Change Due to Burnup as follows and RECORD: $ \begin{array}{rcl} \text{Boron conc} & & \text{Boron conc} & & \text{Boron} \\ \text{at present} & - & \text{at reference} & = & \text{equiv} \\ \text{burnup} & & \text{Critical Data} & & \text{Reactivity} \\ & & \text{burnup} & & \text{change} \\ & & & & \text{due to} \\ & & & & \text{burnup} \end{array} $	Examinee determines difference in present burnup and Reference Critical Data burnup is less than 200 MWD/MTU and records 0.	Y	
Cue:				
Comments:				

20. OP 2208 step 4.1.17	DETERMINE Required Boron Change for Criticality as follows: 1. RECORD the following: <ul style="list-style-type: none"> Boron Equivalent of Defects IF any Boron Equivalent of Reactivity Change Due to Burnup 2. CALCULATE required boron change as follows and RECORD: <i>Boron Equivalent of Defects</i> + <i>Boron Equivalent of Reactivity Change due to Burnup</i> = <i>Required Boron Change</i>	Examinee records Boron Equivalent of Defects: 215.654 Examinee records Boron Equivalent of Reactivity Change due to Burnup: 0 Examinee calculates Required Boron change: 215.654 (Acceptance band 213.280 to 220.685)	Y	
Cue:				
Comments:				
21. OP 2208 Step 4.1.18	DETERMINE Critical Boron Concentration as follows: 1. RECORD the following: <ul style="list-style-type: none"> Present boron concentration Required boron change 2. CALCULATE critical boron concentration as follows and RECORD: <i>Present Boron Concentration</i> + <i>Required Boron Change</i> = <i>Critical Boron Concentration</i>	Examinee records present concentration from initial conditions: 1100 ppm Examinee calculates critical boron concentration: 1100 + 215.654 = 1315.654 (Acceptance band 1311 to 1321)	Y	
Cue:				
Comments:				

<p>22.</p> <p>OP 2208 Step 4.1.19</p>	<p>DETERMINE Limits on CEA Position at Criticality as follows:</p> <ol style="list-style-type: none"> 1. RECORD calculated CEA worth for Desired Critical CEA position 2. CALCULATE CEA worth at <i>minimum</i> insertion as follows and RECORD: $\begin{array}{rcl} \text{CEA worth} & & \text{CEA worth} \\ \text{for desired} & - 0.5\% & = \text{at minimum} \\ \text{Critical CEA} & & \text{insertion} \\ \text{Position} & & \end{array}$ 3. CALCULATE CEA worth at <i>maximum</i> insertion as follows: $\begin{array}{rcl} \text{CEA worth} & & \text{CEA worth} \\ \text{for desired} & + 0.5\% & = \text{at maximum} \\ \text{Critical CEA} & & \text{insertion} \\ \text{Position} & & \end{array}$ 4. Refer to RE Curve and Data Book and PERFORM the following: <ul style="list-style-type: none"> • DETERMINE CEA position (group and step) at minimum insertion and RECORD • DETERMINE CEA position (group and step) at maximum insertion and RECORD • IF CEA position at maximum insertion is below 0% PDIL, RECORD CEA Group 4 at 72 steps. 	<p>Examinee records desired critical CEA position worth: 0.705</p> <p>Examinee calculates CEA worth at minimum insertions: $0.705 - 0.5 = 0.205$</p> <p>Examinee calculates CEA worth at maximum insertion: $0.705 + 0.5 = 1.205$</p> <p>Examinee refers to RE Curve RE-D-01 and determines CEA position for minimum insertion of 0.205% delta rho: Group 7 at 135 steps (Acceptance band 130 to 140)</p> <p>Examinee refers to RE Curve RE-D-01 and determines CEA position for maximum insertion of 1.205% delta rho: Group 6 at 78 steps (Acceptance band 72 to 84)</p>	<p>Y</p>	
Cue:				
Comments:				
<p>23.</p> <p>OP 2208 Step 4.1.20</p>	<p>SIGN "ECP Calculated By" section and RECORD date and time</p>	<p>Examinee completes step.</p>	<p>N</p>	
Cue:	JPM is complete.			

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Rev. 0

Comments:	
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Terminating Cue: When the above step is achieved, the JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETIONTitle: Perform ECP Manual Calculation

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No **X**

Validated Time (minutes): _____

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• The plant tripped on 9/13/2014 at 0800• The estimated time of criticality is 9/19/2014 at 1400• CVBURNUP on the PPC is 4522 MWD/MTU• Current boron concentration is 1100 ppm• At the scheduled time of criticality, Tave will be 535°F• Desired critical position: CEA Group 7 at 55 steps
Initiating Cue:	You are the Unit Reactor Operator. The Unit Supervisor directs you to perform a manual ECP calculation. You are to prepare and complete the ECP Data and Analysis Sheet for approval.

JOB PERFORMANCE MEASURE

ADMIN RO-3

JPM Number: ADMIN RO-3

Rev. 0

JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2

JPM Number: ADMIN RO-3

Task Title: Borated Water Sources Monthly Surveillance

System: Administrative

Time Critical Task: Yes No X

Alternate Path: Yes No X

Validated Time (minutes): XX MINUTES

Task No.(s): NUTIMS 119-01-044

K/A No. 039-A2.04 K/A Rating 3.4/3.7

Method of Testing:

Simulated Performance: X Actual Performance:

Location:

Classroom: X Simulator: In-Plant:

Task Standards: At the completion of this JPM, the examinee will have completed the monthly borated water sources verification surveillance, SP 2601A, documented findings on surveillance form SP 2601A-009, determines that each individual BAST concentration is not sufficient for functionality per the TRM and determines that the weighted average of the concentration of the combined contents of both BASTs meets TRM requirements.

Required Materials
(procedures, equipment): SP 2601A, Borated Water Sources Verification, Rev 019-02
(Steps 4.2.1 thru 4.2.8 circle/slashed)
SP 2601A-009, Surveillance Form, Borated Water Sources
Verification, Monthly (Steps 4.2.8b and c initialed)
Unit 2 Technical Specifications And Bases
Unit 2 Technical Requirements Manual

General References: Unit 2 Technical Specifications And Bases
Unit 2 Technical Requirements Manual

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	None
Initial Conditions:	<ul style="list-style-type: none"> • The plant has just completed an outage and has transitioned from MODE 5 to MODE 4. • The Shift Manager discovered that the Monthly Borated Water Source Verification surveillance was missed and has directed performance of the surveillance. • The PPC Minimum BAST Volume calculation is not available. • The PPC indicates "A" BAST level is 76.3%. • The PPC indicates "B" BAST level is 92.9%. • Steps 4.2.1 through 4.2.8 of SP-2601A are complete and chemistry has just provided the following tank concentration data: <ul style="list-style-type: none"> ➤ "A" BAST Concentration 3.2 wt % ➤ "A" BAST Concentration 5595 ppm ➤ "B" BAST Concentration 2.85 wt % ➤ "B" BAST Concentration 4983 ppm ➤ RWST Concentration 1755 ppm
Initiating Cue:	The Unit Supervisor directs you to perform SP2601A Borated Water Sources Verification Monthly Surveillance, beginning at Step 4.2.9. Document results on Surveillance Form SP 2601A-009.

START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1.	Examinee obtains the copy of SP 2601A, Borated Water Sources Verification and associated documentation SP-2601-009	N/A	N	
Cue:				
Comments:	Examiner to provide copy of procedure and form to examinee.			
2. Step 4.2.9	RECORD new "A" BAST boron concentration (wt% boric acid, and, if provided, ppm boron) on SP 2601A-009.	Examinee fills in concentration in wt% (3.2%) and ppm (5595 ppm) on the surveillance form from initial conditions.	Y	
Cue:				
Comments:				
3. Step 4.2.10	IF needed for PPC calculator <u>AND</u> not provided by Chemistry Department, CONVERT "A" BAST boron concentration wt% to ppm as follows and RECORD on SP 2601A-009: ppm = wt% x 1748.4 ppm/wt%	N/A	N	
Cue:				
Comments:	Chemistry has already provided concentration in both units. The PPC calculation is not available.			
4. Step 4.2.11	RECORD "A" BAST level (%) from PPC on SP 2601A-009.	Examinee records "A" BAST level (76.3%) on the surveillance form from the given data	Y	
Cue:				
Comments:				

5. Step 4.2.12	CALCULATE "A" BAST volume in gallons as follows and RECORD on SP 2601A-009: Calculated BAST volume (gals) = (Level % ÷ 100) x 5,706 (gals)	Calculates "A" BAST volume (4345 to 4360 gallons) and records on SP 2601A-009.	Y	
Cue:				
Comments:				
6. Note before Step 4.2.13	NOTE 10% level is the minimum BAST level for reliable charging pump suction. 685 gallons (10% disallowed + 2% instrument error) is subtracted from the tank volume to calculate usable volume.	Reads the note.	N	
Cue:				
Comments:				
7. Step 4.2.13	Calculate usable "A" BAST volume as follows and RECORD on SP 2601A---009: Usable "A" BAST volume (gals) = Calculated volume --- 685 (gals)	Calculates usable "A" BAST volume (3660 to 3675 gallons) and records on SP 2601A-009.	Y	
Cue:				
Comments:				
8. Step 4.2.14	RECORD the most recently determined RWST boron concentration on SP 2601A---009, from SP 2601A---001, or control board marker (C---01).	Records the RWST concentration (1755 ppm) on SP 2601-009.	Y	
Cue:				
Comments:	RWST concentration provided in initial conditions.			

9. Step 4.2.15	COMPARE "A" BAST boron concentration and usable volume to one of the following acceptance criteria and INITIAL SP 2601A--009: <ul style="list-style-type: none"> • Within acceptable operating zone specified in TRM Figure 3.1-1 • Within acceptable range determined by PPC "MINIMUM BAST VOLUME CALCULATION" display from "PRI SYS" menu 	Determines "A" BAST concentration and usable volume do NOT fall within the acceptable operating zone specific in TRM Figure 3.1-1. Note: 3675 gallons and 3.2% concentration falls close to the 2200 ppm RWST line.	Y	
Cue:				
Comments:	Per initial conditions, the PPC Minimum BAST Volume Calculation is not available.			
10. Step 4.2.16	IF boron concentration and usable volume is not within Acceptance Criteria, Refer To Attachment 1 and perform required actions.	Determines CR is required. Determines additional information needed to assess whether action is required per TRM 3.1.2.8	N	
Cue:	If necessary (per Attachment 1, Step 3), direct the examinee to continue with the surveillance procedure.			
Comments:				
11. Step 4.2.17	RECORD "B" BAST boron concentration (wt% boric acid, and, if provided, ppm boron) on SP 2601A---009.	Examinee fills in concentration in wt% (2.85%) and ppm (4983 ppm) on the surveillance form from initial conditions.	Y	
Cue:				
Comments:				
12. Step 4.2.18	IF needed for PPC calculator <u>AND</u> not provided by Chemistry Department, CONVERT "B" BAST boron concentration wt% to ppm as follows and RECORD on SP 2601A-009: ppm = wt% x 1748.4 ppm/wt%	N/A	N	
Cue:				
Comments:	Chemistry has already provided concentration in both units. The PPC calculation is not available.			

13. Step 4.2.19	RECORD "B" BAST level (%) from PPC on SP 2601A-009.	Examinee records "B" BAST level (92.9%) on the surveillance form from the given data	Y	
Cue:				
Comments:				
14. Step 4.2.20	CALCULATE "B" BAST volume in gallons as follows and RECORD on SP 2601A-009: Calculated BAST volume (gals) = (Level % ÷ 100) x 5,706 (gals)	Calculates "B" BAST volume (5295 to 5310 gallons) and records on SP 2601A-009.	Y	
Cue:				
Comments:				
15. Step 4.2.21	NOTE 10% level is the minimum BAST level for reliable charging pump suction. 685 gallons (10% disallowed + 2% instrument error) is subtracted from the tank volume to calculate usable volume.	Reads the note.	N	
Cue:				
Comments:				
16. Step 4.2.21	Calculate usable "B" BAST volume as follows and RECORD on SP 2601A---009: Usable "A" BAST volume (gals) = Calculated volume --- 685 (gals)	Calculates usable "B" BAST volume (4610 to 4625 gallons) and records on SP 2601A-009.	Y	
Cue:				
Comments:				

17. Step 4.2.22	RECORD the most recently determined RWST boron concentration on SP 2601A---009, from SP 2601A---001, or control board marker (C---01).	N/A	N	
Cue:				
Comments:	RWST concentration provided in initial conditions and recorded earlier in Step 4.2.14			
18. Step 4.2.23	COMPARE "B" BAST boron concentration and usable volume to one of the following acceptance criteria and INITIAL SP 2601A--009: <ul style="list-style-type: none"> Within acceptable operating zone specified in TRM Figure 3.1-1 Within acceptable range determined by PPC "MINIMUM BAST VOLUME CALCULATION" display from "PRI SYS" menu	Determines "B" BAST concentration and usable volume do NOT fall within the acceptable operating zone specific in TRM Figure 3.1-1. Note: 4625 gallons and 2.85% concentration falls between the 2200 ppm and 2300 ppm RWST lines.	Y	
Cue:				
Comments:	Per initial conditions, the PPC Minimum BAST Volume Calculation is not available.			
19. Step 4.2.24	<u>IF</u> boron concentration and usable volume is not within Acceptance Criteria, Refer To Attachment 1 and perform required actions.	Determines CR is required. Determines additional information needed to assess whether action is required per TRM 3.1.2.8	N	
Cue:	If necessary (per Attachment 1, Step 3), direct the examinee to continue with the surveillance procedure.			
Comments:				
20. Step 4.2.25	NOTE 1. Input to the PPC calculator requires boron concentration in units of ppm. 2. Manual calculation of final boron concentration (Cf) of the combined BASTs is done using wt% needed for comparison to TRM Table 3.1---1.	Reads the note.	N	
Cue:				
Comments:				

21. Step 4.2.25	IF "A" OR "B" BAST is <i>not</i> within TRM Figure 3.1---1 or PPC calculation, PERFORM the following:	N/A	N	
Cue:				
Comments:				
22. Step 4.2.25.a	CALCULATE the combined usable volume (Vf) of both BASTs in gallons as follows and RECORD on SP 2601A---009: Vf (gals) = Usable "A" BAST volume (step 4.2.13) + Usable "B" BAST volume (step 4.2.21)	Determines combined <u>usable</u> volume of both BASTs, Vf = 8185 to 8385 gallons	Y	
Cue:				
Comments:				
23. Step 4.2.25.b	CALCULATE the final boron concentration (Cf) of the combined BASTs as follows and RECORD on SP 2601A---009: Cf (wt%) = $C_a \times V_a + C_b \times V_b$ Vf Vf Where: Ca = "A" BAST conc (wt%) (step 4.2.9) Va = <u>Usable</u> "A" BAST volume (gals) (step 4.2.13) Cb = "B" BAST conc (wt%) (step 4.2.17) Vb = <u>Usable</u> "B" BAST volume (gals) (step 4.2.21) Vf = Combined <u>usable</u> BAST volume (gals) (step 4.2.25.a.)	Determines Cf = 3 ± 0.01 wt %	Y	
Cue:				
Comments:				

24. Step 4.2.25.c	COMPARE combined BAST volume and boron concentration to TRM Figure 3.1---1 or PPC calculation and INITIAL SP 2601A--009.	Compares values.	N	
Cue:				
Comments:				
25. Step 4.2.25.d	IF "A" AND "B" BAST combined volume and boron concentration is not within TRM Figure 3.1---1 or PPC Acceptance Criteria, Refer To Attachment 1 and perform required actions.	Determines surveillance acceptance criteria met. Combined usable volume sufficient to meet requirements of TRM 3.1.2.8 Figure 3.1-1. No action required per TRM 3.1.2.8. Note: 1720 ppm in RWST is higher than necessary with 8185 gallons BAST combined volume at 2.99% concentration	Y	
Cue:				
Comments:				

Terminating Cue: When the surveillance is complete, the JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETIONTitle: Borated Water Sources Monthly Surveillance

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No XValidated Time (minutes): XX

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• The plant has just completed an outage and has transitioned from MODE 5 to MODE 4.• The Shift Manager discovered that the Monthly Borated Water Source Verification surveillance was missed and has directed performance of the surveillance.• The PPC Minimum BAST Volume calculation is not available.• The PPC indicates "A" BAST level is 76.3%.• The PPC indicates "B" BAST level is 92.9%.• Steps 4.2.1 through 4.2.8 of SP-2601A are complete and chemistry has just provided the following tank concentration data:<ul style="list-style-type: none">➤ "A" BAST Concentration 3.2 wt %➤ "A" BAST Concentration 5595 ppm➤ "B" BAST Concentration 2.85 wt %➤ "B" BAST Concentration 4983 ppm➤ RWST Concentration 1755 ppm	
Initiating Cue:	The Unit Supervisor directs you to perform SP2601A Borated Water Sources Verification Monthly Surveillance, beginning at Step 4.2.9. Document results on Surveillance Form SP 2601A-009.	

JOB PERFORMANCE MEASURE

ADMIN RO-4

JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2JPM Number: ADMIN RO-4Task Title: Review RWP and Survey MapSystem: AdministrativeTime Critical Task: Yes No **X**Alternate Path: Yes No **X**Validated Time (minutes): 15Task No.(s): NUTIMS 404-01-004K/A No. 2.3.7 K/A Rating 3.5Method of Testing:Simulated Performance: Actual Performance: **X**Location:Classroom: **X** Simulator: In-Plant:

Task Standards: At the completion of this JPM the examinee has reviewed the applicable RWP and survey map and determined the radiological requirements to perform the assigned task.

Required Materials Operations Blanket RWP No. 2140002
(procedures, equipment):

General References: RPM 5.2.2, Basic Radiation Worker Responsibilities

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.

Initial Conditions:	<ul style="list-style-type: none"> • The unit commenced a refueling outage 10 days ago. • The plant is in MODE 6.. • A letdown heat exchanger post-maintenance tag removal and walkdown is required. • Based on previous experience, the walkdown is estimated to take 10 minutes. • Your available dose is 1000 mR.
Initiating Cues:	<ul style="list-style-type: none"> • You have been directed to verify the Letdown heat exchanger has been properly returned to service following maintenance activities. You are to walk down the Letdown heat exchanger, remove tag and close 2-CH-445, Letdown HX Outlet Header Vent Valve and verify all tagging and maintenance materials have been removed from the heat exchanger area. • State the radiological requirements for entering this area. Include in your discussion: <ol style="list-style-type: none"> 1. Which RWP task (job step) is appropriate for this assignment 2. Highest radiation level in the work area (including units of measure) 3. Highest contamination level in the immediate work area (including units of measure) 4. Protective clothing required in the immediate work area (including transition to and from the area) 5. Expected dose for this assignment area (including units of measure) 6. Whether or not a dose rate alarm expected for this task. If yes, identify any required actions. 7. Assuming significant difficulties are encountered, the longest possible stay time for this area, (including units of measure) • The examiner will act as Health Physics (HP) for any related questions.

START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1.	Review Operations Blanket RWP No. 2140002 and Radiation Survey Figure 21	Examinee reviews Operations Blanket RWP No. 2140002 and Radiation Survey Figure 21 and answers the following questions:	N	
Cue:	<ul style="list-style-type: none"> • Provide examinee with Operations Blanket RWP No. 2140002 and Radiation Survey Figure 21. • If required, state that the HP brief is complete. • If required, state that the examinee has obtained a key for the locked high rad area gate. 			
Comments:	<ul style="list-style-type: none"> • Examinee may state that a briefing with HP is required prior to entry into the work area. • Examinee may also state the need to obtain a key for the locked high rad area gate. • The examinee may perform the following steps in any order. 			
2.	1. Determine which RWP task (job step) is appropriate for this assignment.	Examinee states that task (job step) No. 1 is appropriate for this task.	Y	
Cue:				
Comments:	There is a lockable gate into the L/D HX room, but the room is posted HRA, NOT LHRA.			
3.	2. Determine the highest radiation level in the work area.	Examinee states that the highest radiation level in work area is 150 mr/hr.	Y	
Cue:				
Comments:				
4.	3. Determine the highest contamination level in the work area.	Examinee states that the highest contamination level in this area is less than 1,000 DPM/100cm ² .	Y	
Cue:				
Comments:				
5.	4. Determine what protective clothing is required in the area.	Examinee states that contamination levels require full PCs (with modesty garments underneath).	Y	
Cue:				

Comments:	Closing the vent valve cannot be performed in lab count as an "inspect only" task. Examinee may state the individual items that make up "full PCs" (Cotton liners, Booties, Coveralls, Shoe covers, Rubber gloves, Modesty garments).			
6.	5. Determine the expected dose for this assignment.	• Examinee states that the expected dose is 25 mrem .	Y	
Cue:				
Comments:	100 mrem/hr Dose Rate X 1/4 hrs. (i.e.;15 min.) \cong 25mr, 100mrem/hr is highest area radiation level. 150mrem/hr is the contact rate on the heat exchanger.			
7.	6. Determine a dose rate alarm is expected for this task and, if so, any required actions.	Examinee states that the RWP dose rate alarm for this task is 80 mr/hr and that the general area rate is 100mr/hr, so, Yes a rate alarm IS expected. Per the RWP, "an *expected* DOSE RATE alarm must be authorized by HP Supervision, and you must be briefed beforehand on proper response to the alarm, and you must sign to acknowledge this brief."	Y	
Cue:				
Comments:				
8.	7. Determine the longest possible stay time for this assignment.	Examinee states that the longest allowable stay time by RWP limitations is 12 minutes.	Y	
Cue:				
Comments:	25 mrem Dose Limit Alarm / 100 mrem/hr Dose Rate shows dose limit alarm reached in ¼ hour or 15 minutes. However, the RWP REQUIRES RCA exit upon reaching 80% of the dose alarm setpoint (20 mrem). At an assumed dose rate of 100 mrem/hr, the 80% exit threshold is reached in 12 minutes.			

Terminating Cue: The JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETIONTitle: Review RWP and Survey Map

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No **X**Validated Time (minutes): 15

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• The unit commenced a refueling outage 10 days ago.• The plant is in MODE 6..• A letdown heat exchanger post-maintenance tag removal and walkdown is required.• Based on previous experience, the walkdown is estimated to take 10 minutes.• Your available dose is 1000 mR.
Initiating Cues:	<ul style="list-style-type: none">• You have been directed to verify the Letdown heat exchanger has been properly returned to service following maintenance activities. You are to walk down the Letdown heat exchanger, remove tag and close 2-CH-445, Letdown HX Outlet Header Vent Valve and verify all tagging and maintenance materials have been removed from the heat exchanger area.• State the radiological requirements for entering this area. Include in your discussion:<ol style="list-style-type: none">1. Which RWP task (job step) is appropriate for this assignment2. Highest radiation level in the work area (including units of measure)3. Highest contamination level in the immediate work area (including units of measure)4. Protective clothing required in the immediate work area (including transition to and from the area)5. Expected dose for this assignment area (including units of measure)6. Whether or not a dose rate alarm expected for this task. If yes, identify any required actions.7. Assuming significant difficulties are encountered, the longest possible stay time for this area, (including units of measure) <p>The examiner will act as Health Physics (HP) for any related questions.</p>

JOB PERFORMANCE MEASURE

Admin SRO-1

JPM Number: Admin SRO-1

Rev. 0

Facility: Millstone Unit 2

JPM Number: Admin SRO-1

Task Title: Review and Approve an ECP Manual Calculation

System: NA

Time Critical Task: Yes ☐ No ☒

Alternate Path: Yes ☐ No ☒

Validated Time (minutes):

Task No.(s): NA

K/A No. K/A System 001, A4.10: K/A Rating 3.9

Method of Testing:

Simulated Performance: Actual Performance: ☒

Location:

Classroom: ☒ Simulator: In-Plant:

Task Standards: The examinee will perform a review of a manual ECP calculation, identify errors and recalculate the correct critical boron concentration of 1316 \pm 10 ppm.

Required Materials:

(procedures, equipment)

OP 2208, Reactivity Calculations, Rev. 015
ETE-MP-2014-1069, MS2 Cycle 23 Reactor Engineering Curve and Data Book, Rev. 000
ECP Data and Analysis Sheet
Provide applicant with a filled out OP 2208 Attachment 1 ECP Reference Data Sheet with the following information:

- Data good until 5525 MWD/MTU
- Date/Time 9/10/14 / 0800
- Power 100%
- Tave 572°F
- Burnup 4425 MWD/MTU
- RCS Boron 957 ppm
- Xenon 2.615 %
- Samarium 0.780 %
- Controlling Regulating Group 7 at 180 steps
- Desired Critical Position: CEA Group 7 at 55 steps

General References: OP 2208, Reactivity Calculations
ETE-MP-2014-1069, MS2 Cycle 23 Reactor Engineering Curve
and Data Book, Rev. 000

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (I.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	none
Initial Conditions:	<ul style="list-style-type: none">• The plant tripped on 9/13/2014 at 1000• CVBURNUP on the PPC is 4522 MWD/MTU• The estimated time of criticality is 9/19/2014 at 1400• Current boron concentration is 1100 ppm• At the scheduled time of criticality, Tave is 535°F• Desired critical position: CEA Group 7 at 55 steps• The Unit Reactor Operator has manually calculated an ECP for the estimated time of criticality
Initiating Cue:	You are the Unit Supervisor. Per OP-2208, Steps 4.1.21 and 4.1.22, approve the ECP, record date and time, and record any comments concerning the ECP in the Remarks section.

START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1. OP 2208 Step 4.1.1	CHECK the following: <ul style="list-style-type: none"> Reactor Engineering Department has completed and provided critical position data on Attachment 1, "ECP Reference Data Sheet" Chemistry Department has been requested to sample and determine present RCS boron concentration 	Examinee requested information is on Attachment 1	N	
Cue:				
Comments:				
2. OP 2208 Note	All data is recorded and calculated on OP 2208-001, "ECP Data and Analysis Sheet.	Examinee reads the note and proceeds.	N	
Cue:				
Comments:				
3. OP 2208 Step 4.1.2	Refer to Attachment 1 and TRANSFER Reference Critical Data.	Examinee copies data from Attachment 1 to OP 2208-001.	N	
Cue:				
Comments:				
4. OP 2208 Step 4.1.3	Record the following Estimated Status at Criticality Data: <ul style="list-style-type: none"> Date and time RCP temperature (Tavg) 	Examinee records date, time and RCP temperature per the initial conditions given. <ul style="list-style-type: none"> 9/19/2014, 1400 535°F 	N	
Cue:				

Comments:				
5. OP 2208 Step 4.1.4	OBTAIN present burnup from one of the following and RECORD: <ul style="list-style-type: none"> • "CVBURNUP" (PPC) • Reactor Engineering Department 	Examinee obtains present burnup from initial conditions. 4522 MWD/MTU	N	
Cue:				
Comments:				
6. OP 2208 Step 4.1.5	Unless otherwise specified by Reactor Engineering Department, CHECK core burnup <i>change</i> from reference data specified on Attachment 1, to present burnup, does <i>not</i> exceed 1,000 MWD/MTU.	Examinee checks current burnup is less than 1000MWD/MTU from reference. Reference burnup is 4425 MWD/MTU current burnup is 4522 MWD/MTU. $4522 - 4425 = 97$, which is <1000	N	
Cue:				
Comments:				
7. OP 2208 Step 4.1.6	When sample results are obtained, RECORD present boron concentration.	Examinee refers to initial conditions. Boron concentration is 1100 ppm.	N	
Cue:				
Comments:				
8. OP 2208 Note	The Desired Critical CEA Position should maintain a minimum rod insertion worth between 0.5% to 0.9% for "pull to critical"	Examinee reads note and continues.	N	
Cue:				
Comments:				
9. OP 2208 Step 4.1.7	Refer to Attachment 1 and RECORD Desired Critical CEA Position.	Examinee records desired CEA position as CEA group 7 at 55 steps.	N	
Cue:				
Comments:				

10. OP 2208 Step 4.1.8	DETERMINE Power Defect as follows: 1. RECORD Reference Critical Data power value. 2. Refer to RE Curve and Data Book and DETERMINE Power Defect at Reference Critical Data power value and Reference Burnup. 3. Record Power Defect.	Examinee uses Reference Critical Data power value of 100% and determines a Power Defect of 1.363 (Acceptance band 1.347 to 1.379)	Y	
Cue:				
Comments:				

<div>11.</div> <div>OP 2208 Step 4.1.9</div>	<div>DETERMINE Xenon Defect as follows:</div> <div><div>1. RECORD Reference Critical Data xenon worth.</div><div>2. Refer to one of the following and DETERMINE estimated xenon worth at criticality:<div><div>• “Xenon-Samarium Post Trip Report” (printed automatically on Control room printer following reactor trip)</div><div>• RE Curve and Data Book</div><div>• “XENON-SAMARIUM DEMAND” program on PPC</div><div>• Reactor Engineering Department</div></div></div><div>3. IF any of the following conditions exist, REQUEST Reactor Engineering Department assistance to account for xenon reactivity worth inaccuracies:<div><div>• The plant was not at or near full power equilibrium prior to shutdown.</div><div>• The predicted xenon reactivity worth at the estimated time of criticality is greater than 0.5% (500pcm)</div></div></div><div>4. RECORD estimated xenon worth at criticality.</div><div>5. CALCULATE Xenon Defect as follows and Record:</div><div><div>Reference</div><div>Estimated</div><div>Critical Data - xenon</div><div>= Xenon</div><div>xenon worth worth Defect</div></div></div>	<div>Examinee uses reference critical data xenon worth of 2.615.</div> <div>Examinee uses RE curve RE-C-01 to determine estimated xenon worth at criticality of 0.</div> <div>Examine calculated xenon defect to be 2.615.</div>	<div>Y</div>	
<div>Cue:</div>				
<div>Comments:</div>				

<p>12.</p> <p>OP 2208 Step 4.1.10</p>	<p>DETERMINE Samarium Defect as follows:</p> <ol style="list-style-type: none"> 1. RECORD Reference Critical Data samarium worth. 2. Refer to one of the following and DETERMINE estimated samarium worth at criticality: <ul style="list-style-type: none"> • “Xenon-Samarium Post Trip Report” (printed automatically on Control Room printer following reactor trips) • RE Curve and Data Book • “XENON-SAMARIUM DEMAND” program on PPC • Reactor Engineering Department 3. RECORD estimated samarium worth at criticality 4. CALCULATE Samarium Defect as follows and RECORD: $\begin{array}{rcl} \text{Reference} & \text{Estimated} & \\ \text{Critical data} - & \text{samarium} & = \text{Samarium} \\ \text{samarium} & \text{worth} & \text{Defect} \\ \text{worth} & & \end{array}$	<p>Note: Samarium Defect on the data sheet is incorrectly shown as a positive value. The reference critical and estimated criticality values were transposed, yielding a value of +0.351, vice the correct value of -0.351. The applicant needs to identify the error and correct as below.</p> <p>Examinee records reference critical data samarium worth from Attachment 1.</p> <p>Examinee determines estimated samarium worth at criticality from RE-C-03 to be 1.131.</p> $0.780 - 1.131 = -0.351$ <p>Examinee calculated Samarium Defect to be -0.351.</p> <p>(Acceptance band -0.359 to -0.343)</p>	<p>Y</p>	
<p>Cue:</p>	<p>.</p>			
<p>Comments:</p>				
<p>13.</p> <p>OP 2208 Step 4.1.11</p>	<p>Determine CEA Worth Defect as follows:</p> <ol style="list-style-type: none"> 1. Refer to RE Curve and Data Book and Determine CEA worth for the following and RECORD: <ul style="list-style-type: none"> • Reference Critical Data CE Position • Desired Critical CEA Position 2. CALCULATE CEA Worth Defect as follows and RECORD: $\begin{array}{rcl} \text{Reference} & \text{Desired} & \\ \text{Critical Data} - & \text{Critical} & = \text{CEA} \\ \text{CEA Position} & \text{CEA Position} & \text{Worth} \\ \text{worth} & \text{worth} & \text{Defect} \end{array}$	<p>Examinee obtains Reference Critical Data CEA Position worth from Attachment 1 as Gp 7 at 180 steps. Worth at this position is 0.</p> <p>Examinee determines desired critical position as Gp 7 at 55 steps. Worth at this position is 0.705.</p> <p>Examinee calculated CEA defect too be - 0.705.</p> <p>(Acceptance band -0.707 to -0.703)</p>	<p>Y</p>	

Cue:				
Comments:				
14. OP 2208 Step 4.1.12	DETERMINE Boron Defect as follows: 1. RECORD Reference Critical Data boron concentration 2. RECORD present boron concentration 3. Refer to RE Curve and Data Book and DETERMINE the Inverse Boron Worth as present burnup 4. RECORD Inverse Boron Worth 5. CALCULATE Boron Defect as follows and RECORD:	Note: Data sheet boron is incorrectly recorded as 975 ppm. The applicant needs to identify the error and calculate as shown below. Examinee obtains Reference Critical Data boron concentration from attachment 1. 957 ppm Examinee obtains present boron concentration from initial conditions. 1100 ppm $957 - 1100 = -143$ Examinee determines inverse boron worth of 115.2. $-143 / 115.2 = -1.241$ (Acceptance band -1.242 to -1.240)	Y	
Cue:				
Comments:				
15. OP 2208 Step 4.1.13	DETERMINE Plutonium Buildup worth as follows: 1. Refer to RE Curve and Data Book and DETERMINE Plutonium Buildup worth at criticality 2. RECORD Plutonium Buildup worth at criticality	Examinee determines plutonium buildup worth at criticality from RE-E-04 to be 0.203. (Acceptance band 0.199 to 0.207)	Y	
Cue:				
Comments:				

16. OP 2208 Step 4.1.14	DETERMINE the sum of all defects as follows: 1. ENTER <i>all</i> previously calculated reactivity defects. 2. CALCULATE the sum of all reactivity defects and RECORD.	Examinee enters all previously calculated reactivity defects. Examinee calculates the sum of defects to be 1.872. (Acceptance band 1.853 to 1.894)	Y	
Cue:				
Comments:				
17. OP 2208 Step 4.1.15	DETERMINE the Boron Equivalent of Defects as follows: 1. RECORD the following: <ul style="list-style-type: none"> Sum of defects Inverse Boron Worth at present burnup 2. CALCULATE Boron Equivalent of Defects as follows and RECORD: $\begin{array}{rcl} \text{Sum of} & \text{Inverse Boron} & \text{Boron} \\ \text{Defects} & \times \text{Worth} & = \text{Equivalent} \\ & & \text{Of Defects} \end{array}$	Examinee records the previously calculated sum of defects and inverse boron worth on OP 2208-001. Examinee calculates boron equivalent: $1.872 \times 115.2 = 215.654$ (Acceptance band 213.280 to 220.685)	Y	
Cue:				
Comments:				
18. OP 2208 NOTE	There is a reactivity change due to fuel burnup. If the difference between present burnup and reference burnup is less 200 MWD/MTU this reactivity change does not need to be accounted for.	Examinee reads note and continues.	N	
Cue:	JPM is complete.			
Comments:				

<p>19.</p> <p>OP 2208 Step 4.1.16</p>	<p>DETERMINE Boron Equivalent of Reactivity Change Due to Burnup as follows:</p> <ol style="list-style-type: none"> 1. IF the difference between present burnup and Reference Critical Data burnup is less than or equal to 200 MWD/MTU, RECORD "N/A" in this section and Go To step 4.1.17. 2. IF the difference between present burnup and Reference Critical Data burnup is greater than 200 MWD/MTU, Refer To RE Curve and Data Book and PERFORM the following: <ul style="list-style-type: none"> • DETERMINE the predicted critical boron concentration at present burnup and RECORD • DETERMINE the predicted critical boron concentration at Reference Critical Data burnup and RECORD. 3. CALCULATE Boron Equivalent of Reactivity Change Due to Burnup as follows and RECORD: $ \begin{array}{rcl} \text{Boron conc} & & \text{Boron conc} & & \text{Boron} \\ \text{at present} & - & \text{at reference} & = & \text{equiv} \\ \text{burnup} & & \text{Critical Data} & & \text{Reactivity} \\ & & \text{burnup} & & \text{change} \\ & & & & \text{due to} \\ & & & & \text{burnup} \end{array} $	<p>Examinee determines difference in present burnup and Reference Critical Data burnup is less than 200 MWD/MTU and records 0.</p>	<p>Y</p>	
Cue:				
Comments:				

20. OP 2208 step 4.1.17	DETERMINE Required Boron Change for Criticality as follows: 1. RECORD the following: <ul style="list-style-type: none"> Boron Equivalent of Defects IF any Boron Equivalent of Reactivity Change Due to Burnup 2. CALCULATE required boron change as follows and RECORD: <i>Boron Equivalent Of Defects</i> + <i>Boron Equivalent Change due to Burnup</i> = <i>Required Boron Change</i>	Examinee records Boron Equivalent of Defects: 215.654 Examinee records Boron Equivalent of Reactivity Change due to Burnup: 0 Examinee calculates Required Boron change: 215.654 (Acceptance band 213.280 to 220.685)	Y	
Cue:				
Comments:				
21. OP 2208 Step 4.1.18	DETERMINE Critical Boron Concentration as follows: 1. RECORD the following: <ul style="list-style-type: none"> Present boron concentration Required boron change 2. CALCULATE critical boron concentration as follows and RECORD: <i>Present Boron Concentration</i> + <i>Required Boron Change</i> = <i>Critical Boron Concentration</i>	Examinee records present concentration from initial conditions: 1100 ppm Examinee calculates critical boron concentration: 1100 + 215.654 = 1315.654 (Acceptance band 1311 to 1321)	Y	
Cue:				
Comments:				

<p>22.</p> <p>OP 2208 Step 4.1.19</p>	<p>DETERMINE Limits on CEA Position at Criticality as follows:</p> <ol style="list-style-type: none"> 1. RECORD calculated CEA worth for Desired Critical CEA position 2. CALCULATE CEA worth at <i>minimum</i> insertion as follows and RECORD: $\begin{array}{lcl} \text{CEA worth} & & \text{CEA worth} \\ \text{for desired} & - 0.5\% & = \text{at minimum} \\ \text{Critical CEA} & & \text{insertion} \\ \text{Position} & & \end{array}$ 3. CALCULATE CEA worth at <i>maximum</i> insertion as follows: $\begin{array}{lcl} \text{CEA worth} & & \text{CEA worth} \\ \text{for desired} & + 0.5\% & = \text{at maximum} \\ \text{Critical CEA} & & \text{insertion} \\ \text{Position} & & \end{array}$ 4. Refer to RE Curve and Data Book and PERFORM the following: <ul style="list-style-type: none"> • DETERMINE CEA position (group and step) at minimum insertion and RECORD • DETERMINE CEA position (group and step) at maximum insertion and RECORD • IF CEA position at maximum insertion is below 0% PDIL, RECORD CEA Group 4 at 72 steps. 	<p>Examinee records desired critical CEA position worth: 0.705</p> <p>Examinee calculates CEA worth at minimum insertions: $0.705 - 0.5 = 0.205$</p> <p>Examinee calculates CEA worth at maximum insertion: $0.705 + 0.5 = 1.205$</p> <p>Examinee refers to RE Curve RE-D-01 and determines CEA position for minimum insertion of 0.205% delta rho: Group 7 at 135 steps (Acceptance band 130 to 140)</p> <p>Examinee refers to RE Curve RE-D-01 and determines CEA position for maximum insertion of 1.205% delta rho: Group 6 at 78 steps (Acceptance band 72 to 84)</p>	Y	
Cue:				
Comments:				
<p>23.</p> <p>OP 2208 Step 4.1.20</p>	<p>SIGN "ECP Calculated By" section and RECORD date and time</p>	<p>Examinee completes step.</p>	N	
Cue:	JPM is complete.			

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Comments:

Terminating Cue: When the above step is achieved, the JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETIONTitle: Review and Approve an ECP Manual Calculation

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No **X**

Validated Time (minutes): _____

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• The plant tripped on 9/13/2014 at 0800• CVBURNUP on the PPC is 4522 MWD/MTU• The estimated time of criticality is 9/19/2014 at 1400• Current boron concentration is 1100 ppm• At the scheduled time of criticality, Tave is 535°F• Desired critical position: CEA Group 7 at 55 steps• The Unit Reactor Operator has manually calculated an ECP for the estimated time of criticality
Initiating Cue:	You are the Unit Supervisor. Per OP-2208, Steps 4.1.21 and 4.1.22, approve the ECP, record date and time, and record any comments concerning the ECP in the Remarks section.

JOB PERFORMANCE MEASURE

ADMIN SRO-2

JPM Number: ADMIN SRO-2

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JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2

JPM Number: ADMIN SRO-2

Task Title: Loss of Containment Closure

System: Administrative

Time Critical Task: Yes No **X**

Alternate Path: Yes No **X**

Validated Time (minutes): **10 Minutes**

Task No.(s): NUTIMS 119-01-053, 000-04-213

K/A No. 2.1.36 K/A Rating 4.1

Method of Testing:

Simulated Performance: **X** Actual Performance:

Location:

Classroom: **X** Simulator: In-Plant:

Task Standards:

At the completion of this JPM, the examinee will have identified a loss of Containment (CTMT) closure, entered appropriate Technical Specifications Action Statements (TSAS) and directed actions to suspend all operations involving movement of irradiated fuel assemblies in the containment.

Required Materials

(procedures, equipment):

AOP 2515, Loss of Containment Integrity
P&ID 25203-26005-00002, Feed System
Unit 2 Technical Specifications And Bases

General References:

AOP 2515, Loss of Containment Integrity
P&ID 25203-26005-00002, Feed System
Unit 2 Technical Specifications And Bases

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	None
Initial Conditions:	<ul style="list-style-type: none"> • The plant is in MODE 6 with fuel movement in progress. • Containment closure is set with closure plans (administrative controls) established for the following: <ul style="list-style-type: none"> ➤ CTMT Equipment Hatch ➤ CTMT Personnel Hatch ➤ CTMT Purge Valves • The following plant conditions exist: <ul style="list-style-type: none"> ➤ "A" LPSI pump and "A" SDC HX are in service. ➤ T351Y, SDC Return Temperature is 90°F ➤ #2 Steam Generator secondary side manways are open for inspection • You are the Unit Supervisor • The Aux Building PEO calls to report that workers erecting scaffolding in the Enclosure Building 38'6" West have accidentally broken off 2-FW-182, #2 Steam Generator Feedwater Header Drain Valve,
Initiating Cue:	Respond to the broken valve as the Unit Supervisor in the Control Room.

START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1 .	Review P&ID 25203-26005-00002	Refers to P&ID or other documentation and determines that the 2-FW-182 drain path is a breach of CTMT closure.	Y	
Cue:				
Comments:	Examiner to provide copy of procedure and form to examinee.			
2 .	Refer to TRM Table 3.6-1	Refers to TRM Table 3.6-1 and determines that the 2-FW-182 is a containment isolation valve on Penetration 16.	Y	
Cue:				
Comments:	This step is not required if the examinee already has determined 2-FW-182 is a containment isolation valve.			
3 .	Refer To AOP 2515, Loss of Containment Integrity	Directs initial steps of AOP 2515 and then directs the refuel SRO to place ANY fuel assembly being handled in containment in a safe location (Step 17).	N	
Cue:	If Unit Supervisor gives directions to SM, HP or Chemistry, acknowledge directed action of AOP 2515. If directed to place fuel assembly in "safe location" provide examinee with Examinee Handout 2.			
Comments:	Entry into AOP 2515 is not required for success in this JPM.			
4 .	Refers to T.S. LCO 3.9.4 for Containment Penetrations/Refueling Operations ACTION requirement	Declares entry into TSAS 3.9.4 and immediately suspends all operations involving movement of irradiated fuel assemblies in the containment.	Y	
Cue:	If directed to "immediately suspend" all operations involving movement of irradiated fuel assemblies in the containment provide examinee with Examinee Handout 2 .			
Comments:	Entry into Technical Specification 3.9.4 ACTION requirement is required for success in this JPM.			
5 .	IF conditions have been met to provide the handout in JPM Steps 3 or 4 above, then the examinee reads Examinee Handout #2,	Directs the Refueling SRO to complete both moves and then stop all operations involving CORE ALTERATIONS or movement of irradiated fuel in containment.	Y	

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Cue:	If examinee is does not provide specific actions for suspending core alterations, provide examinee with Examinee Handout 2.
Comments:	T.S Definition, 1.12: CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

Terminating Cue: When the examinee determines that reponse actions are complete, then the JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETIONTitle: Shutdown Safety Assessment Time to Core Boil

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No XValidated Time (minutes): 10 Minutes

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT #2

Initial Conditions:	<ul style="list-style-type: none">• In the Containment, a used fuel assembly is over its new core location and is ready to be lowered• In the Spent Fuel Pool, a used fuel assembly is in transit to its final SFP location.
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Initiating Cue:	The Refueling SRO requests guidance on what to do with the fuel assemblies.
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EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• The plant is in MODE 6 with fuel movement in progress.• Containment closure is set with closure plans (administrative controls) established for the following:<ul style="list-style-type: none">➤ CTMT Equipment Hatch➤ CTMT Personnel Hatch➤ CTMT Purge Valves• The following plant conditions exist:<ul style="list-style-type: none">➤ "A" LPSI pump and "A" SDC HX are in service.➤ T351Y, SDC Return Temperature is 90°F➤ #2 Steam Generator secondary side manways are open for inspection• You are the Unit Supervisor• The Aux Building PEO calls to report that workers erecting scaffolding in the Enclosure Building 38'6" West have accidentally broken off 2-FW-182, #2 Steam Generator Feedwater Header Drain Valve,
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Initiating Cue:	Respond to the broken valve as the Unit Supervisor in the Control Room.
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JOB PERFORMANCE MEASURE

ADMIN SRO-3

JPM Number: ADMIN SRO-3

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JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2

JPM Number: ADMIN SRO-3

Task Title: Technical Specification Evaluation

System: Administrative (Auxiliary Feedwater, AC Power Sources)

Time Critical Task: Yes No X

Alternate Path: Yes No X

Validated Time (minutes): XX MINUTES

Task No.(s): NUTIMS 119-01-044

K/A No. 2.2.40 K/A Rating 4.7

Method of Testing:

Simulated Performance: Actual Performance: X

Location:

Classroom: X Simulator: In-Plant:

Task Standards: Identify all required Technical Specification LCO Conditions and entry and exit times and document on the Examinee Handout.

Required Materials Unit 2 Technical Specifications And Bases
(procedures, equipment):

General References: Unit 2 Technical Specifications And Bases

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (I.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	None
Initial Conditions:	<ul style="list-style-type: none"> • At 0030 the Unit was operating normally in MODE 1 at 100% power with no equipment out of service. • Since that time, the following events have occurred: <ul style="list-style-type: none"> ➤ At 0100, Unit 3 SBO Diesel Generator unavailable ➤ At 0400, 'A' Diesel Generator was declared inoperable. ➤ At 0600, 'B' Diesel Generator was declared inoperable ➤ At 0700, 'A' Diesel Generator was returned to operable status. ➤ At 1900, Main Steam Supply Valve to Turbine Driven Auxiliary Feed Water Pump (TDAFWP), MS-201 was declared inoperable ➤ At 2030, 'B' Diesel Generator was returned to operable status. ➤ At 2300, Main Steam Supply Valve to TDAFWP, MS-201 returned to operable status.
Initiating Cue:	Identify all required Technical Specification LCO actions and LCO entry/exit times and document on the Examinee Answer Sheet.

START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1.	Identify LCO entry for 'A' Diesel Generator being declared inoperable at time 0400.	Documented entry into LCO 3.8.1.1, Required Action b.1, b.2, b.3 and b.5. for one diesel generator inoperable, at time 0400. After verifying operability (cue below) of the TDAFWP, exit b.3.	Y	
Cue:	Tell examinee that the TDAFWP has been verified operable by administrative actions. If asked, the Millstone Unit 3 diesel generators are operable.			
Comments:	There is no required LCO entry for the Unit 3 SBO diesel generator not available. LCO 3.8.1.1 Required Action b.4 is not entered because 14 day outage time specified is not used (14 day outage time applies to b. 4 and b.5, b.5 only if you are using it in b.4).			
2.	Identify LCO entry for 'B' Diesel Generator being declared inoperable at time 0600.	Documented entry into LCO 3.8.1.1 Required Action e.1, e.2, and e.3 for <u>two</u> diesel generators inoperable at time 0600.	Y	
Cue:				
Comments:				
3.	Identify LCO 3.8.1.1 Required Actions e.1 and e.2 exit conditions met due to 'A' Diesel Generator being declared operable at time 0700.	Documented exit from LCO 3.8.1.1 Required Actions e.1 and e.2 at 0700.	Y	
Cue:				
Comments:	Action e.3 cannot be exited until the 'B' EDG is restored. In this case, the time requirement for one inoperable diesel (Required Action b) is based on the initial loss of the 'B' EDG, which in this case still allows you 71 hours to restore.			

4.	Identify LCO entry for valve MS-201, Main Steam Supply to TDAFWP P4 inoperable at time 1900.	Documented entry into LCO 3.7.1.2 Required Action for TDAFWP inoperable due to one steam supply being inoperable at time 1900.	Y	
Cue:				
Comments:				
5.	Identify that an inoperable TDAFWP requires re-entry into LCO 3.8.1.1 Required Action b.3 because one diesel generator is still inoperable at time 1900.	Documented entry into LCO 3.8.1.1 Required Action b.3 at time 1900. [Verify the steam-driven auxiliary feedwater pump is OPERABLE (MODES 1, 2, and 3 only). If this condition is not satisfied within 2 hours, be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours.]	Y	
Cue:				
Comments:	Must restore TDAFWP within 2 hours because a diesel is inoperable.			
6.	Identify LCO 3.8.1.1 Required Actions b.1, b.2, b.3, and e.3, exit conditions met due to 'B' Diesel Generator being declared operable at time 2030.	Documented exit from LCO 3.8.1.1 Required Actions b.1, b.2, b.3, and e.3, exit conditions at time 2030.	Y	
Cue:				
Comments:				
7.	Identify LCO 3.7.1.2 Required Action a exit conditions met at time 2300.	Documented exit LCO 3.7.1.2 Required Action a at time 2030 due to steam supply to TDAFWP restored to operable and thus TDAFWP is operable at time 2300	Y	
Cue:				
Comments:				

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Terminating Cue: The JPM is complete when the examinee has evaluated Technical Specification requirements and documented the evaluation on the Examinee Answer Sheet.

STOP TIME: _____

VERIFICATION OF JPM COMPLETIONTitle: Shutdown Safety Assessment Time to Core Boil

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No **X**Validated Time (minutes): 10

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE ANSWER SHEET

LCO	REQUIRED ACTION	ENTRY TIME	EXIT TIME

Use additional sheets if needed.

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• At 0030 the Unit was operating normally in MODE 1 at 100% power with no equipment out of service.• Since that time, the following events have occurred:<ul style="list-style-type: none">➤ At 0100, Unit 3 SBO Diesel Generator unavailable➤ At 0400, 'A' Diesel Generator was declared inoperable.➤ At 0600, 'B' Diesel Generator was declared inoperable➤ At 0700, 'A' Diesel Generator was returned to operable status.➤ At 1900, Main Steam Supply Valve to Turbine Driven Auxiliary Feed Water Pump (TDAFWP), MS-201 was declared inoperable➤ At 2030, 'B' Diesel Generator was returned to operable status.➤ At 2300, Main Steam Supply Valve to TDAFWP, MS-201 returned to operable status.
Initiating Cue:	Identify all required Technical Specification LCO actions and LCO entry/exit times and document on the Examinee Answer Sheet.

JOB PERFORMANCE MEASURE

Admin SRO-4

JOB PERFORMANCE MEASURE WORKSHEETFacility: Millstone Unit 2JPM Number: Admin SRO-4Task Title: **SRO Review and Approve a Radioactive Liquid Waste Release Permit**System: Radiation ControlTime Critical Task: Yes No **X**Alternate Path: Yes No **X**Validated Time (minutes): Task No.(s): NUTIMs #119-02-026K/A No. 2.3.6 K/A Rating 3.8Method of Testing:Simulated Performance: Actual Performance: **X**Location:Classroom: **X** Simulator: In-Plant:

Task Standards: The examinee will review the discharge permit and identify a plant operating condition that will NOT allow authorizing a radioactive liquid waste discharge.

Required Materials:

(procedures, equipment)

- SP 2617A Aerated and Clean Radioactive Liquid Waste Discharges, Section 4.2
- SP 2864, Attachment 2, Evaluation of Rad Monitor Response Based on Isotopic Mix
- OPS Form 2617A-001, Aerated and Clean Radioactive Liquid Waste Discharge
- Chem Form 2864-1, Millstone Unit 2 Liquid Discharge Permit Number 2000
- SP 2852-001, MP2 Liquid Radwaste Eff. Mon. Inop. surveillance

General References:

- SP 2617A Aerated and Clean Radioactive Liquid Waste Discharges, Section 4.2

JOB PERFORMANCE MEASURE WORKSHEET

- SP 2864, Attachment 2, Evaluation of Rad Monitor Response Based on Isotopic Mix
- OPS Form 2617A-001, Aerated and Clean Radioactive Liquid Waste Discharge
- Chem Form 2864-1, Millstone Unit 2 Liquid Discharge Permit Number 2000 and Data Book, Rev. 000

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.

Simulator Requirements:	none
Initial Conditions:	<ul style="list-style-type: none"> • SP 2617A, section 4.2; steps 4.2.1 through 4.2.5 were completed by the Aux Building PEO at 0525. • There are NO other radioactive discharges are in progress. • The tide is outgoing. • SG blowdown is 40 gpm on each Steam Generator. • Chemistry sample results are acceptable. • AWMT level is 89% and stable. • 100% power, equilibrium, steady state conditions. • RM-9116 was placed in bypass at 0245 this morning due to an instrument failure alarm. Chemistry has been informed. • The AWMT Mixer breaker was tagged for electrical PMs at 0535 this morning. • Chemistry has generated a Liquid Discharge Permit (and associated forms) for the Aerated Waste Monitor Tank.
Initiating Cue:	You are to review the discharge permit 'package' and document below what must be accomplished to authorize the discharge.

Cue:	<ul style="list-style-type: none">• If the student queries the Chemist about the recirculation time, state that the Chemist was informed that the AWMT was placed on recirculation at 0625 with the mixer. The sample was taken after the required 30 minutes. (See discharge permit)• If the student queries the Chemist about the second sample, state that the second sample was analyzed; however, the other Chemist forgot to initial Chemistry Form 2852-1.
Comments:	<p>To successfully complete this JPM, the examinee must determine that the discharge <u>CANNOT</u> be performed for <u>either one</u> of the above reasons.</p> <p>The mixer was tagged (de-energized) 10 minutes after the AWMT was placed on recirculation. The required recirculation time is 30 minutes <u>with</u> the mixer and 4 hours <u>without</u> the mixer.</p>
Cue:	JPM is complete.
Comments:	

Terminating Cue: When the above step is achieved, the JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETIONTitle: SRO Review and Approve a Radioactive Liquid Waste Release Permit

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No **X**Validated Time (minutes): 15

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none"> • SP 2617A, section 4.2; steps 4.2.1 through 4.2.5 were completed by the Aux Building PEO at 0525. • There are NO other radioactive discharges are in progress. • The tide is outgoing. • SG blowdown is 40 gpm on each Steam Generator. • Chemistry sample results are acceptable. • AWMT level is 89% and stable. • 100% power, equilibrium, steady state conditions. • RM-9116 was placed in bypass at 0245 this morning due to an instrument failure alarm. Chemistry has been informed. • The AWMT Mixer breaker was tagged for electrical PMs at 0535 this morning. • Chemistry has generated a Liquid Discharge Permit (and associated forms) for the Aerated Waste Monitor Tank.
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Initiating Cue:	You are to review the discharge permit 'package' and document below what must be accomplished to authorize the discharge.
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[illegible]

JOB PERFORMANCE MEASURE

ADMIN SRO-5

JPM Number: ADMIN SRO-5

Rev. 0

JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2

JPM Number: ADMIN SRO-5

Task Title: Classify the Event and Determine the PAR

System: Administrative

Time Critical Task: Yes ☒ No ☐

Alternate Path: Yes ☐ No ☒

Validated Time (minutes): 15 Minutes

Task No.(s): NUTIMS 305-05-091

K/A No. 2.4.41 K/A Rating 4.1

Method of Testing:

Simulated Performance: ☒ Actual Performance: ☐

Location:

Classroom: ☒ Simulator: ☐ In-Plant: ☐

Task Standards: At the completion of this JPM the examinee will have determined the classification of the event, recommended protective action recommendations and properly completed the incident response form.

Required Materials
(procedures, equipment): MP-26-EPI-FAP06-002, "EAL Tables", Rev. 009
MP2-26-EPI-FAP07-001, "Incident Report Form", Rev. 001-03
MP-26-EPI-FAP01-001 "Control Room-Director of Station
Emergency Operations (CR DSEO)", Rev. 010-01
MP-26-EPA-REF02 "MP2 EAL Technical Basis Document"
MP-26-EPI-FAP06, "Classification and PARs", Rev. 009
MP-26-EPI-FAP06-005, "Control Room Protective Action
Recommendations", Rev. 004

General References: MP-26-EPI-FAP06, "Classification and PARs", Rev. 009

**** **READ TO THE EXAMINEE** ****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

**** **NOTES TO EXAMINER** ****

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	None
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Initial Conditions:	<p>T = 0 min The plant is at 100% power. Wind speed is 12 mph at 337°.</p> <p>T = 1 min Crew observes lowering RCS pressure and increased mismatch between charging and letdown. Crew observes lowering RCS pressure and increased mismatch between Charging and Letdown. The US directs a manual trip and implementation of EOP 2525.</p> <p>T = 9 min EOP 2525 complete:</p> <ul style="list-style-type: none"> ➤ SIAS, CIAS and EBFAS are verified. ➤ RCS pressure is at 900 psia and lowering. ➤ Pzr level is off-scale low. <p>T = 10 min The crew enters EOP 2535.</p> <p>T = 14 min The SM / DSEO declares an ALERT.</p> <p>T = 25 min Hot and Cold leg injection has been established. RM 4299A and B for No.1 S/G are reading 0.7 R/hr. RM-8240 and 8241 are reading 1300 and 1280 R/hr.</p> <p>T = 27 min The crew enters EOP 2540 to address SGTR.</p> <p>T=47 min Containment radiation monitors are reading 19,570 R/hr.</p>
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JPM Number: ADMIN SRO-5

Rev. 0

	Containment pressure is 3.2 psi and slowly lowering.
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Initiating Cue:	<p>You are the Shift Manager / DSEO. Classify the event. If applicable, determine the appropriate PAR and notifications. Complete the Incident Response Form (MP-26-EPI-FAP07-001).</p> <p>NOTE: THIS IS A TIME-CRITICAL JPM.</p>
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START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1.	Examinee obtains MP-26-EPI-FAP06-002 "Millstone Unit 2 Emergency Action Levels" and classifies the event.	Examinee determines the classification is OFFSITE RELEASES, BG1; GENERAL EMERGENCY - ALPHA Basis for classification, 2 lost barriers, potential loss of the 3rd: <ul style="list-style-type: none">• Under CNB4, Potential Loss of Containment Barrier on RM-8240 and 8241 > 1,200 R/hr indicates• Under RCB4, Loss of Coolant Barrier based on leak greater than charging capacity with entry into 2540.• Under FCB3, Loss of Clad Barrier based on RM-8240/8241 reading >300 R/hr	Y	
Cue:				
Comments:	A 15 minute requirement has been established as a reasonable time for assessing and classifying an emergency once indications are available that an EAL initiating condition has been exceeded.			

2.	Examinee obtains MP-26-EPI-FAP06-005 "Classification and PARs" and determines the PAR.	<p>Makes PAR to evacuate a 5-mile radius – 10 mile downwind (Sectors A and B).</p> <p>For conditions warranting a 10-mile PAR OR sheltering of all zones, perform the following:</p> <ul style="list-style-type: none">• Contact DEEP dispatcher Identify yourself and read applicable evacuation or shelter recommendations from Section B• IF dose projections or actual dose for thyroid (CDE) is greater than or equal to 5Rem at the site boundary, recommend the State implement KI strategy for general public (N/A)• Request dispatcher to inform the DEEP Duty Officer that a PAR has been issued.• Log the date and time of notification <p>The State must be notified within 15 minutes after a decision is made to issue or update a PAR.</p>	Y	
Cue:				
Comments:				

Terminating Cue: When the examinee determines that response actions are complete, then the JPM is complete.
STOP TIME: _____

VERIFICATION OF JPM COMPLETIONTitle: Classify the Event and Determine the PAR

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes X No XValidated Time (minutes): 15 Minutes

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	T = 0 min	The plant is at 100% power. Wind speed is 12 mph at 337°.
	T = 1 min	Crew observes lowering RCS pressure and increased mismatch between charging and letdown. Crew observes lowering RCS pressure and increased mismatch between Charging and Letdown. The US directs a manual trip and implementation of EOP 2525.
	T = 9 min	EOP 2525 complete: <ul style="list-style-type: none">➤ SIAS, CIAS and EBFAS are verified.➤ RCS pressure is at 900 psia and lowering.➤ Pzr level is off-scale low.
	T = 10 min	The crew enters EOP 2535.
	T = 14 min	The SM / DSEO declares an ALERT.
	T = 25 min	Hot and Cold leg injection has been established. RM 4299A and B for No.1 S/G are reading 0.7 R/hr. RM-8240 and 8241 are reading 1300 and 1280 R/hr.
	T = 27 min	The crew enters EOP 2540 to address SGTR.
	T=47 min	Containment radiation monitors are reading 19,570 R/hr. Containment pressure is 3.2 psi and slowly lowering.

Initiating Cue:	<p>You are the Shift Manager / DSEO. Classify the event. If applicable, determine the appropriate PAR and notifications. Complete the Incident Response Form (MP-26-EPI-FAP07-001).</p> <p>NOTE: THIS IS A TIME-CRITICAL JPM.</p>
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JOB PERFORMANCE MEASURE

CONTROL ROOM / IN-PLANT JPM

S-1

JPM Number: S-1

Rev. 0

JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2

JPM Number: S-1

Task Title: Respond to Control Element Assembly Malfunction

System: Control Rod Drive System

Time Critical Task: Yes No **X**

Alternate Path: Yes **X** No

Validated Time (minutes):

Task No.(s): NUTIMS 000-04-097

K/A No. 000-003-AA1.02 K/A Rating 3.6/3.4

Method of Testing:

Simulated Performance: Actual Performance: **X**

Location:

Classroom: Simulator: **X** In-Plant:

Task Standards:

At the completion of this JPM, the examinee has completed the CEA exercise portion of AOP 2556, CEA Malfunctions, for a CEA lower than all other CEAs in its group, and has recommended that CEA #18 be placed on the HOLD bus following investigation of a CED TROUBLE annunciator.

Required Materials

(procedures, equipment):

AOP 2556 CEA Malfunctions, Rev. 016-10
ARP 2590C-141, CEDS LOGIC OR RELAY POWER FAILURE,
Rev. 000

General References:

OP-AA-100, Conduct of Operations, Rev. 25, Attachment 2
UNIT 2 Technical Specifications
JPM based on Bank JPM 208 (modified)

* * * * **READ TO THE EXAMINEE** * * * *

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

* * * * **NOTES TO EXAMINER** * * * *

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (I.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	<ul style="list-style-type: none"> Initialize to a 100% power IC and perform the following: Enter RD0318 at a severity of 75 to cause CEA #18 to drop partially into the core then remove malfunction Stabilize reactor power and turbine load as necessary Display CVMWTH on C-04 PPC Place the simulator in freeze When the examinee is ready, place the simulator in run. When examinee starts recovering the rod with a 10-step pull in JPM step 16, OVERRIDE Annunciator AB-15 on C-04, CEDS TROUBLE, " ON". During JPM step 16, if examinee fails to release the CEA control switch within ten seconds (5 inches of CEA travel) of receiving CED TROUBLE alarm, then insert MALF RD0118 to fully drop the rod.
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Initial Conditions:	<ul style="list-style-type: none"> The plant is in MODE 1, at approximately X% power and stable. CEA #18 dropped into the core. A recovery of CEA #18 has commenced. All steps of AOP 2556 up to, and including, step 4.15 have been completed. The "NSSS DATA SHEET OPTION SELECT" hardcopy and "INCORE DETECTOR OPERABILITY REPORT" have been printed and are being reviewed by Reactor Engineering. I&C is in the East DC Switchgear room and will inform you if any problems are seen during the withdrawal.
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Initiating Cues:	<ul style="list-style-type: none"> You have been directed by the Unit Supervisor to recover CEA #18 per AOP 2556 starting at step 4.16. You are responsible for all operations on C04
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JPM Number: S-1

Rev. 0

	<ul style="list-style-type: none">• All other actions will be handled by other watchstanders.• Examiner will act as the Unit Supervisor.
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START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1. AOP2556 Step 4.16	MONITOR the following during CEA movement: <ul style="list-style-type: none"> • CEAPDS MONITOR • Backup scanner • PPC CEA positions display, CEA • Core mimic 	During CEA movement, the examinee must observe the following indications: <ul style="list-style-type: none"> • CEAPDS MONITOR • Backup scanner • PPC CEA positions display, "CEA" • Core mimic 	N	
Cue:	If asked to provide oversight and peer checks, acknowledge request and tell examinee to continue.			
Comments:	Step 4.17 is not applicable. Reactivity oversight and peer checks are expected during operation with a full crew complement. Due to the nature of the JPM, the examinee may not request oversight and/or peer checks.			
2. AOP2556 Step 4.18	SELECT misaligned CEA on backup scanner	Examinee rotates the backup scanner CEA select thumbwheels to "1" and "8."	N	
Cue:				
Comments:				
3. AOP2556 Step 4.19	As desired, SELECT applicable CEA group +/- 15 STEPS or FULL SCALE on CEAPDS MONITOR	Examinee should normally select the +/- 15 STEPS on CEAPDS MONITOR when initially withdrawing the CEA.	N	
Cue:				
Comments:				
4. AOP2556 Step 4.20	PRESS MANUAL INDIVIDUAL, MI and CHECK light lit	Examinee presses the MANUAL INDIVIDUAL, MI button and observes light lit.	Y	
Cue:				
Comments:				

5. AOP2556 Step 4.21	PRESS applicable <i>group</i> INHIBIT BYPASS and CHECK the following: <ul style="list-style-type: none"> • Appropriate group red INHIBIT BYPASS lit • CEA MOTION INHIBIT BYP annunciator lit (BA-19 on C-04) (depends on group selected) • 	Examinee presses the <i>Group 2</i> INHIBIT BYPASS switch and observes it lit and that BA-19, CEA MOTION INHIBIT BYP annunciator on C-04 is lit.	Y	
Cue:				
Comments:				
6. AOP2556 Step 4.22	PRESS applicable GROUP SELECTION	Examinee selects <i>Group 2</i> by pressing button 2 and observing it lit.	Y	
Cue:				
Comments:				
7. AOP2556 Step 4.23	LOG entry into Technical Specifications LCO 3.1.3.1 Action B.1 (CMI bypassed)	Examinee informs the Unit Supervisor to log into Technical Specifications LCO 3.1.3.1 Action B.1	Y	
Cue:	Reply as the Unit Supervisor that the Technical Specifications have been logged.			
Comments:				

8. AOP2556	<p>NOTE:</p> <p>If recovering a Group 7 CEA, while a CMI condition exists, <input type="checkbox"/> CEA MOTION INHIBIT annunciator (BA-18 on C-04) clears when system CEA MOTION INHIBIT BYPASS button is pressed and returns when released, until the CMI condition has cleared. For all other groups the annunciator will remain lit until the CMI condition clears.</p> <p>If CEA motion is attempted with a CMI active and not bypassed, a CEDS TROUBLE alarm will be received and all ACTMs receiving the motion demand will have a trouble alarm present.</p>	Examinee reads note and does not become concerned during the next step when BA-18, CEA MOTION INHIBIT annunciator does not clear when the CEA MOTION INHIBIT BYPASS button is pushed.	N	
Cue:				
Comments:				
9. AOP2556 Step 4.24	PRESS and HOLD <i>system</i> "CEA MOTION INHIBIT BYPASS"	Examinee presses and holds the system CEA MOTION INHIBIT BYPASS button.	Y	
Cue:				
Comments:				
10. AOP2556 Step 4.25	PRESS "INDIVIDUAL CEA SELECTION," for misaligned CEA	Examinee selects the misaligned CEA by pressing button 18	Y	
Cue:				
Comments:				

11. AOP2556	NOTE: When CMI relay is bypassed for CEA movement, CMI should remain bypassed for at least 3 seconds after CEA motion is stopped (allows Coil Power Programmers [CPP] operations to be completed).	Examinee reads note.	N	
Cue:				
Comments:				
12. AOP2556 Step 4.26	<p>If CEA is <i>lower</i> than all other CEAs in its group, PERFORM the following:</p> <ul style="list-style-type: none"> a. OBSERVE starting CEA position b. PLACE and HOLD CEA control switch to "WITHDRAW." c. WITHDRAW CEA 6 to 9 steps. d. <u>WHEN</u> CEA has been withdrawn 6 to 9 steps, RELEASE CEA control switch. e. PLACE and HOLD CEA control switch to "INSERT." f. INSERT CEA 3 to 5 steps. g. <u>WHEN</u> CEA has been inserted 3 to 5 steps, RELEASE CEA control switch. 	<ul style="list-style-type: none"> a. Examinee notes starting CEA position. b. Examinee places and holds CEA control switch to WITHDRAW c. Examinee withdraws CEA 6 to 9 steps. d. <u>WHEN</u> CEA has been withdrawn 6 to 9 steps, examinee releases CEA control switch. e. Examinee places and holds CEA control switch to INSERT f. Examinee inserts CEA 3 to 5 steps. g. <u>WHEN</u> CEA has been inserted 3 to 5 steps, examinee releases CEA control switch. 	Y	
Cue:				
Comments:				

13. AOP2556 Step 4.26 continued	h. PLACE and HOLD CEA control switch to WITHDRAW. i. WITHDRAW CEA 3 to 5 steps, not to exceed 10 steps from starting CEA position. j. WHEN CEA has been withdrawn 3 to 5 steps, <input type="checkbox"/> RELEASE CEA control switch. k. WHEN at least 3 seconds have elapsed since CEA control switch was released, <input type="checkbox"/> RELEASE system CEA MOTION INHIBIT BYPASS. l. OBSERVE time of CEA exercise completion. m. Go To step 4.28.	Examinee with draws CEA 3-5 steps and then releases the CEA control switch. Examinee waits at least 3 seconds since CEA control switch last released to releases the CEA MOTION INHIBIT BYPASS button. Examinee observes completion time for the CEA exercise	Y	
Cue:				
Comments:	AOP step 4.27 is not applicable. Examinee moves on to step 4.28			
14. AOP2556	CAUTION To prevent fuel damage due to xenon buildup and local power peaking, no attempt must be made to withdraw CEA greater than 2 hours after misalignment occurs.	Examinee reads caution.	Y	
Cue:				
Comments:				

15. AOP2556	<p style="text-align: center;">NOTE</p> <ol style="list-style-type: none">1. Alignment of the CEA to its group position must be performed as smoothly as possible. To accomplish this, the CEA is aligned in preferably equal increments, less than or equal to 10 steps each increment.2. When CMI relay is bypassed for CEA movement, CMI should remain bypassed for at least 3 seconds after CEA motion is stopped (allows CPP operations to be completed).3. If recovering a Group 7 CEA, CEA MOTION INHIBIT annunciator (BA-18, C-04) clears when system CEA MOTION INHIBIT BYPASS is pressed and returns when released until the CMI condition has cleared.	Examinee reads note.	N	
Cue:				
Comments:				

16. AOP2556 Step 4.28	ALIGN CEA to its group position as follows: a. ENSURE at least 1 minute has elapsed from last movement of CEA. b. OBSERVE present CEA positions. c. PRESS and HOLD <i>system</i> CEA MOTION INHIBIT BYPASS. d. PLACE and HOLD CEA control switch in applicable position: <ul style="list-style-type: none"> • IF CEA is lower than all other CEAs in its group, to WITHDRAW • IF CEA is higher than all other CEAs in its group, to INSERT e. MOVE CEA less than or equal to 10 steps.	Examinee verifies one minute has elapsed from last CEA movement, observes CEA positions and then presses and holds the system CEA MOTION INHIBIT BYPASS button. Examinee withdraws CEA #18 less than or equal to 10 steps.	Y	
Cue:	ALTERNATE PATH BEGINS HERE			
Comments:	Once the CEA is starts moving outward in step e above, the CED TROUBLE annunciator, AB-15 on C-04 will come in which causes examinee to take ALTERNATE PATH in step 17 of this JPM.			
17. ARP2590C -111 Step 1	STOP all CEA motion.	Examinee stops CEA motion and references the ARP for the CED Trouble annunciator. The examinee may release the <i>system</i> CEA MOTION INHIBIT BYPASS button and select the OFF button.	Y	
Cue:				
Comments:	If examinee does not stop CEA motion within ten seconds of receiving CED TROUBLE alarm, CEA #18 will drop to bottom of core. Once examinee reports CEA 18 has dropped into the core terminate the JPM. Note: the CEDS TROUBLE annunciator on C-04 is momentary and will auto-reset.			

18. ARP2590C -111 Step 2	REQUEST I&C Department INVESTIGATE ACTM trouble condition.	Examinee contacts I&C Department to investigate Automatic CEA Timer Module (ACTM) trouble condition.	Y	
Cue:	I&C reports that ACTM Motion Failure LED is lit, the TROUBLE LED is flashing constantly and ACTM ABNORMAL VOLTAGE LED is lit on Control Element Drive Mechanism (CEDM) #18 ACTM. If asked, the Lower Gripper Engaged LED is lit and the Upper Gripper Engaged LED is out.			
Comments:				
19. ARP2590C -111 Step 3	IF alarm is momentary, PERFORM the following: 3.1 MONITOR all ACTMs and REPORT all abnormal red lights (East DC switchgear room). 3.2 IF desired, RESUME CEA motion.	Examinee determines alarm is NOT momentary based on report from I&C that TROUBLE LED is flashing constantly. This step is not applicable.	N	
Cue:				
Comments:				
20. ARP2590C -111 Step 4.1	IF alarm is constant, PERFORM the following: 4.1 MONITOR all ACTMs and REPORT all abnormal red lights (East DC switchgear room).	Examinee determines alarm is constant and requests I&C monitor all ACTMs and REPORT all abnormal red lights.	N	
Cue:	I&C acknowledges request to report all abnormal red lights on ACTMS. I&C reports that the following red lights are lit on CEDM #18 ACTM: Motion Failure LED, TROUBLE LED is flashing constantly, ABNORMAL VOLTAGE LED and, Lower Gripper Engaged LED.			
Comments:				

JPM Number: S-1Rev. 0

21. ARP2590C -111 Step 4.2	IF BOTH of the following conditions exist: <ul style="list-style-type: none"> • ACTM TROUBLE light is flashing constantly • ACTM ABNORMAL VOLTAGE light, ON PERFORM the following: 4.2.1 REQUEST I&C Department or PEO and licensed operator, PLACE CEA on hold bus within 15 minutes from receipt of the constant CEDS TROUBLE alarm as follows (East DC switchgear room):	Examinee recommends to Unit Supervisor to transfer CEA #18 to the hold bus. Transfer needs to occur within 15 minutes of receipt of CEDS TROUBLE alarm.	Y	
Cue:	Unit Supervisor acknowledges recommendation to transfer CEA #18 to the hold bus.			
Comments:				

Terminating Cue: Once the examinee has recommends placing CEA #18 on the hold bus, the JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETIONTitle: Respond to a Control Element Assembly Malfunction

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No X

Validated Time (minutes): _____

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• The plant is in MODE 1, at approximately X% power and stable.• CEA #18 dropped into the core.• A recovery of CEA #18 has commenced. All steps of AOP 2556 up to, and including, step 4.15 have been completed.• The "NSSS DATA SHEET OPTION SELECT" hardcopy and "INCORE DETECTOR OPERABILITY REPORT" have been printed and are being reviewed by Reactor Engineering.• I&C is in the East DC Switchgear room and will inform you if any problems are seen during the withdrawal.
Initiating Cues:	<ul style="list-style-type: none">• You have been directed by the Unit Supervisor to recover CEA #18 per AOP 2556 starting at step 4.16.• You are responsible for all operations on C04• All other actions will be handled by other watchstanders.• Examiner will act as the Unit Supervisor.

JOB PERFORMANCE MEASURE

CONTROL ROOM / IN-PLANT JPM
S-2

JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2JPM Number: S-2Task Title: Reset SIASSystem: Engineered Safety Features Actuation SystemTime Critical Task: Yes No **X**Alternate Path: Yes **X** No Validated Time (minutes): ???Task No.(s): NUTIMSK/A No. 013 A2.06 K/A Rating 3.7/4.0Method of Testing:Simulated Performance: Actual Performance: **X**Location:Classroom: Simulator: **X** In-Plant:

Task Standards: The examinee will reset SIAS following an inadvertent ESFAS actuation using AOP 2571 and take contingency actions per Step 4.2.d for inability to reset SIAS.

Required Materials: AOP 2571, Inadvertent ESFAS Actuation, Rev. 005-003
(procedures, equipment)

General References: AOP 2571

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	<ul style="list-style-type: none"> • Initialize at a full power IC. • Initiate a SIAS.
Initial Conditions:	The plant is at 100% power. An inadvertent SIAS has occurred.
Initiating Cues:	The Unit Supervisor directs you to reset SIAS using AOP 2571, "Inadvertent ESFAS Actuation", Section 4.0.

START TIME: _____

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1. AOP 2571 Step 4.1	Using independent indications, CHECK ALL the following: <ul style="list-style-type: none"> Pressurizer pressure greater than 1,714 psia. or trip function bypassed Containment pressure less than 4.42 psig 	Examinee verifies pressurizer pressure greater than 1,714 psia and containment pressure less than 4.42 psig	N	
Cue:	If asked to provide oversight and peer checks, acknowledge request and tell examinee to continue.			
Comments:				
2. AOP 2571 Note	If a spurious signal is present that cannot be reset, then ESAS is inoperable. With all safeguards equipment running in the accident condition, a safe condition can be maintained until repair or a shutdown can be accomplished.	Examinee reads the note and proceeds.	N	
Cue:				
Comments:				
3. AOP 2571 Caution	Opening service water valves to TBCCW requires close monitoring of total service water header flow.	Examinee reads the note and proceeds.	N	
Cue:				
Comments:				
4. AOP 2571 Step 4.2a	IF an inadvertent SIAS actuation occurred, PERFORM the following as required: <ul style="list-style-type: none"> PLACE ALL charging pumps in Pull-To-Lock. (C-02) 	Examinee places handswitches for Charging Pumps P18A, P18B, P18C in Pull-To-Lock	Y	
Cue:				

Comments:				
5. AOP 2571 Step 4.2b	b. Refer To Attachment 1, "Temperature vs. Power Program," and ADJUST turbine load as necessary to maintain Tave on program.	Examinee refers to Attachment 1 and lowers turbine load as necessary in response to the inadvertent RCS boration to maintain temperature on program.	N	
Cue:				
Comments:				
6. AOP 2571 Step 4.2c	c. OVERRIDE SIAS start signals and STOP the boric acid pumps. (C-02) (Z2)	Examinee to override SIAS start signal and places control switches P19A and P19B to stop and observes red light out and green light lit for pumps BA PPA and BA PPB.	Y	
Cue:				
Comments:				
7. AOP 2571 Step 4.2d	d. Refer To Attachment 2, "Resetting ESFAS," Section 1.0, "Resetting SIAS, CIAS, and EBFAS," and ATTEMPT to reset SIAS.	Examinee refers to Attachment 2 Section 1	N	
Cue:				
Comments:				
8. Attach 1 Step 1.1	CHECK at least THREE of the following four annunciators reset: <ul style="list-style-type: none"> • "CTMT PRES HI A" (A-21, C-01) • "CTMT PRES HI B" (B-21, C-01) • "CTMT PRES HI C" (C-21, C-01) • "CTMT PRES HI D" (D-21, C-01) 	Examinee observes all annunciators reset.	N	

Cue:				
Comments:				
9. Attach 1 Step 1.2	CHECK pressurizer pressure greater than 1850 psia.	Examinee observes pressurizer pressure greater than 1850 psia.	N	
Cue:	Reply as the Unit Supervisor that the Technical Specifications have been logged.			
Comments:				
10. Attach 1 Step 1.3	PRESS "SIAS ACTUATION RESET" (Actuation Cabinet 5).	Examinee depresses "SIAS ACTUATION RESET".	Y	
Cue:				
Comments:	SIAS does NOT reset.			
11. Attach 1 Step 1.4	OBSERVE ALL of the following SIAS actuation module "TRIP" lights extinguished (Actuation Cabinet 5): S "SIAS GROUP 1 AM515" S "SIAS GROUP 2 AM514" S "SIAS GROUP 3 AM516" S "SIAS GROUP 4 AM517" S "SIAS GROUP 5 AM518" S "SIAS GROUP 6 AM519" S "SIAS GROUP 7 AM520" S "SIAS GROUP 8 AM521" S "SIAS GROUP 9 AM522" S "SIAS GROUP 10 AM523" S "SIAS GROUP 11 AM524" S "SIAS GROUP 12 AM525"	Examinee observes the SIAS does not reset.	Y	
Cue:				
Comments:	ALTERNATE PATH BEGINS HERE			
Comments:	The applicant MAY continue with Attachment 1 Steps 1.5 thru 1.19 to complete the section, but MUST return to Step 4.2d in the body of the procedure in order to implement contingency actions for the failure of SIAS to reset.			

12. AOP 2571 Step 4.2d.1 1)	IF SIAS signals cannot be reset, PERFORM the following: 1) Refer To Technical Specification 3.0.3.	Examinee informs shift supervisor to refer to Tech Spec 3.0.3	N	
Cue:				
Comments:				
13. AOP 2571 Step 4.2d.1 2)	OVERRIDE and OPEN the following valves as required: <ul style="list-style-type: none"> SW-3.2A, TBCCW heat exchanger SW inlet (Z2) SW-3.2B, TBCCW heat exchanger SW inlet (Z1) 	Examinee overrides and opens SW-3.2A and SW-3.2B and observes red indicating lights lit.	Y	
Cue:				
Comments:				
14. AOP 2571 Step 4.2d.1 3)	OVERRIDE and STOP the following: <ul style="list-style-type: none"> Running HPSI pumps Running LPSI pumps 	Examinee stops running HPSI and LPSI pumps.	Y	
Cue:				
Comments:				
15. AOP 2571 Step 4.2d.1 4)	CLOSE LPSI injection valves as required: <ul style="list-style-type: none"> SI-615, loop 1A (Z1) SI-625, loop 1B (Z1) SI-635, loop 2A (Z2) SI-645, loop 2B (Z2) 	The examinee closes valves <ul style="list-style-type: none"> SI-615, loop 1A (Z1) SI-625, loop 1B (Z1) SI-635, loop 2A (Z2) SI-645, loop 2B (Z2) 	Y	
Cue:				
Comments:				

JPM Number: S-2Rev. 0

16. AOP 2571 Step 4.2d.1 5)	IF manual control of RBCCW temperature becomes necessary, Refer To OP 2326C, "Off-Normal Service Water System Operations," for manual control of RBCCW header temperature.	Examinee reads step and continues.	N	
Cue:				
Comments:				
17. AOP 2571 Step 4.2d.1 6)	NOTIFY I&C department and GO To Step 4.4.	Examinee reads step and informs control room supervisor to notify I&C.	N	
Cue:	JPM is complete.			
Comments:				

Terminating Cue: When the above step is achieved, the JPM is complete.**STOP TIME:** _____

JPM Number: S-2

Rev. 0

VERIFICATION OF JPM COMPLETION

Title: Reset SIAS

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No X

Validated Time (minutes): _____

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	The plant is at 100% power. An inadvertent SIAS has occurred.
Initiating Cues:	The Unit Supervisor directs you to reset SIAS using AOP 2571, "Inadvertent ESFAS Actuation", Section 4.0.

JOB PERFORMANCE MEASURE

S-3

JPM Number: S-3

Rev. 0

JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2

JPM Number: S-1

Task Title: Perform Success Path HR-3, Once Through Cooling

System: Pressure Control System

Time Critical Task: Yes No **X**

Alternate Path: Yes **X** No

Validated Time (minutes):

Task No.(s): 171-300-05-01

K/A No. 010-000-A4.03 K/A Rating 4.0/3.8

Method of Testing:

Simulated Performance: Actual Performance: **X**

Location:

Classroom: Simulator: **X** In-Plant:

Task Standards: Examinee opens both PORVs by the contingency action of EOP 2540D, Functional Recovery of Heat Removal, Success Path HR-3, Once Through Cooling.

Required Materials EOP 2540D, Functional Recovery of Heat Removal Rev 021-01
(procedures, equipment):

General References: JPM based on Bank JPM 118

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (I.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	<ul style="list-style-type: none"> • Initialize at a normal 100% power IC • Enter ED08A & ED08B @ BT1 (Failure of 6.9 KV Bus Xfer on trip) • Enter FW20A, FW20B, & FW20C (AFP trips) • Enter RC02A @ .1% @ BT1 (#1 Hot leg LOCA) • Enter RC06A & RC06B @ 0% (PORVs failed closed) • Enter P02 (Spurious Rx trip) • Carry out all actions of EOP 2525, Standard Post Trip Actions • Place the simulator in freeze after both S/G wide range levels are at approximately 70 inches • When the examinee is on station and has stated that he/she is ready, place the simulator in run • During JPM step 6, enter RPR18 to remove high pressure trip modules for channels that examinee selects
Initial Conditions:	<ul style="list-style-type: none"> • The plant is undergoing a Loss of all Feedwater and a LOCA in containment. • The crew is in EOP 2540 Functional Recovery. • Steam Generator levels are approximately 70 inches. • SIAS, CIAS, & EBFAS have initiated.
Initiating Cues:	<ul style="list-style-type: none"> • You have been directed by the Unit Supervisor to perform EOP 2540D Functional Recovery of Heat Removal Success Path HR-3: Once Through Cooling. • Examiner will act as the Unit Supervisor.

START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1. EOP2540D Section 3.0	<p>NOTE</p> <p>Once-Through-Cooling should be initiated prior to steam generator wide range level reaching 70 inches, if ANY of the following exist:</p> <ol style="list-style-type: none"> 1. Main or auxiliary feedwater is <i>not</i> expected to be restored. 2. Less than TWO trains of HPSI, PORVs and ADVs are available. 3. At least one charging pump is <i>not</i> available. 	Examinee reads and acknowledges note.	N	
Cue:				
Comments:				
2. EOP2540D Section 3.0 Step 1.a-b	<p>IF steam generator level is not restoring AND ANY of the following conditions exists:</p> <ul style="list-style-type: none"> • At least one steam generator wide range level less than or equal to 70 inches • RCS TC rises uncontrollably by 5°F or more <p>ESTABLISH heat removal via once-through-cooling by performing ALL of the following:</p> <ol style="list-style-type: none"> ENSURE ALL proportional heaters are tripped. ENSURE ALL backup heaters in PULL TO LOCK. 	<ol style="list-style-type: none"> Examinee notes that all proportional heaters are tripped by observing only green lights lit. Examinee observes that all backup heaters are in PULL TO LOCK. 	N	
Cue:				

Comments:				
3 . EOP2540D Section 3.0 Step 1.c-i	(continued) c. IF the main condenser is available, OPEN ALL steam dump valves to greater than 50% open. d. Fully OPEN ALL ADVs. e. ENSURE that ALL RCPs are <input type="checkbox"/> stopped. f. ENSURE that SIAS is actuated. g. ENSURE that HPSI pumps have started. h. ENSURE that ALL HPSI loop injection valves are open. i. ENSURE that ALL available charging pumps are running.	Examinee: c. Observes that all steam dump valves to greater than 50% open. d. Observes that ADVs are fully open e. Observes that ALL RCPs are <input type="checkbox"/> stopped. f. Observes that SIAS is actuated. g. Observes that HPSI pumps have started. h. Observes that ALL HPSI loop injection valves are open. i. Observes that ALL available charging pumps are running.	N	
Cue:				
Comments:				
4 . EOP2540D Section 3.0 Step 1.j-k	(continued) j. ENSURE that BOTH PORV block valves are open k. OPEN BOTH PORVs (key #187)	j. Examinee checks red lights lit for PORV block valves. k. Examinee takes both PORV handswitches to OPEN and observes their failure to open by both green lights only still lit.	Y	
Cue:				
ALTERNATE PATH BEGINS HERE				
Comments: When examinee attempts to open each PORV, the valves will not open.				

5.	REPORT the failure of the PORVS to open.	Examinee informs the Unit Supervisor that both PORVs failed to open with their handswitches.	N	
Cue:	As the Unit Supervisor, acknowledge the report.			
Comments:				
6. EOP2540D Section 3.0 Step 1.k.1- 2	PERFORM the following to open PORVs: 1. POSITION the bypass key in one high pressure trip bistable and SELECT BYPASS position on RPS. 2. OPEN PORVs by pulling the high pressure trip bistable on the bypassed channel and on one other channel.	Examinee obtains the high pressure trip module bypass key. Examinee places the high pressure trip bypass key one channel's high pressure trip module bypass key slot and turns it to the right to bypass the trip module. Examinee states that he would pull that channel's high pressure trip module AND the high pressure trip module for another channel.	Y	
Cue:	If asked to provide which channels to bypass/pull trip bistables, ask examinee for a recommendation. Once examinee selected channels, inform him/her that the respective channel's high pressure trip bistables have been pulled.			
Comments:	Examinee cannot physically remove the modules in the simulator. The Simulator Instructor must enter RPR18 to disconnect Channel A and B high pressure trip modules. Physical removal of any trip unit from the RPS panels results in activation of all of that trip unit's functions. Removal of two high pressurizer pressure trip units would cause a Reactor trip and PORVs to open. Use of the trip unit bypass key to bypass one of the "pulled" trip units would permit open/close control of the PORVs. The trip inhibit relay K29 and the PORV trip relays K27, K1 are located in the RPS auxiliary logic drawers (4) and are activated by key number 6.			

JPM Number: S-3

Rev. 0

7. EOP2540D Section 3.0 Step 1.k.3	(continued) 3. OPERATE bypass key to open PORVs.	Examinee turns the bypass key that was inserted into the high pressure trip module bypass key slot in step 6. Examinee observes that both PORVs open by their red lights only lit	Y	
Cue:				
Comments:				

Terminating Cue: When the above step is achieved, the JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETIONTitle: Perform Success Path HR-3, Once Through Cooling

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No **X**

Validated Time (minutes): _____

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• The plant is undergoing a Loss of all Feedwater and a LOCA in containment.• The crew is in EOP 2540 Functional Recovery.• Steam Generator levels are approximately 70 inches.• SIAS, CIAS, & EBFAS have initiated.
Initiating Cues:	<ul style="list-style-type: none">• You have been directed by the Unit Supervisor to perform EOP 2540D Functional Recovery of Heat Removal Success Path HR-3: Once Through Cooling.• Examiner will act as the Unit Supervisor.

JOB PERFORMANCE MEASURE

CONTROL ROOM / IN-PLANT JPM
S-4

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Start 4th RCP

JPM Number: JPM-S4 Revision: 0/1

Initiated:

David Jacobs 08/05/11
Developer Date

Reviewed:

Tony Smith 08/10/11
Technical Reviewer Date

Approved:

Drew Rodgers 08/11/11
Supervisor, Nuclear Training Date

SUMMARY OF CHANGES

A/I & DATE	DESCRIPTION	REV/CHANGE
10/27/2005	Developed this new JPM	0/0
08/05/2011	Update for LOIT Audit Exam	0/1

JPM WORKSHEET

Facility: MP-2

Examinee: _____

JPM Number: JPM-S4

Revision: 0/1

Task Title: Start 4th RCP

System: Reactor Coolant System

Time Critical Task: () YES (X) NO

Validated Time (minutes): 20

Task Number(s): NUTIMS # 003 01 031

Applicable To: SRO X RO X PEO

K/A Number: 003 A2.02 K/A Rating: 3.7/3.9

Method of Testing: Simulated Performance: _____ Actual Performance: X

Location: Classroom: _____ Simulator: X In-Plant: _____

Task Standards: The examinee will start the RCP, monitor critical RCP parameters including alarms and secure the RCP per OP 2301C and/or ARP 2590B-179.

Required Materials:
(procedures, equipment, etc.)

- OP 2301C, rev. 019-07 “Reactor Coolant Pump Operations for Starting and Stopping RCP marked up to Step 4.5.12.
- ARP 2590B-179, rev. 000-01 “RCP D UPR OIL RSVR LEVEL LO” C02/03 BA-31

General References:

- OP 2301C, rev. 019-07 “Reactor Coolant Pump Operations for Starting and Stopping RCP
- ARP 2590B-179, rev. 000-01 “RCP D UPR OIL RSVR LEVEL LO” C02/03 BA-19
- OP 2201 “Plant Heat Up”

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: JPM-S4

Revision : 0/1

Initiating Cues: The US has directed you to start the 'D' RCP.

Initial Conditions: A plant heat-up is in progress following an outage for unplanned maintenance.

- The RCS is at normal pressure and Tc is > 500°F.
- Three RCPs are running.
- All parameters for the 'D' RCP are normal for this condition.
- OP-2301C, section 4.5 is complete up to step 4.5.12.

Simulator Requirements: Initialize at zero power, ARI. (IC-15) then trip rods.

- Secure the 'D' RCP.
- Cool RCS to ~ 505 °F.
- Ensure plant is stable.
- Insert Malfunction "RC12D @ 20%"

***** NOTES TO TASK PERFORMANCE EVALUATOR *****

1. Critical steps for this JPM are indicated by checking "Y". For the student to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the student states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question student for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the student be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: JPM-S4 Revision: 0/1

Task Title: Start 4th RCP

START TIME: _____

STEP # 1	Performance: NOTE When starting RCPs at low RCS pressure conditions (265 to 1,700 psia), RCP bleedoff flow low alarms may <i>not</i> clear due to insufficient bleedoff flow. As RCS pressure increases, bleedoff flow increases and alarm should clear at approximately 1,700 psia.	Standard: Examinee reads the NOTE and determines the NOTE is Not Applicable.	Critical: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	Grade S <input type="checkbox"/> U <input type="checkbox"/>
	Cue:			
	Comments:			
STEP # 2 4.5. 12	Performance: 12. IF RCS pressure is greater than 1700 psia, PERFORM the following: • CHECK, "RCP D BLEEDOFF FLOW LO" annunciator (CA-29) <i>not</i> lit (C-02/3). • OBSERVE controlled bleedoff flow on PPC or PR-150B (C-04R) between 0.75 and 2 gpm.	Standard: Examinee displays and monitors "D" RCP bleedoff flow on the PPC, or on C-04R.	Critical: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	Grade S <input type="checkbox"/> U <input type="checkbox"/>
	Cue:			
	Comments:			
STEP # 3 4.5. 13	Performance: 13. PLACE "RCP-D LIFT PPS, P-51D/53D" switch to "START"(C-03).	Standard: Examinee places the 'D' RCP Lift Pp switch to start and observes the red light lit.	Critical: Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Grade S <input type="checkbox"/> U <input type="checkbox"/>
	Cue:			
	Comments:			

STEP #4 4.5.14	Performance: 14. ENSURE annunciator AB-30 "RCP D ANTIREV ROT FLOW LO," clear, indicating bearing oil lift pump operation (C-03).	Standard: Examinee reviews the Board Alarms and Verifies C02/03 AB-18 is not lit.	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments:			
STEP #5 4.5.15	Performance: 15. WHEN the bearing oil lift pumps have run for at least two minutes, PLACE "RCP-D, P-40D" switch to "START" (C-03).	Standard: Examinee places the 'D' RCP switch on C-03 to the start position and observes Red Light Lit.	Critical: Y [X] N []	Grade S [] U []
	Cue: When the examinee indicates that the lift pp. must run for 2 minutes, inform the examinee that 2 minutes have lapsed			
	Comments:			
STEP #6 4.5.16	Performance: 16. OBSERVE RCP amp meter as RCP starts and VERIFY the following: a) Meter deflects to full scale high when pump switch turned to start (C-03). b) Meter decays to running current, between 450 and 600 amps depending on RCS temperature, as RCP accelerates to operating speed (about 20 seconds) (C-03).	Standard: Examinee observes the 'D' RCP amp meter pegs high and decays off on C-03.	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments:			

STEP #7 4.5.17	Performance: 17. WHEN RCP is above 90% speed [“RCP LO SPEED TRIP CH D” annunciator (BB-4, on C-04) <i>not</i> lit], PLACE “RCP-D LIFT PPS, P- 51D/53D” to “AUTO” (C-03).	Standard: When annunciator C-04 BB-4 is not lit, examinee places the ‘D’ RCP Lift Pp. switch on C-03 to OFF.	Critical: Y [X] N []	Grade S [] U []
	Cue:			
	Comments:			
STEP #8 4.5.18	Performance: 18. IF less than four RCPs are running, CHECK the following for idle RCPs (PPC)	Standard: Examinee reads the step and determines the step is NA since 4 RCPs are running.	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments:			
STEP #9 4.5.19	Performance: 18. IF seal cavity OR bleedoff temperature limits are reached, PERFORM the following:	Standard: Examinee reads step and determines step is NA	Critical: Y [] N [X]	Grade S [] U []
	Cue: Insert Malfunction “RC12D @ 20%”			
	Comments:			
STEP #10	Performance: Annunciator C-03 BA31 energizes.	Standard: Examinee observes annunciator C-03 BA31 energizes informs the US and refers to or recommends that the ARP 2590B-179 be referred to.	Critical: Y [X] N []	Grade S [] U []
	Cue: Acknowledge the recommendation and direct the examinee to implement the ARP 2590B-179.			
	Comments:			

STEP #11 ARP step 1	Performance: 1. Check 'D' RCP upper reservoir oil level indication and determine rate of level decrease (C-04R or PPC) (normal range, 75 to 85%).	Standard: Examinee displays the "RCP D Motor Data" display on the PPC and monitors <ul style="list-style-type: none"> "L156" (Upper Reservoir Level). calculates the rate of level decrease or <ul style="list-style-type: none"> "L156" on C-04R calculates the rate of level decrease 	Critical: Y [X] N []	Grade S [] U []
	Cue:			
	Comments:			
STEP #12 ARP step 2	Performance: 2. MONITOR "D" RCP bearing temperatures and oil levels (C-04R or PPC).	Standard: The examinee monitors "D" RCP bearing temperatures and oil level by: <ul style="list-style-type: none"> Displaying the "RCP D Motor Data" display on the PPC or <ul style="list-style-type: none"> Monitoring parameters on C-04R 	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments:			
STEP #12 ARP step 3	Performance: 3. IF oil level is rapidly lowering AND bearing temperature is increasing, PERFORM the following: <ul style="list-style-type: none"> TRIP reactor and turbine. STOP "D" RCP. Refer To EOP 2525, "Standard Post Trip Actions" and PERFORM required actions. 	Standard: Examinee recommends securing the "D" RCP.	Critical: Y [X] N []	Grade S [] U []
	Cue:			
	Comments:			

Cue:
Acknowledge the recommendation and direct securing the "D" RCP
Comments:
Tripping the Rx and Turbine is not applicable to plant conditions

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: JPM-S4

Revision: 0/1

Date Performed: _____

Student: _____

Evaluator: _____

For the student to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.

If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No X

Validated Time (minutes): 20

Actual Time to Complete (minutes): _____

JPM Work Practice Evaluation*: SAT UNSAT N/A

Overall Result of JPM: SAT UNSAT

* Pass/Fail criteria for the Work Practice portion of the JPM is that the trainee must 1) Perform the task correctly and IAW procedure use and adherence requirements, 2) Never put anyone's safety at risk, 3) Never put equipment reliability at risk, 4) Never violate radiological work practices, 5) Demonstrate effective use of event-free human performance tools. If a failure occurs, indicate why the failure occurred and which of these 5 task performance criteria contributed to the failure.

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: JPM-S4 Revision: 0/1

Initiating Cues: The US has directed you to start the 'D' RCP.

Initial Conditions: A plant heat-up is in progress following an outage for unplanned maintenance.

- The RCS is at normal pressure and Tc is $> 500^{\circ}\text{F}$.
- Three RCPs are running.
- All parameters for the 'D' RCP are normal for this condition.
- OP-2301C, section 4.5 is complete up to step 4.5.12.

JOB PERFORMANCE MEASURE

CONTROL ROOM / IN-PLANT JPM
S-5

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Shifting Containment Air Recirculation and Cooling Units

JPM Number: JPM-S5 Revision: 0/1

Initiated:

<u>David Jacobs</u>	<u>08/05/11</u>
Developer	Date

Reviewed:

<u>Tony Smith</u>	<u>08/10/11</u>
Technical Reviewer	Date

Approved:

<u>Drew Rodgers</u>	<u>08/11/11</u>
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

A/I & DATE	DESCRIPTION	REV/CHANGE
10/27/2005	Developed this new JPM	0/0
08/05/2011	Update for LOIT Audit Exam	0/1

JPM WORKSHEET

Facility: MP-2 Examinee: _____

JPM Number: JPM-S5 Revision: 0/1

Task Title: Shifting Containment Air Recirculation and Cooling Units

System: Containment Cooling System

Time Critical Task: () YES (X) NO

Validated Time (minutes): 15

Task Number(s): NUTIMS # 022 01 117

Applicable To: SRO X RO X PEO

K/A Number: 022 A4.01 K/A Rating: 3.6/3.6

Method of Testing: Simulated Performance: Actual Performance: X

Location: Classroom: Simulator: X In-Plant:

Task Standards: The examinee will stop and restart an OPERABLE CAR fan.

Required Materials: (procedures, equipment, etc.)

- OP 2313A, rev. 009-06 “Containment Air Recirculation and Cooling System”.
- ARP 2590A-012, rev. 000-01 “CTMT AIR RECIRC FAN D TRIP”

General References:

- OP 2313A, rev. 009-06 “Containment Air Recirculation and Cooling System”.
- ARP 2590A-012, rev. 000-01 “CTMT AIR RECIRC FAN D TRIP” C02/03 D-3
- OP 2330A, rev. “Reactor Building Closed Cooling Water”
- MP-14-OPS-GDL02, rev. Operations Standards

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: _____

JPM-S5

Revision : 0/1

Initiating Cues:

The US has directed you to align CAR fans such that "A", "C", and "D" are operating in fast speed and "B" CAR fan is secured.

Initial Conditions:

The plant is operating at 100% power.

- "A", "B", and "C" CAR fans are operating.
- Electrical PMs are scheduled on the breaker for the "B" CAR fan.

Simulator Requirements:

Initialize at any 100% power IC with "A", "B" and "C" CAR fans operating.

- RBCCW may or may not be aligned to "D" CAR fan.
- Ensure RBCCW header flows within normal range (6000gpm).
- Insert malfunction CH01D on BT39 to cause the "D" CAR Fan to trip when started.

***** NOTES TO TASK PERFORMANCE EVALUATOR *****

1. Critical steps for this JPM are indicated by checking "Y". For the student to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the student states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question student for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the student be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: JPM-S5 Revision: 0/1

Task Title: Shifting Containment Air Recirculation and Cooling

START TIME: _____

STEP # 1 4.2.5	Performance: IF stopping "B" CAR fan, PERFORM the following (C-01): PLACE "B" CAR fan to "STOP" and HOLD for approximately two seconds. WHEN two seconds elapse, RELEASE "B" CAR fan switch.	Standard: Examinee places "B" CAR fan to STOP, holds for two seconds and releases	Critical: Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	Grade S <input type="checkbox"/> U <input type="checkbox"/>
	Cue: Comments: The examinee must realize that 4 CAR fans may not be operated in fast speed simultaneously and must first stop "B" CAR fan. Starting a fourth CAR fan in fast constitutes failure of this JPM.			
STEP # 2 4.2.6	Performance: IF isolating RBCCW flow to 35B "B CAR COOLER," PERFORM the following (C-01) CLOSE RB-28.3B, "EMERG OUTLET" OBTAIN key and CLOSE RB-28.1B, "CLR B INLET." CLOSE RB-28.2B, "NORM OUTLET." MONITOR RBCCW System flow and pressure (C-06, PPC)	Standard: Examinee may NOT opt to close the above listed valves; however, if examinee closes the outlet valves, in order to pass this step, he/she should realize that RBCCW flows need to be adjusted and that he/she must monitor RBCCW header flow and pressure.	Critical: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	Grade S <input type="checkbox"/> U <input type="checkbox"/>
	Cue: If the listed valves are closed, question examinee on how flows would be adjusted.			
	Comments: Based on the reason for shifting CAR fans and the NOTE associated with this step, closing these valves is NOT necessary. If these valves are closed, flow should be adjusted to other components such as SFPC or other CAR fan if possible, to prevent exceeding a maximum pump discharge pressure of 140 psig or a low flow rate of 4000 gpm (prevent lifting relief valves).			

STEP # 3 4.4.2 a	Performance: IF starting "D" CAR fan in fast speed, PERFORM the following:	Standard: Examinee observes only red lights lit for RB-28.2D and RB-28.3D and flow indication on C-01.	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments: Both normal and emergency outlet valves are normally open during operations.			
STEP #4 4.4.2b	Performance: ENSURE RB-28.1D, "CLR D INLET," locked open (C-01)	Standard: Examinee observes only red light lit for RB-28.1D (C-01).	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments: The CAR Cooler Inlet Valves are normally open during operations.			
STEP #5 4.4.2c	Performance: Check "B" RBCCW header flow less than 8,000 gpm (C-06, PPC)	Standard: Examinee observes "B" RBCCW header flow on C-06 or PPC less than 8,000 gpm..	Critical: Y [X] N []	Grade S [] U []
	Cue:			
	Comments:			
STEP #6 4.4.2d	Performance: PLACE "D" CAR fan to "START HIGH" and observe red "FAST SPEED" indicating light lit (C-01)	Standard: Examinee places the handswitch for the "D" CAR fan to "START HIGH" and observes the associated "fast speed" red light is only momentarily lit. The examinee observes the CTMT AIR RECIRC FAN D TRIP and the CTMT AIT RECIRC FAN D VIBRATION HI annunciators on C-01.	Critical: Y [X] N []	Grade S [] U []
	Cue:			
	Comments: Attempting to start the fan in "slow" will not constitute failure of this JPM.			

The examinee may or may not reset the CTMT AIR RECIRC FAN D VIBRATION HI annunciator MP-14-OPS-GDL02, Attachment 2 states, "To protect the plant or prevent a plant transient, the SM is authorized to reset any tripped device without knowing the cause." The loss of the "D" CAR fan is NOT an immediate concern.				
STEP #7	Performance: Obtain Annunciator Response Procedure for annunciator D-3 on C-01 and asks the US/SM to restart the "B" CAR fan	Standard: Examinee obtains ARP 2590A-012, CTMT AIR RECIRC FAN D and asks the US/SM to restart the "B" CAR fan	Critical: Y [X] N []	Grade S [] U []
	Cue: If the examinee does NOT ask the US/SM to restart the "B" CAR fan, then ask the examinee for a recommendation on what to do with the CAR system.			
	Comments: The examinee may or may NOT reset the CTMT AIR RECIRC FAN D VIBRATION HIGH annunciator Failure to ask the US/SM for permission to restart the "B" CAR fan does NOT constitute failure of this JPM.			
STEP #8 4.2.2a	Performance: IF starting "B" CAR fan in fast speed, PERFORM the following: ENSURE the following open (C-01) RB-28.2B, "NORM OUTLET" RB-28.3B, "EMERG OUTLET"	Standard: Examinee observes red only lights lit for RB-28.2B and 28.3B.	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments: Both normal and emergency outlet valves are normally open during operations.			
STEP #9 4.2.2b	Performance: ENSURE RB-28.1B, "CLR B INLET" locked open (C-01).	Standard: Examinee observes red only light lit for RB-28.1B	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments: The CAR Cooler Inlet Valves are normally open during operations.			

STEP #10 4.2.2c	Performance: Check "B" RBCCW header flow less than 8,000 gpm (C-06, PPC).	Standard: Examinee observes "B" RBCCW header flow less than 8,000 gpm.	Critical: Y [X] N []	Grade S [] U []
	Cue:			
	Comments:			
STEP #11 4.2.2d	Performance: PLACE "B" CAR fan to "START HIGH" and OBSERVE red "FAST SPEED" indicating light, lit (C-01)	Standard: Examinee places the handswitch to "START HIGH" and observes the associated "fast spee" red light is lit. Examinee observes the starting and running currents on the ammeter for the "B" CAR fan.	Critical: Y [X] N []	Grade S [] U []
	Cue:			
	Comments: Attempting to start the fan in "slow" will not constitute failure of this JPM provided the fan is placed in "fast" prior to completion of the JPM. Failure to observe the ammenter does NOT constitute failure of this JPM.			
STEP #12 4.2.2e	Performance: IF "B" CAR fan high vibration alarm annunciates, PRES "CAR FAN VIB RESET B & D" button (C-01)	Standard: The examinee depresses the "CAR FAN VIB RESET B & D" pushbutton on C-01 and observes annunciator clearing on C-01.	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments: JPM complete			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: JPM-S4

Revision: 0/1

Date Performed: _____

Student: _____

Evaluator: _____

For the student to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.

If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes No **X**

Validated Time (minutes): 20

Actual Time to Complete (minutes):

JPM Work Practice Evaluation*:	SAT	UNSAT	N/A
--------------------------------	-----	-------	-----

Overall Result of JPM:	SAT	UNSAT
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* Pass/Fail criteria for the Work Practice portion of the JPM is that the trainee must 1) Perform the task correctly and IAW procedure use and adherence requirements, 2) Never put anyone's safety at risk, 3) Never put equipment reliability at risk, 4) Never violate radiological work practices, 5) Demonstrate effective use of event-free human performance tools. If a failure occurs, indicate why the failure occurred and which of these 5 task performance criteria contributed to the failure.

Areas for Improvement / Comments:

[illegible]

STUDENT HANDOUT

JPM Number: JPM-S5 Revision: 0/1

Initiating Cues: The US has directed you to align CAR fans such that “A”, “C”, and “D” are operating in fast speed and “B” CAR fan is secured.

Initial Conditions: Initialize at any 100% power IC with “A”, “B”, and “C” CAR fans operating.

- RBCCW may or may not be aligned to “D” CAR fan.
- Ensure RBCCW header flows within normal range (6000gpm).
- Insert malfunction CH01D on BT39 to cause the “D” CAR fan to trip when started.

JOB PERFORMANCE MEASURE

CONTROL ROOM / IN-PLANT JPM

S-6

JPM Number: S-6

Rev. 0

JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2

JPM Number: S-6

Task Title: Cross-Tie 480 Volt Busses

System: AC Electrical Distribution System

Time Critical Task: Yes No **X**

Alternate Path: Yes No **X**

Validated Time (minutes): 10

Task No.(s): NUTIMS 062-01-394

K/A No. 062-A4.01 K/A Rating 3.3/3.1

Method of Testing:

Simulated Performance: Actual Performance: **X**

Location:

Classroom: Simulator: **X** In-Plant:

Task Standards: At the completion of this JPM, the examinee has cross-tied 480 Volt busses 22A and 22B with 22B supplying bus 22A.

Required Materials OP 2344A, 480 Volt Load Centers. Rev 023-06
(procedures, equipment):

General References:

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	<ul style="list-style-type: none"> • Initialize to a Mode 4 IC. • Place Group 1 and Group 2 Pressurizer Backup Heaters in Pull to Lock and yellow tag them. • Ensure B and C TBCCW pumps running, A TBCCW pump in NUETRAL/NORMAL AFTER TRIP. Yellow tag on both the A and B TBCCW pump hand switches with the following information, "480V Buses 22A and 22B are cross-tied. Refer to OP2344A, step 4.13.1, prior to starting pump." • Place the simulator in run.
Initial Conditions:	<ul style="list-style-type: none"> • The plant is in MODE 4. • Group 1 and Group 2 Pressurizer Backup Heaters are in Pull to Lock and tagged. • A and B TBCCW pumps are yellow tagged.
Initiating Cues:	<ul style="list-style-type: none"> • You have been directed by the Unit Supervisor to cross-tie 480 volt busses, 22A and 22B per OP 2344A, 480 Volt Load Centers, in preparation for tagging and replacement of Bus 22A Transformer.

START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1. OP2344A	CAUTION Current great than 1800 amps on 480 volt bus 22A exceeds the ratings of the 4160/480 volt transformer	Examinee reads and acknowledges the caution.	N	
Cue:				
Comments:				
2. OP2344A Step 4.13.1	To avoid exceeding 1800 amp transformer limit, PERFORM the following: <ul style="list-style-type: none"> PLACE associated pressurizer backup heaters, (Group 1 and Group 2), in PULL TO LOCK and TAG. CONFIGURE TBCCW pumps as necessary so A and B pumps are not both running. Yellow TAG A and B TBCCW pump hand witches with the following information: ""480V Buses 22A and 22B are cross-tied. Refer to OP2344A, step 4.13.1, prior to starting pump." 	Examinee marks step complete.	N	
Cue:				
Comments:	This step was covered in the Initial Conditions.			
3. OP2344A Step 4.13.2	IF Bus 22A will be supplying Bus 22B, PLACE SYN SEL SW 22A/22B in CL TIE/TRIP B. (C-08)	Examinee marks this step "N/A."	N	
Cue:				
Comments:	The request is for the 22A transformer to be removed from service, therefore, 22B will be supplying 22A.			

4. OP2344A Step 4.13.3	IF Bus 22B will be supplying Bus 22A, PLACE SYN SEL SW 22A/22B in CL TIE/TRIP A. (C-08)	Examinee places SYN SEL SW 22A/22B in CL TIE/TRIP A.	Y	
Cue:				
Comments:				
5. OP2344A Step 4.13.4	ENSURE Bus voltages are matched.	Examinee should ensure bus voltages matched using "Incoming" and "Running" meters and/or using C-08 22A and 22B Volt Meters.	N	
Cue:	Incoming and running voltages maybe differ slightly. If the examinee identifies this difference, state that voltages are matched sufficient to cross-tie.			
Comments:				
6. OP2344A Step 4.13.5	Using B0111, 22A/22B TIE BKR, 22A-1T2, breaker control switch, CLOSE B0111. (C-08)	Examinee closes 22A/22B TIE BKR, 22A-1T-2 (B0111) by taking its hand-switch to CLOSE.	Y	
Cue:				
Comments:				
7. OP2344A Step 4.13.6	ENSURE B0111, 22A/22B TIE BKR, 22A-1T-2, has closed and the applicable supply breaker has opened.	Examinee observes 22A/22B TIE BKR, 22A-1T-2 (B0111) red light only lit and then observes that 22A SPLY BKR, 24A1-1X3-2 (B0102) is open by its green light only lit.	N	
Cue:				
Comments:				

8. OP2344A Step 4.13.7	TURN SYN SEL SW 22A/22B to OFF (C-08)	Examinee places the SYN SEL SW 22A/22B to OFF.	N	
Cue:				
Comments:				
9. OP2344A Step 4.13.8	IF current on 480 volt supply bus greater than 1800 amps, OPEN B0111, 22A/22B TIE BKR, 22A-1T-2.	Examinee observes Bus 22B ammeter on C-08 and verifies amps <1800. This step should be "N/A."	N	
Cue:				
Comments:				
10. OP2344A	CAUTION Current greater than 1600 amps indicated on 22A-1T-2 AMMETER PHASE B (local, above B0111 cubicle) exceeds the rating of the cross-tie breaker	The examinee reads and acknowledges the caution.	N	
Cue:				
Comments:				
11. OP2344A Step 4.13.9	IF current on 480 volt supply bus is greater than 1600 amps (C-08), CHECK current, as indicated on 22A-1T-2 AMMETER PHASE B (local above B0111 cubicle) less than 1600 amps.	Examinee observes Bus 22B ammeter on C-08 and verifies amps <1600. This step should be "N/A."	N	
Cue:				
Comments:				
12. OP2344A Step 4.13.10	IF current indicated on 22A-1T-2 AMMETER PHASE B is greater than 1600 amps, OPEN B0111, 22A/22B TIE BKR, 22A-1T-2. (C-08)	Examinee marks this step "N/A."	N	
Cue:				

Comments:				
13. OP2344A Step 4.13.11	To reduce wear on the off-service load center transformer, PERFORM one of the following: (C-08) a. IF Bus 22A is supplying Bus 22B, OPEN A204, 24B/22B FDR BKR 24B4-2. b. IF Bus 22B is supplying Bus 22A, OPEN A103, 24A/22A FDR BKR 24A1-2.	Step 4.13.11.a should be "N/A." Examinee determines that Bus 22B is supplying Bus 22A and takes switch A103, 24A/22A FDR BKR 24A1-2 to the Trip position and verifies the green light only lit and red light out.	N	
Cue:				
Comments:				
14. OP2344A Step 4.13.12	To match breaker indication flags with actual breaker position, PERFORM the following: (C-08) a. IF Bus 22A is supplying Bus 22B, PLACE B0209, 22B SPLY BKR 24B4-1X3-2, in TRIP and allow to spring return to NEUTRAL. b. IF Bus 22B is supplying Bus 22A, PLACE B0102, 22A SPLY BKR 24A1-1X3-2, in TRIP and allow to spring return to NEUTRAL.	Step 4.13.12.a is "N/A." Examinee determines that Bus 22B is supplying Bus 22A and takes switch B0102, 22A SPLY BKR 24A1-1X3-2, to the Trip position and allows switch to spring return to Neutral. Examinee verifies the green light only lit and red light out and the breaker flag is green.	N	
Cue:				
Comments:				

Terminating Cue: When the above step is achieved, the JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETIONTitle: Cross-Tie 480 Volt Busses

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No **X**Validated Time (minutes): 10

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• The plant is in MODE 4.• Group 1 and Group 2 Pressurizer Backup Heaters are in Pull to Lock and tagged.• A and B TBCCW pumps are yellow tagged.
Initiating Cues:	<ul style="list-style-type: none">• You have been directed by the Unit Supervisor to cross-tie 480 volt busses, 22A and 22B per OP 2344A, 480 Volt Load Centers, in preparation for tagging and replacement of Bus 22A Transformer.

JOB PERFORMANCE MEASURE

CONTROL ROOM / IN-PLANT JPM

S-7

JPM Number: S-7

Rev. 0

JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2

JPM Number: S-7

Task Title: Change the Setpoint of the SJAE Radiation Monitor RM-5099

System: Radiation Monitoring

Time Critical Task: Yes ☐ No ☒

Alternate Path: Yes ☐ No ☐

Validated Time (minutes): 15

Task No.(s): NUTIMS # 073-01-050

K/A No. 071 A4.25 K/A Rating 3.2/3.2

Method of Testing:

Simulated Performance: ☐ Actual Performance: ☒

Location:

Classroom: ☐ Simulator: ☒ In-Plant: ☐

Task Standards: At the completion of this JPM, the examinee has adjusted the setpoint of the Steam Jet Air Ejector (SJAE) Radiation Monitor as specified in the attached SP2833-007, SJAE Radiation Monitor RM-5099 & PPC Alarm Setpoint Change Request and verified new alarm setpoint.

Required Materials
(procedures, equipment): SP 2833-007, SJAE Radiation Monitor RM-5099 & PPC Alarm Setpoint Change Request
OP2383C "Radiation Monitor Alarm Setpoint Control, Rev. 014-02

General References: JPM based on Bank JPM 120

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	<ul style="list-style-type: none">• Initialize at any 100% power Mode 1 IC.• Ensure the Steam Generator Blowdown Radiation Monitor is in service• Ensure REMOTE, RMR37A is selected to RI5099 RIT5099 ALARM SP CNTL (FROM PNL)
Initial Conditions:	<ul style="list-style-type: none">• The plant is in MODE 1, at approximately 100% power and stable• Steam Generator Radiation Monitor, RM-4262 is in service.• Chemistry has provided an approved SJAE Radiation Monitor Setpoint Change Request, SP 2833-007
Initiating Cues:	<ul style="list-style-type: none">• You have been directed by the Unit Supervisor to change the setpoint of the SJAE Radiation Monitor, RM-5099• Another operator will change PPC setpoints.

START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1. OP2383C 4.1.1	Adjusting Set points on SJAE Radiation Monitor, RM-5099 Module and PPC: IF new setpoint requested by chemistry is equal to the current setpoint, Go To step 4.1.16.	Examinee reads step and determines step Not Applicable.	N	
Cue:				
Comments:				
2. OP2383C 4.1.2	OBTAIN keys for the following (Operations key locker): <ul style="list-style-type: none"> RI-5099 NORM/SUPV. switch on RC-14D (key 21, 189 or 302) RADMONITOR BYPASS, HS 5099E switch on RC-14A (key 79) 	The examinee retrieves the two keys from the key locker by C-21 and takes them around to RC-14.	Y	
Cue:				
Comments:				
3. OP2383C 4.1.3	IF RM-4262 is out of service and RM-5099 is to be taken out of service, Refer To REMODCM IV.C.1 and DETERMINE applicability.	Examinee reads and determines step Not Applicable.	N	
Cue:				
Comments:				
4. OP2383C	NOTE RADMONITOR BYPASS, HS 5099E switch should be placed to BOTH OUT if RM-4262 is also out.	Examinee reads NOTE and determines note Not Applicable.	N	
Cue:				
Comments:				

5. OP2383C 4.1.4	Position RADMONITOR BYPASS, HS-5099E switch as follows: a. IF RM-4262 is in service, PLACE HS-5099E in RM-5099 OUT. b. IF RM-4262 is out of service, PLACE HS-5099E in BOTH OUT.	Examinee inserts key and determines RM-4262 is in service and places HS-5099E to RM-5099 OUT	Y	
Cue:				
Comments:				
6. OP2383C 4.1.5	PLACE RI-5099 NORM/SUPV. switch to SUPV.	The examinee inserts the key into the NORM/SUPV. switch and selects SUPV.	Y	
Cue:				
Comments:				
7. OP2383C	NOTE Fail alarm for SJAE radiation monitor, RM-5099, is a fixed value of 5 seconds with <i>no</i> counts input. <i>Alert</i> setpoint function is not used.	Examinee reads and acknowledges NOTE.	N	
Cue:				
Comments:				

8. OP2383C 4.1.6.a-f	<p>Using Concurrent Verification, Refer To SP 2833-007, "SJAE Radiation Monitor RM 5099 & PPC Alarm Setpoint Change Request," and ENTER new alarm setpoint as follows:</p> <ol style="list-style-type: none"> PRESS "CH 1." PRESS "0," "0," "9." PRESS "ITEM." ENTER new value using scientific notation. <i>Example, If new setpoint is to be 500:</i> press "5" "0" "0" press "+" press "0" "2" PRESS "ENTER." PRESS "CH. 1." 	At RC-14D, the examinee performs the following steps on the RM-5099 insert. <ol style="list-style-type: none"> PRESS "CH 1." PRESS "0," "0," "9." PRESS "ITEM." ENTERS "1" "7" "5" PRESS "+" ENTERS "0" "3" PRESS "ENTER" PRESS "CH.1" 	Y	
Cue:				
Comments:				
9. OP2383C	<p>NOTE</p> <p>During checksource, LED channel activity does <i>not</i> change.</p>	Examinee reads and acknowledges note.	N	
Cue:				
Comments:				
10. OP2383C Step 4.1.7	PRESS C/S button and CHECK button is lit.	Examinee presses C/S button and checks button is lit.	N	
Cue:				
Comments:				

11. OP2383C Step 4.1.8	WHEN 1 minute has elapsed, CHECK the following: <ul style="list-style-type: none"> • C/S light is <i>not</i> lit • LED channel activity resumes • CH 1 light is lit 	Examinee waits one minute and then checks the following: <ul style="list-style-type: none"> • C/S light is <i>not</i> lit • LED channel activity resumes • CH 1 light is lit 	N	
Cue:				
Comments:				
12. OP2383C Step 4.1.9	IF CH 1 light is <i>not</i> lit and ERROR light is lit, NOTIFY I&C Department.	Examinee observes CH1 light is lit and/or no ERROR light is lit and marks this step N/A	N	
Cue:				
Comments:				
13. OP2383C Step 4.1.10	PERFORM the following to verify <i>alarm</i> setpoint: <ol style="list-style-type: none"> a. PRESS "CH 1." b. ENTER item number "0," "0," "9." c. PRESS "ITEM." d. PRESS "CH. 1." 	Examinee verifies alarm setpoint: <ol style="list-style-type: none"> a. PRESS "CH 1." b. ENTER item number "0," "0," "9." c. PRESS "ITEM." d. PRESS "CH. 1." 	Y	
Cue:				
Comments:				

Terminating Cue: When the above step is achieved, the JPM is complete.

STOP TIME: _____

JPM Number: S-7

Rev. 0

VERIFICATION OF JPM COMPLETION

Title: Change the Setpoint of the SJAE Radiation Monitor RM-5099

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No **X**

Validated Time (minutes): 15

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• The plant is in MODE 1, at approximately 100% power and stable• Steam Generator Radiation Monitor, RM-4262 is in service.• Chemistry has provided an approved SJAE Radiation Monitor Setpoint Change Request, SP 2833-007
Initiating Cues:	<ul style="list-style-type: none">• You have been directed by the Unit Supervisor to change the setpoint of the SJAE Radiation Monitor, RM-5099• Another operator will change PPC setpoints.

JOB PERFORMANCE MEASURE

CONTROL ROOM / IN-PLANT JPM
S-8

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Restore Spent Fuel Pool Cooling

JPM Number: JPM-S8 Revision: 0/1

Initiated:

Joyce Tomlinson 04/05/14
Developer Date

Reviewed:

Technical Reviewer Date

Approved:

Supervisor, Nuclear Training Date

SUMMARY OF CHANGES

A/I & DATE	DESCRIPTION	REV/CHANGE
10/27/2005	Developed this new JPM	0/0
08/05/2011	Update for LOIT Audit Exam	0/1

JPM WORKSHEET

Facility: MP-2 Examinee: _____

JPM Number: JPM-S8 Revision: 0/1

Task Title: Restore Spent Fuel Pool Cooling

System: Plant Service System

Time Critical Task: () YES () NO

Validated Time (minutes): _____

Task Number(s): _____

Applicable To: SRO X RO X PEO

K/A Number: 033 A2.02 K/A Rating: 2.7/ 3.0

Method of Testing: Simulated Performance: _____ Actual Performance: X

Location: Classroom: Simulator: X In-Plant: _____

Task Standards: The examinee will start the

Required Materials: • EOP 2541, rev. 000-01 Appendix 42“Restoring Spent Fuel Pool Cooling”.
(procedures, equipment, etc.) • EOP 2532, rev. 030-00, “Millstone Unit 2 Loss of Coolant Accident”
 • OPS Form 2305-1, “Spent Fuel Pool Cooling”

General References:

- EOP 2541, rev. 000-01 Appendix 42“Restoring Spent Fuel Pool Cooling”.

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: JPM-S8

Revision : 0/1

Initiating Cues: The US has directed you to restore fuel pool cooling in accordance with EOP 2532 beginning at step 55.

Initial Conditions: A Loss of Coolant Accident is in progress.

- EOP-2532 is completed through step 54.
- OPS Form 2305-1 complete
- CRS instructs using SFP pump "A" to restore SFPC

Simulator Requirements:

******* NOTES TO TASK PERFORMANCE EVALUATOR *******

1. Critical steps for this JPM are indicated by checking "Y". For the student to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the student states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question student for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the student be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: JPM-S8 Revision: 0/1

Task Title: Restore Spent Fuel Pool Cooling

START TIME: _____

STEP # 1 55	Performance: When 4 to 5 hours following the reactor trip have elapsed, RESTORE spent fuel pool cooling prior to exceeding 5 hours. Refer to Appendix 42, "Restoring Spent fuel Pool Cooling."	Standard: Examinee reads the NOTE and obtains Appendix 42.	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments:			
STEP # 2 1	Performance: Verify BOTH of the following: SFP level between 36'4" and 37'0" (30" to 18" from top) for single pump operation OR between 36'*" and 37')' for 2 pump operation SFPC pumps and piping filled and vented	Standard: Examinee observes SFP level between 36'0' and 37'0".	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments:			
STEP # 3 2	Performance: Refer to OPS Form 2305-1. "Spent Fuel Pool Cooling", and ENSURE system aligned as specified.	Standard: Examinee reviews initial conditions and finds OPS Form 2305-1 is completed.	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments: If asked if the SFPC system is aligned, have examinee review initial conditions			

STEP #4 3	Performance: ESTABLISH communications between ALL of the following locations: <ul style="list-style-type: none"> FIS-7088, SFPC system flow indicator RW-9, SFPC system return stop Control Room 	Standard: Examinee asks if communications have been established.	Critical: Y [] N [X]	Grade S [] U []
	Cue: Instruct examinee that communications have been established to all areas.			
	Comments:			
STEP #5 4	Performance: To provide minimum flow when SFPC pump is started, crack OPEN RW-9, SFPC system return stop.	Standard: Examinee opens RW-9 and observes ??	Critical: Y [X] N []	Grade S [] U []
	Cue:			
	Comments:			
STEP #6 5	Performance: IF desired to start ONE pump only, START selected SFPC pump, "A" or "B"	Standard: Examinee determines one pump is to be started based upon SFP level. Examinee starts "A" SFP pump in accordance with initial conditions.	Critical: Y [X] N []	Grade S [] U []
	Cue: IF asked, concur with examinee's decision to start the "B" SFPC pump			
	Comments: "A" SFP pump starts and then trips.			
STEP #7 5	Performance: Examinee observes failure of "A" SFPC pump to start and starts "B" SFPC pump	Standard: Examinee observes failure of "A" SFPC pump to start and starts "B" SFPC pump.	Critical: Y [X] N []	Grade S [] U []
	Cue:			
	Comments:			

STEP #8	Performance: NOTE: Low flow alarm actuates at 800 gpm.	Standard: Examinee reads the NOTE and continues	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments:			
STEP #9	Performance: CAUTION: Maximum flow allowable through tube side (RW flow) of each SFPC heat exchanger is less than or equal to 1,050 gpm.	Standard: Examinee reads CAUTION and continues	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments:			
STEP #10 5a	Performance: Adjust RW-9, SFPC system return stop. (reverse acting valve) to obtain flow between 850 and 1,000 gpm (nominal 850gpm) for one pump operation. (SFPC system flow indicator, FIS-7088)	Standard: Examinee adjusts RW-9 and observes flow on FIS-7088 between 850 and 1,000 gpm.	Critical: Y [X] N []	Grade S [] U []
	Cue:.			
	Comments:			
STEP #11 6	Performance: 1. IF desired to run BOTH SFPC pumps, PERFORM the following:	Standard: Examinee determines the step is NA since only one pump is to be run.	Critical: Y [] N [X]	Grade S [] U []
	Cue:			
	Comments:			

STEP #12 7	Performance:	Standard:	Critical:	Grade
	IF shifting from two pump operation to one pump operation PERFORM the following:	The examinee determines the step is NA since only one pump is to be run.	Y [] N [X]	S [] U []
	Cue:			
Comments:				
STEP #12	Performance:	Standard:	Critical:	Grade
	CAUTION: Maximum allowable flow through shell side (RBCCW flow) of each SFPC heat exchange is less than or equal to 1,400 gpm.	Examinee reads caution and continues.	Y [] N [X]	S [] U []
	Cue:			
Comments:				
STEP #12 8	Performance:	Standard:	Critical:	Grade
	ADJUST RBCCW flow through SFP heat exchange(s) to maintain SFP temperature less than 120 F, (TR-7030) (C-07)	The examinee monitors SFP temperature on TR-7030	Y [] N [X]	S [] U []
	Cue:			
Comments: JPM complete				

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: JPM-S8

Revision: 0/1

Date Performed: _____

Student: _____

Evaluator: _____

For the student to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.

If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes No **X**

Validated Time (minutes):

Actual Time to Complete (minutes):

JPM Work Practice Evaluation*:	SAT	UNSAT	N/A
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Overall Result of JPM:	SAT	UNSAT
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* Pass/Fail criteria for the Work Practice portion of the JPM is that the trainee must 1) Perform the task correctly and IAW procedure use and adherence requirements, 2) Never put anyone's safety at risk, 3) Never put equipment reliability at risk, 4) Never violate radiological work practices, 5) Demonstrate effective use of event-free human performance tools. If a failure occurs, indicate why the failure occurred and which of these 5 task performance criteria contributed to the failure.

Arcas for Improvement / Comments:[illegible]

STUDENT HANDOUT

JPM Number: JPM-S8 Revision: 0/1

Initiating Cucs: The US has directed you to restore fuel pool cooling in accordance with EOP 2532 beginning at step 55.

Initial Conditions: A loss of coolant accident is in progress EOP

- EOP-2532 is completed through step 54.
- OPS Form 2305-1 complete
- CRS instructs using SFP pump "A"

JOB PERFORMANCE MEASURE

P-1

JPM Number: P-1

Rev. 0

JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2

JPM Number: P-1

Task Title: Appendix R Actions for a Fire in Fire Area R-1

System: Appendix R

Time Critical Task: Yes No X

Alternate Path: Yes No X

Validated Time (minutes):

Task No.(s): NUTIMS #000-04-113

K/A No. APE-068-AA1.21 K/A Rating 3.9/4.1

Method of Testing:

Simulated Performance: X Actual Performance:

Location:

Classroom: Simulator: In-Plant: X

Task Standards: At the completion of this JPM, the examinee has transferred control from the Control Room to Fire Shutdown Panel C-10, and secured the A Diesel Generator using AOP 2579A, Fire Procedure for Hot Standby Appendix R Fire Area R-1.

Required Materials
(procedures, equipment): AOP 2579A, Fire Procedure for Hot Standby Appendix R Fire Area R-1, Rev. 010-02

General References:

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	Not Applicable
Initial Conditions:	<ul style="list-style-type: none">• A serious fire is in progress in the Control Room.• The reactor is tripped.• The Shift Manager has announced the evacuation of the Control Room.• Steps 1-7 of AOP 2579A, Fire Procedure for Hot Standby Appendix R Fire Area R-1 are complete.• Normal communications are available.
Initiating Cues:	<ul style="list-style-type: none">• You have been directed by the Unit Supervisor to obtain the required keys and perform required local actions per AOP 2579A, Steps 8 thru 12.

START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1. AOP 2579A Prior to Step 8	NOTE Operating "#2 S/G AUX. FW F.C.V. 2-FW-43B (HS-5279D)" in the following step opens 2-FW-43B.	Examinee reads and acknowledges that when the handswitch for 2-FW-43B is taken to LOCAL, the valve will open.	N	
Cue:				
Comments:				
2. AOP 2579A Step 8	PLACE the following isolation switches in "LOCAL" (C-10): <ul style="list-style-type: none"> • "AUX. FW TURB. STEAM INLET HS-4188D" • "#2 S/G AUX. FW F.C.V. 2-FW-43B (HS-5279D)" • "TDAFP SPD CTL" HS-4192D" • "CHARGING PUMP C P18C (HS-2005D)" • "CHARGING PUMP B P18B (HS-2004D)" • "CHARGING HEADER ISOL. 2-CH-429 (HS-2524B)" • "REGEN HX DISCHARGE ISOL. 2-CH-089 and 2-RB-402 (HS-2525B)" • "LOOP 1A CHARGING ISOL. 2-CH-519 (HS-2519B)" • "AUX SPRAY ISOL 2-CH-517 HS-2517B" 	Examinee obtains the necessary key (Key 164) in the SM key locker. Examinee proceeds to Upper 4160V Switchgear Room and unlocks the Fire Shutdown Panel, C-10. Examinee locates each of the listed REMOTE/LOCAL switches and simulates placing each switch in the LOCAL position.	Y	
Cue:	The listed switches are in the LOCAL position.			

Comments:	HS-2525B, is labeled different than the procedure: plant label is "LTDN ISOL & LTDN HX TCV CH-089 & RB-402". Ensure C-10 is locked upon completion of this step. Also, notify the Control Room to regard all further alarms and return the key to the locker. Opening C-10 will bring in annunciator C01-D40.			
3. AOP 2579A Step 9	PLACE "#2 ATMOS. DUMP HIC-4224A" in "M" and ENSURE that 2-MS-190B, #2 SG Atmospheric Dump, is closed (C-10).	Examinee places HIC-4224A in M and observes that 2-MS-190B is closed, green light only lit	N	
Cue:	Green light only lit for 2-MS0190B.			
Comments:				
4. AOP 2579A Step 10	Refer To Attachment 2, "Breaker 10.10.1 Alignment in the DC Switchgear Rooms," and PERFORM the specified actions.	The applicant continues on with Step 11 after being informed that another operator has completed Attachment 2.		
Cue	Another operator has completed the Attachment 2 actions.			
5. AOP 2579A Step 11	ENSURE that BOTH of the following valves are closed (C-10): <ul style="list-style-type: none"> • 2-CH-089, Regenerative Heat Exchanger Discharge Isolation • 2-CH-517, Auxiliary Spray Isolation 	Examinee closes CH-089 by taking HS-2525A to close and observes that 2-CH-089 and 2-CH-517 are closed by observing green lights only lit. Examinee reports to Control Room that AOP 2579A Steps 8, 9 and 11 are complete	N	
Cue:	Green lights only lit for 2-CH-089 and 2-CH-517.			
Comments:				
6. AOP 2579A Prior to Step 12	CAUTION Once DC power has been lost to DG A, failure to promptly secure DG A could result in damage to the DG.	Examinee reads and acknowledges caution.	N	
Cue:				

Comments:				
7. AOP 2579A Step 12	ENSURE that DG A is secured by performing the following (A DG Room): a. IF DG A is operating, PRESS the "EMERGENCY STOP" mechanical overspeed trip button (north side of DG). b. ENSURE the following DG A fuel oil supply and air start valves are closed: <ul style="list-style-type: none">• 2-FO-17, "FUEL OIL HEADER STOP TO "A" DIESEL GENERATOR"• 2-DG-30A, "D/G 12U AIR START HEADER A ISOLATION"• 2-DG-30B, "D/G 12U AIR START HEADER B ISOLATION"	Examinee proceeds, through the Radiologically Controlled Area, to the A Diesel Generator room. Examinee marks Step 6.a. N/A because A DG is not running. Examinee closes 2-FO-17, 2-DG-30A and 2-DG-30B by unlocking and taking their valve handles in the clockwise direction to a hard-stop. Examinee reports to the Control Room that the A Diesel Generator is secured.	Y	
Cue:	The A Diesel Generator is NOT running. 2-FO-17, 2-DG-30A and 2-DG-30B are closed. The Control Room acknowledges report that A DG is secured.			
Comments:				

Terminating Cue: When the above step is achieved, the JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

Title: Actions for a fire in Appendix R Fire Area R-1

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No **X**

Validated Time (minutes): _____

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• A serious fire is in progress in the Control Room.• The reactor is tripped.• The Shift Manager has announced the evacuation of the Control Room.• Steps 1-7 of AOP 2579A, Fire Procedure for Hot Standby Appendix R Fire Area R-1 are complete:<ul style="list-style-type: none">• The Shift Manager has requested outside fire assistance• The Bottle-up Panels, C-70A and C-70B switches have been placed in isolate.• The Shift Manager has directed Security Department support to prevent entry to Control Room following evacuation and to post guards to facilitate ventilation in East and West DC Switchgear Rooms.• Normal communications are available.
Initiating Cues:	<ul style="list-style-type: none">• You have been directed by the Unit Supervisor to obtain the required keys and transfer control from the Control Room to C-10 per AOP 2579A, Step 8 and perform AOP 2579A Steps 9 and 11 at C-10.

JOB PERFORMANCE MEASURE

P-2

JPM Number: P-2

Rev. 0

JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2

JPM Number: P-2

Task Title: Local Manual Operation of the A Atmospheric Dump Valve

System: Main Steam System

Time Critical Task: Yes No X

Alternate Path: Yes No X

Validated Time (minutes): 15

Task No.(s): NUTIMS 035-01-029

K/A No. 039-A2.04 K/A Rating 3.4/3.7

Method of Testing:

Simulated Performance: X Actual Performance:

Location:

Classroom: Simulator: In-Plant: X

Task Standards: At the completion of this JPM, the examinee has taken local manual control of the A Atmospheric Dump Valve (ADV) and placed it to 25% open per EOP 2541 Appendix 36, ADV Local Operation.

Required Materials EOP 2541, Appendix 36, ADV Local Operation, Rev. 000-01
(procedures, equipment):

General References: EOP 2525, Standard Post Trip Actions
JPM based on Bank JPM 93

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	Not Applicable
Initial Conditions:	<ul style="list-style-type: none">• A loss of Instrument Air has occurred in the plant.• The plant is tripped and the crew has entered EOP 2525 Standard Post Trip Actions.• The crew decided to use the A Atmospheric Dump Valve (ADV) to remove decay heat.
Initiating Cues:	<ul style="list-style-type: none">• You have been directed by the Unit Supervisor to take local manual control of the A ADV and open the valve to 25% using EOP Appendix 36, ADV Local Operation.

START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1 . EOP2541- App36 Step 1	IF C-21 operation of the ADV is desired, Refer To Attachment 36-C, "Remote Operation of ADV at C - 21".	Examinee marks step N/A.	N	
Cue:				
Comments:				
2 . EOP2541- App36 Step 1	CAUTION Elevated ambient air temperatures in the East and West penetration rooms may result in conditions that cause heat related health concerns.	Examinee reads and acknowledges caution.	N	
Cue:				
Comments:				
3 . EOP2541- App36 Step 1	DETERMINE local ambient air temperatures for the applicable penetration rooms by reading local area thermometers.	Examinee enters East Penetration Room and reads local thermometer on wall just inside the door.	N	
Cue:	Using pen, indicate thermometer reading of ~ 98°F			
Comments:				

4. EOP2541- App36 Step 1N	NOTE The following equipment may be required to perform the following step: <ul style="list-style-type: none"> • Ice Vest may be obtained from the Maintenance Tool Crib. • Cool Suits may be obtained from the HP Control Point. • Gloves are part of the PEO normal watch station equipment. 	Examinee reads and acknowledges note.	N	
Cue:				
Comments:				
5. EOP2541- App36 Step 1	CHECK local ambient air temperatures less than 120°F.	Examinee verifies temperature is below 120°F and states no additional safety equipment needed.	N	
Cue:				
Comments:				
6. EOP2541- App36 Step 1	IF local operation of the ADV is desired, Refer To Attachment 36---A, Establishing Local ADV Control.	Examinee refers to Attachment 36-A for Establishing Local ADV Control	N	
Cue:				
Comments:				
7. EOP2541- App36 Step 1	ESTABLISH communications with the Control Room.	Examinee states they would establish communications with the Control Room using either Gai-Troincs located on station or other suitable communication device.	N	
Cue:	Communication with the Control Room has been established.			

Comments:				
8. EOP2541- App36 Step 1	ENSURE ADV manual isolation valve, MS-3A is open.	Examinee states they would verify 2-MS-3A is open by rotating the valve hand wheel in the clockwise direction, verifying movement then return it to its original position or they may state that the valve stem is fully raised.	N	
Cue:	ADV Manual Isolation valve, 2-MS-3A, hand wheel rotates in the clockwise direction or the valve stem is in the full out position.			
Comments:				
9. EOP2541- App36 Step 1	REMOVE the "VENT VALVE" assembly from the instrument rack located below the ADV.	Examinee locates the VENT VALVE and removes it by releasing the quick disconnect.	Y	
Cue:				
Comments:				
10. EOP2541- App36 Step 1	ENSURE the "VENT VALVE" assembly is closed.	Examinee verifies the whitey valve on the vent rig closed by rotating the hand wheel in the clockwise direction.	N	
Cue:	ADV Manual Isolation valve, 2-MS-3A, hand wheel is rotated in the clockwise direction. Valve is at a hard stop.			
Comments:				
11. EOP2541- App36 Step 1	NOTE Isolating instrument air to an ADV will result in the valve failing to the closed position.	Examinee reads and understands note. Examinee should recognize as part of the initial conditions that the valve is already in the closed position due to the loss of Instrument Air.	N	
Cue:				
Comments:	If the examinee does not state that the valve is already failed closed, question them as to the status of the valve.			

12. EOP2541- App36 Step 1	CLOSE the instrument air isolation valve to the ADV.	Examinee locates the Instrument air isolation valve and rotates it in the clockwise direction to a hard stop.	Y	
Cue:	Valve rotates clockwise to a hard stop.			
Comments:	Valve is located on the Containment wall behind the ADV.			
13. EOP2541- App36 Step 11	REMOVE the vent cap from the quick disconnect at the top of the ADV operator diaphragm.	Examinee states that they remove the quick disconnect vent cap from the top of the ADV diaphragm.	Y	
Cue:	Vent cap is removed			
Comments:				
14. EOP2541- App36 Step 1	INSERT the VENT VALVE assembly into the quick disconnect.	Examinee connects the VENT VALVE assembly on the top of the operator diaphragm using the quick connect.	Y	
Cue:				
Comments:				
15. EOP2541- App36 Step 1	OPEN the vent valve assembly to ensure air has been vented off the ADV operator.	Examinee states that they would rotate the whitey valve on the VENT VALVE assembly in the counterclockwise direction to a hard stop. Examinee states they may hear some residual air bleed off.	Y	
Cue:	Valve is rotated in the counterclockwise direction to a hard stop. A small amount of air bleed off is heard. Airflow has stopped.			
Comments:				

16. EOP2541- App36 Step 1	ENSURE that the ADV is closed.	Examinee states that the valve is closed by verifying the local valve position indicator and by evidence of no steam flow noise.	N	
Cue:	Acknowledge indications. Using pen, show valve position as closed. No steam flow noise is heard.			
Comments:				
17. AOP2556 Steps 4.20, 4.24 and 4.26 h-m	REMOVE the hand wheel retaining device.	Examinee removes restraining device.	Y	
Cue:	Restraining device has been removed.			
Comments:				
18. AOP2556 Steps 4.20, 4.24 and 4.26 h-m	NOTE ADV hand wheels are reverse operated.	Examinee reads and acknowledges note.	N	
Cue:				
Comments:				
19. AOP2556 Steps 4.20, 4.24 and 4.26 h-m	POSITION the ADV as directed by the Control Room.	Examinee states they contact the control room and communicates to them that they are ready to open the A ADV 25% open. Examinee states that they need to rotate the valve hand wheel in the <u>clockwise</u> direction until the position indicator indicates 25%.	Y	
Cue:	The Control Room acknowledges communication. Using a pen show valve position moving to the 25% open indication.			
Comments:				

JPM Number: P-2

Rev. 0

Terminating Cue: When the above step is achieved, the JPM is complete.

STOP TIME: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• A loss of Instrument Air has occurred in the plant.• The plant is tripped and the crew has entered EOP 2525 Standard Post Trip Actions.• The crew decided to use the A Atmospheric Dump Valve (ADV) to remove decay heat.
Initiating Cues:	<ul style="list-style-type: none">• You have been directed by the Unit Supervisor to take local manual control of the A ADV and open the valve to 25% using EOP Appendix 36, ADV Local Operation.

JOB PERFORMANCE MEASURE

P-3

JPM Number: P-3

Rev. 0

JOB PERFORMANCE MEASURE WORKSHEET

Facility: Millstone Unit 2

JPM Number: P-3

Task Title: Manual Boration to the Reactor Coolant System

System: Chemical and Volume Control System

Time Critical Task: Yes No X

Alternate Path: Yes No X

Validated Time (minutes):

Task No.(s): NUTIMS

K/A No. 004-A2.14 K/A Rating 3.8/3.9

Method of Testing:

Simulated Performance: X Actual Performance:

Location:

Classroom: Simulator: In-Plant: X

Task Standards: At the completion of this JPM, the examinee has commenced a manual boric acid addition to the Reactor Coolant System from the Boric Acid Storage Tanks in accordance with AOP 2551, Shutdown from Outside the Control Room, Attachment 1, Manual Boration.

Required Materials AOP 2551, Shutdown from Outside the Control Room, Rev. 09-03
(procedures, equipment):

General References:

****** READ TO THE EXAMINEE ******

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied. You may use any approved reference materials normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgments, and log entries as if the evolution was actually being performed.

****** NOTES TO EXAMINER ******

1. Critical steps for this JPM are indicated with a "Y". For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").

Simulator Requirements:	Not Applicable
Initial Conditions:	<ul style="list-style-type: none"> • Plant is in Mode 3, approximately 25 minutes following a reactor trip due to the Control Room becoming uninhabitable (<u>not</u> due to a fire). • The Control Room has been evacuated. • The Unit Supervisor has entered AOP 2551, Shutdown from Outside the Control Room and completed steps 3.1 – 3.19. • The plant is being controlled at the Hot Shutdown Panel, C-21. • The Unit Supervisor and a Reactor Operator are stationed at C-21. • Communications are being maintained via portable radios.
Initiating Cues:	<ul style="list-style-type: none"> • In preparation for a plant cooldown to Mode 5, the Unit Supervisor has directed you to perform a manual boration from the Boric Acid Storage Tanks (BASTs) to the reactor coolant system using AOP 2551, Shutdown from Outside the Control Room, Attachment 1, Manual Boration. Start at step 3.20 of AOP 2551, Shutdown from Outside the Control Room. All previous steps have been completed. • The examiner will act as the Unit Supervisor.

START TIME:

STEP	PERFORMANCE	STANDARD	CRITICAL (Y/N)	GRADE (S/U)
1. AOP2551	NOTE Borating the RCS should be considered if it is anticipated cooling the RCS down to a lower mode.	Examinee reads note.	N	
Cue:				
Comments:				
2. AOP2551 Step 3.20	IF desired to borate the RCS, PERFORM the following: a. CONTACT Reactor Engineer for assistance in determining SDM and required boration. b. OPEN the following supply breakers (14'6", Aux. Bldg.): <ul style="list-style-type: none"> • B5151, "BORIC ACID STORAGE TANK B GRAVITY FEED ISOLATION, 2-CH-508" • B5149, "BORIC ACID STORAGE TANK A GRAVITY FEED ISOLATION, 2-CH-509" • B5145, 2-CH-501, "VCT OUTLET HEADER TO CHARGING PUMPS" 	Examinee proceeds to the 14'6" Auxiliary Building, locates and opens the following breakers: <ul style="list-style-type: none"> • B5151, "BORIC ACID STORAGE TANK B GRAVITY FEED ISOLATION, 2-CH-508" • B5149, "BORIC ACID STORAGE TANK A GRAVITY FEED ISOLATION, 2-CH-509" • B5145, 2-CH-501, "VCT OUTLET HEADER TO CHARGING PUMPS" 	Y	
Cue:	Reactor Engineer acknowledges your request. If the examinee inquires, the Unit Supervisors directs Boric Acid addition to commence without a known stop time. Breakers are open.			
Comments:				

3. AOP2551 Step 3.20 continued	c. Refer to Attachment 1 "Manual Boration."	Examinee turns to Attachment 1.	N	
Cue:				
Comments:				
4. AOP2551 Att1 Step 1.1	ENSURE at least ONE charging pump is operating (C-21).	Examinee says that he/she would contact the operator at the Hot Shutdown Panel, C-21 and request charging pump status.	N	
Cue:	Operator at C-21 reports that Charging Pump 'C' is running.			
Comments:	Examinee may verify Charging Pump C is running locally at the pump.			
5. AOP2551 Att1 Step 1.2	MONITOR BAST levels AND CHECK at least ONE BAST level greater than 10% (C-10 or BAST area).	Examinee goes to the BAST Area and observes that at least one BAST level is above 10%.	Y	
Cue:	The Unit Supervisor reports that access to C-10 is not available at this time.			
Comments:				
6. AOP2551 Att1 Step 1.3	Manually OPEN the following: (-5'6", Aux Bldg.): a. CH-508, " 'B' GRAVITY FEED" b. CH-509, " 'A' GRAVITY FEED"	Examinee goes to the -5'6", Aux Bldg. and opens CH-508 and CH-509.	Y	
Cue:	CH-508 and CH-509 are in the fully counter-clockwise position.			
Comments:				

JPM Number: P-3 Rev. 0

7. AOP2551 Att1	NOTE VCT pressure prevents boric acid flow from the BASTs if CH-501, "VCT OUTLET HEADER TO CHARGING PUMPS," is open.	Examinee reads note.	N	
Cue:				
Comments:				
8. AOP2551 Att1 Step 1.4	Manually CLOSE CH-501, "VCT OUTLET HEADER TO CHARGING PUMPS," and COMMENCE timing Boric Acid addition (-25'6", degasifier room).	Examinee goes to the degasifier room and closes CH-501. Examinee reports to the Unit Supervisor that he/she has started the Boric Acid addition and notes the time of start.	Y	
Cue:	CH-501 is in the fully counter-clockwise position. The Unit Supervisor acknowledges status Boric Acid addition.			
Comments:				

Terminating Cue: When the above step is achieved, the JPM is complete.**STOP TIME:**

VERIFICATION OF JPM COMPLETION

Title: Manual Boration to the Reactor Coolant System

Date Performed: _____

Examinee: _____

NRC Examiner: _____

Number of Attempts: _____

For examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

Time Critical Task? Yes _____ No X

Validated Time (minutes): _____

Actual Time to Complete (minutes): _____

Overall Result of JPM: SAT UNSAT (circle one)

Question Documentation:

[illegible]

Examiner's signature and date: _____

EXAMINEE HANDOUT

Initial Conditions:	<ul style="list-style-type: none">• Plant is in Mode 2, approximately 25 minutes following a reactor trip due to the Control Room becoming uninhabitable (<u>not</u> due to a fire).• The Control Room has been evacuated.• The Unit Supervisor has entered AOP 2551, Shutdown from Outside the Control Room and completed steps 3.1 – 3.19.• The plant is being controlled at the Hot Shutdown Panel, C-21.• The Unit Supervisor and a Reactor Operator are stationed at C-21.• Communications are being maintained via portable radios.
Initiating Cues:	<ul style="list-style-type: none">• In preparation for a plant cooldown to Mode 5, the Unit Supervisor has directed you to perform a manual boration from the Boric Acid Storage Tanks (BASTs) to the reactor coolant system using AOP 2551, Shutdown from Outside the Control Room, Attachment 1, Manual Boration. Start at step 3.20 of AOP 2551, Shutdown from Outside the Control Room. All previous steps have been completed.• The examiner will act as the Unit Supervisor.

SIMULATOR SCENARIO #2

Facility: Millstone Unit 2	Scenario No.: 2	Op-Test No.: NRC 2014
Examiners: _____	Operators: _____	SRO
_____	_____	ATC
_____	_____	BOP

Initial Conditions: 74% Power IC, B EDG OOS, A/B Cond Pps running, A/C Chg Pumps running.

Turnover: 74% Power has been less than 85% for one day for "C" condensate pump maintenance; Crew has been instructed to raise power to 100%. Post maintenance testing of the "B" Diesel Generator is scheduled for this shift. "B" Diesel Generator is OOS. 24E is aligned to 24C. Condensate Pumps A and B running. C condensate pump is in standby and ready for testing. A and C Charging pumps running and forcing pressurizer sprays in preparation for up power.

Critical Tasks:

- CT-1 (SPTA-5): Manually shut down the Reactor: The plant must be manually tripped prior to reaching the Automatic Auxiliary Feedwater initiation setpoint of 27% in either S/G.
- Within one hour following a SBO event, Unit 2 will be able to restore one vital AC bus from an alternate AC power source (Unit 3 Bus 34A/34B). (Source EOP User Guide).
- Prior to emptying either Steam Generator, operator action is required to establish AFW flow to Steam Generators. (Source EOP User Guide)

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)		R (ATC, SRO)	Raise power to 100%.
2 (20 min)	CV04C	TS (SRO) C (ATC)	"C" Charging Pump Trip
3 (30 min)	RX11B	C (BOP, SRO)	Failure of No. 1 SG Steam Flow Transmitter (low)
4 (35 min)	RC06D, ORs	TS(SRO) C (ATC)	PORV RC-404 leakage.
5 (+45 min)	FW03B	C (BOP)	"B" Condensate pump trips, "C" condensate pump fails to start (both automatically and manually).
6 (+45 min)	RP27A ED17C	M (All)	SGFP trip due to loss of suction. Rx fails to automatically trip. Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on Reactor Trip (Loss of Normal Power).
7 (+46 min)	SW05A	C (BOP)	Unisolable "A" Service Water header rupture after the "A" EDG loads resulting in a Station Blackout

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

Op-Test No.: NRC Scenario No.: 2 Event No.: 1

Event Description: Raise Power to 100%

Time	Position	Applicant's Actions or Behavior
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Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual
1. Total malfunctions (5–8)	6
2. Malfunctions after EOP entry (1–2)	2
3. Abnormal events (2–4)	4
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	1
6. EOP contingencies requiring substantive actions (0–2)	0
7. Critical tasks (2–3)	3

NRC 2014, Scenario 2 Summary:

The crew will take the shift with the unit at 74% power and the crew has been instructed to raise reactor power to 100%. A and C Charging pumps are running and forcing pressurizer sprays in preparation for up power. B Charging pump is aligned to Facility 1 (24E is aligned to 24C). Condensate Pumps: A running, B running. C secured because of maintenance. C condensate pump is ready for testing and in standby.

Event 1: The crew takes the shift and raises power approximately 5%. The crew may or may not get to the point of starting C condensate pump and could continue scenario with 2 condensate pumps running. If they attempt to start C condensate pump, it WILL NOT start because of malfunction needed for Event 5. This needs to be in the setup file for Scenario 2.

Event 2: The “C” Charging Pump trips. The CHARGING PUMP C TRIP annunciator will alarm and the crew will take ARP actions to lower letdown flow and align B Charging pump to Facility 2. They may start the B charging pump to continue the power change. Two Charging pumps were running initially for the up power. The SRO will address TS for charging pump operability.

Event 3: The alternate steam flow transmitter for No. 1 Steam Generator will fail low. The crew will respond per AOP 2585 Immediate Actions.

Event 4: When feed control has been returned to auto, PORV RC-404 starts to leak by. Quench Tank level will slowly rise and PORV Discharge Temperature will rise. The crew will respond to the QUENCH TANK HI TEMPERATURE alarm and take ARP steps to close the PORV block valve. The SRO will address TS for PORV operability.

Event 5: After the leaking PORV has been isolated and technical specifications evaluated, the “B” Condensate pump trips and “C” Condensate pump fails to start. This causes Steam Generator Feed Pump suction pressure to lower. The crew will manually trip the reactor because of the loss of feed flow. If the crew does not trip the reactor, the reactor will NOT trip automatically as the Low Steam Generator Level auto reactor trip is defeated.

Event 6 and 7: On the reactor trip, there is a failure of 4.16kV Buses 24C and 24D to auto transfer (Loss of Normal Power) and loss of offsite power from Grid for Unit 2. The “A” Diesel Generator (DG) starts and loads.

Op-Test No.: NRC Scenario No.: 2 Event No.: 1

Event Description: Raise Power to 100%

Time	Position	Applicant's Actions or Behavior
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The "B" Diesel Generator is out of service. Shortly after the "A" DG is loaded (before Step 2 of SPTAs), there is an unisolable rupture in the "A" Service Water header causing the operators to trip the "A" DG. The crew will transition to EOP 2540, Station Blackout. Maintenance responds that "B" DG will be available within two hours.

The crew will work to power 24E from Unit 3 SBO Diesel Generator. The scenario is terminated when) one vital 4.16kV bus is energized from offsite (Unit 3 SBO).

INPUT SUMMARY

Either INPUT or VERIFY the following functions:

ID Num	Description	Delay Time	Ramp Time	Event Time	Sev or Value	Final Value	Rel Order
MALFUNCTIONS							
REMOTE FUNCTIONS							
OVERRIDES							

Op-Test No.: NRC Scenario No.: 2 Event No.: 1

Event Description: Raise Power to 100%

Time	Position	Applicant's Actions or Behavior
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Examiner Note: The crew has been instructed to brief the up power prior to taking the watch. The following steps are from OP 2204 Load Changes. OP 2204 Load Changes procedure is marked up with "N/A" and Unit Supervisor signatures for applicable steps.

		<p>Up power in accordance with OP 2204 and Reactivity Plan.</p> <p>Method: dilution and CEAs</p> <p>Rate: 15%/hour</p> <p>4.1.37 WHEN either of the following conditions are met, Go To step 4.1.38 to start a third condensate pump:</p> <ul style="list-style-type: none">• Condensate pump discharge pressure is less than 425 psig• Condensate header flow is greater than 15,500 gpm (does not apply to short term exceedances while placing the second SGFP in service). Crew should start "C" condensate pump and raise power to 100%.

Examiner Note: When reactor power is 5% higher than initial power or at the lead examiner's direction, proceed to Event #2, Trip of "A" Charging Pump.

Op-Test No.: <u> NRC </u> Scenario No.: <u> 2 </u> Event No.: <u> 2 </u>		
Event Description: "A" Charging Pump Trip		
Time	Position	Applicant's Actions or Behavior

Simulator Operator: When directed, initiate Event #2, "C" Charging Pump trip.		
Indications Available: <ul style="list-style-type: none"> CHARGING PUMP C TRIP (B-14 on C-02/3). 		
Examiner Note: The following steps are from ARP 2590B-054.		
Examiner Note: Crew may or may not secure dilution in progress from Event #1.		
	ATC	<p style="text-align: center; margin: 0;">CAUTION</p> <p style="margin: 5px 0;">Prior to starting a standby pump, consider if pump trip was caused by gas binding. ["INPO SOER 97-1, Potential Loss of High Pressure Injection And Charging Capability From Gas Intrusion."]</p>
	ATC	<p>1. Place "CH PP C," charging pump hand switch in "PULL TO LOCK" (C-02).</p> <p>Examiner Note: Step 2 is N/A because gas intrusion is not indicated. Step 3 is N/A because letdown should not isolate on high temperature.</p> <p>4. <u>IF</u> only "C" charging pump was operating and letdown is not isolated, START another charging pump.</p> <p>5. <u>IF</u> more than <i>one</i> charging pump was operating, ADJUST "LTDN FLOW CNTL, HIC-110," bias to balance charging and letdown flows and restore pressurizer level to program (C-02).</p>
CUE: If asked to determine investigate and determine the status of "C" Charging Pump, report back that pump is hot to the touch and tripped on over current.		

Op-Test No.: NRC Scenario No.: 2 Event No.: 2

Event Description: "A" Charging Pump Trip

Time	Position	Applicant's Actions or Behavior
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	SRO	<p>6. Refer To TS 3.5.2 and TRM 3.1.2.3, 3.1.2.4, 7.1.1 and DETERMINE applicability</p> <p>LCO 3.5.2 Two ECCS subsystems shall be OPERABLE.</p> <p><u>APPLICABILITY</u>: MODES 1, 2 and 3*</p> <p>* With pressurizer pressure \geq 1750 psia.</p> <p><u>ACTION</u>:</p> <p>a. With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and reduce pressurizer pressure to less than 1750 psia within the following 6 hours.</p> <p>Examiner Note: Because there is no Charging Pump on Train B (24E aligned to 24C and "B" Charging Pump is in Pull-To-Lock), SRO should enter TS 3.5.2 Action statement "a:"</p> <p>With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and reduce pressurizer pressure to less than 1750 psia within the following 6 hours.</p> <p>Examiner Note: TRM 3.1.2.3 not applicable. SRO should enter TRM 3.1.2.4: With only one charging pump FUNCTIONAL, manage the risk impact in accordance with the requirement of 10 CFR 50.65(a)(4). SRO should enter TRM 7.1.1 TR Item A on Table 7.1.1-1 for Charging Pump "A."</p>
	SRO/ATC	<p>7. <u>IF</u> necessary, Refer To OP 2304E, "Charging Pumps" and ALIGN "B" charging pump, to Facility 2</p> <p>CUE: If directed to align Charging Pump "B" to Facility 2, acknowledge request and align it. Report back to Control Room.</p>
	ATC	<p>8. On the running charging pump(s), VERIFY charging pump suction stabilizer heater indicator switch (amber color) is lit.</p> <p>9. IF valve misalignment is suspected, Refer To OP 2304C-002, "Boric Acid Valve Lineup" and ENSURE proper valve alignment.</p> <p>10. MONITOR performance of operating charging pump(s).</p> <p>CUE: Charging pump suction stabilizer heater indicator switch (amber color) is lit. Operating charging pumps running as expected.</p>

Op-Test No.: NRC Scenario No.: 2 Event No.: 2

Event Description: "A" Charging Pump Trip

Time	Position	Applicant's Actions or Behavior
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Examiner Note: When Technical Specifications have been evaluated or at lead examiner's direction, go to Event 3 Failure of No. 1 Steam Generator (SG) Steam Flow Transmitter.

Op-Test No.: NRC Scenario No.: 2 Event No.: 3

Event Description: Failure of No. 1 SG Steam Flow Transmitter (low)

Time	Position	Applicant's Actions or Behavior
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Op-Test No.: NRC Scenario No.: 2 Event No.: 3

Event Description: Failure of No. 1 SG Steam Flow Transmitter (low)

Time	Position	Applicant's Actions or Behavior
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Simulator Operator: When directed, initiate Event 3, Failure of No. 1 SG Steam Flow Transmitter (low).

Indications Available:

- PPC alarm No. 1 SG Steam Flow
- Steam flow and feed flow mismatch on No. 1 SG Flow Yokojawa
- No. 1 SG FRV closing, No. 1 SG level lowering
- SG LEVEL SETPOINT DEVIATION HI/LO (D-16 on C-05)

	SRO	Enter AOP 2585, Immediate Actions
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Examiner Note: The following steps are from AOP 2585, Immediate Actions Section 4.0 Abnormal Steam Generator Level. Step in [] are expected to be performed from memory.

	BOP	<p>[4.1] PLACE both SGFPs in manual:</p> <ul style="list-style-type: none"> • PRESS "A" SGFP "CONTROL" "MANUAL" pushbutton and ENSURE "MANUAL" pushbutton, lit. • PRESS "B" SGFP "CONTROL" "MANUAL" pushbutton and ENSURE "MANUAL" pushbutton, lit. <p>[4.2] SHIFT affected SG Feedwater Flow Control to MANUAL (C-05):</p> <p><u>No. 1 SG</u></p> <ul style="list-style-type: none"> • "REG VLV, LIC-5268," controller in manual (red light lit) <p>[4.3] RESTORE SGFP speeds to normal value (100% Power: 4400 to 4600 rpm).</p> <p>[4.4] STABILIZE affected SG level (Steam Flow and Feed Flow matched).</p> <p>Examiner Note: Steam Generator Level normal range 60-75%</p>
	SRO/BOP	4.5 Go To ARP 2590D-064, "SG LEVEL SETPOINT DEVIATION HI/LO" (C-05, window D-16).

Examiner Note: The following steps are from ARP 2590D-064.

Op-Test No.: NRC Scenario No.: 2 Event No.: 3

Event Description: Failure of No. 1 SG Steam Flow Transmitter (low)

Time	Position	Applicant's Actions or Behavior
	BOP	<p><u>CORRECTIVE ACTIONS</u></p> <ol style="list-style-type: none">1. DETERMINE which SG has the level deviation (C-05).2. IF necessary, Refer To OP 2385, "Feedwater Control System Operation" and PLACE feedwater control system in manual control to restore SG level to setpoint (C-05).3. OBSERVE PPC S/G transient display to determine if level, steam flow, or feed flow transmitter failure has caused the deviation.4. OBSERVE the affected side green transmitter lights to determine if level, steam flow, or feed flow transmitter failure has caused the deviation (C-05). <p>Examiner Note: Applicant observes that No. 1 SG Flow Transmitter failed low as indicated by PPC and green transmitter light NOT lit.</p>
	BOP	<div><p style="text-align: center;">CAUTION</p><p>SG level is auctioneered low, therefore, when selecting "MAIN" or "ALT" level transmitter, caution must be observed. Selecting "HIGH" could cause a plant trip.</p></div>

Op-Test No.: NRC Scenario No.: 2 Event No.: 3

Event Description: Failure of No. 1 SG Steam Flow Transmitter (low)

Time	Position	Applicant's Actions or Behavior
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	BOP	<p>5. <u>IF</u> transmitter failure has occurred, (indicated by its green LED not lit), or suspected. TURN associated transmitter control switch from "BOTH" position to position for transmitter that is not failed or suspected ("MAIN" or "ALT") (C05).</p> <p>6. <u>IF</u> necessary, PLACE SGFP(s) speed control in "MANUAL," and ESTABLISH FRV differential pressure between 40 to 150 psid (C05).</p> <p>7. DETERMINE cause of abnormal SG level and CORRECT.</p> <p>8. <u>IF</u> deviation is due to a failed feedwater flow instrument, Refer To EN 21002, "Core Heat Balance," and PERFORM actions to deselect affected transmitter input to calorimetric program (cause false indicated calorimetric).</p> <p>9. <u>IF</u> desired, Refer To OP 2385, "Feedwater Control System Operation" and PLACE Feedwater Control System in "Automatic."</p> <p>Examiner Note: The ALTERNATE Transmitter failed. BOP should transfer No. 1 SG transmitter control switch from BOTH to MAIN and then place Feedwater Control System in Automatic using OP 2385. Step 6 was performed during immediate actions and Step 8 does not apply.</p>
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Examiner Note: The following steps are from OP 2385 Feedwater Control System Section 4.3, Operation of No. 1 FW Control System During Normal Operation

	BOP	<p>4.3.2 WHEN manual operation no longer required, to place No. 1 FRV in "AUTO," PERFORM the following (C-05):</p> <p>a. ADJUST "MSTR, LIC-5272," as necessary to match red and black/white needles on "REG VLV, LIC-5268."</p> <p>b. ENSURE the following:</p> <ul style="list-style-type: none"> • "REG VLV, LIC-5268," controller yellow "3E PERM" light, lit • "REG VLV, LIC-5268," controller in "AUTO" (green light, lit) • "BYPASS, LIC-5215," controller in "AUTO" (green light, lit) • "MSTR, LIC-5272," controller level setpoint equal to actual SG level
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Op-Test No.: NRC Scenario No.: 2 Event No.: 3

Event Description: Failure of No. 1 SG Steam Flow Transmitter (low)

Time	Position	Applicant's Actions or Behavior
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	BOP	<p>c. PRESS "MSTR, LIC-5272," controller "A" button and ENSURE green light, lit.</p> <p>d. <u>IF</u> steam flow greater than 15% (900,000 lbm/hr), CHECK yellow light below "M" button on "MSTR, LIC-5272," controller, lit (3 element control).</p> <p>e. <u>IF</u> steam flow less than or equal to 15% (900,000 lbm/hr) on an up-power, CHECK yellow light below "A" button on "MSTR, LIC-5272," controller, lit (single element control).</p> <p>f. <u>IF</u> steam flow less than or equal to 11% (660,000 lbm/hr) on a downpower, CHECK yellow light below "A" button on "MSTR, LIC-5272," controller, lit (single element control).</p> <p>g. As necessary, ADJUST "MSTR, LIC-5272," controller level setpoint and MAINTAIN No. 1 SG level within desired operating band with No. 1 FRV.</p>
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Examiner Note: When Feedwater Control System has been restored to automatic control, or at the lead examiner's direction, proceed to Event 4, PORV RC-404 leakage.

Op-Test No.: NRC Scenario No.: 2 Event No.: 4

Event Description: PORV RC-404 Leakage

Time	Position	Applicant's Actions or Behavior
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Simulator Operator: When directed, initiate Event 4, PORV RC-404 leakage.

Indications:

- Quench Tank level will slowly rise
- PORV Discharge Temperature will rise
- QUENCH TANK TEMP HI (C-36 on C-02/3)

Examiner Note: The following steps are form ARP 2590B-207 for Quench Tank Temp HI alarm.

	SRO/ATC	<p><u>CORRECTIVE ACTIONS</u></p> <ol style="list-style-type: none">1. CHECK temperature of PORV or pressurizer safety valve discharge lines to QT (C-03).2. CHECK AVMS and DETERMINE if safety valve is leaking (RC05E).3. Refer To Technical Specifications LCOs, 3.4.3 and 3.4.6.2, for applicability.
	SRO/ATC	<div><p>NOTE</p><ol style="list-style-type: none">1. If safety valve leakage is causing QT high temperature, the plant must be brought to cold shutdown for valve repair.2. Excessive PORV pilot valve leakage, > 0.75% level rise in an hour in the quench tank, could result in spurious opening of a PORV</div>

Op-Test No.: NRC Scenario No.: 2 Event No.: 4

Event Description: PORV RC-404 Leakage

Time	Position	Applicant's Actions or Behavior
	ATC	<p>4. <u>IF</u> pressurizer safety valve leakage is causing high temperature, NOTIFY SM or US.</p> <p>5. DETERMINE which PORV/safety valve is leaking as follows:</p> <p>5.1 MONITOR the following:</p> <ul style="list-style-type: none">• "PORV DIS TEMP, TI-106" (C-03)• "PORV DIS TEMP, TI-114" (C-03) <p>5.2 MONITOR the following:</p> <ul style="list-style-type: none">• "A SAFETY VLV DIS TEMP," TI-107 (C-03)• "B SAFETY VLV DIS TEMP," TI-108 (C-03) <p>5.3 CHECK the following indicate closed:</p> <ul style="list-style-type: none">• "PORV, RC-402" (C-03)• "PORV, RC-404" (C-03) <p>Examiner Note: PORV Discharge Temperature TI-114 indicates higher than TI-106 and rising. No changes to A and B Safety Vavle Discharge Temperatures. PORV RC-404 indicates open/intermediate on C-03.</p>
	ATC	<p>6. <u>IF</u> leaking PORV is identified, VERIFY RCS pressure is less than or equal to 2,250 psia and CLOSE applicable PORV block valve (C-03):</p> <ul style="list-style-type: none">• "ISOL VLV, RC-405," for "PORV, RC-404" <p>Examiner Note: RCS pressure should be less than or equal to 2250 psia and ATC should close PORV block valve RC-405.</p>

Op-Test No.: NRC Scenario No.: 2 Event No.: 4

Event Description: PORV RC-404 Leakage

Time	Position	Applicant's Actions or Behavior
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	SRO	<p>Review Technical Specifications:</p> <p>LCO 3.4.3: Both power operated relief valves (PORVs) and their associated block valves shall be OPERABLE.</p> <p><u>APPLICABILITY</u>: MODES 1, 2, and 3.</p> <p><u>ACTION</u>:</p> <p>a. With one or both PORVs inoperable and capable of being manually cycled, within 1 hour either restore the PORV(s) to OPERABLE status or close the associated block valve(s) with power maintained to the block valve(s)*; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.</p> <p>b. With one PORV inoperable and not capable of being manually cycled, within 1 hour either restore the PORV to OPERABLE status or close its associated block valve and remove power from the block valve; restore the PORV to OPERABLE status within the following 72 hours or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.</p> <p>Examiner Note: PORV-404 is capable of being manually cycled. SRO enters TSAS "a."</p>
Examiner Note: When the PORV block valve is closed and the SRO has finished evaluating Technical Specifications, or at lead examiner's direction, proceed to Event 5, "B" Condensate Pump Trip.		

Op-Test No.: NRC Scenario No.: 2 Event No.: 5

Event Description: "B" Cond Pump Trip, "C" Cond Pump fails to start. Loss of SGFP suction pressure

Time	Position	Applicant's Actions or Behavior
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Simulator Operator: When directed, initiate Event 5, "B" Condensate pump trip.

Indications:

- CONDENSATE PUMP B DIS PRES LO (C-11 on C-05)
- SGFP A SUCTION FLOW LO (C-1 on C-05)
- SGFP B SUCTION FLOW LO (C-2 on C-05)
- SGFP A/B Suction Press Lo (PPC alarms)
- SGFP A TURBINE TRIP (A-4 on C-05)
- SGFP B TURBINE TRIP (A-5 on C-05)

Examiner Note: The following steps are from ARP 2590B-043 for Condensate Pump "B" Discharge Pressure Low annunciator.

	SRO/BOP	<p><u>AUTOMATIC FUNTIONS</u></p> <p>1. Standby pump starts automatically at 400 psig</p> <p>Examiner Note: The Standby pump (C) fails to start and will not start manually. Two start attempts are allowed IAW OP 2319A Condensate Operations Section 3. Precautions (If a second consecutive start of a condensate motor is to be performed, the motor must be verified to have coasted to a stop between starts.)</p> <p><u>CORRECTIVE ACTIONS</u></p> <p>1. CHECK condensate pump status lights to determine if pump has tripped. 1.1 <u>IF</u> pump has tripped, (amber light on), CHECK standby pump running <u>OR</u> START standby pump as required to maintain discharge header pressure great than 460 psig.</p> <p>2. <u>IF</u> discharge header pressure is less than 460 psig, START additional pump(s) to raise pressure.</p> <p>3. <u>IF</u> additional condensate pumps are <i>not</i> available, REDUCE loads as necessary, to maintain Condensate System pressure.</p>
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Examiner Note: Operators may enter AOP for Rapid Downpower however SGFP pressure cannot be maintained with one condensate pump running.

Examiner Note: The following steps are from ARP 2590C-049 for RPS PRE TRIP (At 54% Steam Generator Level). Note: Applicant may use ARP for SGFP B TURBINE TRIP, RPS PRE TRIP, or SRO may direct tripping reactor without referencing the ARP.

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
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CORRECTIVE ACTIONS

SRO/BOP

5. IF conditions are degrading to the point where an automatic reactor trip would be expected, prior to the actuation of automatic trip, manually TRIP reactor and Go To EOP 2525, "Standard Post Trip Actions."

CRITICAL TASK: Manually shut down the Reactor: The plant must be manually tripped prior to reaching the Automatic Auxiliary Feedwater initiation setpoint of 27% in either S/G.

Steam Generator Level at Reactor Trip: _____

Time of Reactor Trip: _____

Examiner Note: The following steps are from EOP 2525 Standard Post Trip Actions.

Determine Status of Reactivity Control

ATC

1. DETERMINE that Reactivity Control acceptance criteria are met by performing ALL of the following steps:
 - a. CHECK that reactor power is dropping.
 - b. CHECK that SUR is negative.
 - c. CHECK that *no* more than one CEA is *not* fully inserted.
 - a. c.1 IF more than one CEA is *not* fully inserted, COMMENCE emergency boration. Refer to Appendix 3, Emergency Boration.

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
	BOP	<p>2. Status of Maintenance of Vital Auxiliaries continued:</p> <p>a. CHECK that BOTH facilities of RBCCW are operating with service water cooling.</p> <p>e.1 <u>IF</u> a service water pump is not running, PLACE the associated RBCCW pump in "PULL TO LOCK".</p> <p>e.2 <u>IF</u> a RBCCW pump is not running AND ALL of the following conditions are met:</p> <ul style="list-style-type: none">• Associated service water pump is running.• Containment pressure is less than 20 psig.• RBCCW pump is electrically aligned. <p>START the associated RBCCW pump.</p> <p>e.3 IF RBCCW cooling is lost to an RCP, STOP RCPs that are no longer being supplied with RBCCW.</p> <p>Examiner Note: Operator should place the "A" and "B" RBCCW pumps in PULL TO LOCK. RCPs are secured due to the Loss of Normal Power.</p> <p>b. CHECK on facility of CRAC operating.</p>

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
	ATC	<p>Determine Status of RCS Inventory Control</p> <p>3. DETERMINE that RCS Inventory Control acceptance criteria are met by performing ALL of the following:</p> <p>a. CHECK that BOTH of the following conditions exist:</p> <ul style="list-style-type: none"> • Pressurizer level is 20 to 80% • Pressurizer level is trending to 35 to 70% <p>a.1 IF the Pressurizer Level Control System is not operating properly in automatic, RESTORE and MAINTAIN pressurizer level 35 to 70% by performing ANY of the following:</p> <p>1) OPERATE the Pressurizer Level Control System.</p> <p>2) Manually OPERATE charging and letdown.</p> <p>b. CHECK that RCS subcooling is greater than or equal to 30°F</p>
	ATC	<p>Determine Status of RCS Pressure Control</p> <p>4. DETERMINE RCS Pressure Control acceptance criteria are met by BOTH of the following:</p> <ul style="list-style-type: none"> • CHECK that pressurizer pressure is 1900 to 2350 psia. • CHECK that pressurizer pressure is trending to 2225 to 2300 psia.
	ATC	<p>Determine Status of Core Heat Removal</p> <p>5. DETERMINE that Core Heat Removal acceptance criteria are met by performing ALL of the following:</p> <p>a. CHECK that at least one RCP is operating.</p> <p>5.1 PLACE TIC-4165, steam dump TAVG controller, in manual and closed.</p> <p>Examiner Note: No RCPs are running due to the Loss of Normal Power.</p> <p>b. CHECK that loop delta T is less than 10°F</p> <p>c. CHECK that Th subcooling is greater than or equal to 30°F.</p>

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Determine Status of RCS Heat Removal</p> <p>6. DETERMINE that RCS Heat Removal acceptance criteria are met by ALL of the following conditions:</p> <ul style="list-style-type: none">a. CHECK that BOTH steam generators pressure are 880 to 920 psia.b. CHECK that RCS Tc is being maintained 530 to 535°F.c. CHECK that at least one steam generator has BOTH of the following conditions met:<ul style="list-style-type: none">• Level is 10 to 80%.• Main feedwater or TWO auxiliary feedwater pumps are operating to restore level 40 to 70%.c.1 RESTORE level to 40 to 70% in at least one steam generator using ANY of the following:<ul style="list-style-type: none">• TDAFW Pump. Refer To Appendix 6, "TDAFW Pump Normal Startup."d. CHECK that RCS subcooling is greater than or equal to 30°F.

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
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	ATC	<p>Determine Status of Containment Isolation</p> <p>7. DETERMINE that Containment Isolation acceptance criteria are met by ALL of the following:</p> <p>a. CHECK that NONE of the following primary plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity:</p> <p>Radiation Monitors Inside Containment</p> <ul style="list-style-type: none">• RM-7890, Personnel Access Area• RM-7891, Ctmt Refuel Floor Area• RM-8240, High Range• RM-8241, High Range• RM-8123 A and B, Ctmt Atmosphere• RM-8262 A and B, Ctmt Atmosphere <p>Radiation Monitors Outside Containment</p> <ul style="list-style-type: none">• RM-7894, Charging Pump Area• RM-7895, Primary Sample Sink• RM-7896, -25 ft 6 in Waste Process Area• RM-7897, -45 ft 6 in Waste Process Area• RM-8132A and B, Unit 2 Plant Stack• RM-8169, Millstone Stack WR• RM-8168, Unit 2 WR Stack• RM-6038, RBCCW <p>b. CHECK that NONE of the following steam plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity:</p> <p>Steam Plant Radiation Monitors</p> <ul style="list-style-type: none">• RM-5099, Steam Jet Air Ejector• RM-4262, SG Blowdown• RM-4299A and B, Main Steam Line 1• RM-4299C, Main Steam Line 2 <p>c. CHECK that containment pressure is less than 1.0 psig.</p>
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Op-Test No.: <u> NRC </u> Scenario No.: <u> 2 </u> Event No.: <u> 6, 7 </u>		
Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout		
Time	Position	Applicant's Actions or Behavior

	ATC	<p>Determine Status of Containment Temperature and Pressure Control</p> <p>8. DETERMINE that Containment Temperature and Pressure Control acceptance criteria are met by BOTH of the following steps:</p> <ol style="list-style-type: none"> CHECK that containment temperature is less than 120°F. (PPC or avg of Points 5 and 6) CHECK that containment pressure is less than 1.0psig.
	ATC/BOP	<p>Perform Subsequent Steps (9-17) of EOP 2525 SPTAs.</p> <p>Examiner Note: EOP 2525 SPTA Steps 9-17 are attached to guide.</p>
	SRO	<p>18. <u>IF</u> no contingency actions were performed in the Immediate Actions <u>AND ALL</u> safety function acceptance criteria are met, PERFORM ONE of the following:</p> <ul style="list-style-type: none"> Go To EOP 2526, "Reactor Trip Recovery." DIAGNOSE the event. Refer To Appendix 1, "Diagnostic Flowchart." <p>Examiner Note: Step 18 is N/A.</p> <p>19. <u>IF ANY</u> contingency action was performed in the Immediate Actions <u>OR ANY</u> safety function acceptance criteria are not met, PERFORM the following:</p> <ol style="list-style-type: none"> DIAGNOSE the event. Refer To Appendix 1, "Diagnostic Flowchart." Go To the appropriate EOP.

Examiner Note: The Unit Supervisor refers to EOP 2541 Appendix 1, Diagnostic Flowchart to diagnose the event.

	SRO	Enters EOP 2530 Station Blackout.
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Examiner Note: The following steps are from EOP 2530 Station Blackout. Asterisked steps, within the ORP or selected FRPs being implemented, may be brought forward to restore or preserve a Safety Function. Asterisked steps are "Continuously Applicable," and may be performed out of order after they have been accomplished once.

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
	SRO	<p>*1. CONFIRM diagnosis of a Station Blackout by checking that Safety Function Status Check Acceptance Criteria are satisfied.</p> <p>Examiner Note: SRO checks EOP 2530-001 SBO Safety Function Status Checks and confirms that all Safety Criteria are satisfied.</p>
	SRO	<p>*2. CLASSIFY the event. Refer To MP-26-EPI-FAP06, "Classification and PARs"</p> <ul style="list-style-type: none">• IF classification requires RCS sampling, Refer To Appendix 46, "Sampling for EAL Determination" and DIRECT Chemistry as required.
	SRO	<p>3. PERFORM ALL of the following:</p> <ul style="list-style-type: none">• OPEN the placekeeper and ENTER the EOP entry time.• ENSURE the master alarm silence switch is in "NORMAL".
		<p>*4. ALIGN instrument air by performing ANY of the following:</p> <p>a. ALIGN instrument air from Unit 3 by performing the following:</p> <ol style="list-style-type: none">1) CHECK that Unit 3 is available to supply air.2) ENSURE SA- 10.1, station air to instrument air cross- tie is open.3) DIRECT a PEO to perform the following:<ul style="list-style-type: none">• ENSURE SA- 26, SA- 11.1 outlet bypass is open.• OPEN SA- 12, SA- 11.1 inlet bypass.• OPEN SAS- 379, bypass valve for SAS- EFV- 20• OPEN SAS- 6, station air cross tie to Unit 3• Slowly OPEN 3- SAS- V900, service air cross- tie to Unit 2. <p>b. <u>IF</u> instrument air is not available, ENSURE backup air is aligned as necessary. Refer To Appendix 40, "Aligning Backup Instrument Air."</p> <p>Examiner Note: Unit 3 is available to supply instrument air.</p> <p>CUE: For Unit 3 to provide Instrument Air to Unit 2.</p>

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
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*5. MAINTAIN secondary plant inventory by performing **ALL** of the following:

a. SECURE steaming to the condenser by performing the following:

- 1) CLOSE **BOTH** MSIVs.
- 2) ENSURE **BOTH** MSIV bypass valves are closed.
- 3) OPEN AR- 17, condenser vacuum breaker.
- 4) CLOSE **BOTH** main steam leg low point drains:
 - MS- 265B
 - MS- 266B

b. CLOSE MS- 220A, blowdown isolation valve.

c. CLOSE MS- 220A, blowdown isolation valve.

d. CLOSE BOTH steam generator sample valves:

- MS-191A
- MS-191B

*6. MINIMIZE RCS leakage by performing ALL of the following:

a. ENSURE BOTH of the following letdown isolation valves are closed:

- CH- 515
- CH- 516

b. CLOSE CH-506, RCP controlled bleedoff isolation.

c. DIRECT chemistry to ensure at least one facility of RCS sample line isolation valves are closed:

Facility 1

- RC- 45, RC combined sample isolation valve

Facility 2

- RC- 001, RC hot leg isolation valve
- RC- 002, pressurizer surge sample isolation valve
- RC- 003, pressurizer steam sample isolation valve

CUE: For chemistry to sample.

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
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*7. ENSURE RCS TC is being maintained less than 535° F by ANY of the following:

- Operation of the ADVs from the Control Room.
- Local operation of the ADVs. Refer To Appendix 36, "ADV Local Operation."

Examiner Note: ADVs should be operated from the Control Room.

NOTE

Normal lighting may be lost to the TDAFP Room. Emergency lighting is available, but portable lighting may be necessary in order to perform some portions of Appendix 7.

*8. ENSURE at least one steam generator meets ANY of the following conditions:

- Steam generator level is 40 to 70%
- Steam generator level is being restored by ANY of the following:
 - TDAFW Pump. Refer To Appendix 6, "TDAFW Pump Normal Startup."
 - TDAFW Pump. Refer To Appendix 7, "TDAFW Pump Abnormal Startup."

Examiner Note: Step 1 of Appendix 6, TDAFW Pump Normal Startup states: IF a SBO event has occurred OR DC Bus 201B is not energized, Go To Appendix 7, "TDAFW Pump Abnormal Startup."

CUE: For PEO direction of TDAFWP local startup. Add practical time to report back that TDAFWP is running and feeding both Steam Generators (This affects CT below).

CRITICAL TASK: Prior to emptying either SG (X% level Narrow Range), operator actions are required to establish AFW flow to SGs.

Steam Generator Level when AFW established:

Steam Generator 1 Level: _____

Steam Generator 2 Level: _____

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
		<p>*9. ENSURE adequate RCS heat removal by performing the following:</p> <p>a. PLACE TIC-4165, steam dump TAVG controller, in "MANUAL" and closed.</p> <p>b. CHECK natural circulation flow in at least one loop by ALL of the following:</p> <ul style="list-style-type: none">• Loop ΔT is less than 55°F.• T_{hot} and T_{cold} are constant or dropping.• CET subcooling is greater than or equal to 30° F.• T_{hot} and CET temperature ΔT is less than 10°F.
		<p>*10. CHECK DC buses 201A and 201B are energized.</p>
		<p>*11. IF 24C or 24D is not expected to be restored within 30 minutes of event initiation, ALIGN supplemental cooling for vital equipment. Refer To Appendix 14, "Supplemental Cooling on Loss of Ventilation.</p>
CUE: For PEO to perform Appendix 14 Supplemental Cooling on Loss of Ventilation steps.		
		<p>*12. IF either vital battery charger is not expected to be restored within one hour of event initiation, REDUCE loads on the associated vital battery bus. Refer To Appendix 28, "DC Load Reduction."</p> <p>Examiner Note: The SRO may or may not direct this step to be performed at this time.</p>
		<p>*13. ENSURE that all supply breakers on the deenergized 4.16 kV and 6.9 kV buses are open. Refer To Appendix 39, "Opening Supply Breakers on Deenergized Electrical Buses."</p>
		<p>*14. IF power has been lost to a vital DC electrical bus, AND resources permit, ALIGN power to electrical buses as desired. Refer To Appendix 29, "Restoring DC And Vital Instrument AC Buses."</p>
		<p>*15. ENERGIZE at least one vital 4.16 kV bus. Refer To Appendix 23, "Restoring Electrical Power."</p>
Examiner Note: The following steps are from Appendix 23, Restoring Electrical Power, Attachment 23-N Energizing 4.16 kV Bus 24E From Unit 3.		

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
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	BOP	<div><p style="text-align: center;">NOTE</p><p>The following may indicate a fault on 4.16 kV Bus 24E:</p><ul style="list-style-type: none">• Annunciator "4KV BUS 24E/34B TIE BKR A505 TRIP" lit (A-9, C08)• Annunciator "4KV BUS 24C/E TIE BKR A305 TRIP" lit (B-10, C08)• Annunciator "4KV BUS 24D/E TIE BKR A408 TRIP" lit (D-10, C08)</div>
	BOP	<ol style="list-style-type: none">1. CHECK that no fault indications are present for 4.16 kV Bus 24E.2. ENSURE 4.16 kV Bus 24E "SPLY VOLTS" voltage is indicated.3. ENSURE ALL of the following load breakers on 4.16 kV Bus 24E are open:<ul style="list-style-type: none">• A502, "SERVICE WTR PUMP B"• A503, "HPSI PUMP B"• A504, "RBCCW PUMP B"
	BOP	<ol style="list-style-type: none">4. ENSURE ALL of the following breakers are open:<ul style="list-style-type: none">• A305, "24C/24E TIE BKR, 24C-2T-2"• A408, "24D/24E TIE BKR, 24D-2T-2"5. REQUEST permission from Unit Shift Manager or Unit Supervisor to energize Unit 2 4.16 kV Bus 24E from Unit 3 4.16 kV Bus 34A/34B.
	BOP	<div><p style="text-align: center;">NOTE</p><p>Due to the "Dead Bus" state of 4.16 kV Bus 24E, the synchroscope will not move.</p></div>

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
		<p>6. PLACE "SYN SEL SW, 34B-24E-2 (A505)" to "ON" and CHECK "INCOMING" voltage indicated.</p> <p>7. CLOSE A505, "24E/34B TIE BKR, 34B-24E-2".</p> <p>8. CHECK voltage indicated on "RUNNING" voltmeter.</p> <p>9. PLACE "SYN SEL SW, 34B-24E-2 (A505)" to "OFF".</p> <p>10. Refer To Attachment 23-U, "3 MVA Electrical Limit on Bus 34A/34B," and ENSURE that 3 MVA is not exceeded as loads are restored to service.</p> <p>Examiner Note: Attachment 23-U is attached to this guide.</p>
		<p>11. At the direction of the US, REALIGN as necessary for the applicable facility and PLACE the following pumps in service:</p> <ul style="list-style-type: none">• Service Water Pump B• HPSI Pump B• RBCCW Pump B <p>12. <u>IF</u> desired to restore power to 4.16 kV Bus 24C from 4.16 kV Bus 24E, Refer To Attachment 23-D, "Energizing 4.16 kV Bus 24C From 4.16 kV Bus 24E."</p> <p>13. <u>IF</u> desired to restore power to 4.16 kV Bus 24D from 4.16 kV Bus 24E, Refer To Attachment 23-G, "Energizing 4.16 kV Bus 24D From 4.16 kV Bus 24E."</p>
Scenario Termination: When crew has restored power to one Vital 4.16kV bus, or at the lead examiner's direction, the scenario is complete.		

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
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Examiner Note: The following steps are from EOP 2525 Standard Post Trip Actions, Subsequent Actions.

		9. <u>IF</u> charging pumps are taking suction from the VCT, CHECK VCT level is 72 to 86%.
		10. CHECK Main Condenser is available, as indicated by ALL of the following: <ul style="list-style-type: none">• At least one MSIV open• Condenser vacuum better than 15 inches HG-ABS (0 to 15 inches)• At least one condensate pump operating• At least one Circ Water pump operating 10.1 IF Main Condenser is not available, PERFORM the following: <ul style="list-style-type: none">• CLOSE BOTH MSIVs.• ENSURE BOTH MSIV bypass valves are closed.• OPEN AR---17, condenser vacuum breaker.
		11. OPEN HD-106, subcooling valve.
		12. ENSURE BOTH heater drain pumps are stopped.

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
		<p>13. <u>IF</u> MFW is supplying feed to the steam generators, PERFORM the following:</p> <ol style="list-style-type: none"> ENSURE that only ONE main feedwater pump is running. ENSURE that BOTH main feed block valves are closed: <ul style="list-style-type: none"> FW-42A FW-42B ADJUST the running main feedwater pump pressure to 50 to 150 psi greater than SG pressure. ENSURE that BOTH main feed reg bypass valves are throttled to control SG level: <ul style="list-style-type: none"> FW-41A FW-41B <u>IF</u> Main Feedwater Pump A is secured, CLOSE the following: <ol style="list-style-type: none"> FW-38A, main feedwater pump discharge valve FW-36A, main feedwater pump mini flow recirc valve <u>IF</u> Main Feedwater Pump B is secured, CLOSE the following: <ol style="list-style-type: none"> FW-38B, main feedwater pump discharge valve FW-36B, main feedwater pump mini flow recirc valve <p>Examiner Note: Main Feedwater Pump A and B are secured.</p>
		<p>14. <u>IF</u> MFW is not supplying feed to the SGs, CLOSE BOTH main feedwater pump mini flow recirc valves:</p> <ul style="list-style-type: none"> FW-36A FW-36B <p>Examiner Note: Main Feedwater is not supply feed to the Steam Generators.</p>
		<p>15. <u>IF</u> AFAS has actuated <u>AND</u> at least one steam generator is being restored to between 40 and 70%, PERFORM the following:</p> <ol style="list-style-type: none"> PLACE auxiliary feed VERRIDE/MAN/START/RESET handswitches in "PULL TO LOCK". <u>IF</u> auxiliary feed is supplying steam generator makeup, manually CONTROL auxiliary feed flow rate. <p>Examiner Note: AFAS has actuated.</p>

Op-Test No.: NRC Scenario No.: 2 Event No.: 6, 7

Event Description: SGFPs trip, Manual reactor trip required, Failure of 4.16KV Buses 24C and 24D to Auto Transfer on reactor trip, Rupture in "A" Service Water header after "A" Diesel Generator Loads resulting in Station Blackout

Time	Position	Applicant's Actions or Behavior
		<p>16. IF 25A or 25B is energized, ALIGN condensate pumps as follows:</p> <ol style="list-style-type: none">ENSURE that ONE pump is running.ENSURE that ONE pump is in "AUTO".ENSURE that ONE pump is in "PULL TO LOCK". <p>Examiner Note: Buses 25A and 25B are de-energized.</p>
		<p>17. CHECK instrument air pressure greater than 90 psig and stable.</p>
		<p>18. IF <i>no</i> contingency actions were performed in the Immediate Actions AND ALL safety function acceptance criteria are met, PERFORM ONE of the following:</p> <ul style="list-style-type: none">Go To EOP 2526, "Reactor Trip Recovery."DIAGNOSE the event. Refer To Appendix 1, "Diagnostic Flowchart."
		<p>19. IF ANY contingency action was performed in the Immediate Actions OR ANY safety function acceptance criteria are <i>not</i> met, PERFORM the following:</p> <ol style="list-style-type: none">DIAGNOSE the event. Refer To Appendix 1, "Diagnostic Flowchart."Go To the appropriate EOP.

Op-Test No.: NRC Scenario No.: 2 Event No.:

Event Description: Appendix 23, Attachment 23-U: 3 MVA Electrical Limit on Buses 34A/34B

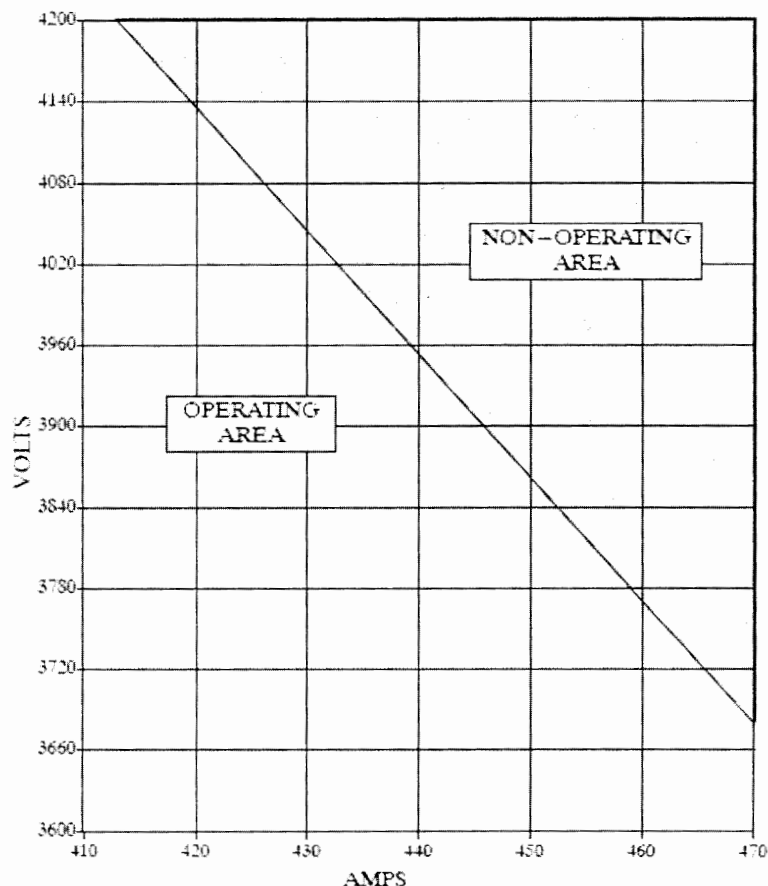
Time	Position	Applicant's Actions or Behavior
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**Millstone Unit 2
Restoring Electrical Power**

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Attachment 23 – U 3 MVA Electrical Limit on Bus 34A 34B

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3 MVA Electrical Limit on Bus 34A/34B

NOTE 1: Refer to table on Page 2 for applicable Source and Limit.

NOTE 2: Obtain amp: from COS.

Level of Use
Continuous

Op-Test No.: NRC Scenario No.: 2 Event No.:

Event Description: Appendix 23, Attachment 23-U: 3 MVA Electrical Limit on Buses 34A/34B

Time	Position	Applicant's Actions or Behavior
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Attachment 23-U

3 MVA Electrical Limit on Bus 34A 34B

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UNIT 3 SUPPLYING TABLE

SOURCE	LIMIT	SOURCE	LIMIT
RSST	3 MVA	NSST	3 MVA

SIMULATOR SCENARIO #3

Facility: Millstone Unit 2	Scenario No.: 3	Op-Test No.: NRC 2014
Examiners: _____	Operators: _____	SRO
_____	_____	ATC
_____	_____	BOP

Initial Conditions: 100% Power IC, BOL, Equilibrium Xenon, 1105 ppm Boron, SGBD @40gpm per Steam Generator, 24E aligned to 24C, Channel C Wide Range Containment Pressure safety instrument is OOS.

Turnover: 100% power, equilibrium Xenon, 1105 ppm Boron, blend ratio: 4.32:1.0, SGBD @ 40gpm per Steam Generator, 24E is aligned to 24C. Channel C Wide Range Containment Pressure (PI 8115) instrument is OOS. Entered TSAS 2 for 3.4.3.4 RPS Instrumentation and 3.4.3.4 ESAS Instrumentation 2 hours ago Prerequisites met for SP2606D 2-CS-4.1B Stroke and Timing IST. Perform IST at the start of this shift. High winds reported on Long Island Sound for the entire day.

Critical Tasks:

1. Manually Shutdown the reactor. The reactor must be manually tripped using the CEDM output breakers immediately (within 1 minute) when an automatic reactor trip fails and/or the manual push buttons do NOT work. (CT-1/SPTA-5)
2. Emergency borate following ATWS. Emergency Borate the RCS following Reactor Trip following the failure of more than one full-length CEA to insert on a reactor trip prior to exiting EOP 2525 Standard Post Trip Actions.
3. Initiate a plant cooldown. A plant cooldown at a rate of greater than 40°F/hr should be initiated within one hour, following an unisolable LOCA, until the condenser steam dump valves or ADVs are full open. (CT-3/LOCA-3)

Event No.	Malfunction No.	Event Type*	Event Description
1 (0 min)	Override for valve indication in Control Room.	N (ATC, BOP) TS (SRO)	Perform Surveillance Procedure SP-2606D to stroke test Containment Spray Valve CS-4.1B. Stroke time is out of specification (overriding one of the position lights on for a few additional seconds to make it look like the valve took longer to stroke).
2 (10 min)	RX01B RX02B Override proportional heater indication	I (ATC, SRO) TS (SRO)	Pressurizer Spray Valve Controller Failure, HIC-100F fails causing Spray Valve 100F to open 25%. During transient, Proportional Pressurizer heater Group 2 breaker trips open. (EN-49779). Must remove RX01B so operator can close spray valve.
3 (30 min)	SW09A	C (BOP, SRO)	Service Water Pump "A" strainer high D/P (4psid and rising)

Op-Test No.: NRC Scenario No.: 2 Event No.: 1

Event Description: Raise Power to 100%

Time	Position	Applicant's Actions or Behavior
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4 (40 min)	FW39A	C (BOP, SRO) N (ATC)	High vibration on "A" SGFP (both HP/LP bearings >3mils, <5mils)
5 (43 min)		R (ATC)	Rapid power reduction to take "A" SGFP offline (~65% power)
6 (60 min)	TU02A RD1401, RD1402, RD1405, RD1406, RD1409, RD1414 RP27B RP04B RP04D	M (All)	Turbine High Vibration results in manual scram (greater than 12 mils sustained, ramp). Reactor Trip manual pushbuttons do not work (ATWS). 6 CEAs fail to insert on reactor trip (ATWS). Emergency Boration required.
7 (60min)	CH-514, CH-508, 509 overrides	C (ATC)	The normal Emergency Boration path is failed. CH-514, boric acid isolation valve and CH-508, CH-509 boric acid gravity feed isolation valves will NOT open. Must perform boration from RWST and charging pumps.
8 (61 min)	RC05A	C (ATC)	Pressurizer Safety Valve RC-200 fails to re-seat (25% severity)
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Op-Test No.: NRC Scenario No.: 2 Event No.: 1

Event Description: Raise Power to 100%

Time	Position	Applicant's Actions or Behavior
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Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual
1. Total malfunctions (5–8)	10
2. Malfunctions after EOP entry (1–2)	3
3. Abnormal events (2–4)	4
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	1
6. EOP contingencies requiring substantive actions (0–2)	0
7. Critical tasks (2–3)	3

NRC 2014, Scenario 3 Summary:

The crew will take the shift with the unit at 100% power and 24E aligned to 24C. The “C” Channel Containment Pressure (wide range) instrument is out of service and the off-going crew entered Technical Specification Action statements for RPS and ESAS instrumentation 2 hours prior to the crew assuming the shift. The appropriate RPS and ESAS channels have been bypassed and I&C expects to return the instrument to operable within the next 5 hours.

Event 1: The crew has been directed to perform Surveillance SP2606D, Section 4.1, 2-CS-4.1B Stroke and Timing IST, Facility 2. Section 2.1 General Prerequisites satisfied for performing surveillance and initialed. During this IST, the valve stroke time will be out of specification. The SRO will have to make a Technical Specification entry for the out of specification stroke time.

Event 2: Once Technical Specifications are evaluated, Pressurizer Spray valve 100F will begin to open and stop at 25% open. This pressure transient (drop) will cause all heaters to energize. A few seconds later, the proportional heater breaker for Group 2 trips open. The crew will respond per Annunciator Response Procedures (ARPs), 2509B-212 for Pressurizer Pressure Selected Channel deviation from setpoint Hi/Lo. This ARP directs that if heaters and spray are not operating properly, manually OPERATE pressurizer heaters and spray to establish desired RCS pressure and refer to Technical Specification LCO 3.4.4. Desired RCS pressure band IAW OP 2204 Load Changes, section for Operation at Steady State power is 2225 – 2300 psia. The ATC operator can take manual control of HIC-100F and close the spray valve.

The Proportional Heater group breaker trip requires a Technical Specification entry. (Reference similar event: Millstone Unit 2 EN-49779 Jan 2014). With only one group of pressurizer heaters OPERABLE, restore at least two groups to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours. The crew will be told that it is repairable.

Event 3: When pressurizer pressure is returned to its normal band, the Train “A” Salt Water Cooling Pump strainer will become clogged as a result of the high winds pushing seaweed into the intake structure. Differential pressure across the service water strainers rises to 4psid. The crew will take actions for SW Pump A Strainer Trouble ARP 2590E-028 for strainer D/P greater than or equal to 3 psid and service water strainer has not started. This will require starting the the B Service Water pump on Facility 1 per OP2326A, Service

Op-Test No.: <u> NRC </u> Scenario No.: <u> 2 </u> Event No.: <u> 1 </u>		
Event Description: Raise Power to 100%		
Time	Position	Applicant's Actions or Behavior

Water System. They may also refer to AOP 2565, Loss of Service Water to more quickly switch to the swing Service Water pump. The SRO will refer to TSAS 3.7.4.1, Service Water System and TRM 7.1.21, Service Water System but no Technical Specification entry is required.

Event 4 and 5: After Service Water is restored, the “A” Steam Generator Feed Pump (SGFP) will have high vibrations requiring the crew to down power to 60% and take the pump off line. They should use AOP 2575, “Rapid Downpower”.

Event 6: Immediately after the crew trips the “A” SGFP, the TURBINE VIBRATION HI annunciator alarms followed by the TURBINE VIBRATION HI HI annunciator. The crew will refer to ARPP 2590E-174 and see that reactor trip criteria is met (greater than 12 mils sustained). The crew will attempt manually trip the reactor. But the manual pushbuttons fail. Operators will have to open the CEDM output breakers to trip the reactor. On the reactor trip, six CEAs fail to fully insert and the crew will commence emergency boration per EOP 2541 Standard Appendixes, Appendix 3A, Emergency Boration.

Event 7: While the ATC operator is performed the Emergency Boration Lineup, the normal flow path will be flawed as a result of boric acid isolation valve CH-514 fails to open. Emergency borate via the RWST using Appendix 3A step 2 for Boric Acid Storage Tanks NOT available.

The crew will perform Emergency Operating Instruction EOP 2525, Standard Post Trip Actions

Event 8: During Step 2 of SPTAs (Vital Auxiliaries) a Pressurizer Safety, RC-200, will fail to close after opening resulting in a LOCA and SIAS signal. The crew should respond by diagnosing a Loss of Coolant Accident and entering EOP 2532 LOCA.

INPUT SUMMARY							
Either INPUT or VERIFY the following functions:							
ID Num	Description	Delay Time	Ramp Time	Event Time	Sev or Value	Final Value	Rel Order
MALFUNCTIONS							
REMOTE FUNCTIONS							
OVERRIDES							

Op-Test No.: NRC Scenario No.: 2 Event No.: 1

Event Description: Raise Power to 100%

Time	Position	Applicant's Actions or Behavior					

Op-Test No.: NRC Scenario No.: 2 Event No.: 1

Event Description: Raise Power to 100%

Time	Position	Applicant's Actions or Behavior
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Examiner Note: The crew has been instructed to perform SP2606D. All prerequisites met. They have been provided a calibrated stop watch and a marked up procedures

The following steps are from SP 2606D, 2-CS-4.1B Valve Tests, Facility 2. Note: Remove position indication testing is NOT required at this time. SP 2606D procedure is marked up with "N/A" and Unit Supervisor signatures for applicable steps.

	ATC	<p>4.1 2-CS-4.1B Stroke and Timing IST</p> <div><p>NOTE</p><p>Cycling 2-CS-4.1B verifies the CS header in Containment filled. [Ref. 6.6]</p></div>
	ATC	<p>4.1.1 <u>IF</u> remote position indication testing is required, Go To Section 4.2.</p> <p>Examiner Note: Remote position indication testing is not required.</p> <p>4.1.2 <u>IF</u> valve does not stroke full open or full closed during testing, Go To Attachment 1.</p> <p>4.1.3 OPEN CS-4.1B, "CS HDR B ISOL," and MEASURE stroke time (C-01).</p> <p>4.1.4 RECORD open stroke time on SP 2606D-004.</p> <p>4.1.5 CLOSE CS-4.1B, "CS HDR B ISOL," and MEASURE stroke time (C-01).</p> <p>4.1.6 RECORD close stroke time on SP 2606D-004.</p>

Op-Test No.: NRC Scenario No.: 2 Event No.: 1

Event Description: Raise Power to 100%

Time	Position	Applicant's Actions or Behavior
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	ATC	<p>4.1.7 COMPARE stroke time data to "Acceptable" and "Normal" limits on SP 2606D-004.</p> <p>4.1.8 MARK SP 2606D-004, "Acceptable" and "Normal" limit "YES" or "NO," and INITIAL.</p> <p>4.1.9 MARK SP 2606D-004, "Operational Readiness," "SAT" or "UNSAT," and INITIAL.</p> <p>4.1.10 <u>IF</u> valve stroke times are not within "Acceptable" limits, Go To Attachment 1.</p> <p>Examiner Note: Applicant informs SRO goes to Attachment 1 because stroke time is not within acceptable limits.</p>
Examiner Note: The following steps are from SP2606D Attachment 1.		

Op-Test No.: NRC Scenario No.: 2 Event No.: 1

Event Description: Raise Power to 100%

Time	Position	Applicant's Actions or Behavior
	SRO	<p>1. CONSIDER component not OPERABLE.</p> <p>2. <u>IF</u> in MODEs 1, 2, 3 ($\geq 1,750$ psia), LOG entry in TSAS 3.6.3.1 and TSAS 3.6.2.1a.</p> <p>3. <u>IF</u> in MODEs 3 or 4 ($< 1,750$ psia), LOG entry in TSAS 3.6.3.1.</p> <p>4. SUBMIT CR and RECORD CR number in applicable Form cover sheet.</p> <p>5. NOTIFY the following:</p> <ul style="list-style-type: none">• IST Coordinator• System Engineer <p>Examiner Note: SRO logs into TSAS 3.6.3.1 and TSAS 3.6.2.1a</p> <p><u>LCO 3.6.3.1</u> Each containment isolation valve shall be OPERABLE.</p> <p>APPLICABILITY: MODES 1, 2, 3 and 4. ACTION:</p> <p>With one or more of the isolation valve(s) inoperable, either:</p> <ul style="list-style-type: none">• Restore the inoperable valve(s) to OPERABLE status within 4 hours, or• Isolate the affected penetration(s) within 4 hours by use of a deactivated automatic valve(s) secured in the isolation position(s), or• Isolate the affected penetration(s) within 4 hours by use of a closed manual valve(s) or blind flange(s); or• Isolate the affected penetration that has only one containment isolation valve and a closed system within 72 hours by use of at least one closed and deactivated automatic valve, closed manual valve, or blind flange; or• Be in COLD SHUTDOWN within the next 36 hours. <p><u>LCO 3.6.2.1</u> Two containment spray trains and two containment cooling trains, with each cooling train consisting of two containment air recirculation and cooling units, shall be OPERABLE.</p> <p>APPLICABILITY: MODES 1, 2 and 3*.</p> <p>ACTION: For one containment spray train inoperable, Restore the inoperable containment spray train to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and reduce pressurizer pressure to less than 1750 psia within the following 6 hours.</p>

Op-Test No.: NRC Scenario No.: 2 Event No.: 1

Event Description: Raise Power to 100%

Time	Position	Applicant's Actions or Behavior
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Examiner Note: When Technical Specifications have been evaluated or at lead examiner's direction, go to Event 2, Pressurizer Spray Valve Controller Failure.

Op-Test No.: NRC Scenario No.: 2 Event No.: 2

Event Description: Pressurizer Spray Valve 100F fails open

Time	Position	Applicant's Actions or Behavior
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Simulator Operator: When directed, initiate Event 2, Pressurizer Spray Valve 100F fails open.

Indications Available:

- 2509B-212 for Pressurizer Pressure Selected Channel deviation from setpoint Hi/Lo
- PZR PRESS DEVIATION C02/3 D37
- PZR PRESS CH X LO C02/3 D38
- PZR PRESS CH Y LO C02/3 D39

Examiner Note: The following steps are from ARP 2590B-212

		<div>NOTE</div> <p>If forcing pressurizer sprays, this is an expected alarm.</p>
	ATC	OBSERVE the following to evaluate RCS pressure: <ul style="list-style-type: none">• PRES CNTL-X, PIC-100X• PRES CNTL-Y, PIC-100Y Pressurizer pressure safety channel indication
	ATC	IF alarm is determined to be valid, VERIFY selected channel setpoint is at desired pressurizer pressure (C-03). ADJUST selected channel setpoint to maintain desired pressure (C-03).
	ATC	VERIFY proper operation of pressurizer heaters and spray valves (C-03). IF heaters and spray are not operating properly, manually OPERATE pressurizer heaters and spray to establish desired RCS pressure, and Refer To T/S LCO 3.4.4. Examiner Note: Operator should energize additional heaters to raise pressure. The effects of this malfunction cannot be mitigated by taking manual control of HIC-100F to operate the spray valve.

Examiner Note: Desired RCS pressure band IAW OP 2204 Load Changes, section for Operation at Steady State power is 2225 – 2300 psia

Op-Test No.: NRC Scenario No.: 2 Event No.: 2

Event Description: Pressurizer Spray Valve 100F fails open

Time	Position	Applicant's Actions or Behavior
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	SRO	Refer to T/S LCO 3.4.4: The pressurizer shall be OPERABLE with: a. Pressurizer water level \leq 70%, and b. At least two groups of pressurizer heaters each having a capacity of at least 130 kW. APPLICABILITY: MODES 1, 2 and 3.
	SRO	IF equipment malfunction was cause of annunciator, SUBMIT Trouble Report to I&C Department.

Examiner Note: Once pressure is restored to normal band, or at lead examiner's direction, proceed to Event 3, Service Water Pump A strainer high D/P.

Op-Test No.: NRC Scenario No.: 2 Event No.: 3

Event Description: **Service Water Pump "A" strainer high D/P**

Time	Position	Applicant's Actions or Behavior
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Simulator Operator: When directed, initiate Event 3, Service Water Pump A strainer high D/P .

Indications Available:

- **SW Pump A STNR TROUBLE on C-06/7**

Examiner Note: The following steps are from ARP 2590E-028

	BOP	1. IF "A" Service Water Pump is operating, CHECK "A" Service Water Strainer backwashing: <ul style="list-style-type: none">• Service Water Strainer rotating• 2-SW-90A, "Service Water Strainer Blowdown," open 1. 2. CHECK Service Water strainer D/P, PDC-6475.
	BOP	Determine that A Service Water Header flow is lowering. Dispatch PEO to Intake Structure to check status of backwashing and strainer D/P.

CUE: PEO reports that the A Service Water Strainer D/P is pegged high and the Service Water Strainer is not rotating. It appears that seaweed is clogging the strainer. (Status of 2-SW-90A "Service Water Strainer Blowdown.")

Op-Test No.: NRC Scenario No.: 2 Event No.: 3

Event Description: **Service Water Pump “A” strainer high D/P**

Time	Position	Applicant’s Actions or Behavior
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	SRO	<p>3. IF strainer D/P is greater than or equal to 3 psid AND Service Water Strainer has <i>not</i> started, PERFORM the following:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p style="text-align: center;">NOTE</p><p>The associated Service Water strainer that is in “HAND” will <i>not</i> restart <i>without</i> operator intervention when power is restored after an LNP.</p></div> <p>3.1 IF in MODE 1, 2, 3, or, 4, LOG entry for applicable ACTIONS of the following:</p> <ul style="list-style-type: none">• TSAS 3.7.4.1, “Service Water System”• TRM 7.1.21, “Service Water System” <p>3.2 PLACE strainer control switch in “HAND” and PRESS “START” pushbutton.</p> <p>3.3 IF strainer <i>cannot</i> be started, Refer To OP 2326A, “Service Water System” and PERFORM applicable actions to place “B” Service Water Pump on associated Facility.</p> <p>3.4 Refer To OP 2328A, “Sodium Hypochlorite System,” and STOP injection to “A” Service Water Pump.</p>
CUE: If directed to start the strainer pump, PEO reports that pump failed to start. When directed, report that Sodium Hypochlorite is secured to the “A” Service Water Pump.		
Examiner Note: SRO may direct BOP to start “B” Service Water Pump and secure “A” Service Water Pump from memory to stabilize the plant. SRO may enter AOP 2565, Loss of Service Water		
Examiner Note: The following steps are from OP 2326A, Service Water System, Section 4.6 Placing “B” Service Water Pump in Service and Removing “A” Service Water Pump from Service		

Op-Test No.: NRC Scenario No.: 2 Event No.: 3

Event Description: **Service Water Pump “A” strainer high D/P**

Time	Position	Applicant's Actions or Behavior
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		<div style="border: 1px solid black; padding: 10px; text-align: center;"> CAUTION </div> <p>To minimize the possibility of exceeding D/G load limits while shifting Service Water pumps, the following must be observed:</p> <ul style="list-style-type: none"> When two Service Water pumps are available to start from the same bus (i.e., <i>not</i> in “PULL---TO---LOCK”), the “B” Service Water Pump switch “SIAS/LNP ACTUATION SIGNAL HS 6484A” (A502) must be in the “BLOCK” position.
	SRO/BOP	<p>4.6.1 ENSURE the following:</p> <ul style="list-style-type: none"> Bus 24E supplied from 24C (C-08) P - 5B, “SERVICE WATER PP B,” in “PULL - TO - LOCK” (C - 06) A502, “SERVICE WATER PP B,” racked up SW - 97B, “PP DIS X -TIE,” closed (C - 06) SW - 97A, “PP DIS X -TIE,” open (C - 06) <p>“SIAS/LNP ACTUATION SIGNAL HS 6484A” (A502) in “BLOCK” position</p>
		<div style="border: 1px solid black; padding: 10px; text-align: center;"> CAUTION </div> <p>“B” Service Water Pump and “B” Service Water Strainer must always be supplied by the same engineered safeguards emergency power supply train.</p>
	SRO/BOP	<p>4.6.2 Refer To OP 2328A, “Sodium Hypochlorite System,” and SUSPEND sodium hypochlorite flow to “A” Service Water Pump.</p> <p>Examiner Note: Step 4.6.3 is not applicable.</p>
<p>CUE: When requested, report that Sodium Hypochlorite is secured to the “A” Service Water Pump.</p>		

Op-Test No.: NRC Scenario No.: 2 Event No.: 3

Event Description: **Service Water Pump “A” strainer high D/P**

Time	Position	Applicant’s Actions or Behavior
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NOTE

With “SIAS/LNP ACTUATION SIGNAL HS 6484A” in “BLOCK” position, the “B” Service Water Pump is considered *not* OPERABLE.

	SRO	4.6.4 IF in MODE 1, 2, 3, or, 4, LOG entry in TSAS 3.7.4.1, “Service Water System.”
	BOP	4.6.5 START P - 5B, “SERVICE WATER PP B” (C -06). 4.6.6 CHECK alarm “SW PUMP B SIAS/LNP START MANUALLY BLOCKED” (C06/07, window AA-19) lit. 4.6.7 STOP P - 5A, “SERVICE WATER PP A” (C - 06).
	BOP	Verifies proper operation of “B” SW pump/Directs PEO to verify. (Steps 4.6.8 – 4.6.11).
CUE: As PEO, report that proper operation of “B” SW pump observed.		
	BOP	4.6.12 PLACE P-5A, “SERVICE WATER PP A” in “PULL-TO-LOCK” (C-06). 4.6.13 PLACE “SIAS/LNP ACTUATION SIGNAL HS 6484A” (A502) in “NORMAL” position. 4.6.14 CHECK alarm “SW PUMP B SIAS/LNP START MANUALLY BLOCKED” (C06/07, window AA-19) <i>not</i> lit. Examiner Note: Step 4.6.15 is not applicable.

Op-Test No.: NRC Scenario No.: 2 Event No.: 3

Event Description: **Service Water Pump “A” strainer high D/P**

Time	Position	Applicant’s Actions or Behavior
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Simulator Operator: When directed to vent the “B” SW Pump strainer, insert an override for the SW PUMP B STNR TROUBLE, CA-4 ON C-06/7. Delete override after 2 minutes.

When directed, insert Remote Function SWR31 in NORM, to place HS-6484A (on A502), SIAS/LNP Actuation Signal Hand Switch in the NORMAL position.

CUE: As PEO, report when each directed action above is complete.

	SRO	4.6.16 IF applicable, LOG exit from TSAS 3.7.4.1., “Service Water System.”
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Examiner Note: Once SRO has exited Technical Specifications for Service Water System, or at lead examiner’s direction, proceed to Event 4, High Vibration of “A” SGFP.

Op-Test No.: NRC Scenario No.: 3 Event No.: 4-5

Event Description: High Vibration of A" SGFP and Rapid Downpower

Time	Position	Applicant's Actions or Behavior
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Simulator Operator: When directed, initiate Event 3, High Vibration of A SGFP.

Indications Available:

- SGFP A Turbine Vibration (C-05, D4)
- SGFP Vibration will be displayed on the PPC and UR4500

Examiner Note: The following steps are from ARP 2590D-016.

	BOP	<p>1. CHECK either of the following PPC Secondary System Menu displays:</p> <ul style="list-style-type: none">• Steam Generator Feed Pump (SGFP_01)• Main Turbine Bentley Nevada (BNTURB_AI) <p>Examiner Note: Step 2 is not applicable.</p> <p>3. IF vibration level on both HP bearing AND LP bearing are greater than 3 mils but less than 5 mils, Refer To AOP 2575, "Rapid Down Power," OR OP 2321, "Main Feedwater System," and REMOVE affected SGFP from service.</p>
<p>Examiner Note: Unit Supervisor should determine that vibration levels (~4 mils) require a Rapid Downpower and removal of "A" SGFP from service.</p>		
	SRO	Enters AOP 2575, Rapid Downpower.

Examiner Note: The following steps are from AOP 2575 Rapid Downpower, Section 3.0 Rapid Downpower.

Op-Test No.: <u> NRC </u> Scenario No.: <u> 3 </u> Event No.: <u> 4-5 </u>		
Event Description: High Vibration of A" SGFP and Rapid Downpower		
Time	Position	Applicant's Actions or Behavior

	SRO	<p>3.1 PERFORM focus brief on the 3.1. following: REACTOR TRIP CRITERIA</p> <ul style="list-style-type: none"> Parameters associated with automatic reactor or turbine trips are challenged RCS T cold <i>not</i> within 10_F of temperature program and efforts to regain control are unsuccessful <p>RCS TEMPERATURE CONTROL</p> <ul style="list-style-type: none"> RCS T cold to be maintained within 10_F of Attachment 5, "Temperature vs. Power program" using Attachment 10, "Main Turbine Load Set Control." To avoid uncontrolled cooldowns or power transients, sudden changes in RCS temperature or boron concentration should be avoided. <p>3.2 REQUEST SM/STA to 3.2. Refer To Attachment 8, "Required Notifications," and PERFORM notifications.</p>
	ATC	3.3 INITIATE forcing pressurizer sprays.
		<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>CAUTION</p> <p>In the case of a dropped CEA, rod motion is <i>not</i> used to initiate downpower.</p> </div>
	ATC	3.4 IF <i>not</i> downpowering due to a dropped rod, INSERT Group 7 CEAs 10 ± 2 steps to initiate downpower.
	BOP	3.5 Using the "Load Speed Control" switch, REDUCE turbine load to Maintain Tc on program (+/-2 deg).
	SRO	3.6 Refer To PPC or Reactor Engineering Curve and Data Book and OBTAIN reactivity plan for the initial reactor power condition and desired load reduction.

Examiner Note: The crew should refer to Reactivity Plan for downpower parameters.

Op-Test No.: NRC Scenario No.: 3 Event No.: 4-5

Event Description: High Vibration of A" SGFP and Rapid Downpower

Time	Position	Applicant's Actions or Behavior
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NOTE

Attachment 11 "Approximate Load Demand vs. Reactor Power," can be used to correlate the desired power level to a turbine load demand setpoint.

BOP

3.7 Refer To Attachment 10, "Main Turbine Load Set Control," REDUCE turbine load and MAINTAIN Tc on program (+/-2 deg).

Examiner Note: The following steps are from AOP 2575 Rapid Downpower Attachment 10 Main Turbine Load Set Control:

BOP

CAUTION

Operation of the "Load/Speed CONTROL" switch will change turbine

NOTE

Steps provided in this attachment are dependent on plant conditions

Op-Test No.: NRC Scenario No.: 3 Event No.: 4-5

Event Description: High Vibration of A" SGFP and Rapid Downpower

Time	Position	Applicant's Actions or Behavior
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BOP

1. IF desired to commence or modify a turbine load ramp, **PERFORM** the following (HMI "Load" screen):
 - a. IF previous ramp has stopped, **SELECT** "Load Hold."
 - b. **SELECT** "Load Setpt" and **ENTER** desired value.
 - c. **SELECT** "Rate setpt" and **ENTER** desired value.
 - d. WHEN ready to commence load reduction, **SELECT** "Load Resume."
2. IF desired to adjust the "Load Ramp Rate," **PERFORM** any of the following:
 - **SELECT** "Rate setpt" and **ENTER** new value.
 - **SELECT** "5% / hour," OR "10% / hour," OR "20% / hour."
 - **SELECT** "Raise" or "Lower" (0.25% / hour change).
- a. IF Tavg and Tc are high off program, **PERFORM** the following:
 - a. **SELECT** "Load Hold" to stop ramp.
 - b. WHEN Tavg and Tc are trending back to program, **SELECT** "Load Resume."
- b. IF Tavg and Tc are low off program, **PERFORM** the following:
 - a. **JOG** the "Load/Speed CONTROL" switch to "Lower."
 - b. WHEN Tavg and Tc are back on program, **SELECT** Load Setpt" and **ENTER** desired value.
 - c. IF desired, Go To Step 1 and **RESUME** turbine load ramp.
- c. IF desired load has been reached **SELECT** "Load Hold."

Examiner Note: operator should select x load setpoint, x load rate. Program band for Tavg and Tc is x (+/- 2 deg for Tc).

Examiner Note: The following steps are from AOP 2575 Rapid Downpower Section 3.0 Rapid Downpower.

Op-Test No.: NRC Scenario No.: 3 Event No.: 4-5

Event Description: High Vibration of A" SGFP and Rapid Downpower

Time	Position	Applicant's Actions or Behavior
	ATC	<p>3.8 IF desired to borate from the RWST (preferred method)</p> <p>PERFORM the following:</p> <ul style="list-style-type: none">a. ENSURE at least one charging pump operating.b. ENSURE CH-196, VCT makeup bypass, closed.c. ENSURE CH-504, RWST to charging suction, open.d. OPEN CH-192, RWST isolation.e. CLOSE CH-501, VCT outlet isolation.f. CHECK charging flow at desired rate.g. Go To step 3.11 <p>Examiner Note: Crew should borate from the RWST.</p>
	SRO/ATC/ BOP	<p>3.11 During the downpower, Refer To Attachment 1, "Rapid Downpower Parameters," and MAINTAIN parameters as specified throughout downpower:</p> <p>Examiner note: Attachment 1 Rapid Downpower Parameters:</p> <ul style="list-style-type: none">• Condensate and heater drain flows and pressures: sufficient to maintain adequate SGFP suction pressure• FRV D/P: greater than 40 psid• Turbine load: responding to changes in load demand, with control valves operating together• Steam generator levels 55 to 70%.• MSR parameters tracking together• Turbine Generator MVARs: as specified by CONVEX• Reactor power: being monitored using delta T power indication• ASI: In accordance with reactivity plan or within 0.01 of ESI or per COLR.• CEA position: greater than PDIL• Tc: less than or equal to 549 deg• Pressurizer level: between 35 and 70% <p>Pressurizer pressure: between 2,225 and 2,300 psia (DNB margin)</p>

Op-Test No.: <u> NRC </u> Scenario No.: <u> 3 </u> Event No.: <u> 4-5 </u>		
Event Description: High Vibration of A" SGFP and Rapid Downpower		
Time	Position	Applicant's Actions or Behavior

	SRO/ATC	<div>NOTE</div> <ol style="list-style-type: none"> 1. Xenon rate of change should be considered when terminating boration. 2. During rapid downpower, the PPC calorimetric may be inaccurate due to SG level transients. The most accurate available indication of reactor power is RPS delta T power.
Examiner Note: The following steps are from OP 2321 Main Feedwater System, Section 4.8 Removing A SGFP from Service, Maintaining B SGFP Operating.		
	BOP	<p>4.8.1 ENSURE power level less than or equal to 60%.</p> <p>4.8.2 To place "A" SGFP "MIN FLOW RECIRC, FIC-5237" controller in manual, PERFORM the following (C-05):</p> <ol style="list-style-type: none"> a. PRESS "SEL" button until cursor appears above controller output (right hand bar graph). b. ENSURE controller set to less than or equal to 0% open signal. <p>PRESS "A/M" button and CHECK "M" light, lit.</p>
	BOP	<div>CAUTION</div> <p>Failing of the discharge check valve can be identified by loss of FRV D/P or rapidly lowering steam generator level. Closing the feed pump discharge valve in a timely manner can prevent a plant trip.</p>

Op-Test No.: NRC Scenario No.: 3 Event No.: 4-5

Event Description: High Vibration of A” SGFP and Rapid Downpower

Time	Position	Applicant’s Actions or Behavior
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	BOP	<div>NOTE</div> <div>1. After stopping the SGFP, FRV D/P may go low out of the desired control band as the remaining SGFP speed increases. FRV D/P may be out of the control band for over one minute. Until FRV D/P recovers, SG levels will trend down slowly.</div> <div>2. When the “A” SGFP is tripped, “SGFP A TURBINE TRIP” (C-05, A-4) and “SGFP A SUCTION FLOW LO” (C-05, C-1) are expected alarms.</div>
	BOP	4.8.3 TRIP “A” SGFP (SGFP insert). 4.8.4 CLOSE FW-38A, “A” SGFP “DIS VLV” (C-05). 4.8.5 ENSURE “B” SGFP speed raises to maintain S/G level.

Examiner Note: Once “A” SGFP is tripped, or at the lead examiner’s direction, proceed to Event 6, Turbine High Vibration.

Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: Turbine High Vibration, ATWS/Reactor Trip, 6 CEAs fail to insert, SPTAs, Emergency Boration, LOCA

Time	Position	Applicant's Actions or Behavior
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Simulator Operator: When directed, initiate Event Number 6, Turbine Vibration High.

Indications Available:

- TURBINE VIBRATION HI
- TURBINE VIBRATION HI-HI

Examiner Note: The following steps are from ARP 2590E-174 for TURBINE VIBRATION HI-HI annunciator.

	BOP	<div>CAUTION If abnormal vibration is detected while the unit is on line, a rapid, safe shutdown of the unit is required to prevent serious Turbine damage</div>
	BOP	<div>NOTE This alarm is expected during performance of SP 2561N, "Main Control Valve Operability Test," but should clear when control valve is re-opened.</div>
	BOP	1. Observe <u>either</u> of the following to determine which point is in alarm: <ul style="list-style-type: none">• HMI "Vibration" screen• PPC

Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: Turbine High Vibration, ATWS/Reactor Trip, 6 CEAs fail to insert, SPTAs, Emergency Boration, LOCA

Time	Position	Applicant's Actions or Behavior
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BOP

2. IF vibration level is great than 12 mils (sustained) AND reactor power is greater than 15%, PERFORM the following:

2.1 TRIP the Reactor and PERFORM EOP 2525, "Standard Post Trip Action."

2.2 MONITOR either of the following and Go To step 3.:

- HMI "Post Trip" screen
- PPC

3. IF vibration is greater than 30 mils (sustained) AND an adjacent bearing vibration is great than 20 mils, PERFORM the following:

EXAMINER NOTE: Vibration is less than 30 mils. Step 3 is not applicable.

Examiner Note: An operator should attempt to trip the reactor using the manual pushbuttons. The reactor will not trip because the pushbuttons fail. An operator will open the CEDMS output breakers to trip the reactor manually.

CRITICAL TASK: Manually Shutdown the reactor. The reactor must be manually tripped using the CEDM output breakers immediately (within 1 minute) when an automatic reactor trip fails and/or the manual push buttons do NOT work. (CT-1/SPTA-5)

Time that manual pushbuttons attempted: _____

Time of reactor trip: _____

CRITICAL TASK: Emergency borate following ATWS. Emergency Borate the RCS following Reactor Trip following the failure of more than one full-length CEA to insert on a reactor trip prior to exiting EOP 2525 Standard Post Trip Actions.

Time emergency boration initiated: _____

Time that EOP 2525 step 19 (diagnosis) complete: _____

Examiner Note: The following steps are from EOP 2525 Standard Post Trip Actions.

Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: Turbine High Vibration, ATWS/Reactor Trip, 6 CEAs fail to insert, SPTAs, Emergency Boration, LOCA

Time	Position	Applicant's Actions or Behavior
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ATC

Determine Status of Reactivity Control

1. DETERMINE that Reactivity Control acceptance criteria are met by performing ALL of the following steps:
 - a. CHECK that reactor power is dropping.
 - b. CHECK that SUR is negative.
 - c. CHECK that *no* more than one CEA is *not* fully inserted.

c.1 IF more than one CEA is *not* fully inserted, COMMENCE emergency boration. Refer to Appendix 3, Emergency Boration.

Examiner Note: The following steps are from EOP 2541 Standard Appendices, Appendix 3-A, Commencing Emergency Boration.

ATC

1. IF boric acid storage tanks are available, INTIATE emergency boration as follows:
 - a. ENSURE CH-512, VCT makeup valve stop is closed.
 - b. ENSURE CH-196, VCT makeup bypass is closed.
 - c. OPEN CH-514, boric acid isolation.
 - d. START **BOTH** boric acid pumps.
 - e. CLOSE **BOTH** boric acid recirc valves.
 - f. OPEN **BOTH** boric acid gravity feed isolations:
 - CH-508
 - CH-509
 - g. CLOSE CH-501, VCT outlet isolation.
 - h. IF CH-500, letdown divert handswitch is in the "VCT" position, PLACE the valve to the "RWS" position.
 - i. ENSURE at least one charging pump is operation.
 - j. CHECK charging flow is greater than 40gpm.

Examiner Note: CH-514 fails to open. CH-508 and CH-509 fail to open. SRO should direct boration from RWST in accordance with Step 2 for boric acid storage tanks NOT available.

Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: Turbine High Vibration, ATWS/Reactor Trip, 6 CEAs fail to insert, SPTAs, Emergency Boration, LOCA

Time	Position	Applicant's Actions or Behavior
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	ATC	<p>2. <u>IF</u> the boric acid storage tanks are <i>not</i> available, INITIATE emergency boration from the RWST as follows:</p> <ul style="list-style-type: none"> a. OPEN CH-192, RWST isolation. b. ENSURE CH-504, RWST to charging suction is open. c. ENSURE CH-196, VCT makeup bypass is closed. d. CLOSE CH-501, VCT outlet isolation. e. <u>IF</u> CH-500, letdown divert handswitch is in the "VCT" position, PLACE the valve to the "RWS" position. f. ENSURE at least one charging pump is operating. g. CHECK charging flow is great than 40 gpm.
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Examiner Note: The following steps are from EOP 2525 Standard Post Trip Actions.

	BOP	<p>Determine Status of Maintenance of Vital Auxiliaries</p> <p>2. DETERMINE that Maintenance of Vital Auxiliaries acceptance criteria are met by performing ALL of the following steps:</p> <ul style="list-style-type: none"> a. CHECK that the main turbine is tripped by BOTH of the following: <ul style="list-style-type: none"> • ALL main stop valves are closed. • Generator megawatts indicate zero. b. <u>IF</u> 15G-2XI-4, motor operated disconnect, is closed, CHECK that the main Generator output breakers 8T and 9T are open.
	BOP	<p>Determine Status of Maintenance of Vital Auxiliaries (continued)</p> <p>2. c. CHECK that ALL Facility 1 and 2 electrical buses are energized:</p> <ul style="list-style-type: none"> • 6.9kV Electrical Buses 25A, 25B • 4.16kV Non-Vital Electrical Buses 24A, 24B • 4.16vV Vital Electrical Buses 24C, 24D • Vital DC Buses 201A, 201B, DV-10, DV-20 • Vital AC Instrument Buses VA-10, VA-20 <p>d. CHECK that BOTH facilities of service water are operating.</p> <p>e. CHECK that BOTH facilities of RBCCW are operating with service water cooling.</p> <p>f. CHECK on facility of CRAC operating.</p>

Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: Turbine High Vibration, ATWS/Reactor Trip, 6 CEAs fail to insert, SPTAs, Emergency Boration, LOCA

Time	Position	Applicant's Actions or Behavior
	ATC	<p>Determine Status of RCS Inventory Control</p> <p>3. DETERMINE that RCS Inventory Control acceptance criteria are met by performing ALL of the following:</p> <ul style="list-style-type: none"> a. CHECK that BOTH of the following conditions exist: <ul style="list-style-type: none"> • Pressurizer level is 20 to 80% • Pressurizer level is trending to 35 to 70% b. CHECK that RCS subcooling is greater than or equal to 30°F
	ATC	<p>Determine Status of RCS Pressure Control</p> <p>4. DETERMINE RCS Pressure Control acceptance criteria are met by BOTH of the following:</p> <ul style="list-style-type: none"> • CHECK that pressurizer pressure is 1900 to 2350 psia. • CHECK that pressurizer pressure is trending to 225 to 2300 psia.
	ATC	<p>Determine Status of Core Heat Removal</p> <p>5. DETERMINE that Core Heat Removal acceptance criteria are met by performing ALL of the following:</p> <ul style="list-style-type: none"> a. CHECK that at least one RCP is operating. b. CHECK that loop delta T is less than 10°F c. CHECK that Th subcooling is great than or equal to 30°F.
	BOP	<p>Determine Status of RCS Heat Removal</p> <p>6. DETERMINE that RCS Heat Removal acceptance criteria are met by ALL of the following conditions:</p> <ul style="list-style-type: none"> a. CHECK that BOTH steam generators pressure are 880 to 920 psia. b. CHECK that RCS Tc is being maintained 530 to 535°F. c. CHECK that at least one steam generator has BOTH of the following conditions met: <ul style="list-style-type: none"> • Level is 10 to 80%. • Main feedwater or TWO auxiliary feedwater pumps are operating to restore level 40 to 70%. d. CHECK that RCS subcooling is greater than or equal to 30°F.

Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: Turbine High Vibration, ATWS/Reactor Trip, 6 CEAs fail to insert, SPTAs, Emergency Boration, LOCA

Time	Position	Applicant's Actions or Behavior
	ATC	<p>Determine Status of Containment Isolation</p> <p>7. DETERMINE that Containment Isolation acceptance criteria are met by ALL of the following:</p> <p>a. CHECK that NONE of the following primary plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity:</p> <p>Radiation Monitors Inside Containment</p> <ul style="list-style-type: none"> • RM---7890, Personnel Access Area • RM---7891, Ctmt Refuel Floor Area • RM---8240, High Range • RM---8241, High Range • RM---8123 A and B, Ctmt Atmosphere • RM---8262 A and B, Ctmt Atmosphere <p>Radiation Monitors Outside Containment</p> <ul style="list-style-type: none"> • RM---7894, Charging Pump Area • RM---7895, Primary Sample Sink • RM---7896, ---25 ft 6 in Waste Process Area • RM---7897, ---45 ft 6 in Waste Process Area • RM---8132A and B, Unit 2 Plant Stack • RM---8169, Millstone Stack WR • RM---8168, Unit 2 WR Stack • RM---6038, RBCCW <p>b. CHECK that NONE of the following steam plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity:</p> <p>Steam Plant Radiation Monitors</p> <ul style="list-style-type: none"> • RM---5099, Steam Jet Air Ejector • RM---4262, SG Blowdown • RM---4299A and B, Main Steam Line 1 • RM---4299C, Main Steam Line 2 <p>c. CHECK that containment pressure is less than 1.0psig.</p>
	ATC	<p>Determine Status of Containment Temperature and Pressure Control</p> <p>8. DETERMINE that Containment Temperature and Pressure Control acceptance criteria are met by BOTH of the following steps:</p> <p>a. CHECK that containment temperature is less than 120°F. (PPC or avg of Points 5 and 6)</p> <p>b. CHECK that containment pressure is less than 1.0psig.</p>

Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: Turbine High Vibration, ATWS/Reactor Trip, 6 CEAs fail to insert, SPTAs, Emergency Boration, LOCA

Time	Position	Applicant's Actions or Behavior
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	ATC/BOP	Perform Subsequent Actions of EOP 2525 SPTAs.
Examiner Note: The Unit Supervisor refers to EOP 2541 Appendix 1, Diagnostic Flowchart to diagnose the event.		
	SRO	Diagnoses EOP 2532 Loss of Coolant Accident.

Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: EOP 2532 LOCA

Time	Position	Applicant's Actions or Behavior
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Examiner Note: The following steps are form EOP 2532 Loss of Coolant Accident. Asterisked steps are “Continuously Applicable,” and may be performed out of order after they have been accomplished once.

		<p style="text-align: center;">NOTE</p> <p>Harsh Containment values are designated with brackets []. These values should be used anytime CIAS has actuated on high containment pressure greater than 4.42 psig.</p>
		<p>Confirm Diagnosis</p> <p>*1.CONFIRM diagnosis of a Loss of Coolant Accident by performing the following:</p> <ol style="list-style-type: none"> a. CHECK Safety Function Status Check Acceptance Criteria are satisfied. b. OPEN the steam generator sample valves. c. DIRECT Chemistry to perform the following: <ul style="list-style-type: none"> • Sample both steam generators • Frisk the samples • Report frisk results • Analyze samples for boron and activity d. WHEN Chemistry reports that samples have been taken, CLOSE the steam generator sample valves.
	SRO	<p>Classify the Event</p> <p>*2. CLASSIFY the event. Refer To MP-26-EPI-FAP06, “Classification and PARs”</p> <ul style="list-style-type: none"> • IF classification requires RCS sampling, Refer To Appendix 46, “Sampling for EAL Determination” and DIRECT Chemistry as required.
	SRO	<p>Implement Placekeeping</p> <p>3. PERFORM ALL of the following:</p> <ul style="list-style-type: none"> • OPEN the placekeeper and ENTER the EOP entry time. • ENSURE the master alarm silence switch is in “NORMAL”.

Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: EOP 2532 LOCA

Time	Position	Applicant's Actions or Behavior
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Check SIAS Actuation

*4. IF pressurizer pressure is less than 1714 psia, PERFORM **ALL** of the following:

- a. ENSURE SIAS, CIAS and EBFAS have actuated. (C01)
- b. ENSURE **ONE** complete facility of CRACS is operating in the recirc mode: (C25)

Facility 1

- HV- 203A, Fan F- 21A exhaust damper is open.
- Fan F- 21A, supply fan is running.
- HV- 206A, Fan F- 31A exhaust damper is open.
- Fan F- 31A, exhaust fan is running.
- HV- 212A, Fan F- 32A exhaust damper is open.
- Fan F- 32A, filter fan is running.
- HV- 202, minimum fresh air damper is closed.
- HV- 207, cable vault exhaust damper is closed.
- HV- 208, exhaust air damper is closed.

Facility 2

- HV- 203B, Fan F- 21 exhaust damper is open.
- Fan F- 21B, supply fan is running.
- HV- 206B, Fan F- 31B exhaust damper is open.
- Fan F- 31B, exhaust fan is running.
- HV- 212B, Fan F- 32B exhaust damper is open.
- Fan F- 32B, filter fan is running.
- HV- 495, fresh air damper is closed.
- HV- 496, exhaust air damper is closed.
- HV- 497, cable vault exhaust damper is closed.

SRO

Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: EOP 2532 LOCA

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Optimize Safety Injection</p> <p>*5. IF SIAS has initiated, PERFORM the following:</p> <ol style="list-style-type: none"> CHECK at least one train of SIAS, CIAS, and EBFAS has properly actuated. (C01X) CHECK that safety injection flow is adequate. Refer to Appendix 2, "Figures." ENSURE ALL available charging pumps are operating. ENSURE vital switchgear cooling is operating for each operating ECCS train as follows: <p>Facility 1</p> <ul style="list-style-type: none"> Fan F- 51 is running. Fan F-134 is running. SW-178A, service water supply is open. SW-178B, service water supply is open. <p>Facility 2</p> <ul style="list-style-type: none"> Fan F- 52 is running. Fan F- 142 is running. Fan F- 133 is running. SW- 178C, service water supply is open.
	SRO	<p>RCP Trip Strategy</p> <p>*6. IF pressurizer pressure is less than 1714 psia <u>AND</u> SIAS has initiated, PERFORM the following:</p> <ol style="list-style-type: none"> ENSURE ONE RCP in each loop is stopped. PLACE associated pressurizer spray valve controller RC- 100E or RC- 100F in manual and CLOSE the valve. IF pressurizer pressure lowers to less than the minimum RCP NPSH limit, PERFORM the following: <ol style="list-style-type: none"> STOP ALL RCPs. PLACE TIC- 4165, steam dump TAVG controller, in manual and closed. PLACE pressurizer spray valve controllers RC- 100E and RC- 100F in manual and CLOSE the valves.

Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: EOP 2532 LOCA

Time	Position	Applicant's Actions or Behavior
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	SRO	<p>Isolate the LOCA</p> <p>d. PERFORM the following to isolate the leak:</p> <p>a. <u>IF</u> pressurizer pressure is less than 2250 psia, CHECK the PORVs are closed.</p> <p>b. ENSURE BOTH of the following letdown isolation valves are closed:</p> <ul style="list-style-type: none">• CH- 515• CH-516 <p>c. ENSURE at least one facility of the following RCS sample line isolation valves are closed:</p> <p>Facility 1</p> <ul style="list-style-type: none">• RC-45, RC combined sample isolation valve <p>Facility 2</p> <ul style="list-style-type: none">• RC-001, RC hot leg isolation valve• RC-002, pressurizer surge sample isolation valve• RC-003, pressurizer steam sample isolation valve <p>d. CHECK no leakage in the RBCCW system by BOTH of the following:</p> <ul style="list-style-type: none">• CHECK RM- 6038, "RBCCW Radiation Monitor," is not alarming or trending to alarm.• CHECK RBCCW Surge Tank level not rising.
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Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: EOP 2532 LOCA

Time	Position	Applicant's Actions or Behavior
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	SRO	<p>Check LOCA NOT Outside of Containment</p> <p>8. CHECK that the LOCA is <i>not</i> occurring outside of containment:</p> <p>a. CHECK that NONE of the following Radiation Monitors Outside Containment have an unexplained alarm or indicate an unexplained rise in activity:</p> <ul style="list-style-type: none"> • RM- 7894, Charging Pump Area • RM- 7895, Primary Sample Sink • RM- 7896, - 25 ft 6 in Waste Process Area • RM- 7897, - 45 ft 6 in Waste Process Area • RM- 8169, Millstone Stack WR • RM- 8168, Unit 2 WR Stack <p>b. CHECK that ALL of the following annunciators are <i>not</i> in alarm:</p> <ul style="list-style-type: none"> • "AUX BLDG SUMP LEVEL HI" (C06, AA-21) • "RBCCW RM SUMP LEVEL HI" (C06, AB-21) • "SI RM A SUMP LEVEL HI" (C06, CA- 21) • "SI RM B SUMP LEVEL HI" (C06, CB- 21) • "SI RM C SUMP LEVEL HI" (C06, DA- 21) <p>c. MONITOR Aerated Waste Tank levels for abnormal rise.</p>
	SRO	<p>Place Hydrogen Analyzers in Service</p> <p>9. PLACE the hydrogen analyzers in service. Refer To Appendix 19, "Hydrogen Analyzer Operation."</p>

Op-Test No.: <u> NRC </u> Scenario No.: <u> 3 </u> Event No.: <u> 6-7-8 </u>		
Event Description: EOP 2532 LOCA		
Time	Position	Applicant's Actions or Behavior

	SRO	<p>ENSURE CIAS</p> <p>*10. <u>IF</u> ANY of the following exists:</p> <ul style="list-style-type: none"> • Containment pressure is great than or equal to 4.42 psig • Radiation monitors inside containment are great than their alarm setpoint <p>PERFORM the following:</p> <ol style="list-style-type: none"> a. ENSURE SIAS, CIAS, EBFAS and MSI have actuated. (C01) b. CHECK that at least one train of SIAS, CIAS, EBFAS and MSI has properly actuated. (C01X). c. ENSURE ONE complete facility of CRACs is operating in the recirc mode: (C25) <p>Facility 1</p> <ul style="list-style-type: none"> • HV- 203A, Fan F- 21A exhaust damper is open. • Fan F- 21A, supply fan is running. • HV- 206A, Fan F- 31A exhaust damper is open. • Fan F- 31A, exhaust fan is running. • HV- 212A, Fan F- 32A exhaust damper is open. • Fan F- 32A, filter fan is running. • HV- 202, minimum fresh air damper is closed. • HV- 207, cable vault exhaust damper is closed. • HV- 208, exhaust air damper is closed. <p>Facility 2</p> <ul style="list-style-type: none"> • HV- 203B, Fan F- 21B exhaust damper is open. • Fan F- 21B, supply fan is running. • HV- 206B, Fan F- 31 exhaust damper is open. • Fan F- 31B, exhaust fan is running. • HV- 212B, Fan F- 32B exhaust damper is open. • Fan F- 32B, filter fan is running. • HV- 495, fresh air damper is closed. • HV- 496, exhaust air damper is closed. • HV- 497, cable vault exhaust damper is closed.
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Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: EOP 2532 LOCA

Time	Position	Applicant's Actions or Behavior
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ENSURE CIAS (continued)

d. ENSURE ALL available CAR fans are operating:

- CAR fans operating in slow speed
- CAR emergency outlet valves open:
 - RB- 28.3A
 - RB- 28.3B
 - RB- 28.3C
 - RB- 28.3D

e. IF 24C or 24D is energized from offsite power, ENSURE no more than TWO CEDM cooling fans are operating.

f. START ALL available containment auxiliary circulation fans in low speed.

g. START ALL available post- incident recirculation fans.

Examiner Note: Steps 11, 12, 13 are not applicable.

SRO

Align Instrument Air

*14. CHECK instrument air pressure great than 90 psig and stable.

Align Condenser Air Removal to Unit 2 Stack

*15. IF EBFAS has initiated AND the condenser is available, ALIGN the condenser air removal system to Unit 2 stack:

SRO

- a. ENSURE condenser air removal fan, MF- 55A or MF- 55B is running.
- b. IF condenser air removal fan MF- 55A is operating, ENSURE makeup damper, EB- 171, is open.
- c. OPEN EB- 57, condenser air removal to Unit 2 stack.
- d. ENSURE AC- 11, Purge exhaust filter outlet damper is closed.
- e. OPEN AC- 59, Outside air makeup damper.
- f. START **ONE** main exhaust fan.
- g. ENSURE HV- 118, Radwaste exhaust damper is closed.
- h. START F- 20, Fuel handling area supply fan.
- i. ENSURE HV- 173, Exhaust mod discharge damper is in "MOD" position.
- j. PLACE AC- 59, Outside air makeup damper to "MID" position.

Examiner Note: Step 16 is not applicable because the LOCA cannot be isolated.

Op-Test No.: NRC Scenario No.: 3 Event No.: 6-7-8

Event Description: EOP 2532 LOCA

Time	Position	Applicant's Actions or Behavior
	SRO	<div style="border: 1px solid black; padding: 10px; margin-bottom: 10px;"> <p style="text-align: center;">NOTE</p> <ol style="list-style-type: none"> 1. RCS cooldown should be initiated within one hour after the event to conserve condensate inventory and comply with the Long Term cooling Analysis. 2. RCS cooldown rate greater than 40°F/hr should be maintained until the steam dump/bypass valves or atmospheric dump valves are full open. 3. The starting point for the RCS cooldown should be the Tc or CET temperatures where RCS has stabilized. 4. Tc should be used for monitoring RCS cooldown if in forced or natural circulation. CETs should be used for all other cases. </div> <div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;">NOTE</p> <p>Technical Specification cooldown rates should be observed during the cooldown. The cooldown rates are as follows:</p> <ol style="list-style-type: none"> 1. RCS Tc greater than 220°F the cooldown rate is 100°F/hr. 2. RCS Tc less than or equal to 220°F the cooldown rate is 50°F/hr. </div>
	SRO/BOP	<p>Perform Controlled Cooldown</p> <p>*17.INITIALTE a controlled cooldown using the steam dumps to establish shutdown cooling entry conditions.</p> <p>Examiner note: the BOP should initiate a controlled cooldown by opening the steam dump valves and establishing a 40-100°F/hr cooldown.</p>
	SRO/ATC	<p>Depressurize RCS to SDC Entry Conditions</p> <p>*18.INITIALTE a controlled depressurization of the RCS to less than or equal to 230 psia [190 psia] using ANY of the following:</p> <ul style="list-style-type: none"> • Main or auxiliary pressurizer spray • IF HPSI throttle/stop criteria are met, DEPRESSURIZE the RCS using ANY of the following: <ul style="list-style-type: none"> • Charging and letdown • HPSI flow <p>Examiner Note: The ATC should depressurize the RCS as necessary using Auxiliary Spray Flow.</p>

Op-Test No.: <u> NRC </u> Scenario No.: <u> 3 </u> Event No.: <u> 6-7-8 </u>		
Event Description: EOP 2532 LOCA		
Time	Position	Applicant's Actions or Behavior

CRITICAL TASK: Initiate a plant cooldown. A plant cooldown at a rate of greater than 40°F/hr should be initiated within one hour, following an unisolable LOCA, until the condenser steam dump valves or ADVs are full open. (CT-3/LOCA-3)

Time that LOCA initiated (during Step 2 of SPTAs): _____
 Time that cooldown initiated (step 17 of EOP 2532): _____

Scenario Termination: The scenario may be terminated once a plant cooldown has been initiated or at the discretion of the Lead Examiner.

Op-Test No.: NRC Scenario No.: 2 Event No.:

Event Description: Appendix 23, Attachment 23-U: 3 MVA Electrical Limit on Buses 34A/34B

Time	Position	Applicant's Actions or Behavior
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Examiner Note: The following steps are from EOP 2525 Standard Post Trip Actions, Subsequent Actions.

		9. IF charging pumps are taking suction from the VCT, CHECK VCT level is 72 to 86%.
		10. CHECK Main Condenser is available, as indicated by ALL of the following: <ul style="list-style-type: none">• At least one MSIV open• Condenser vacuum better than 15 inches HG-ABS (0 to 15 inches)• At least one condensate pump operating• At least one Circ Water pump operating 10.1 IF Main Condenser is not available, PERFORM the following: <ul style="list-style-type: none">• CLOSE BOTH MSIVs.• ENSURE BOTH MSIV bypass valves are closed.• OPEN AR---17, condenser vacuum breaker.
		11. OPEN HD-106, subcooling valve.
		12. ENSURE BOTH heater drain pumps are stopped.

Op-Test No.: NRC Scenario No.: 2 Event No.:

Event Description: Appendix 23, Attachment 23-U: 3 MVA Electrical Limit on Buses 34A/34B

Time	Position	Applicant's Actions or Behavior
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		<p>13. <u>IF</u> MFW is supplying feed to the steam generators, PERFORM the following:</p> <ul style="list-style-type: none">a. ENSURE that only ONE main feedwater pump is running.b. ENSURE that BOTH main feed block valves are closed:<ul style="list-style-type: none">• FW-42A• FW-42Bc. ADJUST the running main feedwater pump pressure to 50 to 150 psi greater than SG pressure.d. ENSURE that BOTH main feed reg bypass valves are throttled to control SG level:<ul style="list-style-type: none">• FW-41A• FW-41Be. <u>IF</u> Main Feedwater Pump A is secured, CLOSE the following:<ul style="list-style-type: none">1) FW-38A, main feedwater pump discharge valve2) FW-36A, main feedwater pump mini flow recirc valvef. <u>IF</u> Main Feedwater Pump B is secured, CLOSE the following:<ul style="list-style-type: none">1) FW-38B, main feedwater pump discharge valve2) FW-36B, main feedwater pump mini flow recirc valve <p>Examiner Note: Main Feedwater Pump A and B are secured.</p>
		<p>14. <u>IF</u> MFW is not supplying feed to the SGs, CLOSE BOTH main feedwater pump mini flow recirc valves:</p> <ul style="list-style-type: none">• FW-36A• FW-36B <p>Examiner Note: Main Feedwater is not supply feed to the Steam Generators.</p>
		<p>15. <u>IF</u> AFAS has actuated <u>AND</u> at least one steam generator is being restored to between 40 and 70%, PERFORM the following:</p> <ul style="list-style-type: none">a. PLACE auxiliary feed OVERRIDE/MAN/START/RESET handswitches in "PULL TO LOCK".b. IF auxiliary feed is supplying steam generator makeup, manually CONTROL auxiliary feed flow rate. <p>Examiner Note: AFAS has actuated.</p>

Op-Test No.: NRC Scenario No.: 2 Event No.:

Event Description: Appendix 23, Attachment 23-U: 3 MVA Electrical Limit on Buses 34A/34B

Time	Position	Applicant's Actions or Behavior
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		<p>16. IF 25A or 25B is energized, ALIGN condensate pumps as follows:</p> <ul style="list-style-type: none">a. ENSURE that ONE pump is running.b. ENSURE that ONE pump is in "AUTO".c. ENSURE that ONE pump is in "PULL TO LOCK". <p>Examiner Note: Buses 25A and 25B are de-energized.</p>
		<p>17. CHECK instrument air pressure greater than 90 psig and stable.</p>
		<p>18. IF <i>no</i> contingency actions were performed in the Immediate Actions AND ALL safety function acceptance criteria are met, PERFORM ONE of the following:</p> <ul style="list-style-type: none">• Go To EOP 2526, "Reactor Trip Recovery."• DIAGNOSE the event. Refer To Appendix 1, "Diagnostic Flowchart."
		<p>19. IF ANY contingency action was performed in the Immediate Actions OR ANY safety function acceptance criteria are <i>not</i> met, PERFORM the following:</p> <ul style="list-style-type: none">a. DIAGNOSE the event. Refer To Appendix 1, "Diagnostic Flowchart."b. Go To the appropriate EOP.

Facility: Millstone Unit 2

Scenario No.: 4

Op-Test No.: NRC 2014

Examiners: _____ Operators: _____

Initial Conditions: (IC 55) 100% Power, MOL, Equilibrium Xenon, 1065 ppm Boron, SGBD @40gpm per Steam Generator, 24E aligned to 24C.

Turnover: 100% Power, BOL, Equilibrium Xenon, 1065 ppm Boron, SGBD @ 40gpm per Steam Generator, 24E aligned to 24C.

Critical Tasks:

1. Manually trip the turbine or close MSIVs within 1 minute following a reactor trip and failure of automatic turbine trip.
2. Isolate AFW to the affected SG #2 within 30 minutes following the generation of MSIS during an ESDE.
3. Manually start "A" HPSI pump prior to reaching pressurizer low level alarm following a failure of "A" HPSI pump to actuate and a degraded of "C" HPSI pump.

Event No.	Malf. No.	Event Type*	Event Description
1 (+10 min)	RX04B	I (ATC, SRO)	Channel Y PZR Level transmitter, LT110Y (selected), fails low (55%, 2 minute ramp).
2 (+20 min)	TC06A	C (BOP, SRO) R (ATC)	No. 1 Turbine control valve failure. (~ 20MWe drop, 20% open total, 1 min ramp)
3 (+35 min)	RP09D	I (ATC, SRO) TS (SRO)	Spurious RPS low flow trip Channel "D"
4 (+40 min)	SG01A	C (All), TS (SRO)	No. 1 Steam Generator tube leak (75 gpd and rising more than 15 gpd/min ~ 0.12 gpm)
5 (+40 min)		R (All)	Rapid power reduction for Steam Generator Tube Leak
6 (+55 min)	SG02A	M (ATC, SRO)	No.1 SGTR exceeds charging pump capacity. Reactor trip required. (200 gpm)
7 (+55 min)	TC10H	C (BOP)	Turbine fails to trip on reactor trip
8 (+57 min)	MS02B	C (BOP, SRO)	Excessive Steam Demand Event outside containment on #2 Steam Generator, upstream of #2 MSIV. (1.5 million lbm/hr, no ramp. need SIAS to occur, do not want to lose NPSH to RCPs, 2 minute delay from reactor trip)
9 (+60 min)	ES03I SI05C	C (ATC, SRO)	"A" HPSI pump fails to start on SIAS (failure of ESAS Module AM 514). C HPSI pump is degraded (50%)

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual
1. Total malfunctions (5–8)	8
2. Malfunctions after EOP entry (1–2)	2
3. Abnormal events (2–4)	4
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	1
6. EOP contingencies requiring substantive actions (0–2)	1
7. Critical tasks (2–3)	3

NRC 2014, Scenario 4

Scenario Summary:

The crew will take the shift with the unit at 100% power and 24E aligned to 24C.

Event 1: Shortly after the crew takes the shift, Channel "Y" Pressurizer level transmitter will fail low causing Pressurizer level to rise. The crew will enter AOP 2585, Immediate Actions, take manual control of Pressurizer level and swap to a Channel "X" level control.

Event 2: When Pressurizer level is restored to automatic control, a turbine control system failure causes Control Valve #1 to slowly throttle closed (20% open total). RCS temperature and pressure will slowly trend up and the crew will have to lower reactor power to match turbine load. The crew should respond using AOP 2584, Turbine Valve Failure.

Event 3: After Tc is restored in its band, a spurious RPS Low Flow trip occurs on Channel "D." The crew should enter applicable TSAS for the failed transmitter and place the channel in bypass in accordance with the ARP for RPS LOW FLOW TRIP CH D.

Events 4 and 5: A N-16 alarm will actuate on a small (0.12 gpm) Steam Generator Tube Leak (SGTL) on #1 Steam Generator. The crew should respond to the N-16 ALERT and N-16 HIGH annunciators on C06. The crew should enter AOP 2569, Steam Generator Tube Leak and carry out applicable steps. The crew will go to the N-16 PPC screen and determine the tube leakage is > 75 gpd and rising > 15 gpd on #1 Steam Generator. This is above the Technical Specification tube leakage limit of 75 gpd. The crew will conclude that a down power is required. The crew will perform a rapid down power per AOP 2575, using CEA insertion first and then boration from the RWST. Technical Specifications require the leakage be within the limits within 4 hours or be in Hot Standby within 6 hours and be in Cold Shutdown with the next 36 hours.

Events 6,7,8 and 9: After the down power has commenced, the tube leak will increase to 200 gpm and the MAIN STM LINE HI RAD/INST FAIL annunciator will sound. The crew will verify that this is a valid alarm and trip the plant due to leakage greater than charging pump capacity. Upon the reactor trip, the turbine will fail to trip and the BOP operator will have to manually trip the turbine by either closing the MSIVs or pressing the turbine trip pushbuttons. An unisolable Excessive Steam Demand Event (ESDE) outside containment occurs on #2 Steam Generator. When SIAS occurs, "A" HPSI pump fails to start and the "C" HPSI pump is degraded. The ATC must start the "A" HPSI pump manually.

The crew will complete EOP 2525, diagnose a Steam Generator Tube Rupture and ESDE and transition to EOP 2540, Functional Recovery as a result of diagnosing multiple events. The crew will stabilize RCS temperature and pressure using #1 Steam Generator during SPTAs. They will steam least affected Steam Generator (#1 Steam Generator) and work through the functional recovery to isolate #2 Steam Generator.

The scenario can be terminated once #2 Steam Generator is isolated.

Op-Test No.: NRC Scenario No.: 4 Event No.: 1

Event Description: Channel Y PZR Level transmitter, LT-110Y (selected), fails low.

Time	Position	Applicant's Actions or Behavior
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Simulator Operator: When directed, initiate Event 1, Channel Y Pressurizer level transmitter fails low.**Indications Available:**

- Pressurizer CH Y LEVEL HI/LO (A-39 on C02-3)
- Pressurizer level rising, letdown flow lowering. Both backup charging pumps start.

Examiner Note: The following steps are from ARP 2590B-217

		<div>CAUTION</div> <p>While restoring Pressurizer level, Pressurizer pressure must be closely monitored to prevent exceeding DNB limits, or effects on reactivity due to pressure changes.</p> <div>NOTE</div> <p>Actual Pressurizer level response should track with pressure response.</p>
	ATC	3.101 OBSERVE Pressurizer level on all channels (C-03). 3.102 OBSERVE Pressurizer pressure on all channels (C-03).
	ATC	<div>NOTE</div> <p><i>Indicated</i> Pressurizer level is observed on Point 1 of LR110 chart recorder on C-03. All actions are based on indicated level.</p>
	ATC	3.103 Not applicable 3.104 <u>IF</u> <i>indicated</i> level is low, ENSURE the following: <ul style="list-style-type: none"> • Both backup charging pumps are running (C-02) • Letdown flow is at minimum of 28 gpm on "LTDN FLOW, FI-202" (C-02).
	ATC	3.105 OBSERVE TAVG/TREF recorder for deviation in TAVG/TREF (C-04). 3.106 OBSERVE Foxboro I/A control screen for Reactor Reg, or PPC status screen (screen "RRS_TP").
		<div>NOTE</div> <p>Invalid level setpoint from Reactor Reg System will cause Pressurizer <i>Actual</i> level to be high or low.</p>

Op-Test No.: NRC Scenario No.: 4 Event No.: 1

Event Description: Channel Y PZR Level transmitter, LT-110Y (selected), fails low.

Time	Position	Applicant's Actions or Behavior
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	ATC	<p>3.107 Not applicable</p> <p>3.108 <u>IF</u> indicated high or low level was caused by controller or transmitter malfunction (other than Reactor Regulating System inputs), PERFORM the following:</p> <p>8.1 SHIFT "LTDN FLOW CNTL, HIC-110" to "MAN" (C-02).</p> <p>8.2 ADJUST "LTDN CNTL, HIC-110" to stabilize Pressurizer level and Letdown flow (C-02).</p> <p>8.3 SHIFT Pressurizer heater control "SEL SW" to channel "X."</p> <p>8.4 As necessary, RESET the following Pressurizer heater breakers:</p> <ul style="list-style-type: none"> • "PROP HTR GROUP 1" • "PROP HTR GROUP 2" • "BACKUP HTRS GROUP 1" • "BACKUP HTRS GROUP 2" • "BACKUP HTRS GROUP 3" • "BACKUP HTRS GROUP 4" <p>8.5 <u>IF</u> desired, COMMENCE forcing Pressurizer sprays.</p> <p>8.6 SHIFT Pressurizer level control to channel "X" (C-03).</p> <p>Examiner Note: Pressurizer heater breakers should not need to be reset.-</p>
	ATC	<p>3.109 RESTORE Letdown to automatic as follows:</p> <p>9.1 ADJUST bias to "0", using black thumbwheel.</p> <p>9.2 SHIFT "LTDN FLOW CNTL, HIC-110" TO "AUTO."</p> <p>9.3 ADJUST bias to restore Pressurizer level to setpoint.</p>

Examiner Note: When automatic control of Pressurizer level is restored, or at the lead examiner's direction, proceed to Event 2, #1 Turbine Control Valve failure. (~ 20MWe drop)

Op-Test No.: NRC Scenario No.: 4 Event No.: 2

Event Description: No. 1 Turbine Control Valve fails closed.

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, initiate Event 2, #1 Turbine Control Valve failure.		
Indications Available: <ul style="list-style-type: none"> • Generator output lowering. RCS temperature rising, RCS pressure rising. Reactor Power lowering. • 		
	SRO	Enter AOP 2584, Turbine Control Valve Failure.
Examiner Note: The following steps are from AOP 2584, Turbine Control Valve Failure. Steps with an * may be completed at any time.		
		3.0 Plant Stabilization <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">CAUTION</p> <p>Raising turbine load to address an actual reactor power transient is never an appropriate response. Lower reactor power with rods or boron in these cases.</p> </div>
	SRO	3.1 * <u>IF</u> any of the following conditions are met, TRIP the reactor and Go To EOP 2525. <ul style="list-style-type: none"> • Parameters associated with automatic reactor or turbine trips are challenged. • RCS Tc not within 10°F of temperature program and efforts to regain control are unsuccessful.
	BOP	3.2 Not applicable 3.3 <u>IF</u> turbine valve position is closed below pre-event position <u>AND</u> RCS temperature is increasing, PERFORM the following: <ol style="list-style-type: none"> SELECT "Load Hold" (HMI). REDUCE reactor power using control rods or boron to stabilize Tc on program. <u>IF</u> necessary, PLACE SGFP controls in MAN and RETURN SG level to pre-transient values (nominally 70%). Examiner Note: HMI Human Machine Interface
	BOP	3.4 * To maintain pressurizer pressure between 22450 to 2300 psi, PERFORM either of the following: <ul style="list-style-type: none"> • INITIATE forcing pressurizer sprays. • OPERATE pressurizer heaters and spray, as necessary.

Op-Test No.: NRC Scenario No.: 4 Event No.: 2

Event Description: No. 1 Turbine Control Valve fails closed.

Time	Position	Applicant's Actions or Behavior
		4.0 Problem Determination <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> • Closure of a single Intermediate Stop Valve (ISV) or Intercept Valve (IV) may cause feedwater heater level or turbine vibration issues. These conditions will be handled with respective ARP performance. • Complete Isolation of steam flow path to either LP Turbine will require a Turbine trip due to configuration uncertainties. • Complete Isolation of a steam flow path from either MSR will require a Turbine trip due to the potential for the MSR reliefs lifting and loss of hotwell inventory. </div>
	BOP	<p>4.1 CHECK all turbine Stop, Control Intercept and Intermediate Stop valves are in the correct position (HMI/PPC).</p> <p>4.1.1 <u>IF</u> reactor power is greater than 15% AND any of the following conditions (HMI/PPC) exist, TRIP the reactor and Go To EOP 2525:</p> <ul style="list-style-type: none"> • More than one HP turbine stop valve is CLOSED or CLOSING. • More than one HP turbine control valve is CLOSED or CLOSING. • Complete isolation of steam flow paths to either LP turbine. • Complete isolation of steam flow paths from either MSR. <p>4.1.2 <u>IF</u> reactor power is less than 15% <u>AND</u> any of the following conditions (HMI/PPC) exist, TRIP the turbine:</p> <p>Examiner Note: Only one HP turbine control valve, is partially closed and Reactor Power is great than 15%. Contingency actions 4.1.1 and 4.1.2 are not applicable.</p>
	BOP	<p>4.2 Refer To the following and CHECK steam flow to reheat for the MSRs is at the correct value:</p> <ul style="list-style-type: none"> • C-04, Mon 1 • Attachment 1, "MSR First Stage Differential Pressure vs. Turbine Load" • Attachment 2, "MSR Second Stage Differential Pressure vs. Turbine Load"
		<p>4.3 CHECK that extraction steam to the feedwater heaters is correctly aligned (C-06/07).</p>

Op-Test No.: NRC Scenario No.: 4 Event No.: 2

Event Description: No. 1 Turbine Control Valve fails closed.

Time	Position	Applicant's Actions or Behavior
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Examiner Note: When Tc and Pressurizer pressure are returned to normal operating bands, or at the lead examiner's direction, proceed to Event 3, Containment Normal Sump Level instrument fails high.

Simulator Operator: When directed, initiate Event 3, Containment Normal Sump Level Transmitter fails high.

Indications:

- CTMT NORM SUMP LEVEL HI/LO (BA-21 on C-06/7)
- Indicated high level of CTMT Normal Sump level displayed on C06

	SRO/BOP	Determine that high level alarm is due to level transmitter failure. Examiner Note: Crew may refer to ARP2590E-107 for CTMT NORM SUMP LEVEL HI/LO alarm.
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Op-Test No.: NRC Scenario No.: 4 Event No.: 3

Event Description: Containment Normal Sump Level Transmitter fails high.

Time	Position	Applicant's Actions or Behavior
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	SRO	<p>Refer To TSAS 3.3.3.8 and 3.4.6.1, and DETERMINE applicability:</p> <p><u>LCO 3.3.3.8 Accident Monitoring Instrumentation</u> The accident monitoring instrumentation channels shown in Table 3.3-11 shall be OPERABLE.</p> <p>APPLICABILITY: MODES 1, 2, and 3.</p> <p>ACTION:</p> <p>a. ACTIONS per Table 3.3-11.</p> <p><u>Instrument Total No. of Channels Min Channels OPERABLE ACTION</u></p> <p>Containment Water Level (Narrow Range) 1 1 7##</p> <p>Containment Water Level (Wide Range) 2 1 4</p> <p>Examiner Note: SRO enters Technical Specification 3.3.3.8 Action Statement 7 or 4 due to inoperability of the Narrow Range Containment Water Level transmitter. ## refer to LCO 3.4.6.1 action statement.</p> <p><u>LCO 3.4.6.1 Reactor Coolant System Leakage</u> The following Reactor Coolant System leakage detection systems shall be OPERABLE:</p> <p>a. One of two containment atmosphere particulate radioactivity monitoring channels, and</p> <p>b. The containment sump level monitoring system.</p> <p>APPLICABILITY: MODES 1, 2, 3 and 4.</p> <p>ACTION:</p> <p>b. With the containment sump level monitoring system inoperable, operation may continue for up to 30 days provided:</p> <p>1. A Reactor Coolant System water inventory balance is performed at least once per 24 hours during steady state operation.</p> <p>Otherwise, be in COLD SHUTDOWN within the next 36 hours.</p> <p>Examiner Note: SRO enters Technical Specification 3.4.6.1 Action statement b. due to inoperability of the containment sump level monitoring system.</p>
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Examiner Note: When SRO has finished evaluating Technical Specifications, or at lead examiner's direction, proceed to Event 4, No. 1 Steam Generator tube leak (75 gpd and rising more than 15 gpd/min).

Simulator Operator: When directed, initiate Event 5, No. 1 Steam Generator tube leak (75 gpd and rising more than 15 gpd/min).

Op-Test No.: NRC Scenario No.: 4 Event No.: 4-5

Event Description: No. 1 Steam Generator tube leak (75 gpd and rising more than 15 gpd/min) and Rapid Power Reduction.

Time	Position	Applicant's Actions or Behavior
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Indications:

- S/G N16 monitor on PPC rising leakage for No. 1 Steam Generator
- N16 Alert Alarm (C-06/7 CB-19 or C19B)
- N16 High Alarm (C-06/7 CA-19 or C19A)
- SJAE Discharge RIT-5099 level rising

	SRO	Enters AOP 2569, Steam Generator Leak.
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Examiner Note: Operators may enter ARP actions for N16 Alert alarm.**Examiner Note: The following steps are from AOP 2569 Steam Generator Tube Leak. Steps marked with an * are performed continuously or once specified conditions are met.**

	SRO	<p>3.1* <u>IF</u> leakage exceeds capability of available charging pumps to maintain pressurizer level, PERFORM the following:</p> <ol style="list-style-type: none"> <u>IF</u> in MODE 1 or 2, PERFORM the following: <ul style="list-style-type: none"> • TRIP the reactor. • Go To EOP 2525, "Standard Post Trip Actions." <u>IF</u> in MODE 2 or lower, PERFORM the following: <ul style="list-style-type: none"> • ENSURE SIAS is actuated. • Go To EOP 2541, Appendix 1, and "Diagnostic Flowchart." <p>3.2* <u>IF</u> the 'Main Steam Line Radiation Monitor High' alarm is annunciated <u>AND</u> is verified to be valid based on other changing RCS indications, PERFORM the following:</p> <ol style="list-style-type: none"> TRIP the reactor Go To EOP 2525, "Standard Post Trip Actions." <p>Examiner Note: SGTL initiates at approximately 2 gpm or 2880 gpd. Leakage will rise slowly over 10 minutes. These steps are not applicable at this time.</p>
	SRO	<p>3.3* <u>IF</u> a SJAE <u>OR</u> SGBD Radiation Monitor alarm is received, ENSURE the following automatic actions occur:</p> <ul style="list-style-type: none"> • MS-220A and MS-220B, blowdown isolation, close. • MS-15, blowdown tank discharge isolation, closes. • MS-135, blowdown quench tank discharge isolation, closes. • HV-4287 and HV-4288, SG blowdown sample discharge to secondary sample sink, close (secondary sample panel). • Blowdown values in PPC reset to "0."

Op-Test No.: NRC Scenario No.: 4 Event No.: 4-5

Event Description: No. 1 Steam Generator tube leak (75 gpd and rising more than 15 gpd/min) and Rapid Power Reduction.

Time	Position	Applicant's Actions or Behavior
	SRO	<p>3.4* IF "N-16 HIGH," (C-06/7) radiation monitor alarm is annunciated AND is verified to be valid based on other indications, Refer To PPC "N16" screen to determine primary to secondary leak rate and PERFORM the following:</p> <ol style="list-style-type: none"> IF primary to secondary leak rate is greater than or equal to 75 gpd AND is increasing by greater than or equal to 15 gpd / 30 minutes, Refer To AOP 2575, "Rapid Downpower," LOWER reactor power to less than 50% within 1 hour, and be in Hot Standby within the following 2 hours. Refer To MP-26-EPI-FAP06, "Classification and PARs," and DETERMINE reportability requirements. Refer To Technical Specification 3.4.6.2, "Reactor Coolant System Operational Leakage" and PERFORM applicable actions. <p>Examiner Note: Primary to secondary leak rate is ≥ 75 gpd AND increasing by ≥ 15 gpd/30minutes. A rapid power reduction is required by this AOP.</p>
	SRO	<p>Examiner Note: The following is from Technical Specification 3.4.6.2, Reactor Coolant System Operational Leakage:</p> <p>Reactor Coolant System Operational LEAKAGE shall be limited to:</p> <ol style="list-style-type: none"> No PRESSURE BOUNDARY LEAKAGE, 1 GPM UNIDENTIFIED LEAKAGE, 75 GPD primary to secondary LEAKAGE through any one steam generator, and 10 GPM IDENTIFIED LEAKAGE. <p>APPLICABILITY: MODES 1, 2, 3 and 4.</p> <p>ACTION:</p> <ol style="list-style-type: none"> With any RCS operational LEAKAGE not within limits for reasons other than PRESSURE BOUNDARY LEAKAGE or primary to secondary LEAKAGE, reduce LEAKAGE to within limits within 4 hours With ACTION and associated completion time of ACTION a. not met, or PRESSURE BOUNDARY LEAKAGE exists, or primary to secondary LEAKAGE not within limits, be in HOT STANDBY within 6 hours and be in COLD SHUTDOWN within <p>Examiner Note: SRO quantifies SGTl leak rate in excess of Technical Specification LCO and enters TSAS 3.4.6.2 c for primary to secondary leakage.</p>

Op-Test No.: NRC Scenario No.: 4 Event No.: 4-5

Event Description: No. 1 Steam Generator tube leak (75 gpd and rising more than 15 gpd/min) and Rapid Power Reduction.

Time	Position	Applicant's Actions or Behavior
	BOP	4.0 Minimizing Unmonitored Releases 4.1 ENSURE CN-334, atmospheric collection tank drain to Long Island Sound, is closed. 4.2* <u>IF</u> the "CONDENSATE SURGE TANK LEVEL HI" alarm is received (C05, A-13), CLOSE CN-20, hotwell reject LCV inlet stop. 4.3 ENSURE the following: a. Condenser air removal fans aligned to the Millstone Stack. b. RM-8169, Millstone Stack WRGM is operable
	SRO	Enter AOP 2575, Rapid Downpower.
Examiner Note: The following steps are from AOP 2575 Rapid Downpower.		
	ALL	3.1 PERFORM focus brief on the following: REACTOR TRIP CRITERIA <ul style="list-style-type: none"> Parameters associated with automatic reactor or turbine trips are challenged RCS T cold <i>not</i> within 10°F of temperature program and efforts to regain control are unsuccessful RCS TEMPERATURE CONTROL <ul style="list-style-type: none"> RCS T cold to be maintained within 10°F of Attachment 5, "Temperature vs Power program" using Attachment 10, "Main Turbine Load Set Control." To avoid uncontrolled cooldowns or power transients, sudden changes in RCS temperature or boron concentration should be avoided.
	SRO	3.2 REQUEST SM/STA to Refer to Attachment 8, "Required Notifications," and PERFORM notifications.
	ATC	3.3 INITIATE forcing pressurizer sprays.
		<div style="border: 1px solid black; padding: 10px; text-align: center;"> CAUTION In the case of a dropped CEA, rod motion is <i>not</i> used to initiate downpower. </div>

Op-Test No.: NRC Scenario No.: 4 Event No.: 4-5

Event Description: No. 1 Steam Generator tube leak (75 gpd and rising more than 15 gpd/min) and Rapid Power Reduction.

Time	Position	Applicant's Actions or Behavior
	ATC	3.4 <u>IF</u> <i>not</i> downpowering due to a dropped rod, INSERT Group 7 CEAs 10+ 2 steps to initiate downpower.
	BOP	3.5 Using the "Load Speed Control" switch, REDUCE turbine load to maintain Tc on program (+/- 2 deg).
	SRO	3.6 Refer to PPC or Reactor Engineering Curve and Data Book and OBTAIN reactivity plan for the initial reactor power condition and desired load reduction.
		<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>NOTE</p> <p>Attachment 11 "Approximate Load Demand vs. Reactor Power," can be used to correlate the desired power level to a turbine load demand setpoint.</p> </div>
	BOP	3.7 Refer To Attachment 10, "Main Turbine Load Set Control," REDUCE turbine load and MAINTAIN Tc on program (+/-2 deg).
	ATC	<p>3.8 <u>IF</u> desired to borate from the RWST (preferred method) PERFORM the following:</p> <ol style="list-style-type: none"> a. ENSURE at least one charging pump operating. b. ENSURE CH-196, VCT makeup bypass, closed. c. ENSURE CH-504, RWST to charging suction, open. d. OPEN CH-192, RWST isolation. e. CLOSE CH-501, VCT outlet isolation. f. CHECK charging flow at desired rate. g. Go To step 3.11. <p>Examiner Note: Crew should borate from the RWST.</p>

Op-Test No.: NRC Scenario No.: 4 Event No.: 4-5

Event Description: No. 1 Steam Generator tube leak (75 gpd and rising more than 15 gpd/min) and Rapid Power Reduction.

Time	Position	Applicant's Actions or Behavior
	ALL	<p>3.11 During the downpower, Refer To Attachment 1, "Rapid Downpower Parameters," and MAINTAIN parameters as specified throughout downpower.</p> <p>Examiner Note: Attachment 1 Rapid Downpower Parameters:</p> <ul style="list-style-type: none"> • Condensate and heater drain flows and pressures: sufficient to maintain adequate SGFP suction pressure. • FRV D/P: greater than 40 psid • Turbine load: responding to changes in load demand, with control valves operating together • Steam generator levels 55 to 70%. • MSR parameters tracking together • Turbine Generator MVARs: as specified by CONVEX • Reactor power: being monitored using ΔT power indication • ASI: In accordance with reactivity plan or within 0.01 of ESI or per COLR. • CEA position: greater than PDIL • Tc: less than or equal to 549°F • Pressurizer level: between 35 and 70% • Pressurizer pressure: between 2,225 and 2,300 psia (DNB margin)
		<p style="text-align: center;">NOTE</p> <ol style="list-style-type: none"> 1. Xenon rate of change should be considered when terminating boration. 2. During rapid downpower, the PPC calorimetric may be inaccurate due to SG level transients. The most accurate available indication of reactor power is RPS ΔT power.
<p>Examiner Note: When reactor power has been lowered approximately 15% or at lead examiner's direction, proceed to Event No. 6, Steam Generator Tube Rupture on No. 1 Steam Generator.</p>		
<p>Simulator Operator: When directed, initiate Event 6, SGTR on No. 1 Steam Generator.</p>		
<p>Indications:</p> <ul style="list-style-type: none"> • Steam Line Radiation Monitor Alarm (C-01 A30) • N16 Alarm (C-06 C19A) • N16 Alert (C-06 C19B) • PROCESS RAD MON HI/HI FAIL (C-06 D24A) • Backup charging pumps start, Letdown lowers • Pressurizer Level Lowering 		

Op-Test No.: NRC Scenario No.: 4 Event No.: 6-7-8-9

Event Description: Reactor Trip, Turbine Fails to trip, ESDE on No. 2 Steam Generator outside of containment, A HPSI pump fails to start on SIAS.

Time	Position	Applicant's Actions or Behavior
	ALL	<p>Trip the Reactor based on leakage exceeding charging pump capability to maintain pressurizer level or Main Steam Line Radiation Monitor High Alarm validated with RCS indications. Go To EOP 2525 Standard Post Trip Actions.</p> <p>Examiner Note: SRO directs step 3.1* or 3.2* of AOP 2569 Steam Generator Tube Leak. Crew may perform step 3.3*.</p>
	SRO	Enters EOP 2525 Standard Post Trip Actions
Examiner Note: Events 7, 8, and 9 occur upon reactor trip. The A HPSI pump fails to start on SIAS.		
Examiner Note: The following steps are from EOP 2525 Standard Post Trip Actions.		
	ATC	<p>Determine Status of Reactivity Control</p> <p>1. DETERMINE that Reactivity Control acceptance criteria are met by performing ALL of the following steps:</p> <ul style="list-style-type: none"> a. CHECK that reactor power is dropping. b. CHECK that SUR is negative. c. CHECK that <i>no</i> more than one CEA is <i>not</i> fully inserted.

Op-Test No.: NRC Scenario No.: 4 Event No.: 6-7-8-9

Event Description: Reactor Trip, Turbine Fails to trip, ESDE on No. 2 Steam Generator outside of containment, A HPSI pump fails to start on SIAS.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Determine Status of Maintenance of Vital Auxiliaries</p> <p>2. DETERMINE that Maintenance of Vital Auxiliaries acceptance criteria are met by performing ALL of the following steps:</p> <ul style="list-style-type: none"> a. CHECK that the main turbine is tripped by BOTH of the following: <ul style="list-style-type: none"> • ALL main stop valves are closed. • Generator megawatts indicate zero. a.1 PERFORM ANY of the following: <ul style="list-style-type: none"> 1) Manually TRIP the main turbine. 2) CLOSE the MSIVs. <p>Examiner Note: Operator should manually TRIP the main turbine.</p> <ul style="list-style-type: none"> b. <u>IF</u> 15G-2XI-4, motor operated disconnect, is closed, CHECK that the main Generator output breakers 8T and 9T are open. c. CHECK that ALL Facility 1 and 2 electrical buses are energized: <ul style="list-style-type: none"> • 6.9kV Electrical Buses 25A, 25B • 4.16kV Non-Vital Electrical Buses 24A, 24B • 4.16vV Vital Electrical Buses 24C, 24D • Vital DC Buses 201A, 201B, DV-10, DV-20 • Vital AC Instrument Buses VA-10, VA-20 d. CHECK that BOTH facilities of service water are operating. e. CHECK that BOTH facilities of RBCCW are operating with service water cooling. f. CHECK on facility of CRAC operating.
	ATC	<p>Determine Status of RCS Inventory Control</p> <p>3. DETERMINE that RCS Inventory Control acceptance criteria are met by performing ALL of the following:</p> <ul style="list-style-type: none"> a. CHECK that BOTH of the following conditions exist: <ul style="list-style-type: none"> • Pressurizer level is 20 to 80% • Pressurizer level is trending to 35 to 70% a.1 IF the Pressurizer Level Control System is not operating properly in automatic, RESTORE and MAINTAIN pressurizer level 35 to 70% by performing ANY of the following: <ul style="list-style-type: none"> 1) OPERATE the Pressurizer Level Control System. 2) Manually OPERATE charging and letdown. b. CHECK that RCS subcooling is greater than or equal to 30°F

Op-Test No.: NRC Scenario No.: 4 Event No.: 6-7-8-9

Event Description: Reactor Trip, Turbine Fails to trip, ESDE on No. 2 Steam Generator outside of containment, A HPSI pump fails to start on SIAS.

Time	Position	Applicant's Actions or Behavior
	ATC	<p>Determine Status of RCS Pressure Control</p> <p>4. DETERMINE RCS Pressure Control acceptance criteria are met by BOTH of the following:</p> <ul style="list-style-type: none"> • CHECK that pressurizer pressure is 1900 to 2350 psia. • CHECK that pressurizer pressure is trending to 2225 to 2300 psia. <p>4.3 IF pressurizer pressure is less than 1714 psia, ENSURE ALL of the following:</p> <ul style="list-style-type: none"> • SIAS has actuated. (C01) • CIAS has actuated. (C01) • EBFAS has actuated. (C01) • ONE complete facility of CRACS is operating in recirc mode. (C25) <p>Facility 1</p> <ul style="list-style-type: none"> • HV-203A, Fan F-21A exhaust damper is open. • Fan F-21A, supply fan is running. • HV-206A, Fan F-31A exhaust damper is open. • Fan F-31A, exhaust fan is running. • HV-212A, Fan F-32A exhaust damper is open. • Fan F-32A, filter fan is running. • HV-202, minimum fresh air damper is closed. • HV-207, cable vault exhaust damper is closed. • HV-208, exhaust air damper is closed. <p>Facility 2</p> <ul style="list-style-type: none"> • HV-203B, Fan F-21B exhaust damper is open • Fan F-21B, supply fan is running. • HV-206B, Fan F-31B exhaust damper is open. • Fan F-31B, exhaust fan is running. • HV-212B, Fan F-32B exhaust damper is open. • Fan F-32B, filter fan is running. • HV-495, fresh air damper is closed. • HV-496, exhaust air damper is closed. • HV-497, cable vault exhaust damper is closed. <p>4.4 IF pressurizer pressure is less than 1714 psia AND SIAS has initiated, ENSURE that ONE RCP in each loop is stopped.</p> <p>4.5 IF pressurizer pressure lowers to less than the minimum RCP NPSH limit, STOP ALL RCPs.</p>

Op-Test No.: NRC Scenario No.: 4 Event No.: 6-7-8-9

Event Description: Reactor Trip, Turbine Fails to trip, ESDE on No. 2 Steam Generator outside of containment, A HPSI pump fails to start on SIAS.

Time	Position	Applicant's Actions or Behavior
	ATC	<p>Determine Status of Core Heat Removal</p> <p>5. DETERMINE that Core Heat Removal acceptance criteria are met by performing ALL of the following:</p> <ul style="list-style-type: none"> a. CHECK that at least one RCP is operating. b. CHECK that loop delta T is less than 10° c. CHECK that Th subcooling is greater than or equal to 30°F.
	ATC	<p>Determine Status of RCS Heat Removal</p> <p>6. DETERMINE that RCS Heat Removal acceptance criteria are met by ALL of the following conditions:</p> <ul style="list-style-type: none"> a. CHECK that BOTH steam generators pressure are 880 to 920 psia. <ul style="list-style-type: none"> a.2 <u>IF</u> ANY steam generator pressure is less than 880 psia, PERFORM the following: <ul style="list-style-type: none"> 1) ENSURE that the steam dumps are closed. 2) ENSURE that the ADV is closed. 3) CHECK that the main steam safety valves are closed. a.3 <u>IF</u> ANY steam generator pressure is less than 800 psia <u>AND</u> lowering, PERFORM the following: <ul style="list-style-type: none"> 1) CLOSE BOTH MSIVS. 2) <u>IF</u> ANY MSIV failed to close, PLACE Bottle-Up Panel isolation switches for the open MSIV to "ISOL": Examiner Note: a3.2 Not Applicable 3) ENSURE BOTH MSIV bypass valves are closed. a.4 <u>IF</u> ANY steam generator pressure is less than 572 psia, ENSURE that MSI has actuated. (C01) <p>Examiner Note: Expected No. 2 Steam Generator Pressure is 600 psia and lowering. No. 1 Steam Generator Pressure is █</p>

Op-Test No.: NRC Scenario No.: 4 Event No.: 6-7-8-9

Event Description: Reactor Trip, Turbine Fails to trip, ESDE on No. 2 Steam Generator outside of containment, A HPSI pump fails to start on SIAS.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Determine Status of RCS Heat Removal (continued)</p> <p>6.</p> <p>b. CHECK that RCS Tc is being maintained 530 to 535°F.</p> <p>Examiner Note: Expected Tc < 530°F contingency action b.2.3 is applicable</p> <p>b.2. <u>IF</u> RCS Tc is less than 530°F, PERFORM the following:</p> <p>3). OPERATE the steam dumps or ADVs to stabilize RCS Tc.</p> <p>c. CHECK that at least one steam generator has BOTH of the following conditions met:</p> <ul style="list-style-type: none"> • Level is 10 to 80%. • Main feedwater or TWO auxiliary feedwater pumps are operating to restore level 40 to 70%. <p>d. CHECK that RCS subcooling is greater than or equal to 30°F.</p>

Op-Test No.: NRC Scenario No.: 4 Event No.: 6-7-8-9

Event Description: Reactor Trip, Turbine Fails to trip, ESDE on No. 2 Steam Generator outside of containment, A HPSI pump fails to start on SIAS.

Time	Position	Applicant's Actions or Behavior
	ATC	<p>Determine Status of Containment Isolation</p> <p>7. DETERMINE that Containment Isolation acceptance criteria are met by ALL of the following:</p> <p>a. CHECK that NONE of the following primary plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity:</p> <p>Radiation Monitors Inside Containment</p> <ul style="list-style-type: none"> • RM-7890, Personnel Access Area • RM-7891, Ctmt Refuel Floor Area • RM-8240, High Range • RM-8241, High Range • RM-8123 A and B, Ctmt Atmosphere • RM-8262 A and B, Ctmt Atmosphere <p>Radiation Monitors Outside Containment</p> <ul style="list-style-type: none"> • RM-7894, Charging Pump Area • RM-7895, Primary Sample Sink • RM-7896, -25 ft 6 in Waste Process Area • RM-7897, -45 ft 6 in Waste Process Area • RM-8132A and B, Unit 2 Plant Stack • RM-8169, Millstone Stack WR • RM-8168, Unit 2 WR Stack • RM-6038, RBCCW <p>b. CHECK that NONE of the following steam plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity:</p> <p>Steam Plant Radiation Monitors</p> <ul style="list-style-type: none"> • RM-5099, Steam Jet Air Ejector • RM-4262, SG Blowdown • RM-4299A and B, Main Steam Line 1 • RM-4299C, Main Steam Line 2
	ATC/BOP	<p>Examiner Note: Radiation Monitors in alarm: RM-5099, Steam Jet Air Ejector, RM-4262, SG Blowdown, RM-4299A and B, Main Steam Line 1. The following contingency actions are applicable:</p> <p>b.1 IF feed is available to BOTH steam generators, THROTTLE feed to the steam generator with the highest radiation readings to maintain level 40-45% by performing ANY of the following:</p> <ol style="list-style-type: none"> 1) OPERATE associated main feed reg bypass valve, FW-41A or FW-41B. 2) IF AFAS has actuated, PERFORM the following: <ul style="list-style-type: none"> • PLACE the auxiliary feed "OVERRIDE/MAN/START/RESET" handswitches in "PULL TO LOCK". • OPERATE the associated aux feed reg valve, FW-43A or FW-43B.

Op-Test No.: NRC Scenario No.: 4 Event No.: 6-7-8-9

Event Description: Reactor Trip, Turbine Fails to trip, ESDE on No. 2 Steam Generator outside of containment, A HPSI pump fails to start on SIAS.

Time	Position	Applicant's Actions or Behavior
	ATC	Determine Status of Containment Isolation continued 7. c. CHECK that containment pressure is less than 1.0psig.
	ATC	Determine Status of Containment Temperature and Pressure Control 8. DETERMINE that Containment Temperature and Pressure Control acceptance criteria are met by BOTH of the following steps: a. CHECK that containment temperature is less than 120°F. (PPC or avg of Points 5 and 6) b. CHECK that containment pressure is less than 1.0psig.
	ATC/BOP	Perform Subsequent Actions of EOP 2525 SPTAs.
	ATC/BOP	Start A HPSI pump following failure to start on SIAS.
Examiner Note: The Unit Supervisor refers to EOP 2541 Appendix 1, Diagnostic Flowchart to diagnose the event.		
	SRO	Enters EOP 2540 Functional Recovery due multiple events in progress (SGTR and ESDE).
Examiner Note: The following steps are from EOP 2540 Functional Recovery. Steps marked with an * can be pulled forward or performed when conditions are met.		
	SRO	1. CLASSIFY the event. Refer To MP- 26- EPI- FAP06, "Classification and PARs" • <u>IF</u> classification requires RCS sampling, Refer To Appendix 46, "Sampling for EAL Determination" and DIRECT Chemistry as required.
	SRO	2. PERFORM ALL of the following: • OPEN the Safety Function Tracking Page and ENTER the EOP entry time. • ENSURE the master alarm silence switch is in "NORMAL."
	ATC	3.* <u>IF</u> pressurizer pressure is less than 1714 psia <u>AND</u> SIAS has initiated, PERFORM the following: a. ENSURE ONE RCP in each loop is stopped. b. PLACE associated pressurizer spray valve controller RC-100E or RC-100F in manual and CLOSE the valve. c. <u>IF</u> pressurizer pressure lowers to less than the minimum RCP NPSH limit, PERFORM the following: 1) STOP ALL RCPS. 2) PLACE TIC-4165, steam dump TAVG controller, in manual and closed. 3) PLACE pressurizer spray valve controllers RC-100E and RC-100F in manual and CLOSE the valves.

Op-Test No.: NRC Scenario No.: 4 Event No.: 6-7-8-9

Event Description: Reactor Trip, Turbine Fails to trip, ESDE on No. 2 Steam Generator outside of containment, A HPSI pump fails to start on SIAS.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>4. SAMPLE steam generators that are available for RCS heat removal as follows:</p> <p>a. OPEN appropriate steam generator sample valves:</p> <ul style="list-style-type: none"> MS-191A <p>Examiner Note: Steam Generator A is available for RCS heat removal. Steam Generator B is not available due to ESDE.</p> <p>b. DIRECT Chemistry to perform ALL of the following:</p> <ul style="list-style-type: none"> Sample ANY steam generator that is available for RCS Heat Removal Frisk the samples Report frisk results Analyze samples for boron and activity. <p>c. <u>WHEN</u> Chemistry reports that samples have been taken, CLOSE the steam generator sample valves.</p> <p>CUE: When directed to sample Steam Generators, respond 10 minutes later that samples have been taken. Report frisk results xxx</p>
	SRO	5. PLACE the hydrogen analyzers in service. Refer To Appendix 19, "Hydrogen Analyzer Operation."
		<p style="text-align: center;">NOTE</p> <p>If the Safety Function Status Checklist is <i>not</i> satisfied for the selected success path, the US may commence the operator actions for safety functions which are <i>not</i> met based on Safety Function hierarchy. The remaining Safety Functions should be prioritized as time permits.</p>
	SRO	<p>6.* IDENTIFY success paths to be used to satisfy each safety function using BOTH of the following:</p> <ul style="list-style-type: none"> Resource Assessment Trees Safety Function Tracking Page
	SRO	<p>7.* PRIORITIZE safety functions to be addressed first based on ALL of the following:</p> <p>a. Safety functions which do not meet the Safety Function Status Checklist for the selected success path.</p> <p>b. Safety functions for which the equipment to support the success path is not operating.</p> <p>c. Safety functions for which success path three has been selected.</p> <p>d. Safety functions for which success path two has been selected.</p> <p>e. e. Safety functions for which success path one has been selected.</p>

Op-Test No.: NRC Scenario No.: 4 Event No.: 6-7-8-9

Event Description: Reactor Trip, Turbine Fails to trip, ESDE on No. 2 Steam Generator outside of containment, A HPSI pump fails to start on SIAS.

Time	Position	Applicant's Actions or Behavior			
	SRO	Safety Function	Path	Met?	Priority
		RC-1	CEA Insertion	Yes	3
		DC-1	DC Power	Yes	4
		AC-1	RSST	Yes	5
		IC-1	CVCS only if Lpzt >20% if not then IC 2	Yes	6
		PC-1	Subcooled	Yes	7
		HR-2	SI operating	Yes	2
		CI-1	Automatic/Manual	No	1
		CTPC-1	CARs (Normal)	Yes	8
		Examiner Note: The success paths and order of priority are based on the conditions seen during the scenario validation. A different path and priorities may be applicable due to the timing of operator mitigating actions.			
	SRO	Identifies CI-1 as the first priority and enters EOP 2540E, Functional Recovery of Containment Isolation.			
		Examiner Note: The following steps are from EOP 2540E Functional Recovery of Containment Isolation. 1.* Not applicable 2.*IF a SGTR is indicated by ANY of the following: <ul style="list-style-type: none"> • Steam generator activities • Main steam piping radiation levels • Steam generator level change when not feeding • Steam generator blowdown activity • Steam generator mismatch in level with essentially the same feed and steaming rate for both steam generators • Feed flow mismatch between steam generators • Steam flow versus feed flow mismatch in a steam generator prior to the trip • Steam flow to feed flow mismatch in a SG prior to the trip IDENTIFY and ISOLATE the most affected SG. Refer To Appendix 12, "SGTR Response."			

Op-Test No.: <u>NRC</u> Scenario No.: <u>4</u> Event No.: <u>6-7-8-9</u>		
Event Description: Reactor Trip, Turbine Fails to trip, ESDE on No. 2 Steam Generator outside of containment, A HPSI pump fails to start on SIAS.		
Time	Position	Applicant's Actions or Behavior
		<p>Examiner Note: The following steps are from Appendix 12, SGTR Response.</p> <p>1.* COMMENCE an RCS cooldown at the maximum controllable rate to a Th of less than 515°F in both loops using the steam dumps.</p> <p>Examiner Note: The following is guidance from OP 2260 EOP User Guide for "maximum controllable rate"</p> <ul style="list-style-type: none"> • If no RCPs are operating, start at approximately 50% open (in manual) on either the ADVs or "A" steam dump, then monitor and adjust as necessary. • If RCPs are operating, the ADVs or "A" steam dump should be placed in manual and opened slowly to attempt to maintain NPSH. NPSH should be closely monitored during the cooldown.
		<p>Examiner Note: The following steps are from Appendix 11, ESDE Response.</p> <p>Examiner Note: The following is guidance from OP 2260 EO User Guide for stabilizing CET temperatures using the least affect SG ADV;</p> <p>If the ESDE progresses to SG dry out conditions, when CET temperatures begin to rise, the operator is required to stabilize CET temperatures using the least affected SG ADV. CET temperatures must be closely monitored and actions taken to minimize any large temperature change (CET temperature may be affected by the establishment of natural circulation and feedwater flow rate). A general rule of thumb that can be used is to adjust the ADV automatic setpoint for the least affected SG to the saturation pressure for the CETs (this can be obtained using the Steam Tables or the value displayed on SPDS).</p>
		<p>Examiner Note: The following steps are from EOP 2540D Functional Recovery of Heat Removal.</p> <p>Examiner Note: The following guidance from OP 2260 EOP User Guide:</p> <p>If there is a conflict between isolating a SG (e.g., due to indications of SGTR or ESDE) and maintaining adequate heat removal via at least one SG, then maintain RCS heat removal via the least affected SG has precedence. At least one SG should always be available for heat removal, if at all possible. [Isolation of both SGs and going to OTC is a last resort option.]</p>