JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Maximum Rate of Change of Power

JPM Number: A1.1R Revision: 2/0

Initiated:

John W. Riley – Signature on File	06/11/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	06/13/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	06/13/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
None 12/01/16	KPD. Updated to align with OP 2204 Rev. 34.	1/1
None 5/10/18 jwr	Updated for the 2018 ILT NRC exam. Changed number from A-08-07 to A1.1R to desired numbering for the NRC.	2/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A1.1R Revision: 2/0

Task Title: Maximum Rate of Change of Power

System: N/A

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): 235501

Applicable To: SRO _____ STA _____ RO X PEO _____

K/A Number: 2.1.25 K/A Rating: 3.9/4.2

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

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

Task Standards: At the completion of this JPM the examinee has correctly determined the applicable Fuel Conditioning Category, target rate of change in power level, and the amount of time per the target rate required to achieve 100% power.

Required Materials: (procedures, equipment, etc.) OP 2204, Load Changes, R 039, Effective 3/27/2018

General References: OP 2204, Load Changes, R 039, Effective 3/27/2018

***** 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. With the exception of the questions at the end, 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: A1.1R Revision : 2/0

Initial Conditions: The plants 7 day operating history following a restart from a refueling outage is as follows:

- **Sunday 23:00:** Reactor Critical, Low Power Physics testing complete.
- **Wednesday 11:00**: Plant reaches 100% power, ARO.
- **Thursday 23:00:** Reactor power reduced to 65% and the 'A' MFW Pump was removed from service due to an oil leak.
- **Saturday 16:00:** Reactor power 64%, Group 7 CEAs @ 166 steps and the 'A' MFW Pump has been returned to service.

Initiating Cues: It is Saturday at 16:00 you are the on shift Reactor Operator. In preparation for raising power, the Unit Supervisor has directed you to perform step 4.1.7 of OP 2204. The Unit Supervisor is looking for a time when the crew can expect to reach 100% to plan the power ascension and communicate this to the organization. The Unit Supervisor specified that Attachment 7 "Maximum Rate of Change of Power" be used and that the following be determined:

- The applicable fuel conditioning category,
- The target rate(s) of change in power level, and
- The amount of time per the target rate required to achieve 100% power.

Simulator Requirements: None

*** * * * 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: A1.1R Revision: 2/0

Task Title: Maximum Rate of Change of Power

START TIME: _____

S T E P # 1	Performance: NOTE: A "Maximum Rate of Change of Power" display can be found on the PPC MMI "Trend Menu," "PPC Trend Menu" and "Rate of Power Change Limits."	Standard: Examinee reads the note and understands that the PPC has a trend for Maximum Rate of Change of Power.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	4.1.7 Refer To Attachment 7, "Maximum Rate of Change of Power," or PPC "Rate of Power Change Limits" display and PERFORM the following:	Examinee refers to Attachment 7, "Maximum Rate of Change of Power." This is what was specified in the initiating cues.	Y ☐ N ☒	S ☐ U ☐
	Cue: Provide the Examinee with a copy of OP 2204 "Load Changes"			
	Comments:			
S T E P # 2	Performance: 4.1.7.a. DETERMINE fuel condition category. **Major Shutdown or Refueling:** Reactor shutdown (zero power), greater than 45 days OR a shutdown which involves handling of fuel assemblies in reactor core.	Standard: Examinee determines the fuel condition category is **Major Shutdown or Refueling** From the initial conditions the plant had been at 100% for < 72 hours (Wednesday 1100 through Thursday 2300 is 36 hours) and restarted from a refueling outage which required handling fuel assemblies in reactor core.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A1.1R Revision: 2/0

Task Title: Maximum Rate of Change of Power

S T E P # 3	Performance: Determine the target rate of change in power level. <u>From 50 to 90% of RATED THERMAL POWER</u> Target 4% every hour, but less than 13% in 3 hours (*Note 3*) until 72 hours of operation at 100% power has been attained (*Note 2*). ***Note 3*:** Maximum Rate of Power Increase in 5% per hour. <u>From 90 to 100% of RATED THERMAL POWER</u> Target 3% every hour, but less than 10% in 3 hours (*Note 4*) until 72 hours of operation at 100% power has been attained (*Note 2*) ***Note 4***: Maximum Rate of Power Increase is 3% per hour.	Standard: Examinee chooses and states the following as the target rates of change in power level: Power from 64 to 90%: **Target 4% every hour,** Power from 90 to 100%: **Target 3% every hour,**	Critical: Y ☒ N ☐ Y ☒ N ☐	Grade: S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments: Note 2 involves CEA movement and is not applicable to this exercise.			

PERFORMANCE INFORMATION

JPM Number: A1.1R Revision: 2/0

Task Title: Maximum Rate of Change of Power

STEP # 4	Performance:	Standard:	Critical:	Grade:
	Determine the amount of time per the target rate required to achieve 100% power <u>From 50 to 90% of RATED THERMAL POWER</u> Target 4% every hour, but less than 13% in 3 hours (*Note 3*) until 72 hours of operation at 100% power has been attained (*Note 2*). ***Note 3*:** Maximum Rate of Power Increase in 5% per hour. <u>From 90 to 100% of RATED THERMAL POWER</u> Target 3% every hour, but less than 10% in 3 hours (*Note 4*) until 72 hours of operation at 100% power has been attained (*Note 2*). ***Note 4***: Maximum Rate of Power Increase is 3% per hour.	Examinee calculates the minimum amount of time required to achieve 100% power: <u>64 – 90%</u> Target 4% per hour = **6.5 hours (+/- 0.25)** $90 - 64\% = 26\%$ $(26\% \div 4\frac{\%}{hr} = 6.5\ hrs)$ <u>90 – 100%</u> Target 3% every hour = **3.3 hours (+/- 0.25)** $100 - 90\% = 10\%$ $(10\% \div 3\frac{\%}{hr} = 3.3\ hrs)$ **Total** Target 6.5 + 3.3 = **<u>9.8 hrs</u>** (+/- **0.5**) **Acceptance criteria 9.3 to 10.2 hours.** The examinee states that the amount of time per the target rate required to achieve 100% power is 9.8 hours +/- 0.5 hours.	Y ☒ N ☐	S ☐ U ☐
	Cue: If examinee asks which limit to use (target values or maximum values) say; “use target”.			
	Comments: CEA withdrawal limits might be mentioned but do not impact the outcome of this JPM.			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A1.1R Revision: 2/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: A1.1R Revision: 2/0

Initial Conditions: The plants 7 day operating history following a restart from a refueling outage is as follows:

- **Sunday 23:00:** Reactor Critical, Low Power Physics testing complete.
- **Wednesday 11:00**: Plant reaches 100% power, ARO.
- **Thursday 23:00:** Reactor power reduced to 65% and the 'A' MFW Pump was removed from service due to an oil leak.
- **Saturday 16:00:** Reactor power 64%, Group 7 CEAs @ 166 steps and the 'A' MFW Pump has been returned to service.

Initiating Cues: It is Saturday at 16:00 you are the on shift Reactor Operator. In preparation for raising power, the Unit Supervisor has directed you to perform step 4.1.7 of OP 2204. The Unit Supervisor is looking for a time when the crew can expect to reach 100% to plan the power ascension and communicate this to the organization. The Unit Supervisor specified that Attachment 7 "Maximum Rate of Change of Power" be used and that the following be determined:

- The applicable fuel conditioning category,
- The target rate(s) of change in power level, and
- The amount of time per the target rate required to achieve 100% power.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Calculate Spent Fuel Pool Heatup Time To 150°F

JPM Number: A1.2R Revision: 2/0

Initiated:

John W. Riley – Signature on File	05/14/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	06/01/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	06/13/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
2006-317	Update JPM to include HUP evaluations and new format	0/0
09/15/11	Minor changes to incorporate NRC validation comments.	0/1
05/14/18 jwr	Updated to latest format for 2018 ILT NRC exam. Changed the JPM number to number to the NRC system. Updated to the latest revision of procedure OU-M2-201.	2/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A1.2R Revision: 2/0

Task Title: Calculate Spent Fuel Pool Heatup Time To 150°F

System: Conduct of Operations

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): 235350

Applicable To: SRO _____ STA _____ RO X PEO _____

K/A Number: 2.1.20 K/A Rating: 4.6

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

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

Task Standards: At the completion of this JPM the examinee has correctly determined the Spent Fuel Pool (SFP) Heatup rate and time to reach 150 °F.

Required Materials: (procedures, equipment, etc.)
- OU-M2-201 Section 3.2, " Heatup Calculations", R22
- OU-M2-201 Attachment 3, " Millstone Unit 2 SFP Heatup Calculations, Time to 150°F Calculation", R22

General References:
- OU-M2-201 Section 3.2, " Heatup Calculations", R22
- TRM 3.9.3.2 Spent Fuel Pool Temperature

***** 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. With the exception of the questions at the end, 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: A1.2R Revision : 2/0

Initial Conditions:

- Unit 2 is in day 12 of a refueling outage.
- Unit 2 is in Mode 6 performing a full core offload with 105 fuel assemblies currently transferred to the Spent Fuel Pool.
- Unit 2 has just experienced a Station Blackout.
- Present Spent Fuel Pool temperature as read on TR-7030 is 93°F.

Initiating Cues: The US has directed you to calculate when the Spent Fuel Pool will reach the Technical Specification temperature limit of 150 °F.

Simulator Requirements: N/A

*** * * * 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: A1.2R Revision: 2/0

Task Title: Calculate Spent Fuel Pool Heatup Time To 150°F

START TIME: _____

S T E P # 1	Performance: **NOTE:** SSA Checklist or Heatup Calculations may be completed by any licensed Operator (except on-duty SM) or STA using, at a minimum, main control board system status. **NOTE:** Systems planned to be removed from service in the next 24 hours may be assumed to be out of service, and, therefore, not credited. **NOTE:** Attachment 4 through Attachment 8 provide further guidance while performing SSA Checklist.	Standard: Examinee reads and acknowledges notes.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: **Provide examinee with the following:** • **OU-M2-201" Shutdown Safety Assessment Checklist" procedure** • **A calculator**			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A1.2R Revision: 2/0

Task Title: Calculate Spent Fuel Pool Heatup Time To 150°F

S T E P # 2	Performance: **NOTE:** SSA Checklists are completed as follows: • Daily • Prior to removing any equipment required to support KSFs unless daily review already assumed equipment is out of service • Equipment available to support KSFs unexpectedly becomes unavailable • Prior to performing plant MODE changes when shutdown • A system/component is restored to available status and is desired to either immediately credit system/component for Shutdown Risk or it is more than six hours until the next SSA Checklist is to be performed.	Standard: Examinee reads and acknowledges note.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A1.2R Revision: 2/0

Task Title: Calculate Spent Fuel Pool Heatup Time To 150°F

S T E P # 3	Performance: **3.2 Heatup Calculations** 3.2.1 IF a Time to Core Boil determination is desired, THEN PERFORM the following: 3.2.2 IF a time to 200 °F determination is desired, THEN PERFORM the following: 3.2.3 IF a time for an uncontrolled 10 °F heatup determination is desired, THEN PERFORM the following:	Standard: Examinee determines that steps 3.2.1, 3.2.2, and 3.2.3 are not applicable.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 4	Performance: **3.2 Heatup Calculations** 3.2.4 IF a time to reach 150 °F SFP design temperature determination is desired, THEN PERFORM the following: a. REFER to Attachment 3, Millstone Unit 2 SFP Time to 150 °F Calculation, and FOLLOW instructions. b. RECORD results on Attachment 3.	Standard: Examinee refers to Attachment 3, Millstone Unit 2 SFP Time to 150°F Calculation.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A1.2R Revision: 2/0

Task Title: Calculate Spent Fuel Pool Heatup Time To 150°F

S T E P # 5	Performance: **ATTACHMENT 3 Millstone Unit 2 SFP Heatup Calculations - SFP Time to 150°F** **NOTE:** If either of the conditions are met, RE-G-16 applies and the Time to 150°F is "N/A": • No fresh fuel assemblies have been transferred to the SFP. • Core reload is complete.	Standard: Examine reads the note. And determines that RE-G-16 does not apply. From the initiating cues, Unit 2 is in Mode 6 performing a full core offload with 105 fuel assemblies currently transferred to the Spent Fuel Pool.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 6	Performance: Instructions: 1. IF NO fuel assemblies have been transferred to the SFP OR core reload is complete, go to SFP Time to 200°F. 2. Record time after reactor shutdown (in days), and current SFP temperature (ºF).	Standard: Examinee determines step 1 is N/A. From the initiating cues, Unit-2 is in Mode 6 with 105 fuel assemblies currently transferred to the SFP. Examinee records **12 days** after shutdown and **93 °F** on Attachment 3.	Critical: Y ☐ N ☒ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A1.2R Revision: 2/0

Task Title: Calculate Spent Fuel Pool Heatup Time To 150°F

S T E P # 7	Performance: Instructions: **NOTE:** When using this table, the more conservative value should be used, so interpolation is not necessary (i.e., on the 23rd day shutdown, use day 20 heatup rate). 3. Record SFP Heatup Rate from Table 1 based on SFP Offload Condition.	Standard: Examinee reads the note and applies it to the determination of a SFP heatup rate. Examinee determines and records SFP heatup rate of **17.7 °F/hour** based on End-of-Cycle Core Offload using Time from Shutdown (days) of 10 days (most conservative value) on Attachment 3.	Critical: Y ☐ N ☒ Y ☒ N ☐	Grade: S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 8	Performance: Instructions: 4. Calculate and record SFP Time to 150ºF. **Calculation:** $\text{SFP Time to 150°F} = \frac{150°F - \text{SFP Temperature}(°F)}{\text{SFP Heatup Rate}(°F/\text{hour})}$	Standard: Examinee performs the following calculation to determine SFP temperature to 150°F: {(150°F – 93 °F) / 17.7 °F/hour} = ~3.2 hours. **Acceptable 3.0 – 3.5 hours.**	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A1.2R Revision: 2/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: A1.2R Revision: 2/0

Initial Conditions:

- Unit 2 is in day 12 of a refueling outage.
- Unit 2 is in Mode 6 performing a full core offload with 105 fuel assemblies currently transferred to the Spent Fuel Pool.
- Unit 2 has just experienced a Station Blackout.
- Present Spent Fuel Pool temperature as read on TR-7030 is 93°F.

Initiating Cues: The US has directed you to calculate when the Spent Fuel Pool will reach the Technical Specification temperature limit of 150 °F.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Shift Staffing Based on Administrative Requirements

JPM Number: A1S Revision: 1/0

Initiated:

John W. Riley – Signature on File	6/12/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	6/15/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	6/14/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
11/30/2011	Created JPM for LOIT 2011 NRC Exam	0
6/12/18 jwr	Revised and upgrade JPM to latest format. Changed number to align with 2018 numbering. Replaced NUTIMS task number with VISION task number.	1/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A1S Revision: 1/0

Task Title: Shift Staffing Based on Administrative Requirements

System: Conduct of Operations

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): 573614

Applicable To: SRO X STA _____ RO _____ PEO _____

K/A Number: 2.1.5 K/A Rating: 3.9

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

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

Task Standards: At the completion of this JPM, the SRO will determine who is fit for duty and can be called in for shift coverage when an on shift RO becomes incapacitated (can't perform licensed activities).

Required Materials: (procedures, equipment, etc.)
- Unit 2 Technical Specifications, Administrative Section
- LI-AA-700, Fatigue Management and Work Hour Limits for Covered Workers
- SY-AA-FFD-101, Fitness For Duty Program
- NyQuil Package Information and FAQ

General References:
- Unit 2 Technical Specifications, Administrative Section
- LI-AA-700, Fatigue Management and Work Hour Limits for Covered Workers
- SY-AA-FFD-101, Fitness For Duty Program
- NyQuil Package Information and FAQ

***** 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. With the exception of the questions at the end, 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: A1S Revision : 1/0

Initial Conditions:

- You are the Night Crew Shift Manager.
- No other Shift Managers are available.
- All other qualified operators are unavailable.
- Prior to the BOP becoming ill, the crew was at minimum staffing.
- The plant is in MODE 1 and stable at 100% power
- The crew began its 12 hour shift at 1800
- Current time and Date is 1830 on Wednesday, October 3, 2018.

Initiating Cues:

- The Balance of Plant Operator has become ill early (1830) on his last night of Night Shift and has been sent home, which places the shift below minimum staffing levels.
- Based on Administrative requirements, determine the following from the attached list of available operators:
  - How soon must a relief be found?
  - From the list provided, who is eligible to assume shift duties?
  - For those who are NOT eligible, what is the reason?

Available	Response
Operator 1	"I have been working a lot lately, but if you need someone, I could probably be there in about 45 minutes. I don't feel tired and have been getting enough rest."
Operator 2	"It's the last day of my seven days off. We just got back from Atlantic City, New Jersey, a half hour ago. I only got a couple hours of sleep while my wife drove. I really don't want to come in, but I can be there in about an hour if you're in a bind."
Operator 3	"I just got home from training at 1630 and I need to attend LORP for the rest of this week. I can't reschedule my training week. As long as I'm out by 0630 in the morning to attend training, I can be there in about an hour."
Operator 4	"I'm on the last day of my seven days off. I had a couple of beers with dinner, but I'll come in if you want me to. I can be there in 50 minutes".
Operator 5	"I'm scheduled to come in tomorrow night for my first night of midnights. I'm just getting over a pretty nasty cold and I don't want to infect anyone, but, if you really need me, I'll come in. I just took a dose of Nyquil Liquid Nighttime Cold Medicine about an hour ago, but I don't feel too bad right now. I can be there in about an hour. I just need to jump in the shower to wake up a little before I leave."

See Operator Schedules on next page 6

*** * * * 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).

Operator Schedules

Operator	Wed 9/26	Thurs 9/27	Fri 9/28	Sat 9/29	Sun 9/30	Mon 10/1	Tues 10/2	Wed 10/3	Thurs 10/4	Fri 10/5	Sat 10/6	Sun 10/7	Mon 10/8	Tues 10/9	Wed 10/10
#1	**Day (12)**	**OFF**	**OFF**	**Day (12)**	**Day (12)**	**Day (12)**	**Day (12)**	**OFF**	**Night (6)**	**Night (12)**	**Night (12)**	**Night (12)**	**Night (6)**	**OFF**	**OFF**
#2	**Day (12)**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**Night (6)**	**Night (12)**	**Night (12)**	**Night (12)**	**Night (6)**	**OFF**	**OFF**
#3	**OFF**	**Day (12)**	**Day (12)**	**Day (12)**	**Day (12)**	**OFF**	**T (8)**	**T (8)**	**T (8)**	**T (8)**	**OFF**	**OFF**	**Night (6)**	**Night (12)**	**Night (12)**
#4	**Day (12)**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**Night (6)**	**Night (12)**	**Night (12)**	**Night (12)**	**Night (6)**	**OFF**	**OFF**
#5	**Day (12)**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**Night (6)**	**Night (12)**	**Night (12)**	**Night (12)**	**Night (6)**	**OFF**	**OFF**

Day (12) = 12 hour Day Shift

Night (12) = 12 Hour Night Shift

Night (6) = 6 hours on the first evening or last morning of Night Shift

T (8) = 8 hours of Training

OFF = Scheduled day off

PERFORMANCE INFORMATION

JPM Number: A1S Revision: 1/0

Task Title: Shift Staffing Based on Administrative Requirements

START TIME: _____

S T E P # 1	Performance: **How soon must a relief be found?** Determines from Technical Specifications Section 6.2 Table 6.2-1, that the crew composition may be less than minimum requirements for a period of time not to exceed 2 hours in order to accommodate unexpected absence. Note 2 of Table 6.2-1 provides the two hour time requirement.	Standard: **Examinee determines that another RO must report within 2 hours.** Examine reviews the Technical Specifications, Section 6.2, Table 6.2-1 and note 2 of the Table. If the examinee states that a replacement must be available by 2030 that is also acceptable.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: Provide the examinee with the following documents: • Unit 2 Technical Specifications • Fatigue Management and Work Hour Limits for Covered Workers, LI-AA-700 • Fitness for Duty Program, SY-AA-FFD-101 • NyQuil Package Information and FAQ			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A1S Revision: 1/0

Task Title: Shift Staffing Based on Administrative Requirements

S T E P # 2	Performance: **From the list provided, determine who is eligible to assume shift duties?** SY-AA-FFD-101 section 3.24, " Fitness For Duty Call-Out Process" 3.24.3 EXHAUST all other options prior to requiring an individual who has consumed alcohol within the previous five hours to report to work. LI-AA-700 section 3.3, "Work Hours, Breaks, and Days Off" 3.3.1 APPLY the following limits to individuals regardless of unit status: • No more that 16 consecutive hours • No more than 16 work hours in any rolling 24-hour period • No more than 26 work hours in any rolling 48-hour period • No more than 72 work hours in any rolling 168-hour (7-day) period • At least 10-hour break between successive work periods • A 34-hour uninterrupted, continuous break in any 216-hour (9-day) period	Standard: The examinee refers to the list of available operators, reviews their responses, and determines that **Operator 2 is eligible to assume shift duties.** Calling Operator 2 in does not violate LI-AA-700 section 3.3, Work Hours, Breaks, and Days Off. Examinee determines Operator 2 will not; • Work more that 16 consecutive hours • Work more than 16 work hours in any rolling 24-hour period • Work more than 26 work hours in any rolling 48-hour period • Work more than 72 work hours in any rolling 168-hour (7-day) period • Violate the at least 10-hour break between successive work periods requirement • Violate the 34-hour uninterrupted, continuous break in any 216-hour (9-day) period requirement. Examinee also determines Operator 2 is Fit for Duty. That he has not consumed alcohol in the previous five hours.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: If the examinee attempts to contact other 'additional' individuals, inform him/her that none of them will answer the phone or pager.			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A1S Revision: 1/0

Task Title: Shift Staffing Based on Administrative Requirements

S T E P # 3	Performance: **For those who are NOT eligible, what is the reason?** LI-AA-700 section 3.3, "Work Hours, Breaks, and Days Off". 3.3.1 APPLY the following limits to individuals regardless of unit status: • No more that 16 consecutive hours • No more than 16 work hours in any rolling 24-hour period • No more than 26 work hours in any rolling 48-hour period • No more than 72 work hours in any rolling 168-hour (7-day) period • At least 10-hour break between successive work periods • A 34-hour uninterrupted, continuous break in any 216-hour (9-day) period	Standard: Examinee determines that **Operator 1 is NOT available** because he/she would work more than **72 hours in a rolling 168-hour (7-day) period**. (LI-AA-700) Examinee determines that **Operator 3 is NOT available** because he/she would work more than **16 hours in a 24 hour** period or because he/she would NOT have a **break of at least 10 hours** between work periods. (LI-AA-700)	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A1S Revision: 1/0

Task Title: Shift Staffing Based on Administrative Requirements

STEP # 4	Performance:	Standard:	Critical:	Grade:
	For those who are NOT eligible, what is the reason? SY-AA-FFD-101section 3.24, "Fitness For Duty Call-Out Process" 3.24.3 **EXHAUST** all other options prior to requiring an individual who has consumed alcohol within the previous five hours to report for work. 3.24.1 **IF** called in for unscheduled work, **THEN INFORM** supervision of the following: Fitness for duty, including stress or other mental or physical factors (including the consumption of prescription or over-the countermedications) that may affect ability to perform normal duties. Supervision 3.24.2 **IF** it is determined the individual is impaired **AND** the individual is **NOT** required to respond to an emergency, **THEN DIRECT** the individual to **NOT** assume duties.	Examinee determines that **Operator 4 is NOT available** due to the **consumption of alcoholic beverages within the past 5 hours**. (SY-AA-FFD-101) Examinee determines that **Operator 5 is NOT available** due to the **use of over-the-counter medication that may affect his/her ability** to perform required duties and/or due to the **consumption of alcoholic beverages within the past 5 hours**. (SY-AA-FFD-101)	Y ☒ N ☐	S ☐ U ☐
	Cue:			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A1S Revision: 1/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: A1S Revision: 1/0

Initial Conditions:

- You are the Night Crew Shift Manager.
- No other Shift Managers are available.
- All other qualified operators are unavailable.
- Prior to the BOP becoming ill, the crew was at minimum staffing.
- The plant is in MODE 1 and stable at 100% power
- The crew began its 12 hour shift at 1800
- Current time and Date is 1830 on Wednesday, October 3, 2018.

Initiating Cues:

- The Balance of Plant Operator has become ill early (1830) on his last night of Night Shift and has been sent home, which places the shift below minimum staffing levels.
- Based on Administrative requirements, determine the following from the attached list of available operators:
  - How soon must a relief be found?
  - From the list provided, who is eligible to assume shift duties?
  - For those who are NOT eligible, what is the reason?

Available	Response
Operator 1	"I have been working a lot lately, but if you need someone, I could probably be there in about 45 minutes. I don't feel tired and have been getting enough rest."
Operator 2	"It's the last day of my seven days off. We just got back from Atlantic City, New Jersey, a half hour ago. I only got a couple hours of sleep while my wife drove. I really don't want to come in, but I can be there in about an hour if you're in a bind."
Operator 3	"I just got home from training at 1630 and I need to attend LORP for the rest of this week. I can't reschedule my training week. As long as I'm out by 0630 in the morning to attend training, I can be there in about an hour."
Operator 4	"I'm on the last day of my seven days off. I had a couple of beers with dinner, but I'll come in if you want me to. I can be there in 50 minutes".
Operator 5	"I'm scheduled to come in tomorrow night for my first night of midnights. I'm just getting over a pretty nasty cold and I don't want to infect anyone, but, if you really need me, I'll come in. I just took a dose of Nyquil Liquid Nighttime Cold Medicine about an hour ago, but I don't feel too bad right now. I can be there in about an hour. I just need to jump in the shower to wake up a little before I leave."

See Operator Schedules on next page

Operator Schedules

Operator	Wed 9/26	Thurs 9/27	Fri 9/28	Sat 9/29	Sun 9/30	Mon 10/1	Tues 10/2	Wed 10/3	Thurs 10/4	Fri 10/5	Sat 10/6	Sun 10/7	Mon 10/8	Tues 10/9	Wed 10/10
#1	**Day (12)**	**OFF**	**OFF**	**Day (12)**	**Day (12)**	**Day (12)**	**Day (12)**	**OFF**	**Night (6)**	**Night (12)**	**Night (12)**	**Night (12)**	**Night (6)**	**OFF**	**OFF**
#2	**Day (12)**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**Night (6)**	**Night (12)**	**Night (12)**	**Night (12)**	**Night (6)**	**OFF**	**OFF**
#3	**OFF**	**Day (12)**	**Day (12)**	**Day (12)**	**Day (12)**	**OFF**	**T (8)**	**T (8)**	**T (8)**	**T (8)**	**OFF**	**OFF**	**Night (6)**	**Night (12)**	**Night (12)**
#4	**Day (12)**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**Night (6)**	**Night (12)**	**Night (12)**	**Night (12)**	**Night (6)**	**OFF**	**OFF**
#5	**Day (12)**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**Night (6)**	**Night (12)**	**Night (12)**	**Night (12)**	**Night (6)**	**OFF**	**OFF**

Day (12) = 12 hour Day Shift

Night (12) = 12 Hour Night Shift

Night (6) = 6 hours on the first evening or last morning of Night Shift

T (8) = 8 hours of Training

OFF = Scheduled day off

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Review Clearance Boundary For "A" Containment Spray Pump

JPM Number: A2R Revision: 0/0

Initiated:

John W. Riley – Signature on File	06/07/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	06/14/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	06/15/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
05/29/18 jwr	Original issue for the 2018 ILT NRC exam.	0/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A2R Revision: 0/0

Task Title: Review Clearance Boundary For "A" Containment Spray Pump

System: Containment Spray

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 20

Task Number(s): 573550

Applicable To: SRO _____ STA _____ RO X PEO _____

K/A Number: 2.2.13 K/A Rating: 4.1

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

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

Task Standards: The examinee when reviewing the tag out for the "A" Containment Spray pump to replace the suction pressure indicator isolation valve identifies that the tagging prepared does not meet the tagging procedural requirement for 1) the control switch P43A-HS was not first in the sequence and 2) the drain valves CS-36A should be tagged closed and CS-36B should be tagged open. Any other discrepancies identified are not part of the task standard.

Required Materials: (procedures, equipment, etc.)

- OP-AA-200, Equipment Clearance. Revision 29.
- OP 2309X11, "A" CS Pump Maintenance. Revision 001, effective 12/14/17.
- OP 2309-001, "CS System Valve Alignment Verification, Facility 1.
- 25203-26015, PIPING & INSTRUMENT DIAGRAM L.P. SAFETY INJECTION SYSTEM
- 25203-30005 (SINGLE LINE METER & RELAY DIAGRAM 4.16KV EMERG. BUSES 24C, 24D (A3, A4)).

General References: OP-AA-200, Equipment Clearance. Revision 29.

***** 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. With the exception of the questions at the end, 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: A2R Revision : 0/0

Initial Conditions:

- The unit is in Mode 6 during a refueling outage.
- A Shutdown Safety Assessment has been performed and removal of the "A" CS pump from service does not affect Shutdown Risk.
- The "A" CS pump is scheduled to be removed from service at this time.
- The Work Order requested tagging as follows:
  - Remove power from "A" CS pump
  - Isolate, vent and drain "A" CS pump
  - Tag as specified in OP 2309X11, "A" CS Pump Maintenance.
- The tagging of the "A" CS pump is being performed to replace the isolation valve 2-CS-032 for the suction pressure indicator (PI-3055).
- All drawing and procedures have been verified current. There are no pending changes to the drawings.
- There are no other entries, besides the requested tagging above, required or noted in the comment section of the Tagging Record.

Initiating Cues:

The Primary SRO has requested you review the tag out that was prepared for the "A" Containment Spray pump to replace valve 2-CS-032. You are performing procedure step 3.2.3.c of OP-AA-200. After your review, report to the SRO either that the tag out is adequate or any items that you feel should be changed. The following are provided for your review;

- Prepared Clearance Sheet.
- OP-AA-200, Equipment Clearance. Revision 29.
- OP 2309X11, "A" CS Pump Maintenance. Revision 001, effective 12/14/17.
- OP 2309-001, "CS System Valve Alignment Verification, Facility 1
- 25203-26015, PIPING & INSTRUMENT DIAGRAM L.P. SAFETY INJECTION SYSTEM
- 25203-30005 (SINGLE LINE METER & RELAY DIAGRAM 4.16KV EMERG. BUSES 24C, 24D (A3, A4)).

Simulator Requirements: Not Applicable

*** * * * 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: A2R Revision: 0/0

Task Title: Review Clearance Boundary For "A" Containment Spray Pump

START TIME: _____

S T E P # 1	Performance: Provide the required material to the examinee for reviewing the clearance for the "A" Containment Spray pump in support of work to replace isolation valve 2-CS-032 for the suction pressure indicator (PI-3055).	Standard: Examinee reviews the material provided for determination of clearance boundary: • Prepared Clearance Sheet. • OP-AA-200, Equipment Clearance. Revision 29. • OP 2309X11, "A" CS Pump Maintenance. Revision 001, effective 12/14/17. • 25203-26015, PIPING & INSTRUMENT DIAGRAM L.P. SAFETY INJECTION SYSTEM • 25203-30005 (SINGLE LINE METER & RELAY DIAGRAM 4.16KV EMERG. BUSES 24C, 24D (A3, A4)).	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: Provide the examinee with the following: • Prepared Clearance Sheet. • OP-AA-200, Equipment Clearance. Revision 29. • OP 2309X11, "A" CS Pump Maintenance. Revision 001, effective 12/14/17. • OP 2309-001, "CS System Valve Alignment Verification, Facility 1 • 25203-26015, PIPING & INSTRUMENT DIAGRAM L.P. SAFETY INJECTION SYSTEM • 25203-30005 (SINGLE LINE METER & RELAY DIAGRAM 4.16KV EMERG. BUSES 24C, 24D (A3, A4)).			
	Comments: The students can use the exam room computers to call up the above reference. Computers are standalone.			

PERFORMANCE INFORMATION

JPM Number: A2R Revision: 0/0

Task Title: Review Clearance Boundary For "A" Containment Spray Pump

STEP # 2	Performance:	Standard:	Critical:	Grade:
	The examinee reviews the prepared clearance and supporting information.	Examinee reports to the SRO that he/she can't sign for the review because there are two errors in the provided clearance. The specifies the errors as;		
		1. The **position control switch tag** on handswitch P43HS **should be sequence 1** and it is on the clearance sheet as sequence 2. Step 3.2.2.i. of OP-AA-200 specifies the normal sequence of isolation is as follows: • POSITION control switch • REMOVE power from components • ISOLATE components/systems from high pressure side to low pressure side • OPEN drain valve(s) • OPEN vent valve(s)	Y ☒ N ☐	S ☐ U ☐
		2. Drain valve **2-CS-36A should be Tagged CLOSED AND CS-36B should be OPEN**. Procedure OP 2309X11 specifies 2-CS-36A be closed and tagged. The Work Order requested tagging as specified in OP 2309X11, "A" CS Pump Maintenance. Step 3.2.2.h. of OP-AA-200 specifies that the preparer ENSURE boundaries for the work are comparable to those submitted by the requesting organization.	Y ☒ N ☐	S ☐ U ☐
	Cue:			
	Comments: Soft matches, such as CS-036B in procedure versus CS-36B on valve lineup and P&ID, will be handled outside this tagging request.			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A2R Revision: 0/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No		
Validated Time (minutes):	20	Actual Time to Complete (minutes):		
Work Practice Performance:		☐ SAT	☐ UNSAT	
Operator Fundamentals:		☐ SAT	☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT	☐ UNSAT	☐ N/A
Attached Question #1		☐ SAT	☐ UNSAT	
Attached Question #2		☐ SAT	☐ UNSAT	
Overall Result of JPM:		☐ SAT	☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: A2R Revision: 0/0

Initial Conditions:

- The unit is in Mode 6 during a refueling outage.
- A Shutdown Safety Assessment has been performed and removal of the "A" CS pump from service does not affect Shutdown Risk.
- The "A" CS pump is scheduled to be removed from service at this time.
- The Work Order requested tagging as follows:
  - Remove power from "A" CS pump
  - Isolate, vent and drain "A" CS pump
  - Tag as specified in OP 2309X11, "A" CS Pump Maintenance.
- The tagging of the "A" CS pump is being performed to replace the isolation valve 2-CS-032 for the suction pressure indicator (PI-3055).
- All drawing and procedures have been verified current. There are no pending changes to the drawings.
- There are no other entries, besides the requested tagging above, required or noted in the comment section of the Tagging Record.

Initiating Cues:

The Primary SRO has requested you review the tag out that was prepared for the "A" Containment Spray pump to replace valve 2-CS-032. You are performing procedure step 3.2.3.c of OP-AA-200. After your review, report to the SRO either that the tag out is adequate or any items that you feel should be changed. The following are provided for your review;

- Prepared Clearance Sheet.
- OP-AA-200, Equipment Clearance. Revision 29.
- OP 2309X11, "A" CS Pump Maintenance. Revision 001, effective 12/14/17.
- OP 2309-001, "CS System Valve Alignment Verification, Facility 1
- 25203-26015, PIPING & INSTRUMENT DIAGRAM L.P. SAFETY INJECTION SYSTEM
- 25203-30005 (SINGLE LINE METER & RELAY DIAGRAM 4.16KV EMERG. BUSES 24C, 24D (A3, A4)).

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Review a Power Ascension Plan

JPM Number: A2S Revision: 0/0

Initiated:

John W. Riley – Signature on File	06/20/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	06/20/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	06/21/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
06/20/2018 jwr	New JPM written for the 2018 ILT NRC Exam	0/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A2S Revision: 0/0

Task Title: Review a Power Ascension Plan

System: N/A

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): 235501

Applicable To: SRO X STA _____ RO _____ PEO _____

K/A Number: 2.1.25 K/A Rating: 4.2

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

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

Task Standards: At the completion of this JPM the examinee has correctly determined the applicable Fuel Conditioning Category, maximum rate(s) of change in power level, and the amount of time per the maximum rate(s) required to achieve 100% power.

Required Materials: (procedures, equipment, etc.) OP 2204, Load Changes, R 039, Effective 3/27/2018

General References: OP 2204, Load Changes, R 039, Effective 3/27/2018

***** 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. With the exception of the questions at the end, 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: A2S Revision : 0/0

Initial Conditions:

- The plant operated at 100% for 117 days of continuous days following a refueling outage.
- The plant down powered to comply with Technical Specifications due to an Inoperable Station Battery.
- **Sunday at 11:00** the down power was stopped and power was stabilized at 20% when the Station Battery was restored to Operable.
- **Sunday at 15:00** the plant reached 45% power and power was stabilized here to place the second Steam Generator Feedwater Pump in service.
- A governor control problem prevented placing the second Steam Generator Feedwater Pump in service and power was held at 45%.
- **Wednesday 18:00** the repairs to the second Steam Generator Feedwater Pump were completed and the pump is being placed in service.
- The outage schedule shows 2 hours for power ascension from 45 to 100%.

Initiating Cues:

The Unit Supervisor on days had requested the OATC prepare a power ascension plan to turn over to night shift. The OATC used OP 2204 Attachment 7 and provided the following;

- The Fuel Conditioning Category is Not Applicable
- Time is 2.0 hours to reach 100% power starting at 45%

The Shift Manger has requested the Unit Supervisor check the power ascension information provided by the OATC and schedule. He specifically requests you, as the Unit Supervisor, provide the following using OP 2204, Attachment 7;

- The applicable fuel conditioning category,
- The maximum rate(s) of change in power level, and
- The time, per the maximum rate(s), required to achieve 100% power to the nearest half hour.

Simulator Requirements: None

*** * * * 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: A2S Revision: 0/0

Task Title: Review a Power Ascension Plan

START TIME: _____

S T E P # 1	Performance: NOTE: A "Maximum Rate of Change of Power" display can be found on the PPC MMI "Trend Menu," "PPC Trend Menu" and "Rate of Power Change Limits."	Standard: Examinee reads the note and understands that the PPC has a trend for Maximum Rate of Change of Power.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	4.1.7 Refer To Attachment 7, "Maximum Rate of Change of Power," or PPC "Rate of Power Change Limits" display and PERFORM the following:	Examinee refers to Attachment 7, "Maximum Rate of Change of Power." This is what was specified in the initiating cues.	Y ☐ N ☒	S ☐ U ☐
	Cue: Provide the examinee with a copy of Attachment 7 "Maximum Rate of Change of Power" from OP 2204 "Load Changes".			
	Comments:			
S T E P # 2	Performance: DETERMINE The applicable fuel conditioning category. **Reduced Power Operation** Power level less than 85% of RATED THERMAL POWER for more than 72 hours (*not* necessarily sequential), during the last 7 days of operation	Standard: Examinee determines the fuel condition category is **Reduced Power Operation** From the initial conditions • On line at 100% for 117 days. • At reduced power for > 72 hours (11:00 Sunday through 18:00 Wednesday = 79 hours).	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: The OATC could have misread the fuel conditioning categories. The hours (79 hours) is not critical. The only thing critical is **Reduced Power Operation.**			

PERFORMANCE INFORMATION

JPM Number: A2S Revision: 0/0

Task Title: Review a Power Ascension Plan

STEP #3	Performance:	Standard:	Critical:	Grade:
	Determine the maximum rate(s) of change in power level. **Maximum Rate of Power Change (Note 1)** From 45 to 80% of RATED THERMAL POWER *Note 1*: There is a 30% per hour power ramp rate restriction below the applicable powers levels specified. From 80 to 100% of RATED THERMAL POWER 6% every hour	Examinee chooses and states the following as the target rates of change in power level: Power from 45 to 80%: **30% every hour,** Power from 80 to 100%: **6% every hour,**	Y ☒ N ☐ Y ☒ N ☐	S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A2S Revision: 0/0

Task Title: Review a Power Ascension Plan

<table>
<tr><td rowspan="3">S T E P
4</td><td>Performance:

Determine the time, per the maximum rate(s), required to achieve 100% power to the nearest half hour.

<u>From 45 to 80% of RATED THERMAL POWER</u>

Note 1: There is a 30% per hour power ramp rate restriction below the applicable powers levels specified.

<u>From 80 to 100% of RATED THERMAL POWER</u>

6% every hour</td><td>Standard:

Examinee calculates the minimum amount of time required to achieve 100% power:

<u>45 – 80%</u>

Maximum Rate 30% per hour = 1.16 hours

$80 - 45\% = 35\% \quad (35\% \div 30\frac{\%}{hr} = 1.16\ hrs)$

<u>80 – 100%</u>

Maximum Rate 6% every hour = 3.33 hours

$100 - 80\% = 20\% \quad (20\% \div 6\frac{\%}{hr} = 3.33\ hrs)$

The examinee determines the time, per the maximum rate(s), required to achieve 100% power to the nearest half hour is:

4.5 hours

1.16 hours + 3.33 hours = 4.49 hours.</td><td>Critical:

Y ☒ N ☐</td><td>Grade:

S ☐ U ☐</td></tr>
<tr><td colspan="3">Cue:</td></tr>
<tr><td colspan="3">Comments:</td></tr>
</table>

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A2S Revision: 0/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: A2S Revision: 0/0

Initial Conditions:

- The plant operated at 100% for 117 days of continuous days following a refueling outage.
- The plant down powered to comply with Technical Specifications due to an Inoperable Station Battery.
- **Sunday at 11:00** the down power was stopped and power was stabilized at 20% when the Station Battery was restored to Operable.
- **Sunday at 15:00** the plant reached 45% power and power was stabilized here to place the second Steam Generator Feedwater Pump in service.
- A governor control problem prevented placing the second Steam Generator Feedwater Pump in service and power was held at 45%.
- **Wednesday 18:00** the repairs to the second Steam Generator Feedwater Pump were completed and the pump is being placed in service.
- The outage schedule shows 2 hours for power ascension from 45 to 100%.

Initiating Cues:

The Unit Supervisor on days had requested the OATC prepare a power ascension plan to turn over to night shift. The OATC used OP 2204 Attachment 7 and provided the following;

- The Fuel Conditioning Category is Not Applicable
- Time is 2.0 hours to reach 100% power starting at 45%

The Shift Manger has requested the Unit Supervisor check the power ascension information provided by the OATC and schedule. He specifically requests you, as the Unit Supervisor, provide the following using OP 2204, Attachment 7;

- The applicable fuel conditioning category,

  _____

- The maximum rate(s) of change in power level, and

  _____

- The time, per the maximum rate(s), required to achieve 100% power to the nearest half hour.

  _____

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Flow Rate and Discharge Volume Calculation for a Clean Radioactive Liquid Waste Discharge

JPM Number: A3R Revision: 0/0

Initiated:

John W. Riley – Signature on File	06/14/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	06/14/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	06/14/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
04/10/2018 jwr	New JPM written for the 2018 ILT NRC examination	0/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A3R Revision: 0/0

Task Title: Flow Rate and Discharge Volume Calculation for a Clean Radioactive Liquid Waste Discharge

System: Clean Radioactive Liquid Waste

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): _____

Applicable To: SRO _____ STA _____ RO X PEO _____

K/A Number: 2.3.11 K/A Rating: 3.8/4.3

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

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

Task Standards: At the completion of this JPM the examinee will have calculated the discharge flow rate when the discharge was stopped and total gallons discharged.

Required Materials: (procedures, equipment, etc.) Clean Radioactive Liquid Waste Discharges, SP 2617D, Rev. 001, effective 9/20/16.

General References: Clean Radioactive Liquid Waste Discharges, SP 2617D, Rev. 001, effective 9/20/16.

***** 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. With the exception of the questions at the end, 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: A3R Revision : 0/0

Initial Conditions:

- The plant is at 100% power.
- A Clean Radioactive Liquid Waste discharge has just been completed.
- The "A" Clean Waste Monitor Tank (CWMT) was lowered from 82% to 13%.

Initiating Cues:

- The "A" Clean Waste Monitor Tank (CWMT) has been discharged using the Clean Radioactive Liquid Waste Discharges procedure, SP 2617D.
- The Unit Supervisor has directed you to calculate the discharge flow rate when the discharge was stopped and volume discharged using SP 2617D, Attachment 2, Clean Radioactive Liquid Waste Discharge With Inoperable Flow Recorder.
- Another operator has recorded data except for the discharge flow rate when the discharge was stopped.
- The operator has turned over Attachment 2, Clean Radioactive Liquid Waste Discharge With Inoperable Flow Recorder data to you.
- Provide the following for the Narrative Log entry;
    1. Discharge flow rate when the discharge was stopped.
    2. Total gallons discharged.

Simulator Requirements:

- None

*** * * * 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: A3R Revision: **0/0**

Task Title: Flow Rate and Discharge Volume Calculation for a Clean Radioactive Liquid Waste Discharge

START TIME: _____

S T E P # 1	Performance: **Attachment 2, Clean Radioactive Liquid Waste Discharge With Inoperable Flow Recorder** 1. RECORD data at least once every hour a. RECORD time and previous level. b. RECORD current CWMT level indication (C-63).	Standard: Examinee notes from the initiating cue that Attachment 2, Clean Radioactive Liquid Waste Discharge With Inoperable Flow Recorder data has been taken and is provided. Step 1a and 1b have been completed and are provided to the examinee.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: **Provide Attachment 2 of SP 2617D to the examinee. This provides the data and the equations used to calculate the requested information.**			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A3R Revision: **0/0**

Task Title: Flow Rate and Discharge Volume Calculation for a Clean Radioactive Liquid Waste Discharge

S T E P # 2	Performance: c. CALCULATE discharge flow rate (gpm) as follows and RECORD: Calculates last discharge flow rate when discharge was stopped. $\text{Flow rate (gpm)} = \frac{[\text{previous level (\%) - current level (\%)}] \times 320 \text{ gallons/\%}}{\text{Time interval between recording levels (minutes)}}$	Standard: Examinee calculates Discharge flow rate when the discharge was stopped **Discharge flow rate when the discharge was stopped equal to 119 gpm +/- 2 gpm**. $\text{Flow rate (gpm)} = \frac{[26\ \% - 13\ \%] \times 320 \text{ gallons/\%}}{35 \text{ minutes}} = 119 \text{ gpm}$	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Examinee only needs to calculate the discharge flow rate when the discharge was stopped. The other discharge flow rates were calculated as another operator was performing the discharge. The other operator recorded the last tank level change when the discharge was stopped but turned the data over to the examinee to complete before performing the flow rate calculation.			

PERFORMANCE INFORMATION

JPM Number: A3R Revision: **0/0**

Task Title: Flow Rate and Discharge Volume Calculation for a Clean Radioactive Liquid Waste Discharge

S T E P # 3	Performance: 2. CALCULATE gallons discharged as follows and RECORD on SP2617D-01: Volume (gal) = (Initial level (%) – Final level (%)) x 320 gal/%	Standard: Examinee calculates gallons discharged using the provided equation. Acceptable tolerance +/- 10 gallons. **Gallons Discharged = 22,080 gallons** Volume (gal) = (82% – 13%) x 320 gal/% = 69% x 320 gal/%	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 4	Performance: Provide the following for the Narrative Log entry for the discharge; 1. Discharge flow rate when the discharge was stopped. 2. Total gallons discharged.	Standard: From the initiating cue the examinee is required to provide discharge flow rate when the discharge was stopped total gallons discharged. Examinee provides the following: 1. **Discharge flow rate when the discharge was stopped equal to 119 gpm +/- 2 gpm**. 2. **Total gallons discharged equal to 22,080 gallons +/- 10 gallons.**	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A3R Revision: 0/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: A3R Revision: 0/0

Initial Conditions:

- The plant is at 100% power.
- A Clean Radioactive Liquid Waste discharge has just been completed.
- The "A" Clean Waste Monitor Tank (CWMT) was lowered from 82% to 13%.

Initiating Cues:

- The "A" Clean Waste Monitor Tank (CWMT) has been discharged using the Clean Radioactive Liquid Waste Discharges procedure, SP 2617D.
- The Unit Supervisor has directed you to calculate the discharge flow rate when the discharge was stopped and volume discharged using SP 2617D, Attachment 2, Clean Radioactive Liquid Waste Discharge With Inoperable Flow Recorder.
- Another operator has recorded data except for the discharge flow rate when the discharge was stopped.
- The operator has turned over Attachment 2, Clean Radioactive Liquid Waste Discharge With Inoperable Flow Recorder data to you.
- Provide the following for the Narrative Log entry;

    1. Discharge flow rate when the discharge was stopped.
    2. Total gallons discharged.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Approve a Clearance Boundary

JPM Number: A3S Revision: 3/0

Initiated:

John W. Riley – Signature on File	06/18/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	06/19/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	06/20/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
10/28/08	Revised JPM for LOIT 2008 NRC Exam	2/0
06/18/2018 jwr	Revised JPM for the 2018 ILT NRC Exam.	3/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A3S Revision: 3/0

Task Title: Approve a Clearance Boundary

System: Service Water

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): 236281

Applicable To: SRO X STA _____ RO _____ PEO _____

K/A Number: 2.2.14 K/A Rating: 4.3

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

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

Task Standards: The examinee will review a tag clearance sheet with associated reference material and determine that two of the proposed tags are incorrect. The "A" Service Water Pump breaker is A306 and not A407, and the "A" Service Water Pump Discharge Stop has the placement configuration as open and it should be closed. Any other discrepancies identified are not part of the task standard. The examinee will conclude and report that the clearance CANNOT be approved.

Required Materials: (procedures, equipment, etc.)

- Clearance Tagout 2C19_2326A11-002A (Coversheet and tagged equipment list)
- P&ID 25203 26008, Sheet 2
- P&ID 25203 30005
- P&ID 25203 30011, Sheet 34E
- SP 2326A-001, Service Water Alignment Verification, Facility 1
- OP-AA-200, Equipment Clearance. Revision 30.

General References: OP-AA-200, Equipment Clearance. Revision 30.

***** 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. With the exception of the questions at the end, 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: A3S Revision : 3/0

Initial Conditions:

- The "A" Service Water Strainer D/P Instrument, PDC-6475, must be replaced and calibrated to restore the "A" Service Water Pump to an OPERABLE condition.
- The tagging software program is temporarily out of service for emergent repairs; therefore, only a hard copy is available.
- A printed Tag Clearance Sheet was prepared for the replacement and calibration of the "A" Service Water Strainer D/P Instrument.
- There are NO other Tag Clearances associated with the Facility 1 Service Water System.

Initiating Cues:

- Your task is to review and approve the attached Tag Clearance Sheet. You are performing procedure step 3.2.3.c of OP-AA-200.
- Approve the Tagout by signing the Approved by block on the coversheet if you determine the Tagout is adequate for the work
- Return the Tagout if you find it is not adequate for the work. Mark the Clearance Sheet with any item you feel should be changed prior for approval for work.

Simulator Requirements: N/A

*** * * * 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: A3S Revision: 3/0

Task Title: Approve a Clearance Boundary

START TIME: _____

STEP # 1	Performance:	Standard:	Critical:	Grade:
	3.2.3 **Approval of a Tagout** b. **ENSURE** the person approving the Tagout is different than the preparer. **NOTE:** Reviewer shall be independent from preparer. c. **REVIEW** the completed Tagging Record for accuracy and completeness, referencing controlled documents as necessary. • **ENSURE** the Tagout is adequate for the tasks and hazards involved.	Examinee notes that he/she is a different person than the preparer. And that they need to be independent from the preparer. This generally means he/she does not used marked up drawings. Examinee reviews the tagout to verify the tagout provides adequate personnel and equipment protection for the replacement and calibration of the "A" Service Water Strainer D/P instrument.	Y ☐ N ☒	S ☐ U ☐
	Cue: Provide the following to the examinee • Clearance Tagout 2C19_2326A11-002A (Coversheet and tagged equipment list) • P&ID 25203 26008, Sheet 2 • P&ID 25203 30005 • P&ID 25203 30011, Sheet 34E • SP 2326A-001, Service Water Alignment Verification, Facility 1 • OP-AA-200, Equipment Clearance.			
	Comments: **ENSURE Exam Key is not handed out.** It is allowable for the examinee to use DocTop to view the above references on a standalone exam computer.			

PERFORMANCE INFORMATION

JPM Number: A3S Revision: 3/0

Task Title: Approve a Clearance Boundary

S T E P # 2	Performance: 3.2.3 **Approval of a Tagout (Continued)** • **ENSURE** the proper sequence of component alignment and tag placement is specified. • **ENSURE** tagout restoration position and sequence are adequate and accurate. • **ENSURE** that the Tagout is in compliance with Technical Specification, Technical Requirements Manual, and regulatory requirements including maintaining redundant equipment operable. • **ENSURE** that the appropriate entries have been made in the comment section of the Tagging Record. • **DETERMINE** if support is required from Maintenance Personnel to execute the Tagout.	Standard: Examinee continues review of the Tagout to verify the Tagout provides adequate personnel and equipment protection for the replacement and calibration of the "A" Service Water Strainer D/P instrument.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A3S Revision: 3/0

Task Title: Approve a Clearance Boundary

STEP # 3	Performance:	Standard:	Critical:	Grade:
	3.2.3 **Approval of a Tagout (Continued)** h. **IF** the review indicates a deficiency, **THEN** the SRO or designee shall **NOTIFY** the preparer and **RESOLVE** the problem **OR RETURN** the Tagout to the preparer for resolution.	Examinee determines that tagging associated with two components is NOT adequate for the task and hazards involved. The following two components have incorrect tags: • **"A" Service Water Pump breaker is A306 and not A407.** • **"A" Service Water Pump Discharge Stop has the placement configuration as "OPEN" and it should be CLOSED".**	Y ☒ N ☐	S ☐ U ☐
		Examinee determines that the tag clearance CANNOT be approved.	Y ☒ N ☐	S ☐ U ☐
		Examinee states he/she would return the Tagout to the preparer for resolution.	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A3S Revision: 3/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: A3S Revision: 3/0

Initial Conditions:

- The "A" Service Water Strainer D/P Instrument, PDC-6475, must be replaced and calibrated to restore the "A" Service Water Pump to an OPERABLE condition.
- The tagging software program is temporarily out of service for emergent repairs; therefore, only a hard copy is available.
- A printed Tag Clearance Sheet was prepared for the replacement and calibration of the "A" Service Water Strainer D/P Instrument.
- There are NO other Tag Clearances associated with the Facility 1 Service Water System.

Initiating Cues:

- Your task is to review and approve the attached Tag Clearance Sheet. You are performing procedure step 3.2.3.c of OP-AA-200.
- Approve the Tagout by signing the Approved by block on the coversheet if you determine the Tagout is adequate for the work
- Return the Tagout if you find it is not adequate for the work. Mark the Clearance Sheet with any item you feel should be changed prior for approval for work.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Radiological Assessment and Task Supervision

JPM Number: A4S Revision: 1/0

Initiated:

John W. Riley – Signature on File	06/17/2018
Developer	Date

Reviewed:

Leone Angelo – Signature on File	06/19/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	06/19/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
12/07/10	Created JPM for LOIT 2011 NRC Exam	0/0
09/06/2011	Corrected Minimum value for LHRA from 1000 mrem/hr to 1001 mrem/hr	0/1
09/14/11	Minor changes to incorporate NRC validation comments	0/2
06/17/2018 jwr	Updated for the 2018 ILT NRC Exam.	1/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A4S Revision: 1/0

Task Title: Radiological Assessment and Task Supervision

System: Administrative

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): 236432

Applicable To: SRO X STA _____ RO _____ PEO _____

K/A Number: 2.3.4 K/A Rating: 3.7

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

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

Task Standards: At the completion of this JPM, the SRO has analyzed the given conditions and designate which PEO should perform each of the two specified tasks, based on the radiological concerns of each.

Required Materials: (procedures, equipment, etc.)
- RPM 5.2.2, "Basic Radiation Worker Responsibilities", R017.

General References:
- RPM 5.2.2, "Basic Radiation Worker Responsibilities", R017.
- Radiation Worker CBT

***** 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. With the exception of the questions at the end, 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: A4S Revision : 1/0

Initial Conditions:

- You are the Work Control SRO.
- The plant has been shut down to repair a leak in the CVCS Regenerative Heat Exchanger.
- The work is complete and the Heat Exchanger is ready to be returned to service, following the clearing of the tags and subsequent required valve lineups.
- The following additional conditions exist:
  - The area around the Heat Exchanger has been posted as a "Locked High Radiation Area".
  - The area is at the minimum radiation level to meet the required posting.
  - All valves on the valve lineup are in the posted area.
  - There are two PEOs available to do the tag removal, initial valve lineup and the second check of the valve lineup.
  - PEO #1, an experienced Operator, has 400 mRem of remaining exposure.
  - PEO #2, a newly qualified Operator, has 850 mRem of remaining exposure.
  - It will take PEO #1 approximately 30 minutes of stay time in the posted area to clear the tags and perform the initial valve lineup. It will take PEO #2 approximately 45 minutes of stay time to perform the same task.
  - It will take PEO #1 approximately 15 minutes of stay time in the posted area to perform the valve lineup Independent Verification. It will take PEO #2 approximately 25 minutes of stay time to perform the same task.

Initiating Cues: Determine the following:

1. Which PEO (#1 or #2) will be directed to clear the tag-out and perform the initial valve lineup?
2. Which PEO (#1 or #2) will be directed to perform the required valve lineup Independent Verification?
3. What specific dose will each PEO get in performing their task?

Simulator Requirements: N/A

*** * * * 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: A4S Revision: 1/0

Task Title: Radiological Assessment and Task Supervision

START TIME: _____

S T E P # 1	Performance: • Review the Initial Conditions and Initiating Cue. • Determine the minimum radiation level for "Locked High Radiation Area". A Locked High Radiation Area is defined as ≥ 1000 mrem/hr • Understand the available exposure for each PEO.	Standard: • Examinee determines the minimum radiation level for "Locked High Radiation Area" is 1000 mrem/hr • Examinee identifies from initial conditions that the PEOs have the following available exposure; o Available exposure PEO #1 is 400 mrem o Available exposure PEO #2 is 850 mrem	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: If requested, provide examinee with a copy of RPM 5.2.2; Basic Radiation Worker Responsibilities.			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A4S Revision: 1/0

Task Title: Radiological Assessment and Task Supervision

<table>
<tr><td rowspan="3">S T E P
2</td><td>Performance:

Using known exposure rate in the area, calculate the maximum available stay time for each PEO.</td><td>Standard:

Examinee calculates the maximum available stay time for each PEO.
• PEO #1 = 24 minutes
$400\ mrem \div 1000 \frac{mrem}{hr} = 0.4\ hours$
$0.4\ hours\ \times 60 \frac{mins}{hour} = 24\ minutes$
• PEO #2 = 51 minutes
$850\ mrem \div 1000 \frac{mrem}{hr} = 0.85\ hours$
$0.85\ hours\ \times 60 \frac{mins}{hour} = 51\ minutes$</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="3">Cue:</td></tr>
<tr><td colspan="3">Comments:</td></tr>
</table>

PERFORMANCE INFORMATION

JPM Number: A4S Revision: 1/0

Task Title: Radiological Assessment and Task Supervision

STEP #3	Performance:	Standard:	Critical:	Grade:
		Examinee determines, based on available stay time for each PEO, which PEO must perform each task.		
	Determine which PEO (#1 or #2) will be directed to clear the tag-out and perform the initial valve lineup**.** Determine PEO #2 must be directed to clear tags and perform the initial valve lineup.	• **PEO #2 must be directed to clear tags and perform the initial valve lineup.** PEO #2 will take ~ 45 minutes in the area to clear tags and perform the initial valve lineup. This is acceptable because he/she has 51 minutes available. PEO #1 does not have enough exposure available to perform this activity.	Y ☒ N ☐	S ☐ U ☐
	Determine which PEO (#1 or #2) will be directed to perform the valve lineup Independent Verification. Determine PEO #1 must be directed to perform the valve lineup Independent Verification.	• **PEO #1 must be directed to perform the valve lineup Independent Verification.** PEO #1 would take ~ 30 minutes in the area to clear tags and perform the initial valve lineup and only has a maximum of 24 minutes available. Therefore he/she can't clear tags and perform the initial valve lineup and stay with his/her available exposure. PEO #1 will take ~ 15 minutes to perform the independent verification and has 24 minutes available. He/she must be directed to perform the valve lineup Independent Verification.	Y ☒ N ☐	S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A4S Revision: 1/0

Task Title: Radiological Assessment and Task Supervision

S T E P # 4	Performance: Determine exposure received for the PEO for the task they are directed to perform.	Standard: Examinee determines the exposures of the PEO has follows; **PEO #1 receives 250 mrem** $15\ mins\ x\ \frac{1000\ mrem}{hr}\ x\ \frac{1\ hr}{60\ mins} = 250\ mrem$ **PEO #2 receives 750 mrem** $45\ mins\ x\ \frac{1000\ mrem}{hr}\ x\ \frac{1\ hr}{60\ mins} = 750\ mrem$	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A4S Revision: 1/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: A4S Revision: 1/0

Initial Conditions:

- You are the Work Control SRO.
- The plant has been shut down to repair a leak in the CVCS Regenerative Heat Exchanger.
- The work is complete and the Heat Exchanger is ready to be returned to service, following the clearing of the tags and subsequent required valve lineups.
- The following additional conditions exist:
  - The area around the Heat Exchanger has been posted as a "Locked High Radiation Area".
  - The area is at the minimum radiation level to meet the required posting.
  - All valves on the valve lineup are in the posted area.
  - There are two PEOs available to do the tag removal, initial valve lineup and the second check of the valve lineup.
  - PEO #1, an experienced Operator, has 400 mRem of remaining exposure.
  - PEO #2, a newly qualified Operator, has 850 mRem of remaining exposure.
  - It will take PEO #1 approximately 30 minutes of stay time in the posted area to clear the tags and perform the initial valve lineup. It will take PEO #2 approximately 45 minutes of stay time to perform the same task.
  - It will take PEO #1 approximately 15 minutes of stay time in the posted area to perform the valve lineup Independent Verification. It will take PEO #2 approximately 25 minutes of stay time to perform the same task.

Initiating Cues: Determine the following:

1. Which PEO (#1 or #2) will be directed to clear the tag-out and perform the initial valve lineup?
2. Which PEO (#1 or #2) will be directed to perform the required valve lineup Independent Verification?
3. What specific dose will each PEO get in performing their task?

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: EAL Classification and PARs

JPM Number: A5S Revision: 1/0

Initiated:

John W. Riley – Signature on File	06/07/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	06/13/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	6/13/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
09/22/2016	New Classification and PARs JPM	0
06/07/2018 jwr	Revised JPM to latest format in preparation for the 2018ILT exam. Changed number based on NRC preference. Replaced NUTIMS task number with VISION number.	1/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A5S Revision: 1/0

Task Title: EAL Classification and PARs

System: Emergency Plan

Time Critical Task: ☒ YES ☐ NO (15 minutes to classify. Then 15 minutes to issue PAR)

Validated Time (minutes): 30

Task Number(s): 236341

Applicable To: SRO X STA _____ RO _____ PEO _____

K/A Number: 2.4.41/2.4.44 K/A Rating: 4.6/4.4

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

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

Task Standards: At the completion of this JPM, the examinee has correctly classified the proposed event and provided the appropriate Protective Action Recommendation.

Required Materials: (procedures, equipment, etc.)
MP-26-EPI-FAP06-002, Millstone Unit 2 Emergency Action Levels, R 012, 11/16/18
MP-26-EPI-FAP06-005, Classification and PARs, R006, 8/26/15
MP-26-EPI-FAP01-001, Control Room Director of Emergency Operations
EOP 2541, Appendix 2, Figures, R002, 06/30/06
Incident Report Form (IRF)

General References:
MP-26-EPI-FAP06-002, Millstone Unit 2 Emergency Action Levels
MP-26-EPA-REF02, Millstone Unit 2 EAL Technical Basis Document
MP-26-EPI-FAP06-005, Classification and PARs.
EOP 2541, Appendix 2, Figures, R002, 06/30/06

***** 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. With the exception of the questions at the end, 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: A5S Revision : 1/0

Initial Conditions: Plant conditions are follows:

TIME	INFORMATION	SOURCE
0 min.	Commenced pumping the CTMT Sump IAW OP 2336A Station Sumps and Drains.	BOP
1 min.	The RO reports a Charging and Letdown mismatch of 10 gpm.	RO
3 min.	The Unit Supervisor directs BOP to secure pumping CTMT Sump and entry into AOP 2568 RCS Leak.	Crew
4 min.	BOP reports both Containment sump pumps off but, both 2-SSP-16.1 "CTMT SUMP ISOL INBOARD" and 2-SSP-16.2 "CTMT SUMP ISOL OUTBOARD" have dual indication (both red and green lights lit).	BOP
5 min.	The US orders a manual reactor trip based on exceeding CVCS capability and enters EOP 2525, "Standard Post Trip Actions."	Crew
10 min.	The following Plant Conditions were noted during implementation of EOP 2525 Standard Post Trip Actions: • Core Exit Thermocouple Readings = 1300°F and rising • RCS Pressure 300 psia and dropping. • CTMT pressure at 6# slowly rising.	Crew
15 min	Winds are from 110° into 290° at 13 mph. Federal limits have been exceeded.	Crew

Initiating Cues: You are the on-duty Shift Manager. Your task is to determine;

- The NRC and STATE POSTURE code classification for the Plant conditions outlined above.
- Provide any Protective Action Recommendations (PARs).
- Complete the attached IRF starting with line 5. This is what will be used to evaluate you classification decision.
- You are to consider all plant conditions during the scenario.
- Your classification should reflect the most severe classification level reached.

Simulator Requirements: NA

*** * * * 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: A5S Revision: 1/0

Task Title: EAL Classification and PARs

START TIME: _____

S T E P # 1	Performance: **Control Room – Director of Station Emergency Operations (CR-DSEO)** **Section A: Emergency Response Immediate Actions** 1. Evaluate the conditions using MP-26-EPI-FAP06, "Classification and PARs." • Review the EAL tables: For Unit 2, EPI-FAP06-002	Standard: The examinee uses the plant status in the initial conditions and Unit 2 EAL tables, EPI-FAP06-002 and classifies conditions as follows **within 15 minutes**: NRC: **General Emergency,** based on **BG1** State Posture Code: **Alpha** • **FUEL CLAD BARRIER**-FCB2-LOSS Core Exit Thermocouple Readings > 1200 °F • **RCS BARRIER –** RCB2 – LOSS RCS Subcooling < 30°F • **CTMT BARRIER** – CNB3**-** LOSS Leakage Through BOTH Isolation Valves AND a Pathway to the Environment Exists Requiring Actions Outside the Control Room to Isolate	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: Provide the examinee with the references listed below. These references can be pre staged at the location the examinee will sit. • MP-26-EPI-FAP06-002, Millstone Unit 2 Emergency Action Levels • MP-26-EPI-FAP06-005, Classification and PARs • Incident Report Form (IRF) • MP-26-EPI-FAP01-001, Control Room Director of Emergency Operations • EOP 2541, Appendix 2, Figures			
	Comments: Classification is a TIME CRITICAL TASK. The classification must be performed with to be performed within 15 minutes. Start the time once the examinee has reviewed the plant conditions in the initial conditions and the initiating cue.			

PERFORMANCE INFORMATION

JPM Number: A5S Revision: 1/0

Task Title: EAL Classification and PARs

STEP # 2	Performance:	Standard:	Critical:	Grade:
	Section E: General Emergency Immediate Actions 7. Review, develop, and issue PARs in accordance with EPI-FAP06-005, "Control Room Protective Action Recommendations." (Non-delegable). **NOTE:** The PAR must be provided to the State DEP within 15 minutes of the classification of the General Emergency or any change in recommended actions.	The examinee using MP-26-EPI-FAP06-005, Classification and PARs, determines the following: • General Emergency Declared • Rapidly Progressing Severe Accident (Table 3) conditions met: o CETs > 1200 °F (1300 °F) o Subcooling < 30 °F (-883 °F) o CTMT Barrier is LOST • **PAR provided within 15 minutes of classification**: Table 4, GE – Alpha – **Evacuate 5 - mile Radius and 10 Miles DW**. 1. WIND DIRECTION (142 FT LEVEL) = FROM: 110 ° TIME: NOW 2. **EVACUATE ZONES: A and B and D and East Lyme in C** 3. **SHELTER IN PLACE ALL OTHER ZONES**	Y ☒ N ☐	S ☐ U ☐
	Cue:			
	Comments: Protective Action Recommendations are a TIME CRITICAL TASK. The PAR must be provided to the State DEP within 15 minutes of the classification of the General Emergency or any change in recommended actions. The time for the PAR starts when the examinee has handed or discussed the classification with the examiner.			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A5S Revision: 1/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☒ Yes ☐ No	
Validated Time (minutes):	30	Actual Time to Complete (minutes): (15 minutes is allowed for classification.) (15 minutes is allowed for PAR)	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT	☐ N/A
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: A5S Revision: 1/0

Initial Conditions: Plant conditions are follows:

TIME	INFORMATION	SOURCE
0 min.	Commenced pumping the CTMT Sump IAW OP 2336A Station Sumps and Drains.	BOP
1 min.	The RO reports a Charging and Letdown mismatch of 10 gpm.	RO
3 min.	The Unit Supervisor directs BOP to secure pumping CTMT Sump and entry into AOP 2568 RCS Leak.	Crew
4 min.	BOP reports both Containment sump pumps off but, both 2-SSP-16.1 "CTMT SUMP ISOL INBOARD" and 2-SSP-16.2 "CTMT SUMP ISOL OUTBOARD" have dual indication (both red and green lights lit).	BOP
5 min.	The US orders a manual reactor trip based on exceeding CVCS capability and enters EOP 2525, "Standard Post Trip Actions."	Crew
10 min.	The following Plant Conditions were noted during implementation of EOP 2525 Standard Post Trip Actions: • Core Exit Thermocouple Readings = 1300°F and rising • RCS Pressure 300 psia and dropping. • CTMT pressure at 6# slowly rising.	Crew
15 min	Winds are from 110° into 290° at 13 mph. Federal limits have been exceeded.	Crew

Initiating Cues:

You are the on-duty Shift Manager. Your task is to determine;

- The NRC and STATE POSTURE code classification for the Plant conditions outlined above.
- Provide any Protective Action Recommendations (PARs).
- Complete the attached IRF starting with line 5. This is what will be used to evaluate you classification decision.
- You are to consider all plant conditions during the scenario.
- Your classification should reflect the most severe classification level reached.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Manual Makeup to the VCT (Alternate Path)

JPM Number: S1 Revision: 9/0

Initiated:

John W. Riley – Signature on File	04/07/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	05/02/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	05/04/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
2006-317	Update JPM to include HUP evaluations and new format	6, Ch. 0
06/04/2007 (DAP)	Validated JPM against OP 2304C Rev.022-03 and OP-2208 Rev013-11 Placed into new JPM format. Made substantial changes to comply with 2208 Rev013-11 calculations.	6, Ch. 0
JWR 08/21/2012	Updated JPM to latest for format. Modified initial conditions to provide blend ratio instead of having examinee calculate. This was done to shorten the JPM length. Also made minor editorial changes.	7/0
06/25/2014	Updated format to latest JPM format.	7/1
06/04/2015 - RJA	Updated JPM to latest format and latest revision of OP 2304C	8
11/04/2015 SMD	Updated to current standards	8/1
4/2/2018 jwr	Revision for the 2018 ILT NRC exam. Numbered for the NRC exam (S1).	9/0

JPM WORKSHEET

Facility: MP 2 Examinee: _____

JPM Number: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

System: CVCS

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 25

Task Number(s): VISION #235458

Applicable To: SRO X STA _____ RO X PEO _____

K/A Number: 004 A2.06 K/A Rating: 4.2/4.3

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

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

Task Standards: The examinee performs a manual makeup to the VCT to raise VCT level by 2%. They calculate the number of gallons that must be added to the VCT to change level by 2%. They set the boric acid and PMW flow controllers to the proper flow setpoints to establish the correct blend. They then commence the blended makeup. They recognize that the boric acid flow controller did not open and stop the blended makeup. This stops the inadvertent dilution.

Required Materials: (procedures, equipment, etc.) OP 2304C, Make Up (Boration and Dilution) Portion of CVCS, Rev. 027, effective 09/27/16.

General References: OP 2304C, Make Up (Boration and Dilution) Portion of CVCS, Rev. 027, effective 09/27/16.

***** 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. With the exception of the questions at the end, 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: S1 Revision : 9/0

Initial Conditions:

- The Blend Ratio is 9.5 gallons of PMW to 1 gallon of Boric Acid using the A BAST (corrected for B-10 depletion). This has been verified to be a neutral blend ratio (i.e. No power change.)
- The pipe is filled with a 9.5 to 1 blend ratio.

Initiating Cues:

- The Unit Supervisor has directed you to perform a manual blended makeup to the VCT and raise VCT level by 2% while maintaining the PMW and Boric Acid flow controllers in the "AUTO" mode of operation. Ensure the blend ratio is neutral (i.e. No power change.)
- The blended makeup is to be performed using section 4.9, Manual Blended Make Up to VCT. This procedure section, along with section 4.20, and the prerequisites and precautions are provided to the examinee.
- A calculator is provided to the examinee.
- When makeup is completed, return the system lineup to normal.
- The examiner will act as the US.
- A blend was just completed to raise VCT level and you are to perform a second blend to raise VCT level an additional 2%.
- Additional blends are anticipated. The pipe will be flushed with PMW at a later time.
- PMW and Boric Acid Flow Controllers have been reset to 0 total gallons in accordance with OP 2304, Attachment 3, Resetting PMW and BA Flow Controllers.

Simulator Requirements:

- Initialize at any IC with charging, letdown, and makeup to the VCT available.
- Enter remote function **CVR14 (CLOSE)** to close 2-CH-172. This will prevent any Boric Acid flow.
- Ensure Boric Acid and Primary Water Makeup Controllers set to 0 in AM and both integrators zeroed out in accordance with OP 2304, Attachment 3, and set to total flow on each.
- Vent VCT, as necessary to between 20-24 psig. Ensure VCT level 72 – 84%. This provides margin so section 4.20 does not need to be used.
- Place VCT screen on Monitor 3. This is the normal screen for Monitor 3 in the control room. It contains VCT level and pressure trends.

*** * * * 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: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

START TIME: _____

S T E P # 1	Performance: **OP 2304C, Section 4.9** 4.9.1 As required, Refer To Section 4.20, "Maintaining VCT Level and Pressure During Normal Operation," and PERFORM applicable actions.	Standard: The examinee references Section 4.20.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 2	Performance: **Section 4.20 C A U T I ON** 1. VCT pressure must be monitored during makeup operations and the VCT must be vented to the waste gas header prior to reaching 35 psig. 2. VCT pressure lowering with a constant VCT level may indicate a level instrument problem. VCT pressure should rise and fall with VCT level.	Standard: Examinee reads and acknowledges the Cautions.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

S T E P # 3	Performance: **NOTE** 1. This section should be performed as required in conjunction with sections 4.2 through 4.11. It may also be used anytime it is desired to adjust VCT level or pressure. 2. Normal VCT level is 72% to 90%. 3. Normal VCT pressure is 15 psig to 30 psig.	Standard: Examinee reads and acknowledges the Notes.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 4	Performance: 4.20.1. IF desired to raise VCT level and pressure, Go To Section 4.4, 4.6, *or* 4.9.	Standard: Examinee returns to Section 4.9	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

STEP # 5	Performance:	Standard:	Critical:	Grade:
	Section 4.9 C A U T I ON 1. Manual make up must be monitored closely as there is *no* automatic shut-off on a high level in the VCT. 2. When calculating the amount of boric acid required for neutral blend, the amount and effects of PMW in the pipe must be considered. 3. When calculating the ratio of boric acid to PMW, the effects of Boron-10 depletion must be considered. 4. When calculating blended makeup flow rates, limitations due to the minimum increments for set points of PMW flow controller FC-210X (0.1 GPM), and BA flow controller FC-210Y (0.01 GPM), should be considered.	Examinee reads and acknowledges the Cautions.	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

S T E P # 6	Performance: 4.9.2 ENSURE the following (C-02): • PMW is available (indicating lights for PMW transfer pumps). • WHEN blend will be injected into the RCS, at least *one* charging pump running.	Standard: The examinee indicates that at least one PMW Pump "RED" Light is lit and that at least one charging pump "RED" light is lit. The examinee verifies at least one charging pump is operating by "RED" light lit on pump handswitch and/or by observing charging flow.	Critical: Y ☐ N ☒ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments: • Examinee should overtly indicate that the appropriate "RED" lights are lit. If it is not overt, consider documenting under "Work Practice Evaluation" section. • Failure to verify appropriate indications is cause for a performance comment.			
S T E P # 7	Performance: 4.9.3 Refer To OP 2208, "Reactivity Calculations" or PPC and DETERMINE required ratio of boric acid flow to PMW flow, corrected for Boron-10 depletion.	Standard: From the Initial Conditions, the examinee determines that the blend ratio as 9.5 gallons of PMW to 1 gallon of Boric Acid.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: You have been given all the information necessary to complete this JPM.			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

<table>
<tr><td rowspan="3">S T E P
8</td><td>Performance:
4.9.4 ENSURE the following are closed:
• CH-512, “MAKEUP VLV STOP," (C-04)
• CH-196, “VCT MAKEUP BYPASS," (C-02)
• CH-192, “RWST ISOL," (C-02)</td><td>Standard:
• Examinee verifies that CH-512 on C-04 is closed by observing the associated green light is lit.
• Examinee verifies that CH-196 and CH-192 on C-02 are closed by observing the associated green lights are lit.</td><td>Critical:
Y ☐ N ☒
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:
Failure to verify appropriate indications is cause for a performance comment.</td></tr>
<tr><td rowspan="3">S T E P
9</td><td>Performance:
4.9.5 DETERMINE desired VCT level change in % level.</td><td>Standard:
Examinee determines from the Initial Conditions that VCT level must be raised an additional 2%.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">S T E P
1 0</td><td>Performance:
4.9.6 DETERMINE total gallons required to make desired level change as follows:
Desired level change in % x $\frac{34\ gallons}{1\%\ level}$ =
Total gallons for make up</td><td>Standard:
Examinee states that a 2% level rise would = 68 gallons of make-up.
2% x $\frac{34\ \text{gallons}}{1\%}$ = 68 gallons</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

PERFORMANCE INFORMATION

JPM Number: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

STEP #11	Performance:	Standard:	Critical:	Grade:
	4.9.7 Refer to Attachment 3 as required and RESET the following to 0 total gallons (C-04): a. "PRI MAKEUP WTR FLOW CONTROLLER FC-210X" b. "BORIC ACID FLOW CONTROLLER FC-210Y"	Examinee determines from the Initial Conditions that Attachment 3 "Resetting PMW and BA Flow Controllers" to reset the Boric Acid and PMW flow controllers to 0 total gallon has been performed.	Y ☐ N ☒	S ☐ U ☐
	Cue: The PMW and BA Flow Controllers have been reset.			
	Comments: Student may decide to reset controllers even if they have been re-zeroed. This is not necessary. The cue above should be used if the examinee indicates they are going to reset controllers.			

PERFORMANCE INFORMATION

JPM Number: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

S T E P # 1 2	Performance: 4.9.8 START PPC trend of VCT level (L226).	Standard: Examinee selects the trend screen on the PPC and enters "L226" to display a graphic trend of "VCT Level" or used C04 Monitor 3 which normally displays VCT pressure and level. The chart recorder on C04 is also acceptable.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: Failure to verify appropriate indications is cause for a performance comment.			
S T E P # 1 3	Performance: **NOTE** Boric acid flow rates of less than 3 gpm and greater than 30 gpm are achievable, but are *not* to be exceeded.	Standard: Examinee reads and acknowledges the Note.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

<table>
<tr><td rowspan="3">STEP #14</td><td>Performance:

4.9.9 ADJUST automatic setpoint of “PRI MAKEUP WTR FLOW CONTROLLER FC-210X" and “BORIC ACID FLOW CONTROLLER FC-210Y" as follows (C-04):
1. Ensure “AM" is lit.
2. PRESS “SEL" button until cursor appears above setpoint (left hand bar graph).
3. Using “▲" and “▼" buttons, ADJUST setpoint to desired flow rate.</td><td>Standard:

From C-04, the examinee adjusts both controllers (210X and 210Y) as follows:
a. Ensure the “AM" is lit on the right of the controller.
b. Momentarily press the “SEL" button until the cursor appears above the Setpoint (left hand bar graph).
c. Press the “▲" and “▼" buttons as required to ADJUST the setpoints to a multiple of the blend ratio of 1 gallon of Boric Acid to 9.5 gallons of PMW.
3:28.5 (± 0.3) 7:66.5 (± 0.3)
4:38.0 (± 0.3) 8:76.0 (± 0.3)
5:47.5 (± 0.3 9:85.5 (± 0.3)
6:57.0 (± 0.3) 10:95.0 (± 0.3)</td><td>Critical:

Y ☒ N ☐
Y ☒ N ☐
Y ☒ N ☐</td><td>Grade:

S ☐ U ☐
S ☐ U ☐
S ☐ U ☐</td></tr>
<tr><td colspan="3">Cue:</td></tr>
<tr><td colspan="3">Comments:
• FC-210Y “Boric Acid Flow Controller” has an upper limit of 30 gpm. The controller becomes less accurate above that limit and should be kept less than 30 gpm.
• Minimum Boric Acid flow is 3 gpm.</td></tr>
<tr><td rowspan="3">STEP #15</td><td>Performance:

4.9.10 PLACE “MAKEUP MODE SEL" in “MANUAL" (C-04).</td><td>Standard:

At C-04, the examinee rotates the “MAKEUP MODE SEL” switch to the “MANUAL” position.</td><td>Critical:

Y ☒ N ☐</td><td>Grade:

S ☐ U ☐</td></tr>
<tr><td colspan="3">Cue:</td></tr>
<tr><td colspan="3">Comments:</td></tr>
</table>

PERFORMANCE INFORMATION

JPM Number: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

STEP #16	Performance: 4.9.11 START one boric acid pump (C-02). • P-19A, "BA PP A" • P-19B, "BA PP B"	Standard: At C-02, the examinee, places the hand switch for A BA PP in the "START" position.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: The examinee should use the "A" Boric Acid Pump. Use of the "B" Boric Acid Pump will result in a lower Boric Acid concentration during the makeup which would cause a slight positive reactivity addition over time. The "A" BAST is contained in the Initial Conditions.			
STEP #17	Performance: 4.9.12 ENSURE the following: • Boric acid pump starts (C-02) • Boric acid pump develops discharge pressure of at least 98 psig, indicated "PP A DIS PRES, PI-206" or "PP B DIS PRES, PI-208" (C-02/PPC).	Standard: • At C-02, the examinee observes that the RED light, for the "A" BA pump is on and that the discharge pressure rises to above 98 psig. • The examinee <u>may</u> also observe the "A" Boric Acid Pump discharge pressure on PPC point P206.	Critical: Y ☒ N ☐ Y ☒ N ☐	Grade: S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments: Failure to verify appropriate indications is cause for a performance comment.			

PERFORMANCE INFORMATION

JPM Number: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

STEP #18	Performance: **NOTE** When CH-512, "MAKEUP VLV STOP," is opened, the "M" part of the "AM" light will extinguish, indicating the controller is activated.	Standard: Examinee reads and acknowledges the Note.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #19	Performance: 4.9.13 OPEN CH-512 (C-04).	Standard: • On C-04, the examinee places the switch for CH-512 to OPEN. • Examinee verifies the red light lit and the green light not lit.	Critical: Y ☒ N ☐ Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: Failure to verify appropriate indications is cause for a performance comment.			

PERFORMANCE INFORMATION

JPM Number: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

<table>
<tr><td rowspan="3">STEP #20</td><td>Performance:
4.9.14 ENSURE flows have stabilized at setpoint of flow controllers (C-04).</td><td>Standard:
• Examinee identifies the flow indicating bar on FC-210X and 210Y and notices there is NO indication of flow on FC-210Y “Boric Acid Flow Controller”
• Examinee notifies the US of the Boric Acid failure.</td><td>Critical:
Y ☐ N ☒

Y ☐ N ☒</td><td>Grade:
S ☐ U ☐

S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:
Acknowledge any reports and concur with recommendation or decisions.</td></tr>
<tr><td colspan="4">Comments:
The examinee may also notice the annunciator on C-04 “BA Makeup Flow HI/LO” not clearing.</td></tr>
<tr><td rowspan="3">STEP #21</td><td>Performance:
4.9.15 MONITOR VCT level and pressure as indicated on the following: (C-02 or PPC).
• “VCT PRES, PI-225”
• “VCT LVL, LI-226”</td><td>Standard:
Examinee observes rise in VCT level and pressure on C-02 and/or PPC Display.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:
Failure to verify appropriate indications is cause for a performance comment.</td></tr>
</table>

PERFORMANCE INFORMATION

JPM Number: S1 Revision: 9/0

Task Title: Manual Makeup to the VCT (Alternate Path)

<table>
<tr><td rowspan="3">S T E P
2 2</td><td>Performance:

The examinee recommends termination and/or terminates the dilution to the VCT.

4.9.16 IF level change is not as expected, CLOSE CH-512 and INVESTIGATE cause of discrepancy (C-04).</td><td>Standard:

• The examinee observes that there is only PMW flowing to the VCT and terminates the dilution by placing the hand switch for CH-512 to CLOSE prior to 2% VCT level increase.
• Examinee states he/she would continue to monitor power level to determine the effects of the dilution.</td><td>Critical:

Y ☒ N ☐

Y ☐ N ☒</td><td>Grade:

S ☐ U ☐

S ☐ U ☐</td></tr>
<tr><td colspan="3">Cue:

Acknowledge recommendations or requests.</td></tr>
<tr><td colspan="3">Comments:

• The examinee should ensure dilution is terminated by multiple indications, (ex. CH-512 green light only lit, no flow indicated on FC-210X, VCT level trend not rising, etc.
• Other methods may be used to terminate the dilution and are acceptable provided the dilution is actually terminated, i.e., NO PMW flow indicated on “PRI MAKEUP WTR FLOW CONTROLLER FC-210X".</td></tr>
</table>

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S1 Revision: 9/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	25	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT	☒ N/A
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: S1 Revision: 9/0

Initial Conditions:

- The Blend Ratio is 9.5 gallons of PMW to 1 gallon of Boric Acid using the A BAST (corrected for B-10 depletion). This has been verified to be a neutral blend ratio (i.e. No power change.)
- The pipe is filled with a 9.5 to 1 blend ratio.

Initiating Cues:

- The Unit Supervisor has directed you to perform a manual blended makeup to the VCT and raise VCT level by 2% while maintaining the PMW and Boric Acid flow controllers in the "AUTO" mode of operation. Ensure the blend ratio is neutral (i.e. No power change.)
- The blended makeup is to be performed using section 4.9, Manual Blended Make Up to VCT. This procedure section, along with section 4.20, and the prerequisites and precautions are provided to the examinee.
- A calculator is provided to the examinee.
- When makeup is completed, return the system lineup to normal.
- The examiner will act as the US.
- A blend was just completed to raise VCT level and you are to perform a second blend to raise VCT level an additional 2%.
- Additional blends are anticipated. The pipe will be flushed with PMW at a later time.
- PMW and Boric Acid Flow Controllers have been reset to 0 total gallons in accordance with OP 2304, Attachment 3, Resetting PMW and BA Flow Controllers.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Inadvertent AEAS Actuation

JPM Number: S2 Revision: 0/0

Initiated:

John W. Riley – Signature on File	04/08/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	05/02/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	05/04/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
04/04/2018	New JPM for the 2018 ILT NRC examination.	0/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: S2 Revision: 0/0

Task Title: Inadvertent Auxiliary Exhaust Actuation Signal Actuation (AEAS) Signal

System: Engineered Safety Features Actuation System (ESFAS)

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): VISION #235154

Applicable To: SRO X STA _____ RO X PEO _____

K/A Number: 013 A2.06 K/A Rating: 3.7/4.0

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 reset the Engineered Safety Features Actuation System (ESFAS). The examinee will be directed to complete procedure steps for an inadvertent Auxiliary Exhaust Actuation Signal (AEAS). The examinee will check Spent Fuel Pool radiation is less than 50 mr/hr, align Condenser Air Removal to the Unit 2 Stack and then reset the AEAS signal on the ESFAS.

Required Materials: (procedures, equipment, etc.) Inadvertent ESFAS Actuation, AOP 2571, Rev. 007, effective 08/03/2017.

General References: Inadvertent ESFAS Actuation, AOP 2571, Rev. 007, effective 08/03/2017.

***** 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. With the exception of the questions at the end, 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: S2 Revision : 0/0

Initial Conditions:

- The plant is at 100% power with no equipment out of service.
- An inadvertent AEAS has occurred.
- The cause of the inadvertent AEAS was welding in the area.
- All work in the SFP area has been stopped.
- Spent Fuel Pool (SFP) radiation monitors are reading normal levels.

Initiating Cues:

- The Unit Supervisor has directed you to reset the inadvertent AEAS actuation signal by completing steps 11.1 through 11.5 of AOP 2571, Inadvertent ESFAS Actuation.
- The associated procedure sections are provided.
- This includes the use of Attachment 2, "Resetting ESAS," Section 5, "Resetting AEAS."
- Other operators are being assigned to restore ventilation systems.

Simulator Requirements:

- Initialize at any 100% power IC that has no equipment out of service.
- Place the simulator in "Run".
- Raise the following SFP radiation monitors to the trip value (> 60 mr/hr)
  - Southeast Radiation monitor; RM01N (ARM R8157)
  - Southwest Radiation monitor; RM01I (ARM R8139)
- Remove increases in above radiation monitor.
- Verify all four SFP radiation monitors reading less than 2 mr/hr.
- Verify AEAS actuation indications on ESAS:
  - Channel A sensor cabinet module BA103 trip light lit (RM 8139).
  - Channel D sensor cabinet module BA403 trip light lit (RM 8157).
  - Actuation cabinet 5 AEAS Group 1 AM513 actuation module trip light lit.
  - Actuation cabinet 6 AEAS Group 1 AM613 actuation module trip light lit.

*** * * * 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: S2 Revision: 0/0

Task Title: Inadvertent AEAS Actuation

START TIME: _____

S T E P # 1	Performance: **11.0 Inadvertent AEAS Actuation** 11.1 CHECK spent fuel pool area radiation is less than 50 mr/hr.	Standard: The examinee uses either the Plant Process Computer or the analog radiation monitor reading on the radiation monitor panel (RC-14).	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: RC-14 is in the rear of C04.			
S T E P # 2	Performance: 11.2 IF an inadvertent AEAS acutaion has occurred. ENSURE condenser air removal aligned to the Unit 2 stack as follows: (C06) a. ENSURE at least ONE of the following closed: • EB-55, condenser air removal #1 stack (Z2) • EB-56, condenser air removal #1 stack (Z1) b. OPEN EB-57, condenser air removal #2 stack.	Standard: The examinee closed either EB-55, condenser air removal #1 stack (Z2) or EB-56, condenser air removal #1 stack (Z1). The examinee opens EB-57, condenser air removal #2 stack.	Critical: Y ☒ N ☐ Y ☒ N ☐	Grade S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments: Closing both EB-55, condenser air removal #1 stack (Z2) and EB-56, condenser air removal #1 stack (Z1) does not constitute a JPM failure. It should be noted as a performance comment.			

PERFORMANCE INFORMATION

JPM Number: S2 Revision: 0/0

Task Title: Inadvertent AEAS Actuation

S T E P # 3	Performance: 11.3 NOTIFY HP and Chemistry that an inadvertent AEAS actuation has occurred.	Standard: Examinee notifies HP and Chemistry and informs them that an inadvertent AEAS actuation has occurred.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: When the examinee states he would notify HP and Chemistry or picks up the phone to call them, state to the examinee that HP and Chemistry have been notified.			
	Comments:			
S T E P # 4	Performance: 11.4 Refer To Attachment 2, "Resetting ESAS," and ATTEMPT to reset AEAS.	Standard: Examinee goes to Attachment 2, "Resetting ESAS," and ATTEMPT to reset AEAS.	Critical: Y ☐ N ☒	Grade S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S2 Revision: 0/0

Task Title: Inadvertent AEAS Actuation

S T E P # 5	Performance: **Attachment 2 Resetting ESFAS** **5.0 Resetting AEAS** 5.1 PRESS to reset the following bistable module "TRIP" lights: • "FUEL AREA RADIATION AEAS BISTABLE BA103" (sensor Cabinet A) • "FUEL AREA RADIATION AEAS BISTABLE BA303" (sensor Cabinet C) • "FUEL AREA RADIATION AEAS BISTABLE BA403" (sensor Cabinet D) • "FUEL AREA RADIATION AEAS BISTABLE BA203" (sensor Cabinet B)	Standard: The examinee presses the four (4) bistable module "TRIP" lights. The examinee observes the four (4) bistable module "TRIP" lights are all out after they are pressed. Note that only two of the four bistable module "TRIP" lights will be lit when the examinee goes to the ESAS panels. This is because only two of the radiation monitors went above the 50 mr/hr actuation setpoint.	Critical: Y ☒ N ☐ Y ☐ N ☒	Grade S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments: The bistable module "TRIP" lights must be reset to reset the AEAS actuation signal. The bistable module "TRIP" lights will go out when the light is pushed in and released. When the light is out on the bistable "TRIP" module the bistable is reset.			
S T E P # 6	Performance: 5.2 PRESS "AEAS ACTUATION RESET" (Actuation Cabinet 5)	Standard: The examinee presses the "AEAS ACTUATION RESET" on Actuation Cabinet 5.	Critical: Y ☒ N ☐	Grade S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S2 Revision: 0/0

Task Title: Inadvertent AEAS Actuation

S T E P # 7	Performance: 5.3 OBSERVE "AEAS GROUP 1 AM513" actuation module "TRIP" light extinguished (Actuation Cabinet 5):	Standard: Examine observes the "AEAS GROUP 1 AM513" actuation module "TRIP" light is out on Actuation Cabinet 5.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 8	Performance: 5.4 PRESS "AEAS ACTUATION RESET" (Actuation Cabinet 6)	Standard: The examinee presses the "AEAS ACTUATION RESET" on Actuation Cabinet 6.	Critical: Y ☒ N ☐	Grade S ☐ U ☐
	Cue:			
	Comments:			
STEP #9	Performance: 5.5 OBSERVE "AEAS GROUP 1 AM613" actuation module "TRIP" light extinguished (Actuation Cabinet 6):	Standard: Examine observes the "AEAS GROUP 1 AM613" actuation module "TRIP" light is out on Actuation Cabinet 6.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #10	Performance: 5.6 IF AEAS cannot be reset, Go To Step 11.4.1 contingency step.	Standard: Examinee notes that this step is not applicable since all indicates are that the ESAS has been successfully reset.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S2 Revision: 0/0

Task Title: Inadvertent AEAS Actuation

STEP #11	Performance: 5.7 OBSERVE "AEAS ACTUATION SIG CH 1 TRIP" annunciator reset (C01, C-37).	Standard: Examinee goes to C01 and observes "AEAS ACTUATION SIG CH 1 TRIP" annunciator (C01, C-37) is flashing indicated it has reset. Examine presses the annunciator "reset" pushbutton and notes that the annunciator is reset by the annunciator no longer lit.	Critical: Y ☐ N ☒ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments: The alarms on C01 reset when the examinee resets ESAS. The alarm tone is in for a few minutes before the examinee gets to this step. It is acceptable for the booth operator to acknowledge the alarm from another board to silent the alarms but leave them in.			
STEP #12	Performance: 5.8 OBSERVE "AEAS ACTUATION SIG CH 2 TRIP" annunciator reset (C01, D-37):	Standard: Examinee goes to C01 and observes "AEAS ACTUATION SIG CH 2 TRIP" annunciator (C01, D-37) is flashing indicated it has reset. Examine presses the annunciator "reset" pushbutton and notes that the annunciator is reset by the annunciator no longer lit.	Critical: Y ☐ N ☒ \ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐
	Cue: The alarms on C01 reset when the examinee resets ESAS. The alarm tone is in for a few minutes before the examinee gets to this step. It is acceptable for the booth operator to acknowledge the alarm from another board to silent the alarms but leave them in. This JPM is complete.			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S2 Revision: 0/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: S2 Revision: 0/0

Initial Conditions:

- The plant is at 100% power with no equipment out of service.
- An inadvertent AEAS has occurred.
- The cause of the inadvertent AEAS was welding in the area.
- All work in the SFP area has been stopped.
- Spent Fuel Pool (SFP) radiation monitors are reading normal levels.

Initiating Cues:

- The Unit Supervisor has directed you to reset the inadvertent AEAS actuation signal by completing steps 11.1 through 11.5 of AOP 2571, Inadvertent ESFAS Actuation.
- The associated procedure sections are provided.
- This includes the use of Attachment 2, "Resetting ESAS," Section 5, "Resetting AEAS."
- Other operators are being assigned to restore ventilation systems.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Respond to a Failed Open PORV

JPM Number: S3 Revision: 1/0

Initiated:

John W. Riley – Signature on File	04/08/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	05/02/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	05/04/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
06/15/2015 - RJA	Developed new JPM to respond to the inadvertent opening of a PORV (Immediate Operator Action) and failure of the associated to fully close.	0
04/03/2018 jwr	Revision for the 2018 ILT NRC exam. Numbered for the NRC exam (S3).	1/0

JPM WORKSHEET

Facility: MP 2 Examinee: _____

JPM Number: S3 Revision: 1/0

Task Title: Respond to a Failed Open PORV

System: RCS

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 5

Task Number(s): VISION #573060

Applicable To: SRO X STA _____ RO X PEO _____

K/A Number: 010 A2.03 K/A Rating: 4.1/4/2

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

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

Task Standards: The examinee will recognize that PORV, RC-402 has failed open and perform Immediate Operator Actions to close PORV Block Valve, RC-403. The Block Valve will fail to close, requiring the examinee to manually trip the Reactor prior to an automatic trip.

Required Materials: (procedures, equipment, etc.) AOP 2585, Immediate Operator Actions, Rev. 003-00, effective 11/16/2017.

General References: AOP 2585, Immediate Operator Actions, Rev. 003-00, effective 11/16/2017.

***** 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. With the exception of the questions at the end, 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: S3 Revision : 1/0

Initial Conditions:

- The plant is operating at 100% power, in a normal configuration.
- The BOP has temporarily left the Control Room.

Initiating Cues:

- As the RO, respond to any primary plant condition.
- I will act as the US.

Simulator Requirements:

- Reset to any 100% power IC in a normal configuration.
- Ensure the **PORV block valves are not closed**. The current operating cycle and simulator load has them closed because that is the way they are in the plant.
- When the examinee assumes the shift, insert malfunction **RC06A to fail PORV, RC-402 open 10%.**
- When the examinee places the hand switch for PORV Block Valve, RC-403, in the CLOSE position, insert the following on **Event 1** (PORV Block Valve, RC-403 fails to close):
  - **Override 02A2A2S7 – RC-403 OPEN**
  - **Override RCHS-1403_1 – RC403 green light ON**

    (BT-17 ZHS1403DI(1) = 0)

  The block valve will stay open and RCS pressure will continue to lower. This will require the examinee to take contingency actions when RCS pressures lowers to 2200 psia. The contingency action is to trip the reactor and go to EOP 2525, "Standard Post Trip Actions."

*** * * * 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: S3 Revision: 1/0

Task Title: Respond to a Failed Open PORV

START TIME: _____

S T E P # 1	Performance: Observe PORV, RC-402 fail open.	Standard: • Examinee observes numerous indications (annunciators, lowering RCS pressure, associated red indication light, etc.) and determines they are caused by the opening of PORV, RC-402. • Examinee reports that PORV, RC-402 is open and initiates Immediate Operator Actions.	Critical: Y ☐ N ☒ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐
	Cue: When the examinee assumes the shift, insert malfunction **RC06A at 10%.**			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S3 Revision: 1/0

Task Title: Respond to a Failed Open PORV

STEP # 2	Performance:	Standard:	Critical:	Grade:
	5.0 Stuck Open Pressurizer PORV			
	5.1. CHECK PORV stuck open by the observing RCS Pressure less than 2,250 psia	Examinee verifies that RCS pressure is less than 2,250 psia by observing control and safety channels of RCS pressure.	Y ☒ N ☐	S ☐ U ☐
	a. IF RC-402, #1 PORV indicates OPEN, THEN PLACE "RC-403, ISOL VLV" to CLOSE.	Examinee places the hand switch for PORV Block Valve, RC-403, in the CLOSE position.	Y ☒ N ☐	S ☐ U ☐
	b. IF RC-404, #2 PORV indicates OPEN, THEN PLACE "RC-405, ISOL VLV" to CLOSE.	Observes the Green and Red light for Block Valve RC-403.	Y ☐ N ☒	S ☐ U ☐
		Examinee observes RCS pressure is continuing to lower.	Y ☐ N ☒	S ☐ U ☐
		Examinee may observe TM/LP Pre-trips on RPS.	Y ☐ N ☒	S ☐ U ☐
	Cue: When the examinee places the hand switch for PORV Block Valve, RC-403, in the CLOSE position, insert **Event 1** (PORV Block Valve, RC-403 fails to close).			
	Comments: It takes approximately 70 seconds for RC-403, PORV Block Valve, to go fully closed. But it will not close. Checking control and safety pressure channels are less than 2,250 psia is the desired action. Failure to check both safety and control channels does not constitute a failure but would be a performance comment. Diverse indication should be utilized.			

PERFORMANCE INFORMATION

JPM Number: S3 Revision: 1/0

Task Title: Respond to a Failed Open PORV

S T E P # 3	Performance: 5.2. CHECK PORV isolated by observing RCS pressures greater than 2,200 psia.	Standard: Examinee observes PORV is not isolated by RC-403 open indication (Red light lit) and RCS pressure less than 2,200 psia. Examinee proceeds to CONTINGENCY ACTION 5.2.1.	Critical: Y ☐ N ☒ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 4	Performance: 5.2.1 IF RCS pressure lowers less than 2,200 psia, THEN PERFORM the following: a. TRIP reactor b. Go To EOP 2525, "Standard Post Trip Actions."	Standard: Examinee observes RCS pressure less than 2,200 psia. Examinee TRIPs reactor and goes to EOP 2525 "Standard Post Trip Actions."	Critical: Y ☒ N ☐ Y ☒ N ☐	Grade: S ☐ U ☐ S ☐ U ☐
	Cue: This JPM is complete when the examinee trips the reactor.			
	Comments: An automatic trip constitutes failure of the JPM.			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S3 Revision: 1/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No		
Validated Time (minutes):	5	Actual Time to Complete (minutes):		
Work Practice Performance:		☐ SAT	☐ UNSAT	
Operator Fundamentals:		☐ SAT	☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT	☐ UNSAT	☐ N/A
Attached Question #1		☐ SAT	☐ UNSAT	
Attached Question #2		☐ SAT	☐ UNSAT	
Overall Result of JPM:		☐ SAT	☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: S3 Revision: 1/0

Initial Conditions:

- The plant is operating at 100% power, in a normal configuration.
- The BOP has temporarily left the Control Room.

Initiating Cues:

- As the RO, respond to any primary plant condition.
- I will act as the US.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Respond to Containment Sump Clogging

JPM Number: S4 Revision: 3/0

Initiated:

John W. Riley – Signature on File	05/02/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	05/02/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	05/04/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
2006-317 7/31/06	Update JPM to include HUP evaluations and new format	1/0
09/22/2008 JWR	Changed IC and password. Minor changes due to procedure change.	1/1
08/30/2012 KgT	Revised JPM to current template. Expanded scope of task to perform post-SRAS actions of EOP 2532 leading into step for monitoring HPSI pumps performance. Validated JPM performance. Revised validated time to 20 minutes based upon performance.	2/0
05/2/2018 jwr	Minor revision for 2018 ILT NRC exam. Removed second degradation of HPSI flow to lessen time of JPM. JPM is still an alternate path. Added new procedure steps 49.j and 49.k.	3/0

JPM WORKSHEET

Facility: MP-2 Examinee: _____

JPM Number: S4 Revision: 3/0

Task Title: Respond to Containment Sump Clogging

System: Emergency Core Cooling

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 20

Task Number(s): 235303

Applicable To: SRO X STA _____ RO X PEO _____

K/A Number: 011-EA1.11 K/A Rating: 4.2/4.2

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

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

Task Standards: At the completion of this JPM the examinee will have performed SRAS supplemental actions, assessed HPSI pump post SRAS performance, determined that HPSI pump performance is degraded as a result of sump clogging, and take Contingency Actions to stop the running Containment Spray (CS) pumps.

Required Materials: (procedures, equipment, etc.) EOP 2532, "Loss of Coolant Accident", R 034 -00, Effective 4/28/2017

General References: EOP 2532, "Loss of Coolant Accident", R 034 -00, Effective 4/28/2017

***** 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. With the exception of the questions at the end, 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: S4 Revision : 3/0

Initial Conditions:

- The unit tripped from 100% power, 90 minutes ago, due to a large break LOCA inside containment.
- The operating crew has completed EOP 2525 and is currently in EOP 2532 "Loss of Coolant Accident".
- The operating crew has completed SRAS verification (step 48 of EOP 2532).

Initiating Cues: The Unit Supervisor has directed you to perform the SRAS Supplemental Actions of EOP 2532 step 49, and continue to monitor HPSI pump post SRAS performance IAW step 50.

Simulator Requirements: Reset Simulator to **IC-224** – IC established for 2018 NRC exam.

IC Password "**2018ilt>nrc**".

OR establish the following conditions:

- 100% power
- RC02A (100%) Large Break LOCA Loop 1 Hot Leg
- Complete EOP 2525 and 2532 up through SRAS verification (step 48)
- Insert Malfunctions **RH12A & RH12B @ 85% with a 10 second ramp** on Event Trigger 1 (BT-1). BT-1 85% w/ 10 second ramp.
- Verify keys 30 & 31 in RO key locker.
- Verify keys 30 & 31 returned to RO key locker after running JPM.
- Sign of step 48 as complete in procedure.

*** * * * 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: S4 Revision: 3/0

Task Title: Respond to Containment Sump Clogging

START TIME: _____

S T E P # 1	Performance: **SRAS Supplemental Actions** *49. IF SRAS has actuated PERFORM the following: a. PLACE ALL charging pumps in "PULL TO LOCK." b. STOP BOTH boric acid pumps. c. CLOSE BOTH gravity feed isolation valves: • CH - 508 • CH - 509 d. CLOSE CH- 514, boric acid isolation. e. IF ANY RCPs are operating, PERFORM the following: 1) STOP the operating RCPs. 2) PLACE associated pressurizer spray valve controller RC- 100E or RC-100F in manual and CLOSE the valve. 3) PLACE TIC- 4165, steam dump TAVG controller, in manual and closed.	Standard: Examinee places ALL Charging Pump Handswitches in the "Pull to Lock" position. Examinee stops both boric acid pumps, closes both gravity feed isolation valves, and closes boric acid isolation valve. Examine should state that this step is N/A since RCPs are not operating.	Critical: Y ☐ N ☒ Y ☐ N ☒ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments: Examinee should determine and state that all RCPs are stopped, and *may* state that RC-100E & 100F are in manual and closed, and TIC-4165 Tavg controller is in manual and closed. Some charging flow will remain when Charging pumps are secured. This flow will go to zero once the Boric Acid pumps are secured and Boric Acid valves are closed.			

PERFORMANCE INFORMATION

JPM Number: S4 Revision: 3/0

Task Title: Respond to Containment Sump Clogging

STEP # 2	Performance:	Standard:	Critical:	Grade:
	*49 (continued) **SRAS Supplemental Actions**			
	f. CLOSE BOTH RWST header isolation valves: (key 30 and 31) • CS - 13.1A • CS - 13.1B	Examinee obtains keys 30 & 31, inserts keys into CS-13.1A & CS-13.1B Switches, and places switches in Close positions.	Y ☐ N ☒	S ☐ U ☐
	g. CLOSE ALL RBCCW CTMT header isolation valves: **Facility 1** • RB - 30.1A • RB - 37.2A **Facility 2** • RB - 30.1B • RB - 37.2B	Examinee places handswitches for RBCCW CTMT Header Isolation valves in the Close position and observes valves close.	Y ☐ N ☒	S ☐ U ☐
	h. IF a LPSI pump was operating for boron precipitation control, START the affected LPSI pump.	Examinee should determine by cue that Boron Precipitation Control was not in progress and this step is N/A.	Y ☐ N ☒	S ☐ U ☐
	i. IF a RBCCW facility is not operating AND BOTH trains of HPSI, LPSI, and CS pumps are operating, SECURE the HPSI, LPSI, CS pumps associated with the non operating RBCCW pump.	Examinee determines by RB pump operation and/or RB header flows that RBCCW is operating, and states, both Facilities of RBCCW are operating and this step is N/A.	Y ☐ N ☒	S ☐ U ☐
	Cue: LPSI Pump was NOT operating for Boron Precipitation Control.			
	Comments: Note that CS-13.1A & CS-13.1B will take approximately 1 minute to close and RBCCW CTMT header isolation valves take approximately a minute and a half to close. CS-13.1A and CS-13.1B keys (key 30 and 31) are in the key locker at the RO desk. CS-13.1A and CS-13.1B hand switches do not need to be held in the close position. Hand switch have seal in contacts.			

PERFORMANCE INFORMATION

JPM Number: S4 Revision: 3/0

Task Title: Respond to Containment Sump Clogging

STEP # 3	Performance:	Standard:	Critical:	Grade:
	*49 (continued) **SRAS Supplemental Actions**			
	j. CHECK ANY of the following pumps running: • "A" HPSI pump OR "B" HPSI pump (if aligned) • "A" LPSI pump • "A" CS pump	Examinee observes and states that "A" HPSI pump and "A" CS pump are running.	Y ☐ N ☒	S ☐ U ☐
	k. CHECK ANY of the following pumps running: • "C" HPSI pump OR "B" HPSI pump (if aligned) • "B" LPSI pump • "B" CS pump	Examinee observes and states that "C" HPSI pump and "B" CS pump are running.	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S4 Revision: 3/0

Task Title: Respond to Containment Sump Clogging

<table>
<tr><td rowspan="3">S T E P
4</td><td>Performance:

NOTE: Degradation in HPSI pump performance, post SRAS, may be indicative of debris fouling the CTMT sump screen. Checking HPSI pump flow greater than 30 gpm ensures minimum flow requirements are met for pump protection when RCS pressure is high and prohibiting flow. This presents differently than the sump blockage issue.</td><td>Standard:

Examinee reads NOTE prior to step and commences monitoring of HPSI pump performance.</td><td>Critical:

Y ☐ N ☒</td><td>Grade:

S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:

Booth: Activate Event Trigger 1 to insert malfunctions RH12A & RH12B (85%) with 10 second ramp to partially clog the CTMT sump screens. This will result in HPSI pump amp swings and fluctuations on HPSI flows to the RCS.</td></tr>
<tr><td rowspan="3">S T E P
5</td><td>Performance:

HPSI Pump Post SRAS Performance Criteria

*50. IF SRAS has actuated,
CHECK for adequate HPSI flow by observing ALL of the following:
• Flow greater than or equal to 30 gpm for each operating pump
• Motor current stable
• Stable HPSI pump discharge pressure</td><td>Standard:

Examinee monitors and reports:
• HPSI flow rate oscillations.
• Motor current oscillations.
• HPSI pump discharge pressure oscillations.

Examinee should recommend taking CONTINGENCY ACTIONS.</td><td>Critical:

Y ☐ N ☒</td><td>Grade

S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:
Acknowledge and agree with any recommendations or reports. Ask for recommendations for actions if none given.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

PERFORMANCE INFORMATION

JPM Number: S4 Revision: 3/0

Task Title: Respond to Containment Sump Clogging

STEP # 6	Performance:	Standard:	Critical:	Grade:
	HPSI Pump Post SRAS Performance Criteria 50.1 IF unable to maintain HPSI flow due to high RCS pressure, STOP ONE HPSI pump to establish the following for the operating HPSI pump: • Flow greater than or equal to 30 gpm • Motor current stable • Stable HPSI pump discharge pressure	Examinee observes and reports: • RCS pressure is not prohibiting flow. (Pressurizer pressure = CTMT pressure), therefore step is N/A. • HPSI pump performance degradation is due to CTMT sump clogging. Examinee recommends **NOT** stopping one HPSI pump.	Y ☐ N ☒	S ☐ U ☐
	Cue: Acknowledge and agree with any recommendations or reports. Ask for recommendations for actions if none given.			
	Comments: Stopping one HPSI pump does not constitute a JPM failure, but should be noted in the JPM work practice evaluation. RCS pressure is approximately 35 psia at this point.			

PERFORMANCE INFORMATION

JPM Number: S4 Revision: 3/0

Task Title: Respond to Containment Sump Clogging

S T E P # 7	Performance: **HPSI Pump Post SRAS Performance Criteria** 50.2 IF HPSI pump performance degradation is due to CTMT sump clogging, (suction problem) PERFORM the following, as necessary, to attempt restoration of HPSI flow: a. IF CTMT pressure can be maintained less than 54 psig, AND at least ONE complete facility of CAR fans is operating, STOP CS pumps.	Standard: Examinee observes and reports: • Containment pressure and trend • Two complete facilities of CAR fans in operation Examinee recommends stopping both CS pumps and performs the following: • **Stops both CS pumps** Observes amperage and flow stabilizing for HSPI pumps.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Containment pressure will be approximately 15 psig and lowering. All (4) CARs fans will be operating in slow speed with good (emergency) RBCCW flow.			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S4 Revision: 3/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	20	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: S4 Revision: 3/0

Initial Conditions:

- The unit tripped from 100% power, 90 minutes ago, due to a large break LOCA inside containment.
- The operating crew has completed EOP 2525 and is currently in EOP 2532 "Loss of Coolant Accident".
- The operating crew has completed SRAS verification (step 48 of EOP 2532).

Initiating Cues: The Unit Supervisor has directed you to perform the SRAS Supplemental Actions of EOP 2532 step 49, and continue to monitor HPSI pump post SRAS performance IAW step 50.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Containment Isolation due to Fuel Handling Accident

JPM Number: S5 Revision: 2/0

Initiated:

John W. Riley – Signature on File	06/06/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	06/15/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	06/15/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
2006-317	Update JPM to include HUP evaluations and new format	0/0
9/14/2011	Revised JPM to incorporate NRC comments.	1/0
9/28/2011	Minor editorial changes.	1/0
06/06/2018 jwr	Updated to latest format. Changed numbering to S5 to conform to NRC numbering preference. Incorporated VISION task number for respond to a fuel handling accident. Modified JPM with a failure in the Facility 1 CRAC system such that it will not be able to be placed in service. This requires the examinee to carry out contingency actions and place the Facility 2 CRAC system in recirculation. Thus making this an Alternate Path JPM.	2/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: S5 Revision: 2/0

Task Title: Containment Isolation due to Fuel Handling Accident

System: Containment

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): 235158

Applicable To: SRO X STA _____ RO X PEO _____

K/A Number: 103 A4.01 K/A Rating: 3.2 / 3.3

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

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

Task Standards: At the completion of this JPM, the examinee will take the required actions in the Control Room to isolate Containment due to a Fuel Handling Accident and place the Control Room Air conditioning system (CRAC) in recirculation. The examinee will be required to use Contingency Actions to place the Facility 2 CRAC in service in response to a failure of Facility 1 CRAC.

Required Materials: (procedures, equipment, etc.) AOP 2577, "Fuel Handling Accident".

General References: AOP 2577, "Fuel Handling Accident".

***** 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. With the exception of the questions at the end, 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: S5 Revision : 2/0

Initial Conditions:

- Unit 2 is in a Refueling outage with fuel movement occurring in Containment.
- The Refuel SRO on the bridge just called the Control Room to report that a fuel bundle has dropped from the refueling machine in CTMT and that a fuel handling accident has occurred. The bundle does NOT appear to be damaged at this time.
- AOP 2577, "Fuel Handling Accident" has been entered and the first three steps have been completed.

Initiating Cues: The US has directed you to perform AOP 2577, Fuel Handling Accident, Section 3.0, Fuel Handling Accident in Containment, starting at step 3.4.

Simulator Requirements:

- IC-153, or any IC in Mode 6 during fuel movement
- Mon 1 (SDC), Mon 2 (STR), Mon 3 (PAV) Train "A" CRACS is operating in "NORMAL" mode.
- Insert Remote CHR04 "NORM" and open all 4 Containment Purge Valves to maintain containment habitability.
- Insert failure of CRAC Exhaust Fan, F-31A. 12A253 (F-31A) STOP on BT-18 ZHS 8346 DI(1)=1 with a 1 second time delay.
- Ensure the following:
  - Purge Fan, F-23 is OFF
  - Purge Damper, AC-1 is CLOSED
  - Purge Damper AC-3 is OPEN
  - AC-11 closed
  - Remove "FUSE REMOVED" magnets from AC-4, 5, 6 & 7.

*** * * * 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: S5 Revision: 2/0

Task Title: Containment Isolation due to Fuel Handling Accident

START TIME: _____

S T E P # 1	Performance: Fuel Handling Accident AOP 2577 **3.0 Fuel Handling Accident in the Containment**	Standard: Examinee, per the initiating cue, is directed to perform AOP 2577, Fuel Handling Accident, starting at step 3.4. Examinee refers to Section 3.0 (Fuel Handling Accident in the Containment)	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: Provide examinee with a copy of AOP 2577.			
	Comments:			
S T E P # 2	Performance: 3.4 IF purging of containment is in progress, VERIFY the following are closed: • AC-4, Containment Outboard Isolation Damper • AC-5, Containment Inboard Isolation Damper • AC-6, Containment Inboard Isolation Damper • AC-7, Containment Outboard Isolation Damper	Standard: Examinee closes the following by rotating their switches to the "CLOSE" position and verifying by green " CLOSE" light indication only that the dampers are closed: • AC-4, Containment Outboard Isolation Damper • AC-5, Containment Inboard Isolation Damper • AC-6, Containment Inboard Isolation Damper • AC-7, Containment Outboard Isolation Damper	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S5 Revision: 2/0

Task Title: Containment Isolation due to Fuel Handling Accident

STEP #3	Performance: 3.5 VERIFY Containment Closure is established.	Standard: Examinee states or requests that assigned personnel establish containment closure.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: Unit Supervisor or booth responds (whoever request was made too) that Containment Closure is being established. Pager message has been sent and over head page has been made.			
	Comments:			
STEP #4	Performance: 3.6 **TCOA:** ENSURE ONE complete facility of CRAC operating, in RECIRC mode (C25A/B) 3.6.1 IF ANY CRAC damper is *not* properly positioned, THEN PLACE **BOTH** facilities "NORM/RECIRC MODE" handswitches in "RECIR:" (C25A/B) • HS-8359 • HS-8346 3.6.2 START "CRACS FLTR FAN, F-32A, HS-8006"	Standard: Examinee recognizes that neither CRAC train is in the RECIRC mode and goes to CONTINGENCY ACTIONS and performs the following: Places both facilities "NORM/RECIRC MODE" handswitches HS-8359 and HS-8346 in "RECIR:" Examinee starts Facility 1 "CRACS FLTR FAN, F-32A" by taking handswitch "HS-8006" to the start position and verifying the fan running by observing red "ON" light lit only.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: CRAC will not be in the recirculation mode because there is no condition that would cause the CRAC to shift to recirculation. Neither EBFAS nor SIAS conditions exist. Therefore manual actions must be taken to place CRAC in recirculation.			

PERFORMANCE INFORMATION

JPM Number: S5 Revision: 2/0

Task Title: Containment Isolation due to Fuel Handling Accident

STEP #5	Performance:	Standard:	Critical:	Grade
	3.6 **TCOA:** ENSURE ONE complete facility of CRAC operating, in RECIRC mode (C25A/B) **Facility 1** • HV-203A, Fan F-21A exhaust damper open • Fan F-21A, supply fan running • HV- 206A, Fan F-31A exhaust damper open • Fan F-31A, exhaust fan running • HV-212A, Fan F-32A exhaust damper, open • Fan F-32A, filter fan, running. • HV-202, minimum fresh air damper, closed • HV-207, cable vault exhaust damper, closed • HV-208, exhaust air damper, closed	Examinee positions or verifies Facility 1 of CRACS in the recirculation by the following: • Verifies HV-203A, Fan F-21A exhaust damper is open by red "OPEN" light lit only. • Verifies Fan F-21A, supply fan running by observing red "ON" light lit only. • Verifies HV-206A, Fan F-31A exhaust damper is open by red "OPEN" light lit only. Damper will not be open because fan F-31A is not running. • Observes Fan F-31A, exhaust fan is not running by observing green "ON" light lit only. Attempts to start or moves on to ensuring Facility 2 CRAC in recirculation. • The examinee can either continue with ensuring the remaining Facility 1 components are in their proper position or go directly to ensuring Facility 2 is in recirculation. • Examinee concludes Facility 1 of CRAC is not in recirculation because exhaust Fan F-31A, is not running and exhaust damper, HV-206A is closed.	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments: Once contingency actions are performed (3.6.1 and 3.6.2) all isolation dampers should be closed and the Facility 1 supply fan F-21A and exhaust fan F-31A should be running with their exhaust (discharge) dampers open. Due to a failure of the Facility 1 exhaust fan F-31A it will not be running and can't be started. And with the fan not running the exhaust (discharge) damper will be closed. The examinee should stop the facility 1supply fan F21A. This is not critical to the JPM. If not stopped during the JPM it should be a comment.			

PERFORMANCE INFORMATION

JPM Number: S5 Revision: 2/0

Task Title: Containment Isolation due to Fuel Handling Accident

STEP #6	Performance:	Standard:	Critical:	Grade:
	3.6 **TCOA:** ENSURE ONE complete facility of CRAC operating, in RECIRC mode (C25A/B)	Examinee identifies that Facility 2 CRAC is not in service and carries out CONTINGENCY ACTIONs	Y ☒ N ☐	S ☐ U ☐
	3.6.3 IF ANY CRAC damper is *not* properly positioned, THEN PLACE **BOTH** facilities "NORM/RECIRC MODE" handswitches in "RECIR:" (C25A/B) • HS-8359 • HS-8346	Examinee verifies both facilities "NORM/RECIRC MODE" handswitches (HS-8359 and HS-8346) in "RECIR" (C25A/B). Examinee placed these handswitches in the "RECIR" position previously.		
	3.6.4 START "CRACS FLTR FAN, F-32B, HS-8007"	Examinee starts Facility 2"CRACS FLTR FAN, F-32B" by taking handswitch "HS-8007" to the start position and verifying the fan running by observing red "ON" light lit only.		
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S5 Revision: 2/0

Task Title: Containment Isolation due to Fuel Handling Accident

STEP #7	Performance:	Standard:	Critical:	Grade:
	3.6 **TCOA:** ENSURE ONE complete facility of CRAC operating, in RECIRC mode (C25A/B) **Facility 2** • HV-203B, Fan F-21B exhaust damper open • Fan F-21B, supply fan running • HV- 206B, Fan F-31B exhaust damper open • Fan F-31B, exhaust fan running. • HV-212B, Fan F-32B exhaust damper, open • Fan F-32B, filter fan, running • HV-495, fresh air damper, closed • HV-496, exhaust damper, closed • HV-497, cable vault exhaust air damper, closed	Once the filter fan is started the examinee ensures Facility 2 CRAC in recirculation by; • Verifies HV-203B, Fan F-21B exhaust damper is open by red "OPEN" light lit only once fan is started. • Starts Fan F-21B, supply fan and verifies running by observing red "ON" light lit only. • Verifies HV-206B, Fan F-31B exhaust damper is open by red "OPEN" light lit only once fan is started. • Starts Fan F-31B, exhaust fan and verifies running by observing red "ON" light lit only. • Verifies HV-212B, Fan F-32B exhaust damper is open by red "OPEN" light lit only. • Verifies Fan F-32B, filter fan running by observing red "ON" light lit only. • Verifies HV-495, minimum fresh air damper is closed by green "CLOSE" light lit only. • Verifies HV-496, exhaust damper is closed by green "CLOSE" light lit only. • Verifies HV-497, cable vault exhaust air damper is closed by green "CLOSE" light lit only.	Y ☒ N ☐	S ☐ U ☐
	Cue: **Once Facility 2 CRAC has been placed in recirculation state that this JPM is complete**			
	Comments: The supply and exhaust fans (F21B and F-31B) will not be running because Facility 2 CRAC was not in service. These fans must be manually started. The exhaust (discharge) dampers associated with these fans do not open until the fans start. These fans can be started simultaneously (two handed operation) but are not required to be started by this method to successfully complete the JPM.			

PERFORMANCE INFORMATION

JPM Number: S5 Revision: 2/0

Task Title: Containment Isolation due to Fuel Handling Accident

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S5 Revision: 2/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: S5 Revision: 2/0

Initial Conditions:

- Unit 2 is in a Refueling outage with fuel movement occurring in Containment.
- The Refuel SRO on the bridge just called the Control Room to report that a fuel bundle has dropped from the refueling machine in CTMT and that a fuel handling accident has occurred. The bundle does NOT appear to be damaged at this time.
- AOP 2577, "Fuel Handling Accident" has been entered and the first three steps have been completed.

Initiating Cues: The US has directed you to perform AOP 2577, Fuel Handling Accident, Section 3.0, Fuel Handling Accident in Containment, starting at step 3.4.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Transfer Electrical Buses from the NSST to the RSST

JPM Number: S6 Revision: 0/0

Initiated:

John W. Riley – Signature on File	04/13/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	05/02/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	05/04/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
4/13/18 jwr	Developed new JPM for the 2018 ILT examination	0/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: S6 Revision: 0/0

Task Title: Transfer Electrical Buses from the NSST to the RSST

System: AC Electrical Distribution System

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): VISION # 235341 & 235468

Applicable To: SRO X STA _____ RO X PEO _____

K/A Number: 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 transferred a 6.9 KV and 4.16 KV bus from the NSST to the RSST.

Required Materials: (procedures, equipment, etc.)
- OP 2342, 6900 Volt Electrical System, R 015, 5/11/17
- OP 2343, 4160 Volt Electrical System, R 025, 6/7/17

General References:
- OP 2342, 6900 Volt Electrical System, R 015, 5/11/17
- OP 2343, 4160 Volt Electrical System, R 025, 6/7/17

***** 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. With the exception of the questions at the end, 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: S6 Revision : 0/0

Initial Conditions:

- The plant is at 100% power.
- All equipment is in service.

Initiating Cues:

- Retest of "RSS SPLY BKR, 22S3-24C-2 (A302)" is required. Cycling the breaker is the retest.
- Bus transfer can be performed in any order.
- The Unit Supervisor has directed you to manually transfer bus 24A and 24C from the NSST to the RSST to support retest of "RSS SPLY BKR, 22S2-24C-2 (A302)". Perform the transfer using OP 2343, section 4.9, Manual Transfer of Buses 24A and 24C from NSST to RSST.
- Retest of "RSS SPLY BKR, 22S2-25A-2 (H103)" is required. Cycling the breaker is the retest.
- The Unit Supervisor has directed you to manually transfer bus 25A from the NSST to the RSST to support retest of "RSS SPLY BKR, 22S2-25A-2 (H103)". Perform the transfer using OP 2342, section 4.5, Manual Transfer of Bus 25A from NSST to RSST.

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: S6 Revision: 0/0

Task Title: Transfer Electrical Buses from the NSST to the RSST

START TIME: _____

S T E P # 1	Performance: **4.9 Manual Transfer of Buses 24A and 24C from NSST to RSST** Note: Buses will be transferred manually before taking unit off-line at 10% electric power (90 MWe).	Standard: Examinee reads note. May state it is not applicable because the unit is not being taken offline.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 2	Performance: 4.9.1 ENSURE RSST, 15G-22S, is available.	Standard: Examinee checks voltage on 4.16 KV windings of the RSST.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	4.9.2 ENSURE "RSS SPLY BKR, 22S3-24C-2 (A302)" is open AND control power is available.	Examinee observes Green light lit on A302 breaker indicating control power is available and the breaker is open.	Y ☐ N ☒	S ☐ U ☐
	4.9.3 ENSURE "24A/24C TIE BKR, 24C-1T-2 (A304)" is closed.	Examinee observes Red light lit on A304 breaker indicating the breaker is closed.	Y ☐ N ☒	S ☐ U ☐
	4.9.4 PLACE "SYN SW 22S3-24C-2 (A302)" to "ON" and OBSERVE indication of incoming and running voltages.	Examinee places synchronizing switch handle in "SYN SW 22S3-24C-1T-2 (A302)" slot and turns to the "ON" position. Then observes incoming and running voltages.	Y ☒ N ☐	S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S6 Revision: 0/0

Task Title: Transfer Electrical Buses from the NSST to the RSST

STEP #3	Performance:	Standard:	Critical:	Grade:
	CAUTION: 1. Slow operation of breaker control switch can cause malfunction resulting in reactor trip. Switch should be moved briskly to CLOSE" position and held briefly to verify incoming breaker closure, then allowed to spring return to "AFTER CLOSE" position. 2. If "ESAS UV CH1 or CH2 TRIP" (C-01, windows C-33 or D-33) are annunciated, regardless of *actual* RSST voltage, an RSST undervoltage signal *has* been processed. NOTE: When control switch for "RSS SPLYBKR, 22S3-24C-2 (A302)" is released to normal position, "NSS SPLY BKR, 2S3-24A-2 (A102)" automatically opens. Buses 24A and 24C are then powered from RSST, 15G-22S.	Examinee reads and understands caution. Examinee reads and understands note.	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S6 Revision: 0/0

Task Title: Transfer Electrical Buses from the NSST to the RSST

STEP # 4	Performance:	Standard:	Critical:	Grade:
	4.9.5 IF "ESAS UV CH1 OR CH2 TRIP"(C-01, windows C-33 or D-33) are annunciated, STOP transfer and NOTIFY I&C Department.	Examinee reads the step understands they must watch for these annunciator as they proceed.	Y ☐ N ☒	S ☐ U ☐
	4.9.6 CLOSE "RSS SPLY BKR, 22S3-24C-2 (A302)" and OBSERVE indication for normal response.	Examinee closes A302 and observes Red light lit indicating breaker is closed.	Y ☒ N ☐	S ☐ U ☐
	4.9.7 OBSERVE bus meter for voltage.	Examinee observes 24C bus voltage at ~ 4.16 KV.	Y ☐ N ☒	S ☐ U ☐
	4.9.8 PLACE "SYN SW 22S3-24C-2 (A302)" to "OFF."	Examinee places SYN SW 22S3-24C-2 (A302)" to off. And acknowledges annunciator reset.	Y ☐ N ☒	S ☐ U ☐
	4.9.9 PLACE "NSS SPLY BKR, 2S3-24A-2 (A102)" to "OPEN" and CHECK amber light, *not* lit.	Examinee places "NSS SPLY BKR, 2S3-24A-2 (A102)" to open and checks the amber light is not lit.	Y ☐ N ☒	S ☐ U ☐
	- End of Section 4.9 -			
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S6 Revision: 0/0

Task Title: Transfer Electrical Buses from the NSST to the RSST

S T E P # 5	Performance: 4.5 **Manual Transfer of Bus 25A from NSST to RSST** NOTE: 1. Bus must be transferred manually before taking unit off line at 10% turbine power. 2. Incoming and Running voltages may *not* be matched due to differences in loading of the NSST and RSST.	Standard: Examinee reads and understands note.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 6	Performance: 4.5.1 ENSURE RSST, 15G-22S, is energized from 345 kV bus. 4.5.2 IF "RSS SPLY BKR, 22S2-25A-2 (H103)" is racked down, Refer To OP 2348A, "6,900 and 4,160 Volt Breaker Operation," and RACK UP "RSS SPLY BKR, 22S2-25A-2 (H103)." 4.5.3 ENSURE "RSS SPLY BKR, 22S2-25A-2 (H103)" open.	Standard: Examinee checks voltage on 6.9 KV windings of the RSST. Examinee determines H103 is racked up by Green breaker indicating light lit and that this step is not applicable since breaker is racked up. Examinee checks breaker H103 is open by the Green breaker indicating light lit.	Critical: Y ☐ N ☒ Y ☐ N ☒ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S6 Revision: 0/0

Task Title: Transfer Electrical Buses from the NSST to the RSST

S T E P # 7	Performance: 4.5.4 MAKE the following Plant Page: **"Attention Unit 2 personnel, Transferring Bus 25A from the NSST to the RSST. All personnel stand clear of Bus 25A and the Lower Switchgear Room"**	Standard: Examinee makes the plant page.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	4.5.5 TURN "SYN SW 22S2-25A-2 (H103)" to "ON" and OBSERVE indication of incoming and running voltages.	Examinee places synchronizing switch handle in "SYN SW 22S2-24C-25A-2 (H103)" slot and turns to the "ON" position. Then observes incoming and running voltages.	Y ☒ N ☐	S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 8	Performance: CAUTION: Slow operation of breaker control switch can cause a malfunction resulting in reactor trip. Switch should be moved briskly to "CLOSE" position and allowed to spring return to the "after close" position.	Standard: Examinee reads and understands caution.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S6 Revision: 0/0

Task Title: Transfer Electrical Buses from the NSST to the RSST

STEP # 9	Performance:	Standard:	Critical:	Grade:
	4.5.6 CLOSE "RSS SPLY BKR, 22S2-25A-2 (H103)" and CHECK the following:	Examinee closes H103 by taking the handswitch to closed position.	Y ☒ N ☐	S ☐ U ☐
	• "NSS SPLY BKR, 2S2-25A-2 (H101)" open	Examinee checks H101 is open by the Green breaker light lit. Examinee checks the bus 25A voltage meter for ~ 6.9 KV indicated.	Y ☐ N ☒	S ☐ U ☐
	• Bus 25A volt meter indicates normal voltage		Y ☐ N ☒	S ☐ U ☐
	4.5.7 TURN "SYN SW 22S2-25A-2 (H103)" to "OFF."	Examinee places SYN SW 22S2-25A-2 (H103)" to Off. And acknowledges annunciator reset.	Y ☐ N ☒	S ☐ U ☐
	4.5.8 PLACE "NSS SPLY BKR, 2S2-25A-2 (H101)" to "TRIP" to clear amber light on "NSS SPLY BKR, 2S2-25A-2 (H101)."	Examinee places "NSS SPLY BKR, 2S2-25A-2 (H101)" to trip and checks the amber light is not lit.	Y ☐ N ☒	S ☐ U ☐
	- End of Section 4.5 -			
	Cue: This JPM is complete.			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S6 Revision: 0/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: S6 Revision: 0/0

Initial Conditions:

- The plant is at 100% power.
- All equipment is in service.

Initiating Cues:

- Retest of "RSS SPLY BKR, 22S3-24C-2 (A302)" is required. Cycling the breaker is the retest.
- Bus transfer can be performed in any order.
- The Unit Supervisor has directed you to manually transfer bus 24A and 24C from the NSST to the RSST to support retest of "RSS SPLY BKR, 22S2-24C-2 (A302)". Perform the transfer using OP 2343, section 4.9, Manual Transfer of Buses 24A and 24C from NSST to RSST.
- Retest of "RSS SPLY BKR, 22S2-25A-2 (H103)" is required. Cycling the breaker is the retest.
- The Unit Supervisor has directed you to manually transfer bus 25A from the NSST to the RSST to support retest of "RSS SPLY BKR, 22S2-25A-2 (H103)". Perform the transfer using OP 2342, section 4.5, Manual Transfer of Bus 25A from NSST to RSST.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Securing of CVCS due to VCT Level Instrument Failure

JPM Number: S7 Revision: 0/0

Initiated:

John W. Riley – Signature on File	06/14/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	06/15/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	06/15/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
06/14/2018 jwr	Original issue for 2018 ILT NRC exam	0/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: S7 Revision: 0/0

Task Title: Securing of CVCS due to VCT Level Instrument Failure

System: Non-Nuclear Instrumentation System

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 5

Task Number(s): 235169/573060

Applicable To: SRO X STA _____ RO X PEO _____

K/A Number: 016 A2.02 K/A Rating: 2.9 / 3.2

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 recognized that a loss of VA-10 has occurred and taken Immediate Operator Actions to secure charging and letdown.

Required Materials: (procedures, equipment, etc.)
AOP 2585, Immediate Operator Actions, R003-00, effective 11-16-17
AOP 2504C, Loss of VAC Vital Instrument Panel VA-10, R005-00, effective 6-1-17

General References:
AOP 2585, Immediate Operator Actions, R003-00, effective 11-16-17
AOP 2504C, Loss of VAC Vital Instrument Panel VA-10, R005-00, effective 6-1-17

***** 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. With the exception of the questions at the end, 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: S7 Revision : 0/0

Initial Conditions:

- The plant is at 100% power steady state.
- You are the Reactor Operator designed as the Operator at the Controls (OATC).

Initiating Cues:

- As the RO, respond to any primary plant condition.
- I will act as the US.

Simulator Requirements:

- Reset to any 100% power IC in a normal configuration with no equipment out of service.
- Ensure PORV Block valves are not closed and all tags are off the Main Control Boards C01, C02/3 and C04.
- Ensure Channel "Y" is controlling pressurizer level. If Channel "X" is controlling pressurizer level, charging will go to maximum and letdown will go to minimum.
- Ensure the pressurizer heater selector switch is in the "X" and "Y" position.
- Place the Loss of VA-10 malfunction (**ED16A_LOSS OF VA10**) on Trigger #1.

*** * * * 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: S7 Revision: 0/0

Task Title: Securing of CVCS due to VCT Level Instrument Failure

START TIME: _____

S T E P # 1	Performance: Identify a loss of vital instrument bus VA-10 by any of the following; • Loss of power to all channel "A" indications • Multiple and various annunciators on main control boards. • RPS channel "A" de-energizes. • Any of the following C-08 annunciators, lit: o "INVERTER INV-1 TROUBLE" (A-25) o "VA-10 ON ALTERNATE SUPPLY INV-5" (A-26) o "INVERTER INV-5 TROUBLE" (A-27)	Standard: Examinee identifies that vital instrument bus VA-10 has been lost by any of the following: • **RPS channel "A" de-energizes**. • **Loss of power to all "A" safety channel indications**, such as pressurizer pressure, RWST level, steam generator level, etc. Note: Multiple and various annunciators on main control boards will come in and the examinee should look at various indications and identify the loss off VA-10.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: When the examinee assumes the shift, insert malfunction **Trigger #1 "ED16A_LOSS OF VA10".**			
	Comments: The charging pump suction swaps from VCT to RWST due to loss of power to VCT level indicators. LC-227 actuates the VCT LEVEL LO-LO alarm on panel C-02/3 and shifts the suction of the charging pumps to the RWST. This results in reactor power lowering. This is further complicated by the inability to control the feedwater regulating valve to steam generator #1 which locks up on a loss of VA-10.			

PERFORMANCE INFORMATION

JPM Number: S7 Revision: 0/0

Task Title: Securing of CVCS due to VCT Level Instrument Failure

<table>
<tr><td rowspan="3">S T E P
2</td><td>Performance:

Recognize Immediate Operator Actions are required for a loss of VA-10.

Completes Immediate Operator Actions are required for a loss of VA-10.

11.0 Loss of VA- 10, VA- 20, VR- 11, VR- 21

[11.1] SECURE Letdown and Charging as follows:

a. CLOSE CH 515, “LTDN ISOL.”

b. PLACE all charging pumps in “PULL TO LOCK.”</td><td>Standard:

Examinee secures Letdown and Charging as follows by :

• Closing CH 515, “LTDN ISOL.”
• Placing all charging pumps in “PULL TO LOCK.”

Examinee should announce that he/she is carrying out Immediate Operator Actions. And voice the actions he/she is taking. Then state his/her Immediate Operator Actions are completed. Announcements and verbalizing is not are critical.</td><td>Critical:

Y ☒ N ☐

Y ☐ N ☒</td><td>Grade:

S ☐ U ☐

S ☐ U ☐</td></tr>
<tr><td colspan="3">Cue:</td></tr>
<tr><td colspan="3">Comments:

Immediate Operator Actions should be carried out from memory.</td></tr>
</table>

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S7 Revision: 0/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	5	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: S7 Revision: 0/0

Initial Conditions:

- The plant is at 100% power steady state.
- You are the Reactor Operator designed as the Operator at the Controls (OATC).

Initiating Cues:

- As the RO, respond to any primary plant condition.
- I will act as the US.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Change the Setpoint of the SJAE RM 5099

JPM Number: S8 Revision: 4/0

Initiated:

John W. Riley – Signature on File	04/07/18
Developer	Date

Reviewed:

Angelo Leone – Signature on File	05/02/18
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	05/04/18
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
03/29/1995	New JPM	0/0
10/09/1998	Updated JPM	1/0
12/01/2005	Updated JPM & Changed to JPM-S8 for NRC Exam	2/0
08/05/2011	Updated JPM & Restored to JPM-120	3/0
04/02/2018	Revision for use on the 2018 ILT NRC examination. Changed number from JPM-120 to JPM-S8.	4/0

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: S8 Revision: 4/0

Task Title: Change the Setpoint of the SJAE RM 5099

System: Radiation Monitoring

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): VISION #235887

Applicable To: SRO X STA _____ RO X PEO _____

K/A Number: 071 A4.25 K/A Rating: 3.2/3.2

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

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

Task Standards: The examinee changing and verifying the new setpoint successfully performs this JPM task. The examinee will adjust the setpoint of the Steam Jet Air Ejector Radmonitor (RM 5099) to the new setpoint using the Radiation Monitor Alarm Setpoint Control procedure. The setpoint is provided to the examinee on the SJAE Radiation Monitor RM 5099 & PPC Alarm Setpoint Change Request form.

Required Materials: (procedures, equipment, etc.)
- SP2833-007 "SJAE Radmonitor MR 5099 & PPC Alarm Setpoint Change Request, Rev. 002-03, effective 07/18/11.
- OP2383C "Radiation Monitor Alarm Setpoint Control Section 4.1, Rev. 016, effective 05/02/17.

General References:
- OP2383C "Radiation Monitor Alarm Setpoint Control, Rev. 016, effective 05/02/17.

***** 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. With the exception of the questions at the end, 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: S8 Revision : 4/0

Initial Conditions:

- The Plant is at 100% power all systems are normal.
- The S/G Blowdown Radmonitor (RM-4262) is in service.

Initiating Cues:

- The US has assigned you to change the setpoint of the SJAE Radmonitor (RM5099) in accordance with, section 4.1 of OP 2383C, Radiation Monitor Alarm Setpoint Control (hand to examinee).
- Chemistry has provided an approved "SJAE Radmonitor Setpoint Change Request, SP-2833-007 (hand to examinee).
- The PPC Setpoint change will be assigned to another person.

Simulator Requirements:

- Any IC in Mode 1.
- Ensure the S/G Blowdown Radmonitor is in service. The display should be updating (number changing).
- Verify current setpoint is at 1000 cps using step 4.1.10 of OP 2388C.
- Ensure REMOTE, RMR37A is selected to RI5099. RIT5099 ALARM SP CNTL (FROM "RI 5099").
- Ensure RI-5099 "NORM/SUPV." key (key 189) and "RADMONITOR BYPASS, HS 5099E" key (key 79) are in key locker.
- Ensure there are no magnets (like INOP) associated with RM 4262 an RM 5099 on RC-14.

*** * * * 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: S8 Revision: 4/0

Task Title: Change the Setpoint of the SJAE RM 5099

START TIME: _____

<table>
<tr><td rowspan="3">S T E P
1</td><td>Performance:
4.1 Adjusting Set points on SJAE Radiation Monitor, RM-5099 Module and PPC
4.1.1 IF new setpoint requested by chemistry is equal to the current setpoint, Go To step 4.1.16.</td><td>Standard:
Examinee reads Step 4.1.1 and determines the step is Not Applicable.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="3">Cue:</td></tr>
<tr><td colspan="3">Comments:
Ensure REMOTE, RMR37A is selected to RI5099 so that RIT5099 alarm setpoint can be changed from the panel.</td></tr>
<tr><td rowspan="3">S T E P
2</td><td>Performance:
4.1.2 OBTAIN keys for the following (Operations key locker):
• RI-5099 “NORM/SUPV.” switch on RC-14D (key 189)
• “RADMONITOR BYPASS, HS 5099E” switch on RC-14A (key 79)</td><td>Standard:
The examinee retrieves the two keys from the key locker by C-21 and takes them around to RC-14.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="3">Cue:</td></tr>
<tr><td colspan="3">Comments:</td></tr>
</table>

PERFORMANCE INFORMATION

JPM Number: S8 Revision: 4/0

Task Title: Change the Setpoint of the SJAE RM 5099

S T E P # 3	Performance: 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.	Standard: Examinee reads Step 4.1.3 and determines step Not Applicable.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 4	Performance: **NOTE** "RADMONITOR BYPASS, HS 5099E" switch should be placed to "BOTH OUT" if RM-4262 is also out.	Standard: Examinee reads NOTE and determines that the note is Not Applicable.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 5	Performance: 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."	Standard: Examinee inserts key and determines RM-4262 is in services and places HS-5099E to "RM-5099 OUT"	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S8 Revision: 4/0

Task Title: Change the Setpoint of the SJAE RM 5099

S T E P # 6	Performance: 4.1.5 PLACE RI-5099 "NORM/SUPV." switch to "SUPV."	Standard: The examinee inserts the key into the "NORM/SUPV." switch and turns it to "SUPV".	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 7	Performance: **NOTE** Fail alarm for SJAE radiation monitor, RM-5099, is a fixed value of 5 seconds with *no* counts input. *Alert* setpoint function is not used.	Standard: Examinee reads and understands NOTE.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S8 Revision: 4/0

Task Title: Change the Setpoint of the SJAE RM 5099

<table>
<tr><td rowspan="3">S T E P
8</td><td>Performance:

4.1.6 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:
a. PRESS “CH 1.”
b. PRESS “0,” “0,” “9.”
c. PRESS “ITEM.”
d. ENTER new value using scientific notation.

Example, If new setpoint is to be 500:
press “5” “0” “0”
press “+”
press “0” “2”
Example, If new setpoint is to be 5000:
press “5” “0” “0”
press “+”press “0” “3”

e. PRESS “ENTER.”
f. PRESS “CH. 1.”</td><td>Standard:

At RC-14D, the examinee performs the following steps on the RM-5099 insert.

a. PRESS “CH 1."
b. PRESS “0," “0," “9."
c. PRESS “ITEM."
d. ENTERS “1” “7” “5”
PRESS “+”
ENTERS “0” “3”
e. PRESS “ENTER”
f. PRESS “CH.1”</td><td>Critical:

Y ☒ N ☐</td><td>Grade:

S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:

You will not have a concurrent verifier. Perform procedure steps as though a concurrent verifier is in agreement with your actions.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">S T E P
9</td><td>Performance:

NOTE: During check source, LED channel activity does not change.</td><td>Standard:

Examinee reads and understands NOTE.</td><td>Critical:

Y ☐ N ☒</td><td>Grade:

S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

PERFORMANCE INFORMATION

JPM Number: S8 Revision: 4/0

Task Title: Change the Setpoint of the SJAE RM 5099

STEP #10	Performance: 4.1.7 PRESS "C/S" button and CHECK button is lit.	Standard: Examinee presses "C/S" button and checks that it is lit.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #11	Performance: 4.1.8 WHEN one minute has elapsed, CHECK the following: • "C/S" light is not lit • LED channel activity resumes • "CH 1" light, lit	Standard: After one minute the examinee checks: • "C/S" light is not lit • LED channel activity resumes • "CH 1" light, lit	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #12	Performance: **NOTE**: If "CH 1" light is *not* lit and "ERROR" light is lit, SJAE radiation monitor, RM-5099 is *not* operational and I&C Department must be notified.	Standard: Examinee reads and understands NOTE.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S8 Revision: 4/0

Task Title: Change the Setpoint of the SJAE RM 5099

STEP #13	Performance: 4.1.9 If "CH 1" light is *not* lit and "ERROR" light is lit, NOTIFY I&C Department.	Standard: Examinee observes "CH 1" light is lit and "ERROR light is not lit, and notes step is not applicable.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #14	Performance: 4.1.10 PERFORM the following to verify alarm setpoint: a. PRESS "CH. 1" (Current activity displayed). b. ENTER item number "0", "0", "9". c. PRESS "ITEM" (Setpoint displayed). d. PRESS "CH. 1" (Current activity displayed).	Standard: Examinee verifies the alarm setpoint as follows: a. PRESS "CH. 1" (Current activity displayed). b. ENTER item number "0", "0", "9". c. PRESS "ITEM" (Setpoint displayed as 1750 CPM). d. PRESS "CH. 1" (Current activity displayed).	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #15	Performance: 4.1.11 IF desired setpoint is not displayed, Go To step 4.1.6.	Standard: Examinee notes that desired setpoint of 1750 CPM is displayed and determines this step is not applicable. If the setpoint is not the desired 1750 CPM, goes to step 4.1.6 to re-enter the desired setpoint.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S8 Revision: 4/0

Task Title: Change the Setpoint of the SJAE RM 5099

STEP #16	Performance: 4.1.12 PLACE RI-5099 "NORM/SUPV." switch to "NORM."	Standard: Examinee places RI-5099 "NORM/SUPV." switch to "NORM."	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #17	Performance: 4.1.13 Position "RADMONITOR BYPASS, HS-5099E" switch as follows: a. IF RM-4262 is in service, PLACE HS-5099E in "NORMAL." b. IF RM-4262 is out of service, PLACE HS-5099E in "RM-4262 OUT."	Standard: Examinee notes that RM-4262 is in service and places HS-5099E in "NORMAL." Step 4.1.13.b. is not applicable.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S8 Revision: 4/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: S8 Revision: 4/0

Initial Conditions:

- The Plant is at 100% power all systems are normal.
- The S/G Blowdown Radmonitor (RM-4262) is in service.

Initiating Cues:

- The US has assigned you to change the setpoint of the SJAE Radmonitor (RM5099) in accordance with, section 4.1 of OP 2383C, Radiation Monitor Alarm Setpoint Control.
- Chemistry has provided an approved "SJAE Radmonitor Setpoint Change Request, SP-2833-007.
- The PPC Setpoint change will be assigned to another person.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Supplying Backup Air to 2-CH-192

JPM Number: P1 Revision: 8

Initiated:

John W. Riley – Signature on File	5/21/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	5/31/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	5/22/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
2006-317	Update JPM to include HUP evaluations and new format	6
08/19/2008	Minor changes due reference procedure step numbering.	7
03/20/2018	JPM was revised for use in the 2018 NRC ILT exam. The number was changed from 045 to P1 to support the NRC preference for numbering. Also ungraded to latest format. Changed reference to EOP 2541, Appendix 40, Aligning Backup Instrument Air, Rev. 001-01. This task is now performed per this reference.	8

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: P1 Revision: 8

Task Title: Supplying Backup Air to 2-CH-192

System: Instrument Air (2332B)

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 10

Task Number(s): 235152

Applicable To: SRO X STA _____ RO X PEO X

K/A Number: 2.1.23 K/A Rating: 4.3/4.4

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

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

Task Standards: At the completion of this JPM, the examinee will have aligned a backup air supply to 2-CH-192 per EOP 2541, Appendix 40.

Required Materials: (procedures, equipment, etc.) EOP 2541, Appendix 40, Aligning Backup Instrument Air, Rev. 001-01 (5/07/2015).

General References: EOP 2541, Appendix 40, Aligning Backup Instrument Air, Rev. 001-01 (5/07/2015).

***** 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. With the exception of the questions at the end, 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: P1 Revision : 8

Initial Conditions: The plant has suffered a loss of Instrument Air.

Initiating Cues: The Unit Supervisor has directed you to supply backup air to 2-CH-192, "RWST to CVCS Isolation" using step 3 of EOP 2541, Appendix 40, Aligning Backup Instrument Air, Attachment 40-A.

Simulator Requirements: N/A

*** * * * 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: P1 Revision: 8

Task Title: Supplying Backup Air to 2-CH-192

START TIME: _____

S T E P # 1	Performance: **NOTE:** The next step places Backup Air Supply System in service for the following (-5-Aux Bldg near letdown HX room): • SI-659, Safety injection minimum flow recirculation header isolation • CH-192, RWST to CVCS isolation	Standard: The Notes are used to provide the information detailing which components are affected by each step and location of B/U Air Bottle. The examinee reads and understands the note that this is the correct step of the procedure to use to align backup air to 2-CH-192.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: Examinee should proceed to step 3.			
S T E P # 2	Performance: IF placing backup air in service for 2-SI-659 and 2-CH-192, PERFORM the following: (-5 Aux Bldg near letdown HX room) a. ADJUST 2-IA-594, backup air PCV to minimum. (full *counterclockwise*).	Standard: Examinee simulates rotating 2-IA-594 full counterclockwise.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: 2-IA-594 is rotated fully in the counterclockwise direction.			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: P1 Revision: 8

Task Title: Supplying Backup Air to 2-CH-192

S T E P # 3	Performance: b. Slowly OPEN 2-IA-602, master stop C- 4A.	Standard: Examinee simulates rotating 2-IA-602 in the counterclockwise direction to a hard stop.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: 2-IA-602 is opened to a hard stop. If asked use pen to indicate bottle pressure ~2000 psig.			
	Comments: Examinee may simulate rotating the valve closed slightly to take the valve off its back seat. This is acceptable.			
S T E P # 4	Performance: c. OPEN 2-IA-593, master stop.	Standard: Examinee simulates rotating 2-IA-593 in the counterclockwise direction to hard stop.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: 2-IA-593 is opened to a hard stop.			
	Comments: Examinee may simulate rotating the valve closed slightly to take the valve off its back seat. This is acceptable.			
S T E P # 5	Performance: d. ADJUST 2-IA-594, backup air PCV clockwise *clockwise* and ESTABLISH 100 psig outlet pressure.	Standard: Examinee simulates turning 2-IA-594 in the clockwise direction, while observing the PCV outlet pressure gauge, until 100 psig is achieved.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: Using a pen show pressure rising to 100 psig and then stabilizing when examinee stops turning valve. Pressure between 50 to 120 psig is acceptable.			
	Comments: Note that the inner (red) pressure scale is psig.			

PERFORMANCE INFORMATION

JPM Number: P1 Revision: 8

Task Title: Supplying Backup Air to 2-CH-192

S T E P # 6	Performance: e. Slowly OPEN 2-IA-596, "MASTER STOP."	Standard: Examinee simulates opening 2-IA-596 by turning it in the counterclockwise direction to a hard stop.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: 2-IA-596 is open to a hard stop.			
	Comments: Examinee may simulate rotating the valve closed slightly to take the valve off its back seat. This is acceptable.			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: P1 Revision: 8

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: P1 Revision: 8

Initial Conditions: The plant has suffered a loss of Instrument Air.

Initiating Cues: The Unit Supervisor has directed you to supply backup air to 2-CH-192, "RWST to CVCS Isolation" using step 3 of EOP 2541, Appendix 40, Aligning Backup Instrument Air, Attachment 40-A.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Local Manual Start of the "A" Diesel Generator

JPM Number: P2A Revision: 11/0

Initiated:

John W. Riley – Signature on File	05/22/18
Developer	Date

Reviewed:

Angelo Leone – Signature on File	05/31/18
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	05/22/18
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
2006-317	Update JPM to include HUP evaluations and new format	7/0
	Modified for LOIT 2008 NRC Exam	8/0
11/13/14 jgr	Modified to upgrade format and add questions.	9/0
07/08/2015 - RJA	Revised to latest format and procedure revision	10
05/22/2018 jwr	The JPM was revised for use in the 2018 NRC ILT exam. The number was changed from 060A/B to P2A and P2B to support the NRC preference for numbering. P2A is for the "A" EDG and P2B is for the "B" EDG. This allows the JPM to be run on the non protected EDG. The validated time was changed to 10 minutes.	11/0

JPM WORKSHEET

Facility: MP 2 Examinee: _____

JPM Number: P2A Revision: 11/0

Task Title: Local Manual Air start of the "A" Diesel Generator

System: Emergency Diesel Generator

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 10

Task Number(s): 235305

Applicable To: SRO X STA _____ RO X PEO _____

K/A Number: 064 A4.06 K/A Rating: 3.9/3.9

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

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

Task Standards: At the completion of this JPM, the examinee will have performed a local manual air start of the "A" Emergency Diesel Generator per EOP 2541, Appendix 23.

Required Materials: (procedures, equipment, etc.) EOP-2541, Appendix 23, Restoring Electrical Power, Attachment 23-C, Energizing 4.16 kV Bus 24C From DG A. Revision 003-00, effective 12/21/17.

General References: EOP-2541, Appendix 23, Restoring Electrical Power, Attachment 23-C, Energizing 4.16 kV Bus 24C From DG A. Revision 003-00, effective 12/21/17.

***** 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. With the exception of the questions at the end, 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: P2A Revision : 11/0

Initial Conditions: The plant has tripped with a loss of Bus 24C due to a failure of A302, "RSS SPLY BKR, 22S3-24C-2"

The "A" Emergency Diesel Generator failed to automatically start.

The US has entered EOP-2541, Appendix 23, Attachment 23-C, to energize 4.16KV Bus 24C from "A" EDG.

"A" Emergency Diesel Generator could NOT be started from the Unit 2 Control Room.

Initiating Cues: The US directs you to perform a local manual air start of the "A" EDG per EOP-2541, Appendix 23, Attachment 23-C, Contingency Action step 8.1.

Simulator Requirements: N/A

Prior to the start of the JPM, discuss with on-shift SM whether the "A" EDG relay panel (TO40, NW side of EDG skid) may be opened for observing the SDR pin position. If the relay panel door CAN NOT be opened, then this step may be simulated.

*** * * * 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: P2A Revision: 11/0

Task Title: Local Manual Air start of "A" D/G

START TIME: _____

S T E P # 1	Performance: **EOP 2541, Appendix 23, Attachment 23-C** 8.1. IF DG A can *not* be started from the Control Room, PERFORM the following to locally start the A DG. a. ENSURE communications established between an operator at DG A and the Control Room.	Standard: • Examinee determines from the Initial Conditions that the "A" D/G CAN NOT be started from the Control Room. • Examinee states that he/she will obtain a set of headphones to use in the "A" D/G room and after arriving in the room, plug the phones into the maintenance jack. (alternately, examinee may use portable phone with headset.)	Critical: Y ☐ N ☒ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐
	Cue: Communications have been established.			
	Comments:			
S T E P # 2	Performance: b. PERFORM the following at the DG A: 1) PRESS "ALARM RESET" pushbutton. (DG Gage Board)	Standard: Examinee locates the "Alarm Reset" pushbutton on the DG Gageboard and simulates momentarily pressing it.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: Alarm Reset button has been pressed.			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: P2A Revision: 11/0

Task Title: Local Manual Air start of "A" D/G

S T E P # 3	Performance: 2) ENSURE the shutdown relay is reset by observing blue pin in center of relay panel is fully extended. (northwest corner of the DG)	Standard: • Examinee opens (or simulates opening) the Relay Panel door, locates the shutdown relay (SDR), and verifies it is reset by observing that the blue pin in the center of the relay is fully extended.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: The blue pin for the Shut Down Relay is fully extended.			
	Comments: Examinee may simulate opening the cabinet door and locating the relay, if required. The SDR is located in the middle of the RELAY CABINET, T040, at the northwest corner of the diesel engine.			
S T E P # 4	Performance: 3) UNLOCK and CLOSE 2-DG-88A, "D/G 12U AIR START VENT HEADER ISOLATION".	Standard: Examinee locates 2-DG-88A, "D/G 12U AIR START VENT HEADER ISOLATION", and simulates opening the lock with a valve lock key, removing the chain, and closing the valve by turning the handwheel clockwise until full inward stem travel and hard stop is met.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: Valve is unlocked. Chain is removed. Valve stem lowered to full in position. Hard stop met.			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: P2A Revision: 11/0

Task Title: Local Manual Air start of "A" D/G

<table>
<tr><td rowspan="3">S T E P
5</td><td>Performance:
c. START the DG by performing the following steps at the same time:
1) TURN the DG A "MAN START-STOP" switch to "START". (C08)
2) Locally PULL AND HOLD the lever on 2-DG-94A "CONTROL AIR 2-DG-92A SUPPY."</td><td>Standard:
• Examinee contacts the Control Room and coordinates with the BOP operator to place the DG A "MAN START-STOP" switch in the "START" position on C-08 until the "A" Emergency Diesel Generator starts.
• The examinee locates 2-DG-94A and simulates pulling back and holding the associated lever at the same time the BOP operator places the DG A "MAN START-STOP" switch in the "START" position on C-08.</td><td>Critical:
Y ☒ N ☐
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:
• Acknowledge the request to turn the DG A "MAN START-STOP" switch to "START".
• Report that the switch is in "START".
• The lever has been pulled back and air is bleeding off.
• The loud noise in the room indicates the Emergency Diesel Generator is running.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">S T E P
6</td><td>Performance:
d. <u>WHEN</u> the DG has started, RELEASE the lever on DG-94A.</td><td>Standard:
Examinee releases the lever.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:
The lever is back to its normal position.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

PERFORMANCE INFORMATION

JPM Number: P2A Revision: 11/0

Task Title: Local Manual Air start of "A" D/G

S T E P # 7	Performance: e. OPEN and LOCK 2-DG-88A, "D/G 12U AIR START VENT HEADER ISOLATION".	Standard: • Examinee simulates opening 2-DG-88A, "D/G 12U AIR START VENT HEADER ISOLATION", by turning the handwheel counterclockwise until full outward stem travel and hard stop is met. • Examinee simulates installing the chain on the valve and locking it.	Critical: Y ☐ N ☒ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐
	Cue: • The valve stem is fully out to a hard stop. • The chain is installed and locked.			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: P2A Revision: 11/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	10	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: P2A Revision: 11/0

Initial Conditions:

- The plant has tripped with a loss of Bus 24C due to a failure of A302, "RSS SPLY BKR, 22S3-24C-2"
- The "A" Emergency Diesel Generator failed to automatically start.
- The US has entered EOP-2541, Appendix 23, Attachment 23-C, to energize 4.16KV Bus 24C from "A" EDG.
- The "A" Emergency Diesel Generator could NOT be started from the Unit 2 Control Room.

Initiating Cues: The US directs you to perform a local manual air start of the "A" EDG per EOP-2541, Appendix 23, Attachment 23-C, Contingency Action step 8.1.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Local Manual Start of the "B" Diesel Generator

JPM Number: P2B Revision: 11/0

Initiated:

John W. Riley – Signature on File	05/22/18
Developer	Date

Reviewed:

Angelo Leone – Signature on File	05/31/18
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	05/22/18
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
2006-317	Update JPM to include HUP evaluations and new format	7/0
	Modified for LOIT 2008 NRC Exam	8/0
11/13/14 jgr	Modified to upgrade format and add questions.	9/0
07/08/2015 - RJA	Revised to latest format and procedure revision	10
05/22/2018 jwr	The JPM was revised for use in the 2018 NRC ILT exam. The number was changed from 060A/B to P2A and P2B to support the NRC preference for numbering. P2A is for the "A" EDG and P2B is for the "B" EDG. This allows the JPM to be run on the non protected EDG. The validated time was changed to 10 minutes.	11/0

JPM WORKSHEET

Facility: MP 2 Examinee: _____

JPM Number: P2B Revision: 11/0

Task Title: Local Manual Air start of the "B" Diesel Generator

System: Emergency Diesel Generator

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 10

Task Number(s): 235305

Applicable To: SRO X STA _____ RO X PEO _____

K/A Number: 064 A4.06 K/A Rating: 3.9/3.9

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

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

Task Standards: At the completion of this JPM, the examinee will have performed a local manual air start of the "B" Emergency Diesel Generator per EOP 2541, Appendix 23.

Required Materials: (procedures, equipment, etc.) EOP-2541, Appendix 23, Restoring Electrical Power, Attachment 23-F, Energizing 4.16 kV Bus 24D From DG B. Revision 003-00, effective 12/21/17.

General References: EOP-2541, Appendix 23, Restoring Electrical Power, Attachment 23-F, Energizing 4.16 kV Bus 24D From DG B. Revision 003-00, effective 12/21/17.

***** 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. With the exception of the questions at the end, 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: P2B Revision : 11/0

Initial Conditions: The plant has tripped with a loss of Bus 24D due to a failure of A411, "RSS SPLY BKR, 22S3-24D-2"

The "B" Emergency Diesel Generator failed to automatically start.

The US has entered EOP-2541, Appendix 23, Attachment 23-F, to energize 4.16KV Bus 24D from "B" EDG.

"B" Emergency Diesel Generator could NOT be started from the Unit 2 Control Room.

Initiating Cues: The US directs you to perform a local manual air start of the "B" EDG per EOP-2541, Appendix 23, Attachment 23-F, Contingency Action step 8.1.

Simulator Requirements: N/A

Prior to the start of the JPM, discuss with on-shift SM whether the "B" EDG relay panel (TO41, NW side of EDG skid) may be opened for observing the SDR pin position. If the relay panel door CAN NOT be opened, then this step may be simulated.

*** * * * 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: P2B Revision: 11/0

Task Title: Local Manual Air start of "B" D/G

START TIME: _____

S T E P # 1	Performance: **EOP 2541, Appendix 23, Attachment 23-F** 8.1. IF the DG B can *not* be started from the Control Room, PERFORM the following to locally start the B DG. a. ENSURE communications established between an operator at DG B and the Control Room.	Standard: • Examinee determines from the Initial Conditions that the "B" D/G CAN NOT be started from the Control Room. • Examinee states that he/she will obtain a set of headphones to use in the "B" D/G room and after arriving in the room, plug the phones into the maintenance jack. (alternately, examinee may use portable phone with headset.)	Critical: Y ☐ N ☒ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐
	Cue: Communications have been established.			
	Comments:			
S T E P # 2	Performance: b. PERFORM the following at the DG B: 1) PRESS "ALARM RESET" pushbutton. (DG Gage Board)	Standard: Examinee locates the "Alarm Reset" pushbutton on the DG Gageboard and simulates momentarily pressing it.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: Alarm Reset button has been pressed.			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: P2B Revision: 11/0

Task Title: Local Manual Air start of "B" D/G

S T E P # 3	Performance: 2) ENSURE the shutdown relay is reset by observing blue pin in center of relay panel is fully extended. (northwest corner of the DG)	Standard: • Examinee opens (or simulates opening) the Relay Panel door, locates the shutdown relay (SDR), and verifies it is reset by observing that the blue pin in the center of the relay is fully extended.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: The blue pin for the Shut Down Relay is fully extended.			
	Comments: Examinee may simulate opening the cabinet door and locating the relay, if required. The SDR is located in the middle of the RELAY CABINET, T041, at the northwest corner of the diesel engine.			
S T E P # 4	Performance: 3) UNLOCK and CLOSE 2-DG-88B, "D/G 13U AIR START VENT HEADER ISOLATION".	Standard: Examinee locates 2-DG-88B, "D/G 13U AIR START VENT HEADER ISOLATION", and simulates opening the lock with a valve lock key, removing the chain, and closing the valve by turning the handwheel clockwise until full inward stem travel and hard stop is met.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: Valve is unlocked. Chain is removed. Valve stem lowered to full in position. Hard stop met.			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: P2B Revision: 11/0

Task Title: Local Manual Air start of "B" D/G

<table>
<tr><td rowspan="3">S T E P
5</td><td>Performance:
c. START the DG by performing the following steps at the same time:
1) TURN the DG B "MAN START-STOP" switch to "START". (C08)
2) Locally PULL AND HOLD the lever on 2-DG-94B "CONTROL AIR 2-DG-92B SUPPY."</td><td>Standard:
• Examinee contacts the Control Room and coordinates with the BOP operator to place the DG B "MAN START-STOP" switch in the "START" position on C-08 until the "B" Emergency Diesel Generator starts.
• The examinee locates 2-DG-94B and simulates pulling back and holding the associated lever at the same time the BOP operator places the DG B "MAN START-STOP" switch in the "START" position on C-08.</td><td>Critical:
Y ☒ N ☐
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:
• Acknowledge the request to turn the DG B "MAN START-STOP" switch to "START".
• Report that the switch is in "START".
• The lever has been pulled back and air is bleeding off.
• The loud noise in the room indicates the Emergency Diesel Generator is running.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">S T E P
6</td><td>Performance:
d. WHEN the DG has started, RELEASE the lever on DG-94B.</td><td>Standard:
Examinee releases the lever.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:
The lever is back to its normal position.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

PERFORMANCE INFORMATION

JPM Number: P2B Revision: 11/0

Task Title: Local Manual Air start of "B" D/G

STEP #7	Performance:	Standard:	Critical:	Grade:
	e. OPEN and LOCK 2-DG-88B, "D/G 13U AIR START VENT HEADER ISOLATION".	• Examinee simulates opening 2-DG-88B, "D/G 13U AIR START VENT HEADER ISOLATION", by turning the handwheel counterclockwise until full outward stem travel and hard stop is met.	Y ☐ N ☒	S ☐ U ☐
		• Examinee simulates installing the chain on the valve and locking it.	Y ☐ N ☒	S ☐ U ☐
	Cue: • The valve stem is fully out to a hard stop. • The chain is installed and locked.			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: P2B Revision: 11/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	10	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: P2B Revision: 11/0

Initial Conditions:

- The plant has tripped with a loss of Bus 24D due to a failure of A411, "RSS SPLY BKR, 22S3-24D-2"
- The "B" Emergency Diesel Generator failed to automatically start.
- The US has entered EOP-2541, Appendix 23, Attachment 23-F, to energize 4.16KV Bus 24D from "B" EDG.
- The "B" Emergency Diesel Generator could NOT be started from the Unit 2 Control Room.

Initiating Cues: The US directs you to perform a local manual air start of the "B" EDG per EOP-2541, Appendix 23, Attachment 23-F, Contingency Action step 8.1.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Local Manual Operation of the Turbine Driven Auxiliary Feedwater Pump (Alternate Path)

JPM Number: P3 Revision: 2/0

Initiated:

John W. Riley – Signature on File	05/23/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	05/31/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	05/30/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
None 04/17/2009	Developed from JPM085 as an Alternate Path JPM for the 2008 LOIT Audit exam, designated as JPM085A REV 0 modified to new JPM format.	0
JWR 07/08/2011	New Template and minor editorial changes	0/1
JWR 08/07/2012	Format change on verification of JPM completion page. Incorporated minor editorial changes. Validation completed 08/07/2012.	0/2
07/14/2015 - RJA	Revised JPM to newest template and latest procedure revision.	1
05/23/2018	Replaced NUTIMS task number with VISION task number. The number was changed from 085A to P3 to support the NRC preference for numbering. Made editorial changes. Added statement about checking room temperature prior to running this JPM to establish acceptable stay and rest times.	2/0

JPM WORKSHEET

Facility: MP 2 Examinee: _____

JPM Number: P3 Revision: 2/0

Task Title: Local Manual Operation of the Turbine Driven Auxiliary Feedwater Pump (Alternate Path)

System: Auxiliary Feedwater

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 20

Task Number(s): 235306

Applicable To: SRO X STA _____ RO X PEO _____

K/A Number: 054 AA1.02 K/A Rating: 4.4/4.4

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 simulated manually starting the turbine driven AFW pump locally.

Required Materials: (procedures, equipment, etc.) EOP 2541, Standard Appendix 7, TDAFW Pump Abnormal Startup. Revision 001-00. Effective 12/29/16.

General References: EOP 2541, Standard Appendix 7, TDAFW Pump Abnormal Startup. Revision 001-00. Effective 12/29/16.

***** 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. With the exception of the questions at the end, 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: P3 Revision : 2/0

Initial Conditions:

- The plant has been tripped due to worsening vacuum
- The further vacuum degradation resulted in the loss of both SGFPs.
- DC power is NOT available to the TDAFW Pump due to an electrical fault.
- Both electric auxiliary feedwater pumps have been lost.
- The shift is in EOP 2540, "Functional Recovery."
- SG levels are at 220 inches and lowering.
- Auxiliary feedwater piping integrity has been verified satisfactory.
- TDAFW Pump area temperature is less than 120°F.

Initiating Cues: The Unit Supervisor has directed you to locally start the Turbine Driven Auxiliary Feed Pump starting at Step 3 of EOP 2541, Appendix 7. Attempts to start the TDAFW Pump, in steps 1 and 2 of Appendix 7, were unsuccessful due to the electrical fault.

Simulator Requirements: N/A

The room temperature should be checked prior to running this JPM to establish stay times. Plant areas can be very warm in the summer months.

*** * * * 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: P3 Revision: 2/0

Task Title: Local Manual Operation of the Turbine Driven Auxiliary Feedwater Pump (Alternate Path)

START TIME: _____

S T E P # 1	Performance: **EOP 2541, Appendix 7** NOTE: The following equipment may be required to perform the following step: • 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.	Standard: Examinee reads and acknowledges the Note.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: P3 Revision: 2/0

Task Title: Local Manual Operation of the Turbine Driven Auxiliary Feedwater Pump (Alternate Path)

S T E P # 2	Performance: 3. IF DC power is not available, PERFORM the following: a. DIRECT a PEO to obtain portable pyrometer. b. DETERMINE TDAFW pump area temperature. c. IF TDAFW pump area temperature is less than 120 °F, Go To Step 3.e. d. IF TDAFW pump area temperature is between 120 °F to 150 °F, PERFORM the following: 1) NOTIFY EMTs of pending entry. 2) INITIATE use of Ice Vest and gloves.	Standard: Based on the initiating cue, the examinee states that the TDAFW Pump area temperature is less than 120°F, and proceeds to Step 3.e.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: P3 Revision: 2/0

Task Title: Local Manual Operation of the Turbine Driven Auxiliary Feedwater Pump (Alternate Path)

S T E P # 3	Performance: e. Slowly OPEN MS-464, "TERRY TURBINE AUX FEED PUMP STEAM SUPPLY."	Standard: • Examinee simulates opening MS-464 by pushing down on the manual clutch lever and rotating the handwheel in the counterclockwise direction. • Examinee determines that the Turbine Driven Aux Feed Pump has tripped on overspeed.	Critical: Y ☒ N ☐ Y ☒ N ☐	Grade: S ☐ U ☐ S ☐ U ☐
	Cue: • The manual lever is pushed down and the valve stem is rising as the handwheel is rotated. • You hear the sound of steam passing and the terry-turbine rotating. • **Then you hear a chugging sound followed by a rapid rise in pitch of the steam flow**. You hear a 'clunk' followed by the sound of the TDAFP slowing to a stop. • You observe that the latch collar on Steam Supply Valve, MS-464 has fallen and the overspeed trip mechanism has shifted position.			
	Comments: The TDAFW pump tripped on overspeed. Contingency Actions are required to attempt to restart the TDAFW pump.			
S T E P # 4	Performance: **Contingency Action** e.1 IF the TDAFW pump trips on overspeed, PERFORM the following: 1) ADJUST the governor speed control knob to minimum speed.	Standard: • Examinee proceeds to Contingency Action e.1. • Examinee checks the speed control knob at 0.0 or rotates the governor speed control knob in the counterclockwise direction to obtain a reading of 0.0.	Critical: Y ☐ N ☒ Y ☒ N ☐	Grade: S ☐ U ☐ S ☐ U ☐
	Cue: The governor speed control knob is now where you see it (at minimum).			
	Comments: The governor speed control knob should be at 0.0.			

PERFORMANCE INFORMATION

JPM Number: P3 Revision: 2/0

Task Title: Local Manual Operation of the Turbine Driven Auxiliary Feedwater Pump (Alternate Path)

STEP #5	Performance: 2) CLOSE MS-464, "TERRY TURBINE AUX FEED PUMP STEAM SUPPLY."	Standard: Examinee simulates closing MS-464 by pushing down on the manual clutch lever and rotating the handwheel in the clockwise direction.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: Manual lever is pushed down. Handwheel rotated in the clockwise direction. The handwheel comes to a hard stop after several turns.			
	Comments:			
STEP #6	Performance: 3) OPEN MS-436, "LS-4590 INSTRUMENT DRAIN."	Standard: Examinee simulates opening MS-436 by rotating the handwheel in the counterclockwise direction until motion stops.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: The valve is rotated in the counterclockwise direction to the hard stop.			
	Comments:			
STEP #7	Performance: 4) Slowly OPEN MS-447, "LS-4590 INSTRUMENT BACKUP DRAIN."	Standard: Examinee simulates slowly opening MS-447 by rotating the handwheel in the counterclockwise direction until motion stops.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: • When rotated in the counterclockwise direction, the handwheel comes to a hard stop after several turns. • Several gallons of water have drained, • The drain is now passing steam.			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: P3 Revision: 2/0

Task Title: Local Manual Operation of the Turbine Driven Auxiliary Feedwater Pump (Alternate Path)

STEP #8	Performance: 5) WHEN the condensate has drained from the steam line drip leg, CLOSE BOTH MS-436 and MS-447.	Standard: One at a time, the examinee simulates closing MS-447 and MS- 436 by rotating their handwheel in the clockwise direction until motion stops.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: Valves simulated being operated are rotated clockwise to the hard stop.			
	Comments:			
STEP #9	Performance: 6) RESET the TDAFW pump mechanical overspeed trip latch.	Standard: Examinee simulates pulling the latch mechanism arm (from left side) or push latch mechanism arm (from right side) to reestablish engagement of the latch mechanism arm with the latch collar on MS-464 and the manual trip lever on the overspeed trip device.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: Overspeed Trip Latch is reset.			
	Comments:			
STEP #10	Performance: 7) Go To Step 3.e.	Standard: Examinee proceeds to step 3.e	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: P3 Revision: 2/0

Task Title: Local Manual Operation of the Turbine Driven Auxiliary Feedwater Pump (Alternate Path)

STEP #11	Performance: e. Slowly OPEN MS-464, "TERRY TURBINE AUX FEED PUMP STEAM SUPPLY."	Standard: Examinee simulates opening MS-464 by pushing down on the manual clutch lever and slowly rotating the handwheel in the counterclockwise direction.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: • Manual lever is pushed down. Valve handwheel is rotated in counterclockwise direction. Valve stem is rising. • You hear the sound of steam and the sound of the terry-turbine coming up to a stable pitch.			
	Comments:			
STEP #12	Performance: f. IF SI-4194B, "S/G AUXFEED PUMP TURBINE SPEED INDICATOR" is available, MAINTAIN TDAFP at 1400 to 1600 rpm using the governor speed control knob. (C144)	Standard: Examine observes SI-4194B, "S/G AUXFEED PUMP TURBINE SPEED INDICATOR" and maintains TDAFP at 1400 to 1600 rpm using the governor speed control knob. (C144)	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: SI-4194B is reading 1500 RPM.			
	Comments: SI-4194B is powered from VR-21.			

PERFORMANCE INFORMATION

JPM Number: P3 Revision: 2/0

Task Title: Local Manual Operation of the Turbine Driven Auxiliary Feedwater Pump (Alternate Path)

STEP #13	Performance:	Standard:	Critical:	Grade:
	g. WHEN TDAFW pump parameters have stabilized, ADJUST governor speed control knob to maintain TDAFW pump discharge pressure 50 to 150 psi above steam generator pressure, as indicated by BOTH the following: (C144) • "PI-5284-1, TERRY TURBINE AUX F/P DISCH PRESSURE INDICATOR" • "PI-4190-1, TERRY TURBINE STEAM SUPPLY PRESSURE INDICATOR"	When TDAFW pump parameters have stabilized, the examinee simulates turning the governor speed control knob in the clockwise direction until Pump discharge pressure, PI-5284-1, indicates 50 - 150 psig higher than steam supply pressure, PI-4190-1.	Y ☒ N ☐	S ☐ U ☐
	Cue: • Steam inlet pressure gage (PI-4190-1, TERRY TURBINE STEAM SUPPLY PRESSURE INDICATOR) indicates current S/G pressure • Terry Turbine discharge pressure (PI-5284-1, TERRY TURBINE AUX F/P DISCH PRESSURE INDICATOR) indicates 150 psi when speed is 1500 rpm. • Using a pen show discharge pressure on the pump rising until the examinee stops adjusting the governor speed control knob.			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: P3 Revision: 2/0

Date Performed: _____

Student: _____

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.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	20	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2		☐ SAT ☐ UNSAT	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: P3 Revision: 2/0

Initial Conditions:

- The plant has been tripped due to worsening vacuum.
- The further vacuum degradation resulted in the loss of both SGFPs.
- DC power is NOT available to the TDAFW Pump due to an electrical fault.
- Both electric auxiliary feedwater pumps have been lost.
- The shift is in EOP 2540, "Functional Recovery."
- SG levels are at 220 inches and lowering.
- Auxiliary feedwater piping integrity has been verified satisfactory.
- TDAFW Pump area temperature is less than 120°F.

Initiating Cues: The Unit Supervisor has directed you to locally start the Turbine Driven Auxiliary Feed Pump starting at Step 3 of EOP 2541, Appendix 7. Attempts to start the TDAFW Pump, in steps 1 and 2 of Appendix 7, were unsuccessful due to the electrical fault.

SIMULATOR SCENARIO #1

Facility: Millstone Unit 2 Scenario No.: 1 Op-Test No.: ES18LI1

Examiners: _____ Operators: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: 100% Power IC-21, No Equipment OOS, Ch-Y PZR Level in service.

Turnover: 100% Power, steady state, no equipment OOS. 24E is aligned to 24C. SP 2654B, ***Forcing Pressurizer Sprays***, is ready to be performed.

Critical Tasks:

1. [SPTA-5] Manually shutdown the reactor.
2. [ESDE-2] Establish RCS temperature control (BOP).
3. [ESDE-6] Isolate the most affected SG (BOP).
4. [ESDE-7] Maintain containment temperature and pressure control (ATC).

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (ATC/S)	Force Pressurizer Sprays (per SP 2654B).
2	CH01A	C (ATC/S) TS (S)	Trip "A" Containment Air Recirc. Fan.
3	RD0108	C (BOP/S) TS (S)	CEA #8 drops fully into the core. Reduce turbine load and stabilize RCS temperature.
4	N/A	R (All)	Downpower to < 70% per AOP 2575.
5	05A1A2S23, C06/7-D01A, TPHA-6282A_3	C (BOP/S)	Trip of "A" TBCCW Pump, requires manual start of the standby TBCCW Pump.
6	RD0128	C (ATC/S)	2nd rod drop (RG-1 #28), requires a reactor trip.
7	MS01A, ED05C	M (ALL)	ESD in CTMT #1 S/G and loss of 24C on plant trip.
8	ES03L	I (ATC/S)	Failure of "B" CS Pump and Valve to trigger on CSAS.

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

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

Scenario 1 Summary:

The crew will take the shift with the unit at 100% power, steady state, with no equipment out of service (IC-21). The crew has been instructed to perform surveillance SP 2654B, Forcing Pressurizer Sprays.

Event 1: Upon taking the shift, the crew has been instructed to perform surveillance SP 2654B, ***Forcing Pressurizer Sprays***, to equalize RCS and pressurizer boron concentration. Once the surveillance is started and pressurizer pressure has been stabilized, Event 2 will be triggered.

Event 2: The "A" Containment Air Recirculation Fan, F-14A, will trip, triggering the CAR Fan Trip annunciator. The ATC should respond per ARP 2590A-009, ***CTMT AIR RECIRC FAN A TRIP*** and OP 2313A, ***Containment Air Recirculation and Cooling System***, to start the standby CAR fan in fast mode and properly align RBCCW flow to the fan's heat exchanger. The US should evaluate the lost CAR fan impact on Tech. Specs. Once this is accomplished, or at the examiners discretion, Event 3 will be triggered.

Event 3: Shutdown Group "B" CEA #8 will drop to the fully inserted position (0 steps withdrawn). The ATC should diagnose that one, and only one, CEA has dropped and the BOP should take the IOA of lowering main turbine load to stabilize RCS temperature. The crew will enter AOP 2585, ***Immediate Operator Actions***, then transition to AOP 2556, ***CEA Malfunctions***, and begin the process of recovering the dropped CEA. The US should also note the dropped rod impact on Tech. Specs.

Event 4: Per Technical Specifications, reactor power is required to be lowered to < 70% within one hour of the rod drop. This will required the crew to perform a plant downpower using AOP 2575, ***Rapid Downpower***. Once the power change evaluation is completed, or at the examiners discretion, Event 5 will be triggered.

Event 5: "A" TBCCW pump will trip, but the standby pump does not automatically start. The crew must manually start the standby TBCCW pump before the Main Turbine trips on high Stator Water Cooling temp. Once TBCCW system flow is restored to normal, or at the examiners discretion, Event 6 is triggered.

Event 6: Regulating Group 1, CEA #28 will drop into the core before the crew has a chance to recover the first dropped CEA. The MP2 core has not been analyzed for more than one CEA violating the Tech. Spec. alignment requirements, therefore, a manual plant trip is required IAW AOP 2556, ***CEA Malfunctions***. The crew should then manually trip the plant and commence EOP 2525, ***Standard Post Trip Actions.***

Event 7: On the trip, an Excess Steam Demand Event will occur in containment and vital 4.16 kV bus 24C will de-energize due to a bus fault. During the performance of SPTA, the ATC should secure "A" & "C" RCPs and manually initiate SIAS, CIAS, EBFAS and MSI if not yet triggered automatically. The BOP should trip the "A" Emergency Diesel Generator and secure all feedwater to the #1 SG.

Event 8: When containment pressure reaches the CSAS setpoint, the CSAS signal will fail to start the "B" Containment Spray Pump or open the CS Pump discharge valve to containment. This, combined with the loss of Facility 1 power, will require the ATC to manually start the "B" CS pump and open the "B" CS valve.

The scenario will end when the crew has isolated the affected Steam Generator IAW EOP 2536, ***Excess Steam Demand Event***, or at the Examiners discretion.

INPUT SUMMARY							
Either INPUT or VERIFY the following functions:							
ID Num	Description	Delay Time	Ramp Time	Event Trigger	Severity or Value	Final Value	Relative Order
MALFUNCTIONS							
CH01A	"A" CAR Fan, F-14A, trip			E-2	Active		1
RD0108	CEA #8 Dropped Rod			E-3	Active		2
C06-D01A	TBCCW Pump Trip alarm C06/7-DA1			E-5	CRY-WOLF		3
RD0128	CEA #28 Dropped Rod			E-6	Active		4
MS01A	Main Steam Rupture "A" Header on trip			E-30	3.04		5
ED05C	Loss of 24C on the trip		1 min	E-30	Active		5
ES03L	ESAS Act. Mod. AM-609/610 failure when RCS Tavg < 518°F			E-22	Active		6
REMOTE FUNCTIONS							
OVERRIDES							
05A1A2S23	"A" TBCCW Pump at **first** STOP			E-5	STOP		3
TPHS-6282A_3	"A" TBCCW Pump Amber light lit			E-5	A		3

Op-Test No.: __ES18LI1___ Scenario No.: __1__ Event No.: _1__ Event Description: Force Pressurizer Sprays		
Time	**Position**	**Applicant's Actions or Behavior**
Examiner Note: **The following steps are from SP 2654B, *Forcing Pressurizer Sprays*. The crew will pre-stage with a review of the applicable procedure and surveillance form.**		
	ATC	4.3.1 RECORD *one* of the following from PIC-100Y, "PRESS CNTL-Y" on SP 2654B-001 (C-03): • Controller setpoint (black and white arrow) • Controller output signal 4.3.2 RECORD pressurizer pressure on SP 2654B-001 (PPC or C-03).
	ATC	**NOTE** PZR. PRESSURE SELECTED CHANNEL DEVIATION HI/LO, C-02/03 D-37, is an expected alarm while forcing sprays. **Note about expected alarm discussed with US** 4.3.3 PLACE all *available* pressurizer "BACKUP HTR" groups handswitches to "CLOSE" (C-03). 4.3.4 *Slowly* LOWER selected pressure controller setpoint to obtain the following: • Pressurizer controller output signal 40% - 50% • HIC-100E, "PZR SPRAY-1A," controller output signal starts to rise • HIC-100F, "PZR SPRAY-1B," controller output signal starts to rise
	ATC	**NOTE** Sample isolation valves 2-RC-003 and 2-RC-045 not being closed, which occurs during steam space venting, currently drives the RCS Leak Rate Calculation to NOT VALID status. VALID status will not be displayed until four hours after both of these valves are closed. 4.3.5 REQUEST Chemistry to establish, monitor, and adjust as required, the pressurizer steam space vent path to the VCT.
<u>Simulator Operator</u>: When Chemistry is called, report steam space vent path open and monitored.		
		4.3.6 RECORD start date and time on SP 2654B-001. 4.3.7 To maintain pressurizer pressure recorded on SP 2654B-001 in step 4.3.2, ADJUST PIC-100Y, "PRESS CNTL-Y." (C03)

Op-Test No.: __ES18LI1___ Scenario No.: __1__ Event No.: _1__ Event Description: Force Pressurizer Sprays		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	4.3.8 WHEN pressurizer spray has been forced for a minimum of two hours, PERFORM the following: a. REQUEST Chemistry to secure pressurizer steam space vent path to the VCT. b. PLACE all *available* "BACKUP HTR" group handswitches to "TRIP" (C-03). c. RAISE controller setpoint to achieve value recorded in step 4.3.1. d. RECORD stop date and time on SP 2654B-001. e. DOCUMENT Acceptance Criteria results "SAT" or "UNSAT" on SP 2654B-001 and INITIAL. f. To maintain pressurizer pressure recorded on SP 2654B-001 in step 4.3.2, ADJUST PIC---100Y, "PRESS CNTL-Y" (C03). **Examiner Note:** This step is N/A due to time constraints of the scenario.
Examiner Note: When the RO reports to the US that PZR Sprays are being forced, or at the lead examiner's direction, proceed to Event #2, Trip of "A" Containment Air Recirc Fan.		

Op-Test No.: __ES18LI1___ Scenario No.: __1__ Event No.: _2__ Event Description: "A" Containment Air Recirc Fan Trip		
Time	**Position**	**Applicant's Actions or Behavior**

Simulator Operator: When directed, initiate Event #2, "A" Containment Air Recirc Fan Trip.		
Indications Available: • **CTMT AIR RECIRC FAN A TRIP (C-01, A-3).**		
Examiner Note: The following steps are from ARP 2590A-009, *CTMT AIR RECIRC FAN A TRIP*.		
	ATC	**AUTOMATIC FUNCTIONS** 1. None **CORRECTIVE ACTIONS** 1. Refer To OP 2313A, "Containment Air Recirculation and Cooling System," and PERFORM applicable actions to start idle CAR fan.
Simulator Operator: If asked to investigate and determine the status of "A" CTMT Recirc Fan breaker, wait 10 min., report the breaker appears tripped on overcurrent, no indication of any other problem.		
Examiner Note: The following steps are from OP 2313A, *Containment Air Recirculation and Cooling System*.		
		4.4 Operation of "D" CAR Fan
	N/A	4.4.1 IF starting "D" CAR fan in slow speed, PERFORM the following: a. ENSURE the following, open (C-01): • RB-28.2D, "NORM OUTLET" • RB-28.3D, "EMERG OUTLET" b. ENSURE RB-28.1D, "CLR D INLET," locked open (C-01). c. CHECK "B" RBCCW header flow less than 8,000 gpm (C-06, PPC). d. PLACE "D" CAR fan to "START LOW PULL TO LOCK" and OBSERVE red "SLOW SPEED" indicating light, lit (C-01). e. IF "D" CAR fan high vibration alarm annunciates, PRESS "CAR FAN VIB RESET B & D" button (C-01).
Examiner Note: The "D" CAR fan should be started in "fast" speed, making step 4.4.1 N/A.		

Op-Test No.: ES18LI1 Scenario No.: 1 Event No.: 2		
Event Description: "A" Containment Air Recirc Fan Trip		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	4.4.2 IF starting "D" CAR fan in fast speed, PERFORM the following: a. ENSURE the following, open (C-01): • RB-28.2D, "NORM OUTLET" • RB-28.3D, "EMERG OUTLET" b. ENSURE RB-28.1D, "CLR D INLET," locked open (C-01). c. CHECK "B" RBCCW header flow less than 8,000 gpm (C-06, PPC). d. PLACE "D" CAR fan to "START HIGH" and OBSERVE red "FAST SPEED" indicating light lit (C-01). e. IF "D" CAR fan high vibration alarm annunciates, PRESS "CAR FAN VIB RESET B & D" button (C-01).
Examiner Note: The following steps are continued from ARP 2590A-009.		
	ATC	2. MONITOR Containment atmospheric conditions for increasing pressure, temperature and moisture content (C-01).
	SRO	3. SUBMIT Condition Report to Maintenance Department to investigate cause of fan trip. 4. Refer To Technical Specification LCO 3.6.2.1 and DETERMINE applicability. **NOTE** Loss of multiple pumps or unexpected electrical malfunctions may be indicative of an Open Phase Condition (OPC). For an OPC event, the 6.9 kV and 4,160V busses must be de-energized from the affected power source and re-energized from non-affected source if possible. 5. IF an OPC event is suspected, Refer To ARP 2590F-021, "GENERATOR NEGATIVE PHASE SEQUENCE (A-6)," for OPC guidance (even if alarm is not lit) (C-08).
Examiner Note: Per the Note in ARP 2590F-021, (C-06/7 A-6), an OPC event must not have occurred because the plant would have tripped.		

Op-Test No.: __ES18LI1___ Scenario No.: __1__ Event No.: _2__ Event Description: "A" Containment Air Recirc Fan Trip		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	**Review Tech. Specs. 3.6.2.1 and Determine applicability**: **LCO 3.6.2.1:** 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. **APPLICABILITY**: MODES 1, 2 and 3 **ACTION**: Per the table: **Inoperable Equipment:** b. One containment cooling train **Required Action:** b.1 Restore the inoperable containment cooling train to OPERABLE status within 7 days or be in HOT SHUTDOWN within the next 12 hours. **Examiner Note: SRO should note TSAS 3.6.2.1, Action b. applies and requires the "A" CAR fan be returned to OPERABLE status within the TSAS.**
Examiner Note: When the "A" CAR fan trip has been mitigated, or at lead examiner's direction, go to Event 3, Dropped CEA.		

Op-Test No.: __ES18LI1___ Scenario No.: __1__ Event No.: _3__ Event Description: CEA # 8 Drops to the Fully Inserted Position.		
Time	**Position**	**Applicant's Actions or Behavior**

Simulator Operator: When directed, initiate Event 3, Dropped CEA (SD CEA #8).		
Key Indications Available for the dropped CEA: • **Red bar for CEA #8 on the CEAPDS display for Shutdown Group "B".** • **Amber and green LEDs lit for CEA #8 on the Core Mimic.** • **Various CEA group deviation annunciator alarms (C04).**		
Examiner Note: The following steps are from AOP 2585, *Immediate Operator Actions*, (Dropped CEA)		
	BOP/SRO	The following steps should be performed from memory as soon as the dropped CEA is identified. 8.0 Dropped CEA [8.1] CHECK only one CEA dropped. [8.2] Using "LOAD/SPEED CONTROL" switch, LOWER main turbine load to stabilize Tc (C- 07). [8.3] Slowly RESTORE Tc within +/ - 2°F of program. 8.4 Go To AOP 2556, "CEA Malfunctions."
	SRO	Entering AOP 2556, *CEA Malfunctions*
Examiner Note: The following steps are from AOP 2556, *CEA Malfunctions*		
	SRO	**REACTOR TRIP CRITERIA** **IF** Any Of The Following Conditions Exist: • Two or more CEAs are dropped. **OR** • One CEA is dropped, **AND** one or more CEAs are misaligned greater than 10 steps, but less than 20 steps. **OR** • Two or more CEAs are Untrippable **THEN TRIP** the Reactor. **AND** **GO TO** EOP 2525, Standard Post Trip Actions. **CONTINUOUS ACTION PAGE FOR AOP 2556** **NONE**

Op-Test No.: __ES18LI1___ Scenario No.: __1__ Event No.: _3__ Event Description: CEA # 8 Drops to the Fully Inserted Position.		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	**NOTE:** Foldout page shall be monitored throughout this procedure. **NOTE:** A Misaligned CEA is defined as a CEA that is more than 10 steps and less than 20 steps out of position from any other CEA in its respective Group. **NOTE:** A Dropped CEA is defined as a CEA that is GREATER THAN or equal to 20 steps out of position from any other CEA in its respective Group. **NOTE:** An Untrippable CEA can only be determined by the I&C Department.
	SRO	**ACTION/EXPECTED RESPONSE** 1. CHECK Reactor Trip Criteria Met a. CHECK any of the following conditions exist: • Two or more CEAs are dropped **OR** • One CEA is dropped, and one or more CEAs are misaligned GREATER THAN 10 Steps, but less than 20 Steps **OR** • Two or more CEAs are Untrippable b. **TRIP** the Reactor **AND** **GO TO** EOP 2525**,** Standard Post Trip Actions **RESPONSE NOT OBTAINED** **PROCEED TO** Step 2.
	Crew	b. **Stabilize The Plant** a. **STOP** any evolutions in progress b. **CHECK** CEDM Control System, in OFF
Simulator Operator: When sent as PEO to investigate the dropped CEA, wait ~10 minutes then report, "Both ACTM control power supplies appear de-energized and there are NO lights lit on the ACTM."		

Op-Test No.: __ES18LI1___ Scenario No.: __1__ Event No.: _3__ Event Description: CEA # 8 Drops to the Fully Inserted Position.		
Time	**Position**	**Applicant's Actions or Behavior**

	SRO	**ACTION/EXPECTED RESPONSE** **3. Notify The Following Of Plant Conditions:** • I&C Department 1. **DIRECT** I&C Department Technicians to commence troubleshooting using MA-AA-103, Conduct of Troubleshooting, and ATTACHMENT A, CEDS Troubleshooting Plan • Reactor Engineering • OMOC **4. CHECK CEA Dropped Or Misaligned From Any Other CEA In Its Group** **AND** **PROCEED TO** ATTACHMENT D, Dropped or Misaligned CEA SRO proceeds to Attachment D.
Simulator Operator: When called, report as I&C for direction on troubleshooting the dropped CEA. Wait ~10 minutes then report, "Preliminary check shows that both ACTM control power supplies are failed or failing, which by itself would cause the CEA to drop. We have spare power supplies bench tested and ready to install. Estimated time to repair is about 30 minutes." **If simultaneous power supply failure is questioned, reply, "These power supplies are known to occasionally fail. They're scheduled for replacement in an upcoming outage. Two in one CEA was just bad luck"**		
Examiner Note: The following steps are from AOP 2556, Attachment D, *Dropped or Misaligned CEA*		
	Crew	**D.1___ Using LOAD SPEED CONTROL Switch, LOWER Main Turbine Load To Stabilize Tc** **D.2___ Using LOAD SPEED CONTROL Switch, RESTORE Tc Within 2°F Of Program** **D.3___ RECORD CEA Drop Time _____** **D.4___ RECORD CEA number _____** **D.5___ Using** ATTACHMENT F, CEA Positions Data Sheet, **RECORD CEA Positions In Accordance With Tech Spec Surveillance Requirement: 4.1.3.1.1**
	RO	Records all CEA positions on Attachment F

Op-Test No.: __ES18LI1___ Scenario No.: __1__ Event No.: _3__ Event Description: CEA # 8 Drops to the Fully Inserted Position.		
Time	**Position**	**Applicant's Actions or Behavior**

	SRO	**D.6___ CHECK Reactor Power Level** a. **CHECK** Reactor Power GREATER THAN OR EQUAL TO 70% b. **ENTER** T/S LCO, 3.1.3.1, ACTION A.1, **AND** **PERFORM** the following:
	SRO	**Tech. Specs. 3.1.3.1**: **LCO 3.3.1.1 :** All CEAs shall be OPERABLE with each CEA of a given group positioned within 10 steps (indicated position) of all other CEAs in its group, and the CEA Motion Inhibit and the CEA Deviation Circuit shall be OPERABLE. **APPLICABILITY**: MODES $1^{*(1)}$ and $2^{(1)}$. **ACTION**: As shown in Table. **INOPERABLE EQUIPMENT** A. One or more CEAs trippable and misaligned from all other CEAs in its group by > 10 steps and < 20 steps. **OR** One CEA trippable and misaligned from all other CEAs in its group by ≥ 20 steps. **REQUIRED ACTION** A.1 Reduce THERMAL POWER to < 70% of the maximum allowable THERMAL POWER within 1 hour and restore CEA(s) misalignment within 2 hours or otherwise be in MODE 3 within the next 6 hours.
	Crew	1. Using AOP 2575, Rapid Downpower, **REDUCE** power to LESS THAN 70% (between 65 - 68%) within one hour, with only boration **AND** **CONTINUE** with this procedure starting at step D.6.c c. **WHEN** Power has been reduced to LESS THAN OR EQUAL TO 70%, **THEN STOP** Boration **AND** **MAINTAIN** Tc within 2°F of program d. **MARK** time to reach 70%_____
	SRO	US refers to AOP 2575, *Rapid Downpower*.

Op-Test No.: __ES18LI1___ Scenario No.: __1__ Event No.: _4__ Event Description: Rapid Downpower (required for dropped CEA).		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following steps are from AOP 2575, *Rapid Downpower*		
	SRO	Enters AOP 2575, Rapid Downpower
	SRO	3.1 PERFORM focus brief on the following: REACTOR TRIP CRITERIA • Parameters associated with automatic reactor or turbine trips are challenged • RCS T cold *not* within 10°F of temperature program and efforts to regain control are unsuccessful RCS TEMPERATURE CONTROL • RCS T cold to be maintained within 5°F of Attachment 5, "Temperature vs. Power program" using Attachment 9, "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 PERFORM notifications of Unit rapid downpower as follows: a. Announce using plant page (extension 810), that Unit 2 is commencing a rapid downpower, including the reason for the downpower. b. CONTACT Unit 3 Control Room (extension 6200), and REQUEST that they make applicable notifications to OMOC, CONVEX, and ISO-New England.
<u>Simulator Booth</u>: When contacted as Unit 3, reply that all requested contacts will be made.		
	ATC	3.3 INITIATE forcing pressurizer sprays.
		CAUTION In the case of a dropped CEA, rod motion is *not* used to initiate downpower.

Op-Test No.: ES18LI1 Scenario No.: 1 Event No.: 4 Event Description: Rapid Downpower (required for dropped CEA).		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	3.4 IF not downpowering due to a dropped rod, AND Reactor power is greater than 99% (2673 MWTh) 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.		
	SRO	NOTE Attachment 10 "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 9, "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 9 *Main Turbine Load Set Control*		
	BOP	C A U T I O N Operation of the "Load/Speed CONTROL" switch will change turbine load at 600%/hour, and cancel any previous load setpoint. NOTE Steps provided in this attachment are dependent on plant conditions and may be performed in any sequence, and repeated as necessary.

Op-Test No.: __ES18LI1___ Scenario No.: __1__ Event No.: _4__ Event Description: Rapid Downpower (required for dropped CEA).		
Time	**Position**	**Applicant's Actions or Behavior**
	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."
	BOP	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). 3. 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." 4. 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. 5. IF desired load has been reached SELECT "Load Hold."
Examiner Note: The following steps are from AOP 2575 *Rapid Downpower*, Section 3.0 *Rapid Downpower*.		
	SRO	3.8 Based on required rate of downpower, START additional charging pumps as necessary and balance charging and letdown.
	ATC	[ATC "Skill-Of-The-Craft" actions if direct to start a second charging pump] • Selects "LVL-1" position on the Charging Pump Override switch (C-02) • Then adjusts the "Bias" on HIC-110 to balance charging and letdown flow, while monitoring letdown parameters.

Op-Test No.: __ES18LI1___ Scenario No.: __1__ Event No.: _4__ Event Description: Rapid Downpower (required for dropped CEA).		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	3.9 IF desired to borate from the RWST (preferred method), PERFORM the following: 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 **Examiner Note:** Crew should borate from the RWST.
	N/A	3.10 IF desired to borate from the BAST.
	SRO/ATC/ BOP	3.11 During the downpower, Refer To Attachment 1,"Rapid Downpower Parameters," and MAINTAIN parameters as specified throughout downpower: **Examiner Note:** Attachment 1 Rapid Downpower Parameters: • 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 DT 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) • Turbine steam packing rubs can occur at any turbine load. Slow and careful changes in condenser vacuum should be made. (<1 in Hg/hr) • At turbine load >/= 75% (675 MWe), condenser backpressure can be at best available.

Op-Test No.: __ES18LI1___ Scenario No.: __1__ Event No.: _4__ Event Description: Rapid Downpower (required for dropped CEA).		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO/ATC/ BOP	**Examiner Note:** Attachment 1 Rapid Downpower Parameters (cont.): • Between, 25% turbine load (225 MWe) and 75% turbine load (675 MWe), maintain condenser backpressure 2.0 - 4.0 in Hga. • At turbine load </= 25%, (225 MWe), maintain condenser backpressure 2.5 - 4.0 in Hga. • Turbine bearing vibrations should be monitored during power changes. When vibration changes are observed and the situation allows the power change should be stopped until the monoblock rotor is allowed to stabilize.
	SRO/ATC	NOTE 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: Shortly after the power reduction is underway, or at the lead examiner's direction, proceed to Event 5, "A" TBCCW Pump Trip.		

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _5__ Event Description: : "A" TBCCW Pump Trip (No Standby Pump Start)		
Time	**Position**	**Applicant's Actions or Behavior**

Simulator Operator: When directed, initiate Event #5, "A" TBCCW Pump Trip.		
Indications Available: • **TBCCW PP OVERLOAD/TRIP (C-06/7, DA-1)** • **"A" TBCCW Pump red light out and amber light lit (C-06/7 handswitch)**		
Examiner Note: The following steps are from ARP 2590E-007, *TBCCW PP OVERLOAD/TRIP*.		
Simulator Operator: If asked to investigate and determine the status of "A" pump and/or breaker, report that a pump oil globe is empty and the bearing is very hot. Breaker tripped on over current. If asked, TBCCW Surge level is normal, about ¾ full.		
Examiner Note: They may not progress past starting of the standby pump (ARP Step #2) due to the apparent cause of the "A" pump trip.		
	ATC	AUTOMATIC FUNCTIONS • Standby TBCCW Pump starts. **[ATC reports S/B pump did NOT start]**
	ATC	CORRECTIVE ACTIONS 1. DETERMINE if standby TBCCW Pump is operating (C-06). 2. IF standby TBCCW Pump is *not* operating, START TBCCW Pump (C-06). 3. IF standby TBCCW Pump does *not* start, Go To OP 2330B, "TBCCW System," and REVIEW for single TBCCW Pump operation. 4. SEND operator to check TBCCW Surge Tank level. 5. IF TBCCW Surge Tank level is lowering, PERFORM the following: 5.1. OPEN TBCCW surge tank make up valve, 2-PMW-219. 5.2. RESTORE TBCCW surge tank level to 3/4 full in local sightglass. 5.3. WHEN level is at 3/4 full, CLOSE TBCCW surge tank make up valve, 2-PMW-219. 6. SUBMIT Trouble Report to Maintenance Department for pump trip. **NOTE** Loss of multiple pumps, or unexpected electrical malfunctions, may be indicative of an Open Phase Condition (OPC) event. For an OPC event, the 6.9kV and 4,160V busses must be de-energized from the affected power source and re-energized from non-affected source if possible. 7. IF OPC event is suspected, Refer To ARP 2590F-021, "GENERATOR NEGATIVE PHASE SEQUENCE," Window A-6 (C-08), for guidance (even if alarm not in).
Examiner Note: Once the power reduction is complete and the TBCCW pump trip is mitigated, or at the lead examiner's direction, proceed to Event 6, 2nd Dropped CEA (Requires a manual plant trip).		

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _6__ Event Description: Second Dropped CEA and Manual Plant Trip		
Time	**Position**	**Applicant's Actions or Behavior**

Simulator Operator: When directed, initiate Event 6, 2nd Dropped CEA (Requires a Manual Plant Trip).		
Key Indications Available for the second dropped CEA: • **Red bar for CEA #28 on the CEAPDS display for Regulating Group "1".** • **Amber and green LEDs lit for CEA #28 on the Core Mimic.** • **Various CEA group deviation annunciator alarms (C04).**		
Examiner Note: Once the 2nd dropped CEA is identified, the crew should immediately trip the plant IAW AOP 2556, *CEA Malfunction* (previously discussed). No ARPs should be utilized at this time.		
CRITICAL TASK: Manually Shutdown the reactor. The reactor must be manually tripped IAW AOP 2556, *CEA Malfunctions*, because it is operating in an unanalyzed condition with more than one CEA misaligned by > 20 steps from its associated group. (CT-1/SPTA-5) **Time of 2nd Dropped CEA indication: _____** **Time of Reactor Manual Trip:_____**		
	ATC	• Reports indication of 2nd dropped CEA. • Recommends/states the reactor must be manually tripped. • Reactor trip successful, all CEAs inserting.
	SRO	Acknowledge the need to trip, directs (or acknowledges) reactor trip. Entering EOP 2525, Standard Post Trip Actions. Directs implementation of EOP 2525 actions.

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7 & 8_		
Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following steps are from EOP 2525, *Standard Post Trip Actions*, modified slightly to improve clarity.		
	ATC	**ACTION/EXPECTED RESPONSE** **Reactivity Control – Reactor Trip** 1. ENSURE Reactor trip by ALL of the following: • **ALL** CEAs are fully INSERTED. • Reactor power is dropping. • SUR is negative.
	BOP	**Reactivity Control – Turbine Trip** 2. ENSURE Turbine Trip by ALL of the following: a. CHECK main turbine is tripped by ALL of the following conditions: • ALL main stop valves OR ALL control valves are closed. • Generator megawatts indicate zero. • Turbine speed is lowering. b. IF 15G-2XI-4, motor operated disconnect, is closed, THEN CHECK BOTH Main Generator output breakers 15G-8T-2 and 15G-9T-2 are open.
	BOP	**Maintenance of Vital Auxiliaries** 3. ENSURE Maintenance of Vital Auxiliaries met by ALL of the following conditions: a. CHECK vital and non-vital busses energized: 6.9 kV Electrical Buses energized • 25A, 24B 4.16 kV Non-Vital Electrical Buses energized • 24A, 24B 4.16 kV Vital Electrical Buses energized • **24C**, 24D Vital DC Buses energized • 201A, 201B, DV-10, DV-20 Vital AC Instrument Buses energized • VA-10, VA-20 **Examiner Note:** Vital bus **24C** is faulted with a severe ground and, therefore, cannot be recovered. This will eliminate Facility 1 Safeguards Equipment.

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7 & 8_		
Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	**RESPONSE NOT OBTAINED** a.1 IF EITHER bus 24C or 24D is *not* energized THEN PERFORM ALL of the following for associated bus 1) IF containment pressure is greater than or equal to 20 psig, THEN PLACE the RBCCW pump in "PULL TO LOCK." 2) ENSURE diesel generator has started. 3) ENSURE bus vital to non-vital tie breaker is open. 4) ENSURE diesel generator output breaker Synchronizing switch is "ON". 5) ENSURE the diesel generator output breaker is closed. 6) IF the diesel generator output breaker can *not* be closed, THEN TRIP the Diesel Generator. **Examiner Note:** It is unknown what CTMT pressure will be at this time. However, with bus 24C permanently lost, the only key step is tripping the "A" EDG (RNO 6).
	BOP	**3. Maintenance of Vital Auxiliaries (cont.)** b. CHECK that BOTH facilities of service water are operating. c. CHECK that BOTH facilities of RBCCW are operating with service water cooling.
	ATC	**RESPONSE NOT OBTAINED** c.3 IF RBCCW cooling is lost to an RCP, THEN STOP RCPs not supplied with RBCCW. **Examiner Note:** Although this is an ATC task, the US or BOP needs to ensure the ATC knows Vital Bus 24C is lost.
	ATC	**ACTION/EXPECTED RESPONSE** **RCS Inventory Control** 4. ENSURE RCS Inventory Control are met by **ALL** of the following conditions: a. CHECK **BOTH** of the following conditions exist: • Pressurizer level is between 20 to 80% • Pressurizer level is trending to 35 to 70% **b.** CHECK that RCS subcooling is greater than or equal to 30°F

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7 & 8_ Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**RESPONSE NOT OBTAINED** a.1 IF the Pressurizer Level Control System is *not* operating properly in automatic, THEN RESTORE and MAINTAIN pressurizer level 35 to 70% by performing ANY of the following: 1) OPERATE the Pressurizer Level Control System. 2) Manually OPERATE charging and letdown. **Examiner Note:** All available Charging pumps are started. Letdown may be isolated if PZR level <35%.
	ATC	**RCS Pressure Control** 5. ENSURE RCS Pressure Control met by BOTH of the following: • CHECK that pressurizer pressure is 1900 to 2350 psia. • CHECK that pressurizer pressure is trending to 2225 to 2300 psia.
	ATC	**RESPONSE NOT OBTAINED** **5.1** IF the Pressurizer Pressure Control System is *not* operating properly in automatic, THEN RESTORE and MAINTAIN between 2225 to 2300 psia by performing ANY of the following: a. OPERATE the Pressurizer Pressure Control System. b. Manually OPERATE pressurizer heaters and spray valves. **Examiner Note:** PZR Heaters will trip if PZR level is less than ~20%. **5.2** PZR Spray valves (Verifies Closed). **5.3** PORVs (Verifies Closed). **5.4** IF PZR Pressure <1714 psia THEN ENSURE ALL of the following: • SIAS, CIAS, EBFAS actuated (C01). **5.5** IF PZR <1714 psia w/SIAS, Secure ONE RCP in each loop . **Examiner Note:** SIAS manually actuated (if not auto actuated), Trip 2 – Leave 2 RCPs (preferably secure "A" & "C" RCPs if not tripped earlier). 5.6 **TCOA**: RCS pressure < NPSH SECURE ALL RCPs **Examiner Note:** 5.6 is NOT an expected condition.

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7 & 8_		
Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**Core Heat Removal** 6. ENSURE Core Heat Removal met by **ALL** of the following conditions: a. CHECK at least one RCP is operating AND loop ΔT is less than 10°F. b. CHECK that RCS subcooling is greater than or equal to 30°F.
	BOP	**RCS Heat Removal** 7. ENSURE RCS Heat Removal met by ALL of the following conditions: a. CHECK that at least one steam generator has **BOTH** of the following conditions met: • Level is 10 to 80%. • Main feedwater or TWO auxiliary feedwater pumps are operating to restore level 40 to 70%. **Examiner Note:** Manual/Auto start Aux. Feedwater to #2 SG </= 300 gpm to restore level.
	BOP	**RESPONSE NOT OBTAINED** a.1 RESTORE level to between 40% to 70% in at least ONE steam generator using ANY of the following: • Main feedwater • Motor-driven auxiliary feedwater pump • TDAFW Pump. Refer To Appendix 6, "TDAFW Pump Normal Startup." • TDAFW Pump. Refer To Appendix 7, "TDAFW Pump Abnormal Startup." **Examiner Note:** Manual start the TDAFP and supply feed to #2 SG.
Examiner Note: The BOP may be delayed in starting the TDAFP if they begin to address the ESD first by ensuring feedwater is isolated to the #1 SG.		

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7 & 8_		
Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	**7. RCS Heat Removal (cont.)** b. CHECK that RCS Tc is being maintained between 530°F to 535°F. **RESPONSE NOT OBTAINED** b.1 IF RCS TC is less than 530°F, THEN CONFIRM steam generator steam and feed rates are NOT excessive: 1) ENSURE feed flow is not excessive. 2) STABLIZE RCS Tc using steam dumps or ADVs THEN slowly restore Tc to between 530°F and 535°F. 3) IF MSI has actuated and terminates the cooldown THEN OPERATE ADVs to stabilize RCS TC. **Examiner Note:** When #1 SG boils dry, #2 ADV is opened and RCS temperature is stabilized. This may occur at any time, however the applicable Critical Task is located after the EOP 2525 step where it is directly addressed, RNO Step **7.c.3**.
CRITICAL TASK: Excess steam demand event resulting in a Main Steam Isolation Signal (MSIS) **OP 2260 (TCOA); Isolate AFW flow to the affected S/G from control room within 15 minutes of a Main Steam Isolation Signal (CT-3/ESDE-6)** **TIME Main Steam Isolation Signal (MSIS):_____** **TIME AFW Isolated EOP 2525 RNO Step 7c.2:_____**		

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7 & 8_		
Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	**7. RCS Heat Removal (cont.)** c. CHECK BOTH steam generator's pressures are 880 to 920 psia. **RESPONSE NOT OBTAINED** c.1 IF **ANY** SG pressure is less than 572 psia, THEN ENSURE MSI actuated. (C01) c.2 **TCOA:** IF **ANY** SG pressure is less than 572 psia AND an ESDE is in progress, THEN PERFORM the following to isolate AFW to the most affected SG 1) PLACE **BOTH** auxiliary feed "OVERRIDE/ MAN/START/ RESET" handswitches in "PULL TO LOCK." 2) CLOSE applicable Aux Feed Reg valve: • 2-FW-43A • 2-FW-43B 3) IF necessary, CONSIDER use of 2-FW-44: • IF #1 SG faulted, THEN CLOSE 2-FW-44 and STOP the motor driven AFW pumps • IF #2 SG faulted, THEN CLOSE 2-FW-44 and STOP the TDAFW pump c.3 IF **ANY** steam generator pressure is less than 572 psia AND an excess steam demand event is in progress, THEN PERFORM the following: 1) CLOSE the ADV for the most affected steam generator. 2) IF the most affected steam generator has boiled dry, as indicated by CET temperature rising, THEN OPERATE the ADV for the least affected steam generator to stabilize CET temperature. **Examiner Note:** When #2 SG boils dry, #1 ADV is opened and RCS temperature is stabilized. This may occur at any time.
Simulator Operator: If called to check Main Steam Safety Valves, wait about 5 minute then report all MSSVs indicate closed.		
CRITICAL TASK: Excess Steam Demand Event **Establish RCS temperature control using the ADV on the unaffected SG (CT-2/ESDE-2)** **TIME #1 SG Boiled Dry (RCS Temperature Begins to Rise):_____** **RCS Temperature When Stabilized:_____**		

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7 & 8_		
Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**Containment Isolation** 8. ENSURE Containment Isolation met by **ALL** of the following: a. CHECK Containment pressure is less than 1.0 psig. **RESPONSE NOT OBTAINED** a.1 IF containment pressure is greater than or equal to 4.42 psig, THEN ENSURE **ALL** of the following: • SIAS actuated. (C01) • CIAS actuated. (C01) • EBFAS actuated. (C01) • MSI actuated. (C01) **Examiner Note:** ATC may notice CTMT pressure triggered a CSAS and Facility 2 CS is not operating and take action at this time. However, required actions are listed with "Containment Temperature and Pressure Control under Step 9.
		b. CHECK that **NONE** of the primary plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity: **Radiation Monitors Inside Containment** • 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 c. CHECK that NONE of the following steam plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity: **Steam Plant Radiation Monitors** • RM-5099, Steam Jet Air Ejector • RM-4262, SG Blowdown • RM-4299A and B, Main Steam Line 1 • RM-4299C, Main Steam Line 2

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7 & 8_		
Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**Containment Temperature and Pressure Control** 9. ENSURE that Containment Temperature and Pressure Control met by **BOTH** of the following conditions: a. CHECK Containment temperature is less than 120°F. (PPC or avg. of Points 5 and 6) b. CHECK Containment pressure is less than 1.0 psig. **RESPONSE NOT OBTAINED** a.1 ENSURE **ALL** available normal cooling and ventilation systems are OPERATING: • CAR fans operating on the facility with an operating train of RBCCW • CTMT Aux Circ fans b.1 IF containment pressure is greater than or equal to 4.42 psig, THEN ENSURE **ALL** of the following • SIAS actuated. (C01) • CIAS actuated. (C01) • EBFAS actuated. (C01) • MSI actuated. (C01) 1) PLACE **ALL** available containment aux circ fans in low speed. 2) START **ALL** available containment post incident recirc fans. b.2 IF containment pressure is greater than or equal to 9.48 psig, THEN ENSURE **ALL** of the following: • CSAS actuated. (C01) • **ALL** operating containment spray pumps are delivering at least 1300 gpm each.
CRITICAL TASK: Maintain containment temperature and pressure control. (CT-4/ESDE-7) **Ensure all available equipment cooling and air recirculation systems are operating prior to exceeding containment design pressure (54psig, 285°F).** **CTMT pressure when CTMT Spray was established: _____**		
	SRO	10. PERFORM the following: a. DIAGNOSE the event. Refer To Appendix 1, "Diagnostic Flowchart." **[Note: Diagnostic Flow Chart starts on Page 37]** b. INITIATE Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions." c. Go To the appropriate EOP

Op-Test No.: ES16LI1 Scenario No.: 1 Event No.: 7 & 8 Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC/BOP	{Step 10.b above} Perform Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions". **Examiner Note:** EOP Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions." are attached to the end of the guide, starting on **page 33**.
Examiner Note: The US refers to EOP 2541 Appendix 1, Diagnostic Flowchart to diagnose the event.		
	SRO	**Event Diagnosis**: 1. Reactivity met? **YES** 2. One vital AC and DC bus energized? **YES** 3. RCPs running? **YES** (If all RCPs are secured, *consider* EOP 2528, LOOP). 4. Any SG receiving feed flow? **YES** 5. PZR pressure 1900-2350 psia. **NO** 6. RCS subcooling is < 30°F? **NO** 7. Both SG pressure 880-920 psia? **NO**, then consider EOP 2536, ESD 8. CTMT pressure < 1 psig? **NO** 9. CTMT Rad monitors showing rads? **NO**, then consider EOP 2536, ESD 10. Is SGTR indicated (Note 3)? **NO**, then consider EOP 2536, ESD 11. All safety functions satisfied? **NO** 12. Any event diagnosed? **YES** 13. Only one event in progress? **YES** (Note 4 states that losing 24C does **not** constitute a 2nd event.) 14. Go To Appropriate ORP **Transitions to EOP 2536, *Excess Steam Demand Event*.**
Examiner Note: The following steps are from EOP 2536, *Excess Steam Demand Event*. 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. **Examiners Note: All Facility 1 components are de-energized due to the loss of 24C on a bus fault.**		
	SRO	*1. CONFIRM diagnosis of a Loss of All Feedwater by performing the following. a. Check SFSC Acceptance Criteria are satisfied. **Examiner Note**: SRO checks EOP 2536-001 ESD Safety Function Status Checks and confirms that all Safety Criteria are satisfied. b. Verify no primary-to-secondary leakage by having Chemistry sample both SGs. [#1 SG may have dried out by now.]

Op-Test No.: ES16LI1 Scenario No.: 1 Event No.: 7 & 8		
Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	b. Verify no primary-to-secondary leakage. [cont.] 1) CHECK "B" train RBCCW in service. 2) ENSURE 2-RB-210, Degasifier Effluent Cooler Return Outlet, is open. 3) OPEN steam generator sample valves: • S MS---191A • S MS---191B 4) DIRECT Chemistry to perform the following: • Sample **ANY** SG that is available for RCS Heat Removal. • Frisk the samples • Report frisk results • Analyze samples for boron and activity 5) WHEN Chemistry reports that samples have been taken, PERFORM the following: • CLOSE the steam generator sample valves • IF SIAS has actuated, AND no other sampling is in progress, CLOSE 2-RB-210, Degasifier Effluent Cooler Return Outlet
Simulator Operator: When Chemistry is called to sample the SGs, acknowledge given sample instructions, then after about 15 minutes report, "There was NO sample flow from the #1 SG but, the #2 SG frisked less than MDA. You will report the other sample test results when complete."		
	SRO	*2. CLASSIFY the event. Refer To MP-26-EPI-FAP06, "Classification and PARs" • IF classification requires RCS sampling, Refer To Appendix 46, "Sampling for EAL Determination" and DIRECT Chemistry as required.
	SRO	*3. PERFORM ALL of the following: • OPEN the placekeeper and ENTER the EOP entry time. • ENSURE the master alarm silence switch is in "NORMAL".

Op-Test No.: ES16LI1 Scenario No.: 1 Event No.: 7 & 8 Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**Check SIAS Actuation** *4. IF PZR pressure < 1714 psia, verify the following: a. SIAS, CIAS, EBFAS actuated. (C-01) b. ENSURE **ONE** complete facility of CRACS is operating in the recirc mode: (C25) **Facility 1(Facility 2)** [Facility 1 has no power due to loss of 24C] • HV-203A(B), Fan F-21A(B) exhaust damper is open. • Fan F-21A(B), supply fan is running. • HV-206A(B), Fan F-31A(B) exhaust damper is open. • Fan F-31A(B), exhaust fan is running. • HV-212A(B), Fan F-32A(B) exhaust damper is open. • Fan F-32A(B), filter fan is running. • HV-202(495), minimum fresh air damper is closed. • HV-207(497), cable vault exhaust damper is closed. • HV-208(496), exhaust air damper is closed
	ATC	**Optimize Safety Injection** *5. IF SIAS has initiated, PERFORM the following: a. CHECK at least one train of SIAS, CIAS and EBFAS has properly actuated. (C01X) a.1 IF **ANY** component is *not* in its required position, manually ALIGN the applicable component. b. CHECK that safety injection flow is adequate. Refer To Appendix 2, "Figures." b.1 PERFORM **ANY** of the following to restore safety injection flow within the SI Flow Curve: 1) ENSURE electrical power to safety injection pumps and valves. 2) ENSURE correct safety injection valve lineup. 3) ENSURE operation of necessary auxiliary systems: • RBCCW • ESF Room Coolers 4) START additional safety injection pumps as needed until safety injection flow is within the SI Flow Curve. c. ENSURE **ALL** available charging pumps are operating.

Op-Test No.: ES16LI1 Scenario No.: 1 Event No.: 7 & 8 Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**Optimize Safety Injection (cont.)** d. ENSURE vital switchgear cooling is operating for each operating ECCS train as follows: **Facility 1** • Fan F-51 is running. • Fan F-134 is running. • SW-178A, service water supply is open. • SW-178B, service water supply is open. **Facility 2** • Fan F-52 is running. • Fan F-142 is running. • Fan F-133 is running. • SW-178C, service water supply is open.
	BOP	**Close MSIVs to Isolate Leak** *6. Perform the following to isolate the leak: a. Ensure MSI has actuated. (C-01) **RNO** a.1 Manually align any component not in required position. b. Check at least one train of MSI has properly actuated. (C-01X) c. Open AR-17, condenser vacuum breaker.
	ATC	**RCP Trip Strategy** *7. IF PZR pressure <1714 psia and SIAS actuated, perform the following: a. ENSURE one RCP in each loop is stopped. b. Place associated spray controller in manual/close. **[RC-100E]** c. IF pressure lowers to less than NPSH: • Stop all RCPs. • Place TIC-4165 in manual/closed. • Place all spray valve controllers in manual/closed.
	SRO	**Determine Most Affected Steam Generator** 8. DETERMINE the most affected SG by considering **ALL** of the following: • High steam flow from steam generator • Lowering steam generator pressures • Lowering steam generator levels • Lowering RCS cold leg temperatures

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7 & 8_		
Event Description: Excess Steam Demand Event in Containment with Loss of 24C and CSAS Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO/BOP	9. IF the leak has *not* been isolated, ISOLATE the most affected steam generator by performing the following: **Number 1 Steam Generator** a. ENSURE MS-64A, MSIV, is closed. b. ENSURE MS-65A, MSIV bypass valve, is closed. c. ENSURE **ALL** of the following for the associated ADV: • ADV controller is in manual, PIC-4223 • ADV is closed. d. PLACE ADV Quick Open Permissive switch to "OFF".
	SRO/BOP	e. CLOSE LIC-5215, main feedwater regulating bypass valve. f. ENSURE FW-42A, main feedwater block valve, is closed. **[Local isolation required due to loss of bus 24C]** **RNO** f.1 ENSURE LIC-5268, MFW Reg valve, is closed. g. PLACE FW-5A, main feed isolation air assisted check valve, to "CLOSE". h. CLOSE MS-201, steam to turbine driven aux feed pump supply valve. i. ENSURE MS-220A, steam generator blowdown isolation valve, is closed. j. Place **BOTH** AFAS "OVERRIDE/MAN/START RESET" handswitches in "PULL-TO-LOCK." k. Close FW-43A, AFW Reg Valve. l. PLACE FW-12A, aux feed isolation air assisted check valve, to "CLOSE". m. CLOSE MS-265B, main steam leg low point drain. n. CHECK main steam safety valves are closed.
Simulator Operator: If a PEO is sent to FW-42A, acknowledge and report complete in ~ 15 minutes.		
Examiner Note: Once the crew has isolated the #1 SG, or at the lead examiner's direction, the scenario is complete.		

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7__ Event Description: EOP 2541, Followup Actions, Appendix 4-A, Reactor Trip Subsequent Actions		
Time	**Position**	**Applicant's Actions or Behavior**

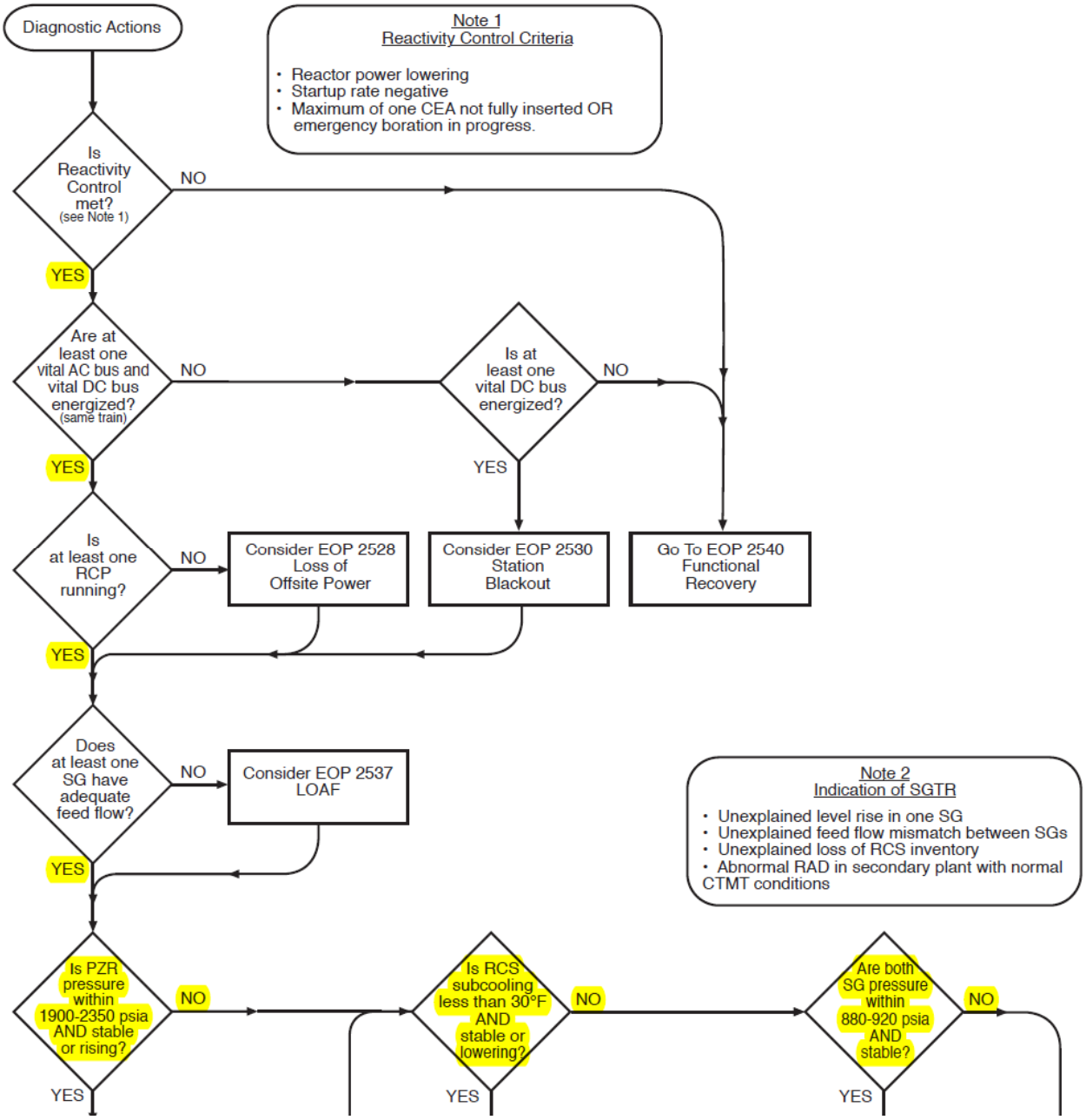
Examiner Note: The following steps are from EOP 2541, Followup Actions, Appendix 4-A, Reactor Trip Subsequent Actions.		
	ATC	*1. IF charging pumps suction is aligned to the VCT, THEN CHECK VCT level is between 72% to 86%: a. IF VCT level is less than 72%, THEN ALIGN charging pump suction to RWST as follows: a. OPEN CH- 192, RWST isolation. b. ENSURE CH- 504, RWST to charging suction is open. c. CLOSE CH- 501, VCT outlet isolation. d. ENSURE CH- 196, VCT makeup bypass is closed. b. IF VCT level is greater than 88%, THEN PLACE CH-500, letdown divert handswitch, to the "RWS" position, and divert as required to maintain VCT level 72% to 86%.
	ATC	*2. TCOA: IF SIAS actuated, THEN ENSURE **ONE** complete facility of CRAC operating, in RECIRC mode, as follows: (C25A/B) **Facility 1 [Facility 1 de-energized]** • HV- 203A, Fan F- 21A exhaust damper open • Fan F- 21A, supply fan running • HV- 206A, Fan F- 31A exhaust damper open • Fan F- 31A, exhaust fan running • HV- 212A, Fan F- 32A exhaust damper, open • Fan F- 32A, filter fan, running • HV- 202, minimum fresh air damper, closed • HV- 207, cable vault exhaust damper, closed • HV- 208, exhaust air damper, closed **Facility 2** • HV- 203B, Fan F- 21B exhaust damper open • Fan F- 21B, supply fan running • HV- 206B, Fan F- 31B exhaust damper open • Fan F- 31B, exhaust fan running • HV- 212B, Fan F- 32B exhaust damper, open • Fan F- 32B, filter fan, running • HV- 495, fresh air damper, closed • HV- 496, exhaust air damper, closed • HV- 497, cable vault exhaust damper, closed

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7__ Event Description: EOP 2541, Followup Actions, Appendix 4-A, Reactor Trip Subsequent Actions		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	*3. TCOA: IF SIAS not actuated, THEN CHECK ONE facility of CRAC operating, in NORMAL mode, as follows: (C25A/B) **Facility 1** • HV- 203A, Fan F- 21A exhaust damper is open • Fan F- 21A, supply fan running • HV- 206A, Fan F- 31A exhaust damper open • Fan F- 31A, exhaust fan running **Facility 2** • HV- 203B, Fan F- 21B exhaust damper open • Fan F- 21B, supply fan running • HV- 206B, Fan F- 31B exhaust damper open • Fan F- 31B, exhaust fan running
	ATC	*4. IF charging pumps suction aligned to the RWST AND boration not required, THEN RESTORE charging pump suction to VCT as follows: a. CHECK BOTH of the following: i. VCT level between 72% and 86% ii. VCT pressure greater than 15 psig b. CHECK letdown is in service. c. OPEN CH- 501, VCT outlet isolation. d. CLOSE CH- 192, RWST isolation.
	BOP	*5. CHECK instrument air pressure greater than 90 psig and stable.
	BOP	*6. IF AFAS has actuated, WHEN **BOTH** steam generators are restored to greater than 33%, THEN PERFORM the following: a. PLACE the following switches in "M" (Manual) and ADJUST to obtain desired flow (C- 05): i. FW- 43A, "AFW- FCV, HIC- 5276A" ii. FW- 43B, "AFW- FCV, HIC- 5279A" b. PLACE **BOTH** of the following switches to "RESET" and ALLOW to spring return to neutral (C- 05): i. "OVERRIDE/MAN/START RESET" (Facility 1) ii. "OVERRIDE/MAN/START RESET" (Facility 2) c. ADJUST the following switches to obtain desired flow (C- 05): i. FW- 43A, "AFW- FCV, HIC- 5276A" ii. FW- 43B, "AFW- FCV, HIC- 5279A" d. IF main feedwater pump is supplying steam generators, THEN STOP **BOTH** auxiliary feedwater pumps.

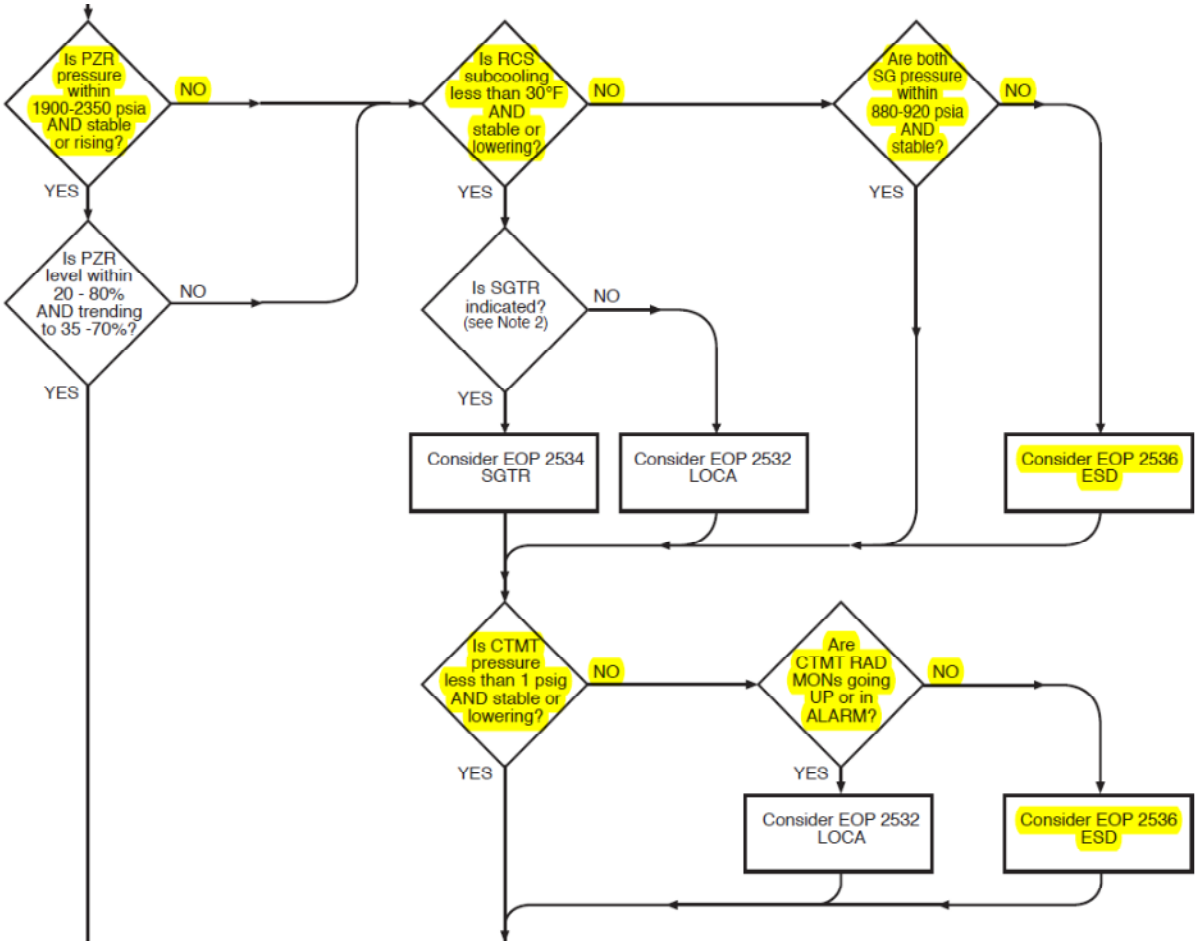
Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7__ Event Description: EOP 2541, Followup Actions, Appendix 4-A, Reactor Trip Subsequent Actions		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	*7. CHECK Main Condenser is available, as indicated by ALL of the following: • At least 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 **RNO** 7.1 IF Main Condenser is not available, PERFORM the following: • CLOSE BOTH MSIVs. • ENSURE BOTH MSIV bypass valves are closed. • OPEN AR-17, condenser vacuum breaker. **Examiner Note: Not available due to the MSI actuation.**
	BOP	*8. OPEN HD-106, subcooling valve.
	BOP	*9. ENSURE BOTH heater drain pumps stopped.
	BOP	*10. IF MFW is supplying feed to the steam generators, THEN PERFORM the following: a. ENSURE that only **ONE** main feedwater pump is operating. b. ENSURE that **BOTH** main feed block valves are closed: • FW- 42A • FW- 42B c. ADJUST the operating main feedwater pump pressure to 50 to 150 psi greater than SG pressure. d. ENSURE BOTH main feed reg bypass valves are throttled to control SG level: • LIC- 5215 • LIC- 5216 e. IF Main Feedwater Pump A is secured, THEN CLOSE the following: • FW- 38A, main feedwater pump discharge valve • FIC- 5237, main feedwater pump mini flow recirc valve f. IF Main Feedwater Pump B is secured, THEN CLOSE the following: • FW- 38B, main feedwater pump discharge valve • FIC- 5240, main feedwater pump mini flow recirc valve **Examiner Note: Loss of condenser vacuum secures both MFW pumps.**
	BOP	*11. IF **BOTH** MFW pumps are secured, THEN PERFORM the following: a. CLOSE BOTH main feedwater pump mini flow recirc valves. • FIC- 5237 • FIC- 5240

Op-Test No.: __ES16LI1___ Scenario No.: __1__ Event No.: _7__ Event Description: EOP 2541, Followup Actions, Appendix 4-A, Reactor Trip Subsequent Actions		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	*12. IF 25A OR 25B is energized, THEN ALIGN condensate pumps as follows: a. ENSURE **ONE** pump is running. b. ENSURE **ONE** pump is in "PULL TO LOCK." c. ENSURE **ONE** pump is in "AUTO."
Examiner Note: End of Attachment 4-A		

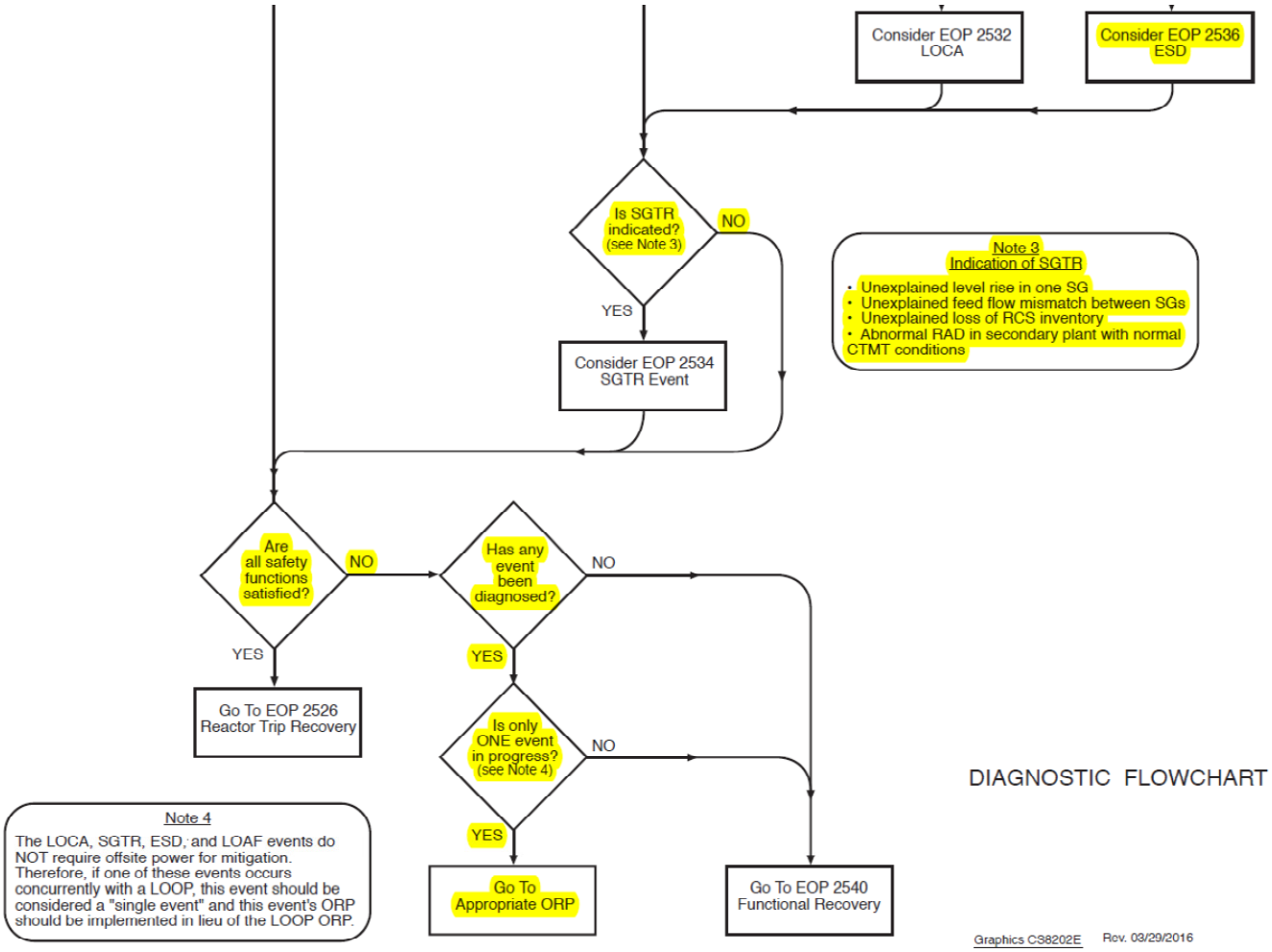
Op-Test No.: ES16LI1 Scenario No.: 1 Event No.: 7 Event Description: EOP 2541, Appendix 1, Diagnostic Flow Chart		
Time	**Position**	**Applicant's Actions or Behavior**



Op-Test No.: ES16LI1 Scenario No.: 1 Event No.: 7 Event Description: EOP 2541, Appendix 1, Diagnostic Flow Chart		
Time	**Position**	**Applicant's Actions or Behavior**



Op-Test No.: ES16LI1 Scenario No.: 1 Event No.: 7 Event Description: EOP 2541, Appendix 1, Diagnostic Flow Chart		
Time	**Position**	**Applicant's Actions or Behavior**



SIMULATOR SCENARIO #2

Facility: Millstone Unit 2 Scenario No.: 2 Op-Test No.: ES18LI1

Examiners: _____ Operators: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: 100% Power IC-21, steady state, No equipment OOS, Ch-Y PZR Level in service.
ENSURE "B" Charging pump is aligned to 22E.

Turnover: 100% Power, steady state, no equipment OOS. 24E is aligned to 24C.

Critical Tasks:

1. [OP 2260, EOP 2525 RCP Trip Criteria] RCPs with any abnormal operating condition prior to the trip should be secured. (ATC).
2. [LOOP-3] Establish a Primary-to-Secondary Heat Sink. (BOP).
3. [OP 2260, EOP 2525 RCP Trip Criteria] RCPs experiencing a loss of RBCCW should be secured.(ATC)
4. [LOAF-4] Establish a Primary-To-Secondary Heat Sink. (ATC/BOP).

Event No.	Malf. No.	Event Type*	Event Description
1	02A2A5S5, RXHS-100-2_3, C03-C41	C (ATC/S) TS (S)	Pressurizer Proportional Heaters Group #2 feeder breaker trip, causing loss of Pressurizer Group #2 Proportional Heaters.
2	WD03	TS (BOP/S)	Containment Normal Sump level detector, L9155, fails low.
3	RC08B, RC09B	I (ATC/S)	RCP "B" Upper and Middle Seal failures.
4	N/A	R (ALL)	Plant shutdown required due to 2 RCP failed seals.
5	RC28B	M (ALL)	"B" RCP High Vibration requiring a manual plant trip.
6	ED17C, FW20A	C (BOP/S)	Both Vital 4.16 kV buses fail to transfer to the RSST (LOOP), and "A" AFW Pump trips, requiring start of TDAFW pump
7	EG14B	C (All)	"B" EDG breaker fails open, requires "B" EDG manual trip (BOP) and securing of "B" & "D" RCPs (ATC).
8	FW20C	N/A	Trip of TDAFW pump requires transition to EOP 2537, LOAF or EOP 2540/2540D, Functional Recovery of Heat Removal.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor	
Target Quantitative Attributes (Per Scenario; See Section D.5.d)	**Actual**
1. Malfunctions after EOP entry (1–2)	2
2. Abnormal events (2–4)	2
3. Major transients (1–2)	1
4. EOPs entered/requiring substantive actions (1–2)	1
5. EOP contingencies requiring substantive actions (0–2)	0
6. Critical tasks (2–3)	2

Scenario 2 Summary:

The crew will take the shift with the unit at 100% power, steady state, no equipment out of service (IC-21).

Event 1: Immediately after the crew takes the watch, the Group #2 PZR Proportional Heater breaker will trip and annunciator C03-C41, ***PRESSURIZER HTR CNTL GP FEEDER BKR TRIP***, will alarm. The crew should reference ARP 2590B-227 and the US should log into the applicable Tech. Spec. Action Statement (TSAS). The ATC will need to energize at least one bank of PZR Backup Heaters and/or adjust the selected PZR pressure controller (PIC-100Y) automatic setpoint, in order to maintain PZR pressure constant at 2250 psia. Once RCS pressure has been stabilized, or at the examiners discretion, Event 2 is triggered.

Event 2: The sump level detector, L9155, will instantly fail low, triggering annunciator alarm C06/7-BA21, ***CTMT NORM SUMP LEVEL HI/LO***. The crew should refer to ARP 2590E-107 for annunciator C06/7-BA21. The US should evaluate the impact on Tech. Specs. Once this is accomplished, or at the examiners discretion, Event 3 is triggered.

Event 3: The upper and middle seals of "B" RCP will fail triggering various alarms on C02/3 pertaining to the "B" RCP seals. Based on ARP 2590B guidance for any of the RCP seal alarms, the crew should refer to AOP 2586, ***RCP Malfunctions***. Using the guidance of AOP 2586, the crew should determine that two RCP seals have failed or are substantially degraded, and a plant shutdown is required.

Event 4: IAW AOP 2586, the crew should utilize OP 2204, ***Load Changes***, and commence a plant shutdown. To speed up the power change, the OMOC or SM could express concern over the degraded RCP status and direct the crew to utilize AOP 2575, ***Rapid Downpower***, to shut down the plant more expeditiously. Once the power change evaluation is completed, or at the examiners discretion, Event 6 is triggered.

Event 5: The "B" RCP will begin to experience vibration levels exceeding the procedural limit for tripping the plant, per AOP 2586, ***RCP Malfunctions***. The crew should verify all CEAs fully inserted, main turbine tripped and commence EOP 2525, ***Standard Post Trip Actions.***

Event 6: On the trip, both Vital 4.16 kV buses fail to transfer to the RSST, causing ESAS to start both Emergency Diesel Generators (EDG). The EDGs will re-energize both vital buses, however, the loss of the non-vital 4.16 kVA buses will cause a loss of both Main Feedwater Pumps. Also on the trip, the "A" AFW Pump will trip, requiring the BOP to start the Turbine Driven Aux. Feedwater (TDAFW) pump.

Event 7: The "B" EDG output breaker will fail open, de-energizing vital bus 24D and requiring the BOP to emergency trip the "B" EDG. The loss of Fac. 2 RBCCW will require the ATC to secure the "B" & "D" RCPs.

Event 8: Three minutes after the TDAFW pump is started, it will trip. All attempts at restart will fail, resulting in a loss of all feedwater flow to both SGs. This will require EOP transition to either EOP 2537, ***Loss Of All Feedwater*** or EOP 2540, ***Functional Recovery***. RCS Heat Removal Safety Function can be restored by using a Condensate pump to feed a SG or via Once-Through-Cooling and SI flow to the RCS.

The scenario will end when RCS Heat Removal Safety Function is restored or at the examiners discretion.

INPUT SUMMARY							
Either INPUT or VERIFY the following functions:							
ID Num	Description	Delay Time	Ramp Time	Event Trigger	Severity or Value	Final Value	Relative Order
MALFUNCTIONS							
ED17C	Failure of 24C & 24D transfer to RSST			E-0	Active		0
FW20A	"A" AFW pump trip/fail to start			E-30	Active		0
C03-C41	PZR Htr Cntrl Gp Feeder Bkr Trip alarm			E-1	ON		1
WD03	CTMT Normal Sump Level fails low			E-2	0%		2
RC08B	"B" RCP Middle Seal failed			E-3	50%		3
RC09B	"B" RCP Upper Seal failed			E-3	100%		3
RC28B	"B" RCP High Vibration		3 min.	E-5	30 mils		5
EG14B	"B" EDG output breaker trip			E-7	Active		5
FW20C	TDAFW pump trip	3 min.		E-29	Active		6
REMOTE FUNCTIONS							
OVERRIDES							
02A2A5S5	PZR Prop. Htr Gp-2 breaker OFF			E-1	OFF		1
RXHS-100-2_3	PZR Proptional Heater GP-2 Bkr AMBER light lit			E-1	A		1
RXHS-100-2_3	PZR Proptional Heater GP-2 Bkr AMBER light lit [if handswitch is reset]			E-10	NA		1

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 1		
Event Description: Loss of Pressurizer Proportional Heater Group #2		
Time	**Position**	**Applicant's Actions or Behavior**
Simulator Operator: When directed, initiate Event #1, Loss of PZR Proportional Group #2.		
Indications Available: • **PRESSURIER HTR CNTL GP FEEDER BKR TRIP (C-02/3, C-41).**		
Examiner Note: The following steps are from ARP 2590B-227.		
	ATC/SRO	AUTOMATIC FUNCTIONS 1. None CORRECTIVE ACTIONS 1. DETERMINE tripped proportional group feeder breaker (C-03). 2. LOG entry into Technical Specifications ACTION Statement, 3.4.4, ACTION a. **Examiner Note: Tech. Spec. 3.4.4 info follows these ARP actions.** 3. IF heater group is needed to prevent plant transient, one reset attempt may be performed. 4. To determine the cause of the breaker trip, PERFORM the following: • REQUEST Electrical Maintenance investigate cause of breaker trip • CONTACT Engineering for further assistance
Simulator Operator: If contacted to investigate breaker trip, acknowledge and report back in about 10 minutes that the cause of the trip could not be determined without a "troubleshooting" Work Order and a Trouble Report is being generated to create one.		
	ATC/SRO	5. WHEN cause of breaker trip is determined AND Electrical Maintenance allows, RESET applicable breaker. 6. CHECK RCS pressure is maintained by redundant proportional group heaters (C-03/PPC). 7. IF necessary, OPERATE back up heaters to maintain RCS pressure (C-03/PPC). 8. WHEN breaker is reset, RE-ENERGIZE tripped heaters (C-03). 9. LOG exit from Technical Specifications ACTION Statement, 3.4.4, ACTION a. 10. IF breaker will not reset OR breaker trips again, SUBMIT Trouble Report to Maintenance Department. 11. Refer To Technical Specification LCO, 3.4.4.

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 1		
Event Description: Loss of Pressurizer Proportional Heater Group #2		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	**NOTE** Loss of multiple pumps, or unexpected electrical malfunctions, may be indicative of an Open Phase Condition (OPC) event. For an OPC event, the 6.9kV and 4160V busses must be de-energized from the affected power source and re-energized from the non-affected source if possible. 12. IF an OPC event is suspected, Refer To ARP 2590F-021, "GENERATOR NEGATIVE PHASE SEQUENCE (A-6)," for OPC guidance (even if alarm not in). **Examiner Note: An OPC event should not be diagnosed.**
Simulator Operator: If asked to submit a TR to Maintenance report that one has been submitted.		
	SRO	**Review Tech. Specs.**: **LCO 3.4.4 (PRESSURIZER):** The pressurizer shall be OPERABLE with: a. Pressurizer water level ≤ 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. **ACTION**: Per the TS Table: **Inoperable Equipment =** "b. One group of pressurizer heaters." **Required ACTION =** "b.1 Restore the inoperable group of pressurizer heaters to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 12 hours." **Examiner Note: SRO logs into TSAS 3.4.4b**
Examiner Note: When the PZR heater breaker trip has been mitigated, or at lead examiner's direction, go to Event 2 Containment Sump Level detector failure.		

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 2		
Event Description: Containment Sump Level detector failure		
Time	**Position**	**Applicant's Actions or Behavior**
Simulator Operator: When directed, initiate Event #2, Containment Sump Level detector failure.		
Indications Available: • **CTMT NORM SUMP LEVEL HI/LO (C-06/7, BA-21).**		
Examiner Note: The following steps are from ARP 2590E-107.		
	ATC/SRO	AUTOMATIC FUNCTIONS 1. None **NOTE** On a sump high level alarm due to a high influent flow, the operator should immediately attempt to determine the source of influent. 1. IF level is high, PERFORM the following: 1.1. IF level is high, due to high influent flow, Refer To AOP 2568, Reactor Coolant System Leak." 1.2. Refer To TSAS 3.3.3.8 and 3.4.6.1, and DETERMINE applicability. 1.3. Refer To OP 2336A, "Station Sumps and Drains," and PUMP the sump. 1.4. IF pumps can not be started, VERIFY the following supply breakers, "ON": • B31B04, "CONTAINMENT SUMP PUMP A (P33A)" • B41B08, "CONTAINMENT SUMP PUMP B (P33B)" 2. IF level is low AND pump is running, STOP pump.
Simulator Operator: If I&C is asked to investigate (or put the other detector in service), report back that paperwork is being assembled but job will take over an hour due to electrical penetration work.		
Examiner Note: Tech. Spec. 3.3.3.8 and 3.4.6.1 follow.		

Op-Test No.: __ES18LI1___ Scenario No.: __2__ Event No.: _2__

Event Description: Containment Sump Level detector failure

Time	Position	Applicant's Actions or Behavior
	SRO	**Review Tech. Specs.**: **LCO 3.3.3.8 (ACCIDENT MONITORING):** The accident monitoring instrumentation channels shown in Table 3.3-11 shall be OPERABLE. **APPLICABILITY**: MODES 1, 2 and 3. **ACTION**: a. ACTIONS per Table 3.3-11. **ACCIDENT MONITORING INSTRUMENTATION** Instrument | Total No. of Channels | Minimum Ch. OPERABLE | ACTION 8. Containment Water Level (Narrow Range) | 1 | 1 | 7## ## Refer to ACTION statement in Technical Specification 3.4.6.1. ACTION 7; Restore the inoperable system to OPERABLE status within 7 days or be in COLD SHUTDOWN within the next 36 hours. (See the ACTION statement in Technical Specification 3.4.6.1.). **Examiner Note: SRO logs into TSAS 3.3.3.8, Action 7**
	SRO	**Review Tech. Specs.**: **LCO 3.4.6.1 (LEAKAGE DETECTION SYSTEM):** The following Reactor Coolant System leakage detection systems shall be OPERABLE: a. One of two containment atmosphere particulate radioactivity monitoring channels, and b. The containment sump level monitoring system. **APPLICABILITY**: MODES 1, 2, 3 and 4. **ACTION**: b. With the containment sump level monitoring system inoperable, operation may continue for up to 30 days provided: 1. A Reactor Coolant System water inventory balance is performed at least once per 24 hours during steady state operation. Otherwise, be in COLD SHUTDOWN within the next 36 hours. **Examiner Note: SRO logs into TSAS 3.4.6.1, Action b.**
Examiner Note: When the Containment Sump Level detector failure has been addressed, or at lead examiner's direction, go to Event 3, RCP "B" Upper and Middle Seal Failure.		

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 3		
Event Description: RCP "B" Upper and Middle Seal Failure		
Time	**Position**	**Applicant's Actions or Behavior**

Simulator Operator: When directed, initiate Event 3, RCP "B" Upper and Middle Seal Failure.		
Indications Available: • **RCP B MID SEAL PRES LO (C02/3, BB-22)** • **RCP B UPPER SEAL PRES LO (C02/3, CB-22)**		
Examiner Note: The following steps are from ARP 2590B-108, "RCP B MID SEAL PRES LO". (Annunciator CB-22 has similar actions.)		
	ATC	AUTOMATIC FUNCTIONS 1. None. **NOTE** Low middle seal pressure could indicate any of the following: • Failed or failing upper seal stage • Failed or failing middle seal stage • Combination of excessive leakage of middle and upper seal stages
	ATC	CORRECTIVE ACTIONS 1. IF "RCP SEAL HDR PRESS, PI-215" is *not* between 40 and 75 psig, ADJUST "RCP BLD OFF PRESS CNTL, PIC-215" to 40 to 75 psig (C-02). 2. IF alarm is intermittent AND D/P for one or more seal stages is cycling, PERFORM the following: 4.1 MONITOR RCP controlled bleedoff temperature. 4.2 DETERMINE if alarm is caused by changing RBCCW temperature. 4.3 IF changing RBCCW header temperature is possible cause, Refer To OP 2330A, "RCBBW System" and ADJUST associated RBCCW heat exchanger temperature. 3. IF alarm remains lit, Go To AOP 2586, "RCP Malfunctions."
Examiner Note: SRO proceeds to AOP 2586, "RCP Malfunctions".		
	SRO	SRO enters AOP 2586, "RCP Malfunctions".
Examiner Note: The following steps are from AOP 2586, "RCP Malfunctions".		

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 3 Event Description: RCP "B" Upper and Middle Seal Failure		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	SRO briefs RCP and Reactor trip criteria. 1. **RCP AND REACTOR TRIP CRITERIA** **IF** any of the following conditions occur: **RCP SEAL CRITERIA** • Any vapor seal failure is indicated or suspected • Any RCP has two failed stages, and the remaining seal stage integrity is degraded • RCP Lower Seal temperature GREATER THAN 170 °F • RCP Bleedoff temperature GREATER THAN 195 °F • RCP controlled bleedoff excess flow check valve is closed **RCP VIBRATION CRITERIA** • One RCP vibration reading is GREATER THAN 28 mils **AND** the other vibration reading is GREATER THAN 15 mils **RCP OIL LEVEL AND TEMPERATURE CRITERIA** • ANY RCP oil level is trending outside normal band of 75% to 85% **AND** bearing temperature is INCREASING • RCP Upper/Lower Thrust Bearing temperature GREATER THAN 194 °F • RCP Upper/Lower Guide Bearing temperature GREATER THAN 194 °F • RCP Anti-Reverse Device temperature GREATER THAN 250 °F • RCP Stator temperature GREATER THAN 260 °F **THEN PERFORM** the following: a. **TRIP** Reactor b. **TRIP** affected RCP c. **GO TO** EOP 2525, Standard Post Trip Actions **CONTINUOUS ACTION PAGE FOR AOP 2586**

Op-Test No.: __ES18LI1___ Scenario No.: __2__ Event No.: _3__ Event Description: RCP "B" Upper and Middle Seal Failure		
Time	**Position**	**Applicant's Actions or Behavior**
		ACTION/EXPECTED RESPONSE (A/ER) **1___ Check RCP Trip Criteria Met** a. **CHECK** RCP Trip Criteria based on a change of the following parameters: o • RCP Seal Criteria o • RCP Vibration Criteria o • RCP Oil Level and Temperature Criteria **RESPONSE NOT OBTAINED (RNO)** **PROCEED TO** step 2.
	SRO/ATC	***2___ Monitor RCP Data** _ a. **CHECK** PPC available _ b. ON RCP Seal Arrangement/Vibs screen, **SELECT** RCP Trend, for affected RCP **AND** **REFER** to ATTACHMENT E Using Att. "E", the ATC should determine that 2 RCP seals are failed or failing (may also mention seal delta-P is > 1500 psid).
	SRO/ATC	*3___ Check RCP For Plant Shutdown Required a. CHECK affected RCP for the following: o • Any RCP seal stage D/P is GREATER THAN 1500 psid o OR o • RCP has one RCP seal stage failed and another seal stage LESS THAN 650 psid b. GO TO one of the following AND INITIATE a plant shutdown while continuing with actions of this procedure, beginning with step 3.c o • OP 2204, Load Changes o • AOP 2575, Rapid Downpower c. WHEN Reactor is sub-critical, THEN STOP affected RCP **SRO determines seal failure meets plant shutdown requirements and enters AOP 2575, "Rapid Downpower" or OP 2204, "Load Changes".**
Simulator Operator: If crew elects to use OP 2204 to shutdown, call as the OMOC and state the RCP engineer expressed serious concern over RCP seal status and recommends the plant and RCP be shut down as soon as possible without tripping.		

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 4		
Event Description: : Rapid Downpower (required due to RCP seal failures).		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following steps are from AOP 2575, *Rapid Downpower*		
	SRO	Enters AOP 2575, Rapid Downpower
	SRO	3.1 PERFORM focus brief on the following: REACTOR TRIP CRITERIA • Parameters associated with automatic reactor or turbine trips are challenged • RCS T cold *not* within 10°F of temperature program and efforts to regain control are unsuccessful RCS TEMPERATURE CONTROL • RCS T cold to be maintained within 5°F of Attachment 5, "Temperature vs. Power program" using Attachment 9, "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 PERFORM notifications of Unit rapid downpower as follows: a. Announce using plant page (extension 810), that Unit 2 is commencing a rapid downpower, including the reason for the downpower. b. CONTACT Unit 3 Control Room (extension 6200), and REQUEST that they make applicable notifications to OMOC, CONVEX, and ISO-New England.
Simulator Booth: When contacted as Unit 3, reply that all requested contacts will be made.		
	ATC	3.3 INITIATE forcing pressurizer sprays.
		CAUTION In the case of a dropped CEA, rod motion is *not* used to initiate downpower.

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 4 Event Description: : Rapid Downpower (required due to RCP seal failures).		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	3.4 IF not downpowering due to a dropped rod, AND Reactor power is greater than 99% (2673 MWTh) 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.		
	SRO	NOTE Attachment 10 "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 9, "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 9 *Main Turbine Load Set Control*		
	BOP	CAUTION Operation of the "Load/Speed CONTROL" switch will change turbine load at 600%/hour, and cancel any previous load setpoint. NOTE Steps provided in this attachment are dependent on plant conditions and may be performed in any sequence, and repeated as necessary.

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 4 Event Description: : Rapid Downpower (required due to RCP seal failures).		
Time	**Position**	**Applicant's Actions or Behavior**
	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."
	BOP	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). 3. 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." 4. 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. 5. IF desired load has been reached SELECT "Load Hold."
Examiner Note: The following steps are from AOP 2575 *Rapid Downpower*, Section 3.0 *Rapid Downpower*.		
	SRO	3.8 Based on required rate of downpower, START additional charging pumps as necessary and balance charging and letdown.
	ATC	[ATC "Skill-Of-The-Craft" actions if direct to start a second charging pump] • Selects "LVL-1" position on the Charging Pump Override switch (C-02) • Then adjusts the "Bias" on HIC-110 to balance charging and letdown flow, while monitoring letdown parameters.

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 4 Event Description: : Rapid Downpower (required due to RCP seal failures).		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	3.9 IF desired to borate from the RWST (preferred method), PERFORM the following: 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 **Examiner Note:** Crew should borate from the RWST.
	N/A	3.10 IF desired to borate from the BAST.
	SRO/ATC/ BOP	3.11 During the downpower, Refer To Attachment 1,"Rapid Downpower Parameters," and MAINTAIN parameters as specified throughout downpower: **Examiner Note:** Attachment 1 Rapid Downpower Parameters: • 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 DT 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) • Turbine steam packing rubs can occur at any turbine load. Slow and careful changes in condenser vacuum should be made. (<1 in Hg/hr) • At turbine load >/= 75% (675 MWe), condenser backpressure can be at best available.

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 4 Event Description: : Rapid Downpower (required due to RCP seal failures).		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO/ATC/ BOP	**Examiner Note:** Attachment 1 Rapid Downpower Parameters (cont.): • Between, 25% turbine load (225 MWe) and 75% turbine load (675 MWe), maintain condenser backpressure 2.0 - 4.0 in Hga. • At turbine load </= 25%, (225 MWe), maintain condenser backpressure 2.5 - 4.0 in Hga. • Turbine bearing vibrations should be monitored during power changes. When vibration changes are observed and the situation allows the power change should be stopped until the monoblock rotor is allowed to stabilize.
	SRO/ATC	NOTE Attachment 10 "Approximate Load Demand vs. Reactor Power," can be used to correlate the desired power level to a turbine load demand setpoint.
Examiner Note: Once the power reduction is complete, or at the lead examiner's direction, proceed to Event 5, "B" RCP High Vibrations (Requires a manual plant trip).		

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 5

Event Description: **"B" RCP High Vibrations and Manual Plant Trip**

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, initiate Event 5, "B" RCP High Vibrations.		
Indications: • **"RCP HIGH VIBRATION" (PPC, C-04, CB-7)**		
Examiner Note: The following steps are from ARP 2590C-054, "RCP HIGH VIBRATION", C-04, CB-7 annunciator. Because the vibration malfunction is ramping in over 3 minutes, the crew may utilize indications on the PPC to trip the plant and RCP before this annunciator reaches the alarm setpoint. In that instance, this ARP will not be used. However, the PPC alarm actions are similar to these.		
	SRO/ATC	**AUTOMATIC FUNTIONS** 1. None NOTE 1. High vibration alarms may occur while operating less than four RCPs or while starting an RCP. 2. If a vibration probe is *not* within the upper and lower limits of normal transducer operation, the vibration on the affected channel is clamped to zero. When this occurs, it is possible to have one of the two vibration channels (X or Y) on an RCP, display zero vibration while the other channel displays high or overranged vibration. If both probes clamp to zero there will be *no* vibration monitoring or alarms for that pump. 3. Abnormal vibration may be caused by or may cause, changes in other pump parameters such as seal and bearing temperature and pressures. **CORRECTIVE ACTIONS** 1. IF RCP is idle, *no* action is required. 2. IF PPC is available, PERFORM the following: 2.1. DETERMINE which RCP is in alarm. 2.2. DETERMINE if any PPC RCP Vibration"Alert" (> 15 mils) alarms exist. 3. IF PPC is *not* available, OBSERVE the dedicated "System 1" RCP vibration computer monitor in the New Computer Room, and PERFORM the following: 3.1. DETERMINE which RCP is in alarm. 3.2. DETERMINE if any "Alert" (> 15 mils) alarms exist.

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 5

Event Description: **"B" RCP High Vibrations and Manual Plant Trip**

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	**CORRECTIVE ACTIONS (cont.)** 4. OBSERVE trends of the following parameters for the affected RCP: • Motor bearing temperature • Upper and lower oil levels • Stator temperatures • Seal stage DPs • RCP Pp Proximitor X and Y 5. IF any parameters in step 4., *other than* the proximitor in alarm, are trending abnormally (e.g., bearing temps or stator temp increasing, one or more seal stage DPs decreasing), Go To AOP 2586, "RCP Malfunctions." 6. IF alarm is *not* considered valid OR vibration reading on the other channel is below the "ALERT" level, PERFORM the following: 6.1. NOTIFY the OMOC and the EDM to make a determination as to whether the affected RCP should remain in service. 6.2. MONITOR operating parameters on the affected RCP. 7. IF instrument malfunction is suspected, SUBMIT CR to I&C Department. 8. WHEN proximitor causing alarm indicates < 27.5 mils, RESET latched RCP High Vibration Alarm by selecting the "RCP 3500 Rack Reset" located on the PPC "RCP Seal Arrangement" screen (RCP_SEAL). 9. IF "Alert" level PPC alarms are indicated, AND vibration levels are below setpoint with deadband applied, RESET alarms by selecting the "RCP 3500 Rack Reset" button on the "RCP Seal Arrangement PPC screen (RCP_SEAL).
	SRO/ATC	AOP 2586, RCP Malfunctions, RCP and Reactor trip criteria: One RCP vibration reading is GREATER THAN 28 mils **AND** the other vibration reading is GREATER THAN 15 mils
	SRO	Manually trip the plant, carry out EOP 2525,(Standard Post Trip Actions) and securing of "B" RCP.

Op-Test No.: __ES18LI1___ Scenario No.: __2__ Event No.: _6__ Event Description: Manual Trip, Loss of Normal Power to 24C & 24D, Loss of "A" AFW Pump.		
Time	**Position**	**Applicant's Actions or Behavior**
Examiner Note: The following steps are from EOP 2525, *Standard Post Trip Actions*, modified slightly to improve clarity.		
Examiner Note: IAW AOP 2586, the SRO should have directed the ATC to secure the "B" RCP once the reactor was tripped. The ATC may not secure the RCP until after the reactor is verified tripped, depending on how quickly the SRO queries Step #1.		
	ATC	**ACTION/EXPECTED RESPONSE** **Reactivity Control – Reactor Trip** 1. ENSURE Reactor trip by ALL of the following: • ALL CEAs are fully INSERTED. • Reactor power is dropping. • SUR is negative.
CRITICAL TASK: OP 2260, Unit 2 EOP User's Guide, EOP 2525 guidance for tripping RCPs. Any RCP operating with alarms, abnormal conditions or without RBCCW flow, it is desirable to trip this RCP [Note; ATC may also trip the "D" RCP due to guidance in OP 2260 about tripping the RCP in the opposite loop (i.e.; trip "B" RCP due to high vibrations and trip "D" RCP in the opposite loop. [CT-1/ OP 2260, EOP 2525 RCP Trip Criteria] **TIME of manual reactor trip:_____** **TIME "B" RCP was secured:_____**		
	BOP	**Reactivity Control – Turbine Trip** 2. ENSURE Turbine Trip by ALL of the following: a. CHECK main turbine is tripped by ALL of the following conditions: • ALL main stop valves OR ALL control valves are closed. • Generator megawatts indicate zero. • Turbine speed is lowering. b. IF 15G-2XI-4, motor operated disconnect, is closed, THEN CHECK BOTH Main Generator output breakers 15G-8T-2 and 15G-9T-2 are open.

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 7 & 8		
Event Description: Loss of Vital Bus 24D (and "B" AFW Pump) and Loss of the TDAFW Pump.		
Time	**Position**	**Applicant's Actions or Behavior**
Simulator Operator: After the BOP and SRO complete their review of this step and move on to review of RBCCW and SW at C-06/7, initiate Event 7, Loss of 24D.		
	BOP	**Maintenance of Vital Auxiliaries** 3. ENSURE Maintenance of Vital Auxiliaries met by ALL of the following conditions: a. CHECK vital and non-vital busses energized: 6.9 kV Electrical Buses energized • 25A, 24B 4.16 kV Non-Vital Electrical Buses energized • 24A, 24B 4.16 kV Vital Electrical Buses de-energized • 24C, 24D Vital DC Buses energized • 201A, 201B, DV-10, DV-20 Vital AC Instrument Buses energized • VA-10, VA-20
Examiner Note: Vital busses 24C & 24D did not transfer to the RSST, therefore, Non-Vital 4.16 kVA busses 24A & 24B are de-energized. This will eliminate Main Feedwater as a source of feed to the Steam Generators. Event 7 will be triggered immediately after the BOP first completes this step with only 24A & 24B de-energized. Although the BOP may review the RNO actions based on the loss of 24A & 24B, the subsequent RNO steps only have mitigating actions for the loss of 24C or 24D. Also note that when bus 24D is lost, the SRO is required to restart querying of EOP 2525, *Standard Post Trip Actions*, from the beginning. Those duplicated actions follow the BOP's RNO actions.		
	BOP	**Maintenance of Vital Auxiliaries (cont.)** **RESPONSE NOT OBTAINED** a.1 IF EITHER bus 24C or 24D is *not* energized THEN PERFORM ALL of the following for associated bus 1) IF containment pressure is greater than or equal to 20 psig, THEN PLACE the RBCCW pump in "PULL TO LOCK." 2) ENSURE diesel generator has started. 3) ENSURE bus vital to non-vital tie breaker is open. 4) ENSURE diesel generator output breaker Synchronizing switch is "ON". 5) ENSURE the diesel generator output breaker is closed. 6) IF the diesel generator output breaker can *not* be closed, THEN TRIP the Diesel Generator.

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 7 & 8		
Event Description: Loss of Vital Bus 24D (and "B" AFW Pump) and Loss of the TDAFW Pump.		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: When bus 24D is lost, the SRO is required to restart querying of EOP 2525, *Standard Post Trip Actions*, from the beginning. Due to this "review", EOP 2525 steps start from the beginning.		
	ATC	**ACTION/EXPECTED RESPONSE** **Reactivity Control – Reactor Trip** 1. ENSURE Reactor trip by ALL of the following: • ALL CEAs are fully INSERTED. • Reactor power is dropping. • SUR is negative.
	BOP	**Reactivity Control – Turbine Trip** 2. ENSURE Turbine Trip by ALL of the following: c. CHECK main turbine is tripped by ALL of the following conditions: • ALL main stop valves OR ALL control valves are closed. • Generator megawatts indicate zero. • Turbine speed is lowering. d. IF 15G-2XI-4, motor operated disconnect, is closed, THEN CHECK BOTH Main Generator output breakers 15G-8T-2 and 15G-9T-2 are open.
	BOP	**Maintenance of Vital Auxiliaries** 4. ENSURE Maintenance of Vital Auxiliaries met by ALL of the following conditions: a. CHECK vital and non-vital busses energized: 6.9 kV Electrical Buses energized • 25A, 24B 4.16 kV Non-Vital Electrical Buses energized • 24A, 24B 4.16 kV Vital Electrical Buses de-energized • 24C, 24D **Examiner Note: BOP reports loss of 24D, proceeding to RNO actions (next page).** Vital DC Buses energized • 201A, 201B, DV-10, DV-20 Vital AC Instrument Buses energized • VA-10, VA-20

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 7 & 8		
Event Description: Loss of Vital Bus 24D (and "B" AFW Pump) and Loss of the TDAFW Pump.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	**Maintenance of Vital Auxiliaries (cont.)** **RESPONSE NOT OBTAINED** a.1 IF EITHER bus 24C or 24D is *not* energized THEN PERFORM ALL of the following for associated bus 1) IF containment pressure is greater than or equal to 20 psig, THEN PLACE the RBCCW pump in "PULL TO LOCK." 2) ENSURE diesel generator has started. 3) ENSURE bus vital to non-vital tie breaker is open. 4) ENSURE diesel generator output breaker Synchronizing switch is "ON". 5) ENSURE the diesel generator output breaker is closed. 6) IF the diesel generator output breaker can *not* be closed, THEN TRIP the Diesel Generator.
Examiner Note: BOP reports unable to close "B" EDG output breaker, then trips the "B" EDG by simultaneously pushing both emergency trip push buttons on C-08. BOP may evaluate new alarms on C-08 indicating a fault on bus 24D, in which case closing the EDG breaker may not be attempted.		
	BOP	3. **Maintenance of Vital Auxiliaries** (cont.) b. CHECK that BOTH facilities of service water are operating. **BOP Reports: Only Facility 1 service water operating.**
	BOP	**RESPONSE NOT OBTAINED** b.1 CHECK service water pump electrically aligned to facility. 1) Mechanically ALIGN SW pump. 2) START aligned SW pump b.2 IF service water can *not* be supplied to a running diesel, THEN TRIP the affected diesel generator.
	BOP	3. **Maintenance of Vital Auxiliaries** (cont.) c. CHECK that BOTH facilities of RBCCW are operating with service water cooling. **BOP Reports: Only Facility 1 RBCCW operating.**
	BOP	**RESPONSE NOT OBTAINED** c.1 IF a service water pump is *not* running, **THEN PLACE the associated RBCCW pump in "PULL TO LOCK".**
	ATC	c.3 IF RBCCW cooling is lost to an RCP, **THEN STOP RCPs not supplied with RBCCW.**
Examiner Note: If the ATC does not already know, they should be informed of the loss of "B" RBCCW header, and based on this, secure the "D" RCP if it is still running.		

Op-Test No.: __ES18LI1___ Scenario No.: __2__ Event No.: _7 & 8__ Event Description: Loss of Vital Bus 24D (and "B" AFW Pump) and Loss of the TDAFW Pump.		
Time	**Position**	**Applicant's Actions or Behavior**

CRITICAL TASK: OP 2260, Unit 2 EOP User's Guide, EOP 2525 guidance for tripping RCPs. Any RCP operating without RBCCW flow, it is desirable to trip this RCP. [CT-3/ OP 2260, EOP 2525 RCP Trip Criteria] **TIME Informed of RBCCW Flow Loss:_____** **TIME "D" RCP was secured:_____**		
	ATC	**ACTION/EXPECTED RESPONSE** **RCS Inventory Control** 4. ENSURE RCS Inventory Control are met by ALL of the following conditions: a. CHECK BOTH of the following conditions exist: • Pressurizer level is between 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	**RESPONSE NOT OBTAINED** a.1 IF the Pressurizer Level Control System is *not* operating properly in automatic, THEN RESTORE and MAINTAIN pressurizer level 35 to 70% by performing **ANY** of the following: 1) OPERATE the Pressurizer Level Control System. 2) Manually OPERATE charging and letdown.
	ATC	**RCS Pressure Control** 5. ENSURE RCS Pressure Control met by BOTH of the following: • CHECK that pressurizer pressure is 1900 to 2350 psia. • CHECK that pressurizer pressure is trending to 2225 to 2300 psia.
Examiner Note: Due to the loss of 4.16 kVA busses, there is only one bank of PZR heaters available. Therefore, PZR pressure recovery will be much slower than on a normal post-trip recovery.		
	ATC	**RESPONSE NOT OBTAINED** 5.1 IF the Pressurizer Pressure Control System is *not* operating properly in automatic, THEN RESTORE and MAINTAIN pressurizer pressure between 2225 to 2300 psia by performing **ANY** of the following: a. OPERATE the Pressurizer Pressure Control System. b. Manually OPERATE pressurizer heaters and spray valves. 5.2 IF **ANY** pressurizer spray valve will *not* close, THEN STOP RCPs as necessary. 5.3 IF any PORV is open AND pressurizer pressure is less than 2250 psia, THEN CLOSE the associated PORV block valve

Op-Test No.: __ES18LI1___ Scenario No.: __2__ Event No.: _7 & 8__		
Event Description: Loss of Vital Bus 24D (and "B" AFW Pump) and Loss of the TDAFW Pump.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**RESPONSE NOT OBTAINED** (cont.) 5.4 IF pressurizer pressure is less than 1714 psia, THEN ENSURE **ALL** of the following: • SIAS actuated. (C01) • CIAS actuated. (C01) • EBFAS actuated. (C01) 5.5 IF pressurizer pressure is less than 1714 psia AND SIAS actuated, THEN ENSURE **ONE** RCP in each loop is stopped. 5.6 **TCOA:** IF Pressurizer pressure lowers to less than the minimum of Fig. 2 "RCP NPSH Curve" THEN STOP **ALL** RCPs
	ATC	**Core Heat Removal** 6. ENSURE Core Heat Removal met by **ALL** of the following conditions: a. CHECK at least **ONE** RCP is operating, AND loop ΔT is less than 10° F. b. CHECK that RCS subcooling is greater than or equal to 30° F.
	BOP	**RCS Heat Removal** 6. ENSURE RCS Heat Removal met by ALL of the following conditions: a. CHECK that at least one steam generator has BOTH of the following conditions met: • Level is 10 to 80%. • Main feedwater or **TCOA**: TWO auxiliary feedwater pumps are operating to restore level 40 to 70%.
Examiner Note: Manual/Auto start Aux. Feedwater of both Motor-driven AFW (MDAFW) pumps to each SG to restore level. "A" and "B" AFW pumps are failed so the Turbine Driven Aux. Feedwater (TDAFW) pump must be manually started. (*This is the criteria for CT-2*). ***** Due to the need to address the loss of 24D and restart EOP 2525 initial actions, the BOP may not have a chance to start the TDAFW pump within the specified time. *****		
	BOP	**RESPONSE NOT OBTAINED** a.1 RESTORE level to between 40% to 70% in at least ONE steam generator using ANY of the following: • Main feedwater • Motor-driven auxiliary feedwater pump • TDAFW Pump. Refer To Appendix 6, "TDAFW Pump Normal Startup." • TDAFW Pump. Refer To Appendix 7, "TDAFW Pump Abnormal Startup."

Op-Test No.: __ES18LI1___ Scenario No.: __2__ Event No.: _7 & 8__ Event Description: Loss of Vital Bus 24D (and "B" AFW Pump) and Loss of the TDAFW Pump.		
Time	**Position**	**Applicant's Actions or Behavior**
CRITICAL TASK: OP 2260, Unit 2 EOP User's Guide, EOP 2525 guidance for TCOA. **If SG level is lowering and both MDAFW pumps are not operating, the operator is required to start the TDAFP within 10 minutes following a Loss of Normal Feedwater.** **[CT-2/ LOOP-3, Establish a Primary-To-Secondary Heat Sink]** **TIME Loss of Normal Feedwater (due to loss of vacuum):_____** **TIME TDAFP started EOP 2525 RNO Step 7a.1:_____**		
	BOP	7. **RCS Heat Removal** (cont.) b. CHECK that RCS Tc is being maintained between 530°F to 535°F. c. CHECK BOTH steam generator's pressures are 880 to 920 psia.
Simulator Operator: If called to check Main Steam Safety Valves, wait about 5 minute then report all MSSVs indicate closed.		
Examiner Note: The TDAFW pump will trip 3 minutes after being started by the BOP.		
Indications: • **AUX TURBINE DRIVEN FEED PP OVERSPEED TRIP (C-05, C-15)** • **Aux Feed flow indication to both SGs will be < 300 gpm (minimum required).**		
Simulator Operator: When a PEO is sent to investigate the problem with the TDAFW Pump, inform the crew that the overspeed trip linkage is broken and cannot be reset. **If asked, Unit 3 cannot power 24E for ~ 2 hours due to problems with their 4.16 kVA bus X-tie breaker.**		
	BOP	7. a. RNO a.1 RESTORE level to 40 to 70% in at least one steam generator using ANY of the following: • Motor- driven auxiliary feedwater pump. • TDAFW Pump. Refer To Appendix 6, "TDAFW Pump Normal Startup." **BOP attempts to restart TDAFW pump. Informs SRO of loss of all feed flow.**
Examiner Note: The BOP should report the loss of all feed to the SGs, due to the inability to restart the TDAFW Pump before the SRO completes the Diagnostic Flow Chart.		

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 7 & 8		
Event Description: Loss of Vital Bus 24D (and "B" AFW Pump) and Loss of the TDAFW Pump.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**Containment Isolation** 8. ENSURE Containment Isolation met by ALL of the following: a. CHECK Containment pressure is less than 1.0 psig. b. CHECK that NONE of the following primary plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity: **Radiation Monitors Inside Containment** • 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 c. CHECK that NONE of the following steam plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity: **Steam Plant Radiation Monitors** • 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	**Containment Temperature and Pressure Control** 9. ENSURE that Containment Temperature and Pressure Control met by BOTH of the following conditions: a. CHECK Containment temperature is less than 120°F. (PPC or avg. of Points 5 and 6) b. CHECK Containment pressure is less than 1.0 psig.
	SRO	10. PERFORM the following: a. DIAGNOSE the event. Refer To Appendix 1, "Diagnostic Flowchart." **[See Page 39 for Diagnostic Flow Chart]** b. INITIATE Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions." c. Go To the appropriate EOP
	ATC/BOP	{Step 10.b above} Perform Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions".
Examiner Note: Examiner Note: EOP Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions" are attached to the end of the guide, starting on page 36.		

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 8 Event Description: Loss of the TDAFW Pump resulting in Loss Of All Feedwater flow		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	**Enters EOP 2537, Loss Of All Feed.**
Examiner Note: The following steps are from EOP 2537 Loss Of All Feedwater. 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.		
	SRO	*1. CONFIRM diagnosis of a Loss of All Feedwater by performing the following. **Examiner Note: SRO checks EOP 2537-001 LOAF Safety Function Status Checks and confirms that all Safety Criteria are satisfied.**
	SRO	*2. CLASSIFY the event. Refer To MP-26-EPI-FAP06, "Classification and PARs" IF classification requires RCS sampling, Refer To Appendix 46, "Sampling for EAL Determination" and DIRECT Chemistry as required.
	SRO	*3. PERFORM ALL of the following: • OPEN the placekeeper and ENTER the EOP entry time. • ENSURE the master alarm silence switch is in "NORMAL".
	SRO/ATC	*4. PERFORM the following: a. STOP ALL RCPs. b. PLACE HIC- 4165, steam dump TAVG controller, in manual AND closed. c. PLACE the following pressurizer spray valve controllers in manual and CLOSE the valves: • HIC- 100E • HIC- 100F
	BOP	*5. PERFORM ALL of the following to conserve steam generator inventory: a. ENSURE MS- 220A, blowdown isolation valve is closed. b. ENSURE MS- 2206, blowdown isolation valve is closed. c. CLOSE BOTH steam generator sample isolation valves: • MS- 191A • MS- 1918

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 8		
Event Description: Loss of the TDAFW Pump resulting in Loss Of All Feedwater flow		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP/ATC	NOTE OTC should be initiated prior to **ONE** steam generator wide range level reaching 70 inches, AND **ONE** steam generator wide range level reaching 165 inches if **ANY** of the following exist: 1. Main or auxiliary feedwater is *not* expected to be restored. 2. Less than **TWO** trains of HPSI, PORVs and ADVs are available. 3. Less than **THREE** charging pumps are available. **Check For Adequate RCS Heat Removal** *6. CHECK for adequate RCS heat removal via the steam generators by BOTH of the following: • BOTH steam generator wide range levels are greater than 70 inches • RCS Tc stable or controlled within 5°F or less **RNO Contingency Actions**: 6.1. IF steam generator level is not restoring **AND** **ANY** of the following conditions exists: • **ONE** steam generator wide range level less than or equal to 70 inches **AND** the **REMAINING** steam generator wide range level is less than or equal to 165 inches • RCS TC rises uncontrollably by 5°F or more ESTABLISH heat removal via once- through- cooling by performing **ALL** of the following: 6.1 ENSURE **ALL** proportional heaters are tripped a. ENSURE **ALL** backup heaters in "PULL- TO- LOCK". b. IF main condenser is available, THEN OPEN **ALL** steam dump valves. c. OPEN **BOTH** ADVs. d. ENSURE SIAS actuated. e. ENSURE **BOTH** HPSI pumps have started. f. ENSURE that **ALL** HPSI loop injection valves are open. g. ENSURE that **ALL** available charging pumps are running. h. ENSURE that **BOTH** PORV block valves are open. i. WHEN at least **ONE** HPSI pump has started, THEN OPEN **BOTH** PORVs. (Key # 187) j. Go To EOP 2540, "Functional Recovery." **[Examiner Note: This is one path to meet CT-4.]**

Op-Test No.: __ES18LI1___ Scenario No.: __2__ Event No.: _8__		
Event Description: Loss of the TDAFW Pump resulting in Loss Of All Feedwater flow		
Time	**Position**	**Applicant's Actions or Behavior**
Examiner Note: The SRO must make a judgement call as to whether sufficient SG level exists to attempt use a condensate pump to recover feedwater flow. Regardless of which path is chosen, the criteria of the Critical Task below still apply.		
CRITICAL TASK: Once-Through-Cooling (OTC) shall be fully implemented (both ADVs open, both PORVs open, and two trains of HPSI in operation) prior to either SG level lowering to less than 32 inches wide range level. [CT-4/ LOAF-4, Establish a Primary-To-Secondary Heat Sink] **Steam Generator Level when feed flow was restored or OTC was fully implemented:** **Steam Generator 1 Level: _____** **Steam Generator 2 Level: _____**		
Examiner Note: The SRO may decide to use the Once-Through-Cooling success path if all three condensate pumps were secured in error or he feels conditions warrant. In that instance, RNO 6.1 is used for that path. **If the crew uses the Once-Through-Cooling success path, once it is implemented and the US transitions to EOP 2540, the remainder of EOP 2537 is N/A. Go to Page 32 for EOP 2540 steps.**		
	BOP	*7. WHEN feedwater source becomes available, THEN RESTORE feedwater to the affected steam generators as follows: a. CHECK steam generator level is less than 33%. a.1 FEED affected steam generators at any desired flow rate to restore and maintain level within 40% to 70%. b. FEED each affected steam generator by raising feedwater flow rate in increments of 50 gpm within BOTH of the following limits: • Flow limited to within the capacity of the available feedwater source • Maximum flow rate of less than, or equal to 650 gpm, (325 klbm/hr). c. WHEN ANY of the following conditions are met: • Steam generator shows a rising trend • Feedwater flow rate has been established within the capacity of the available feedwater source, with a maximum flow rate of less than, or equal to 650 gpm, (325 klbm/hr). • Steam generator level is greater than 33% THEN FEED affected steam generators at any desired flow rate, within the capacity of the available feedwater source, to restore and maintain level within 40% to 70%.
Examiner Note: The SRO may quickly proceed to Step 17 if the Condensate Pump success path is believed to be a viable option with very limited time availability.		

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 8		
Event Description: Loss of the TDAFW Pump resulting in Loss Of All Feedwater flow		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	*8. IF a main feedwater line break is indicated, ISOLATE the affected portion of the main feedwater system by performing the following: **Examiner Note: Step 8 is N/A**
	BOP	*9. IF a auxiliary feedwater line break is indicated, ISOLATE the affected portion of the auxiliary feedwater system by performing the following: **Examiner Note: Step 9 is N/A**
	SRO/BOP	*10. IF offsite power has been lost, OR the condenser is *not* available, PERFORM the following: a. CLOSE BOTH MSIVs: • MS - 64A • MS- 648 b. ENSURE BOTH MSIV bypass valves are closed: • MS - 65A • MS – 658 c. OPEN AR- 17, condenser vacuum breaker.
	SRO	*11. RESTORE feedwater flow to at least ONE steam generator using the motor-driven AFW pumps as follows: **Examiner Note: Step 11 is N/A**
	SRO	*12. IF auxiliary feedwater flow is restored, Go To step 23. **Examiner Note: Step 12 is N/A**
	SRO	*13. RESTORE feedwater flow to at least one steam generator using the TDAFW pump as follows **Examiner Note: Step 13 is N/A**
	SRO	*14. IF auxiliary feedwater flow is restored, Go To step 23. **Examiner Note: Step 14 is N/A**
	SRO	*15. START ONE SG feedwater pump by performing the following for the pump to be started: **Examiner Note: Step 15 is N/A due to the loss of condenser vacuum.**
	SRO	*16. IF SG feedwater flow is restored, Go To step 23. **Examiner Note: Step 16 is N/A**
	BOP	*17. ENSURE at least ONE condensate pump is running.

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 8 Event Description: Loss of the TDAFW Pump resulting in Loss Of All Feedwater flow		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO/BOP	*18. ESTABLISH a flowpath from the hotwell to at least **ONE** steam generator as follows: a. ENSURE **BOTH** SGFP discharge valves are open: • FW- 38A • FW- 38B b. CLOSE **BOTH** SGFP "MIN FLOW RECIRC": • FIC- 5237 • FIC- 5240 c. OPEN CNM-2, CPF bypass valve. d. OPEN **BOTH** main feed reg bypass valves: • LIC-5215 • LIC-5216 e. ENSURE **BOTH** main feed isolation air assisted check valves are open: • FW-5A • FW-5B
	BOP	*19. IF SIAS is *not* present AND SIAS Block is permitted, THEN BLOCK the automatic initiation as the cooldown and depressurization proceeds.
Examiner Note: The crew should block SIAS as the event does not warrant its actuation.		
	BOP	*20. IF MSI is *not* present AND MSI Block is permitted, THEN BLOCK the automatic initiation as the cool down and depressurization proceeds.
Examiner Note: The crew should block MSI as its actuation will delay feed flow restoration.		
	BOP	*21. IF a flowpath from the hotwell to a steam generator is established, THEN DEPRESSURIZE at least ONE steam generator at the maximum controllable rate, until adequate feed flow is obtained from the condensate pump to restore steam generator level. **[Examiner Note: This is one path to meet CT-4.]**
	ATC	*22. COMMENCE emergency boration. Refer To Appendix 3, "Emergency Boration."
	BOP	*23. IF feed flow is restored, RESTORE and MAINTAIN 40 to 70% level in at least one steam generator.
Scenario Termination: When crew has restored feedwater flow to one SG, or at the lead examiner's direction, the scenario is complete.		

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 8		
Event Description: Loss of the TDAFW Pump resulting in Loss Of All Feedwater flow		
Time	**Position**	**Applicant's Actions or Behavior**
Examiner Note: If OTC is initiated in EOP 2537, Loss Of All Feedwater, once initiated, the US will transition to EOP 2540, Functional Recovery. **The following steps are from EOP 2540, Functional Recovery.**		
Indications: • **#2 S/G Pressure** • **RCS Cold Leg Temperature** • **Sub Cool Margin**		
	SRO	1. CLASSIFY the event. Refer To MP-26-EPI-FAP06, "Classification and PARs" • IF classification requires RCS sampling, Refer To Appendix 46, "Sampling for EAL Determination" and DIRECT Chemistry as required.
Examiner Note: Classified as an Alert/C-1; Alert/C-1; RCS Barrier, RCB2 Loss (Subcooling < 30°F)		
	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. IF pressurizer pressure is less than 1714 psia AND 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. IF 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.: ES18LI1 Scenario No.: 2 Event No.: 8 Event Description: Loss of the TDAFW Pump resulting in Loss Of All Feedwater flow		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	4. SAMPLE steam generators that are available for RCS heat removal as follows: a. CHECK "B" train RBCCW in service. b. ENSURE 2-RB-210 "Degasifier Effluent Cooler Return Outlet" is open. c. OPEN appropriate steam generator sample valves: • MS-191A • MS-191B d. DIRECT Chemistry to perform **ALL** of the following: • Sample **ANY** steam generator that is available for RCS Heat Removal • Frisk the samples • Report frisk results • Analyze samples for boron and activity e. **WHEN** Chemistry reports that samples have been taken, PERFORM the following: • CLOSE the steam generator sample valves • IF SIAS has actuated, AND no other sampling is in progress, CLOSE 2-RB-210, "Degasifier Effluent Cooler Return Outlet"
Simulator Operator: When directed to sample Steam Generators, respond 20 minutes later that samples have been taken. Report that frisk results show all background levels.		
	BOP	5. PLACE the hydrogen analyzers in service. Refer To Appendix 19, "Hydrogen Analyzer Operation."
	SRO	**NOTE** If the Safety Function Status Checklist is *not* satisfied for the selected success path, the US may commence the operator actions for safety functions which are *not* met based on Safety Function hierarchy. The remaining Safety Functions should be prioritized as time permits.
	SRO	6. IDENTIFY success paths to be used to satisfy each safety function using **BOTH** of the following: • Resource Assessment Trees • Safety Function Tracking Page

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 8

Event Description: Loss of the TDAFW Pump resulting in Loss Of All Feedwater flow

Time	Position	Applicant's Actions or Behavior
	SRO	7. PRIORITIZE safety functions to be addressed first based on **ALL** of the following: a. Safety functions which do *not* meet the Safety Function Status Checklist for the selected success path. b. Safety functions for which the equipment to support the success path is *not* operating. c. Safety functions for which success path three has been selected. d. Safety functions for which success path two has been selected. e. Safety functions for which success path one has been selected.

Examiner Note: SRO will direct the Board Operators through the Resource Assessment Trees and query plant status to determine the correct Functional Procedure to use.

SRO / SRO

4.0 SAFETY FUNCTION STATUS CHECKLIST

SAFETY FUNCTION TRACKING PAGE **EOP ENTRY TIME** _____

Safety Function	Success Path		Procedure	SFSC Met	Priority
Reactivity Control	**RC-1**	**CEA Insertion**	EOP 2540A	**Y**	**5**
	RC-2	Boration CVCS			
	RC-3	Boration SI			
Maintenance of Vital DC Power	**MVA-DC-1**	Battery Chargers/ Station Batteries	EOP 2540B	**Y**	**6**
Maintenance of Vital AC Power	MVA-AC-1	RSST	EOP 2540B		**2**
	MVA-AC-2	**EDG**		**Y**	
	MVA-AC-3	BUS 34A/34B			
RCS Inventory Control	IC-1	CVCS	EOP 2540C1		**3**
	IC-2	**Safety Injection**		**Y**	
RCS Pressure Control	PC-1	Subcooled	EOP 2540C2		**4**
	PC-2	**Saturated**		**Y**	
	PC-3	PORVs			
RCS Core Heat Removal	HR-1	SI no operating	**EOP 2540D**		**1**
	HR-2	SI operating			
	HR-3	**O-T-C**		**Y**	
Containment Isolation	**CI-1**	**Automatic / Manual**	EOP 2540E	**Y**	**7**

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 8

Event Description: Loss of the TDAFW Pump resulting in Loss Of All Feedwater flow

Time	Position	Applicant's Actions or Behavior

	SRO	Containment Temperature and Pressure Control	**CTPC-1**	**CARs (Normal)**	EOP 2540F	**Y**	**8**
			CTPC-2	CARs (Emerg)		May be **Y** if >4.42psi	May be #5 if CTMT >4.42psi
	SRO	8. DIRECT the STA to check that Safety Function Status Checklist Criteria are satisfied for chosen success paths.					
		9. PERFORM operator actions for chosen success paths based on priority assigned.					

Examiner Note: The US should transition to EOP *2540D, Functional Recovery of Heat Removal, Success Path HR-3* at which time the scenario is complete.

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 7		
Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**
Examiner Note: The following steps are from EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions, performed by the ATC and BOP while the SRO is diagnosing the event.		
	ATC	1. IF charging pumps suction is aligned to the VCT, THEN CHECK VCT level is between 72% to 86%: a. IF VCT level is less than 72%, THEN ALIGN charging pump suction to RWST as follows: 1) OPEN CH- 192, RWST isolation. 2) ENSURE CH- 504, RWST to charging suction is open. 3) CLOSE CH- 501, VCT outlet isolation. 4) ENSURE CH- 196, VCT makeup bypass is closed. b. IF VCT level is greater than 88%, THEN PLACE CH- 500, letdown divert handswitch, to the "RWS" position, and divert as required to maintain VCT level 72% to 86%.
	ATC	2. TCOA: IF SIAS actuated, THEN ENSURE **ONE** complete facility of CRAC operating, in RECIRC mode, as follows: (C25A/B) **Facility 1** • HV- 203A, Fan F- 21A exhaust damper open • Fan F- 21A, supply fan running • HV- 206A, Fan F- 31A exhaust damper open • Fan F- 31A, exhaust fan running • HV- 212A, Fan F- 32A exhaust damper, open • Fan F- 32A, filter fan, running • HV- 202, minimum fresh air damper, closed • HV- 207, cable vault exhaust damper, closed • HV- 208, exhaust air damper, closed **Facility 2** • HV- 203B, Fan F- 21B exhaust damper open • Fan F- 21B, supply fan running • HV- 206B, Fan F- 31B exhaust damper open • Fan F- 31B, exhaust fan running • HV- 212B, Fan F- 32B exhaust damper, open • Fan F- 32B, filter fan, running • HV- 495, fresh air damper, closed • HV- 496, exhaust air damper, closed • HV- 497, cable vault exhaust damper, closed

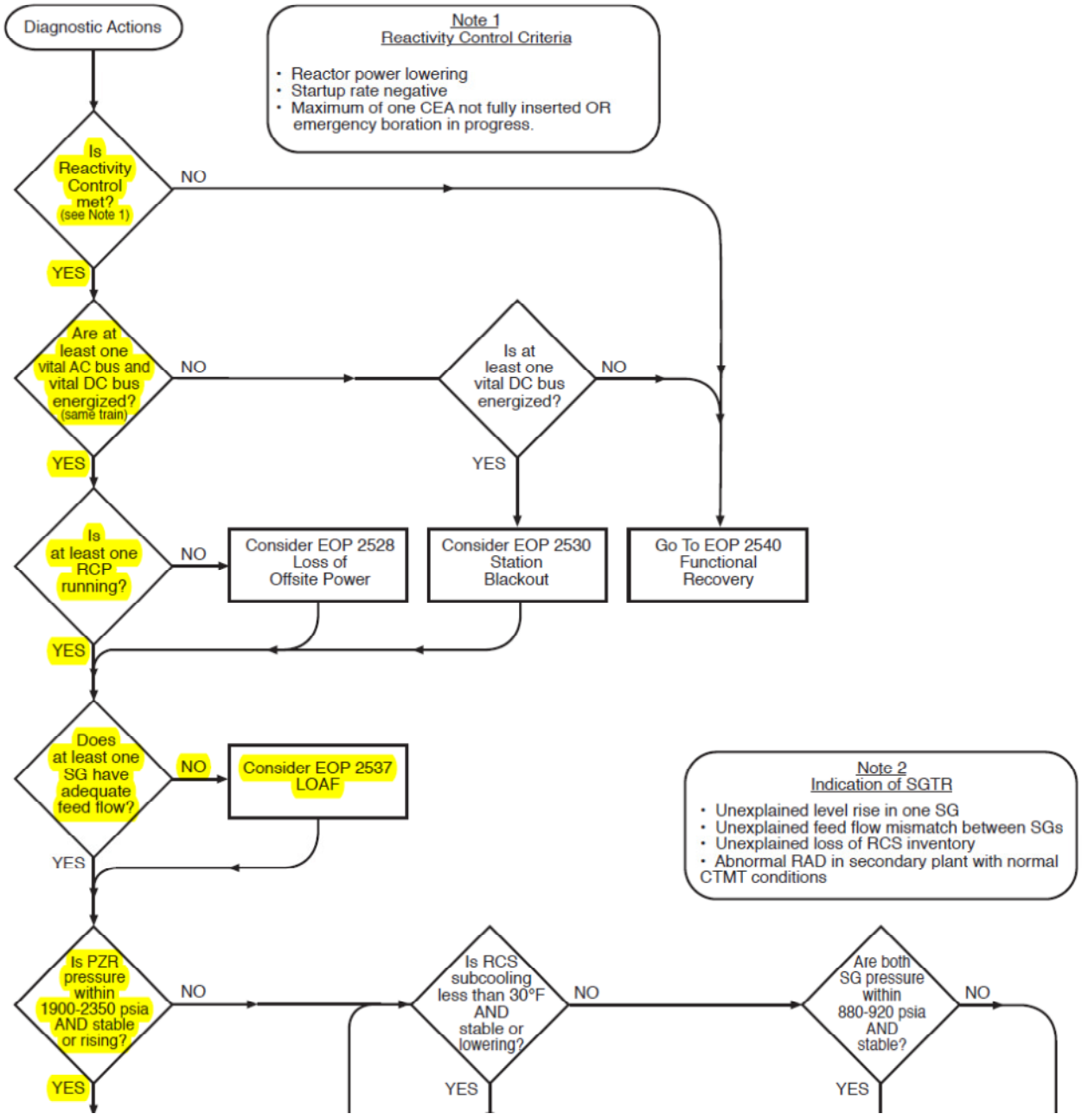
Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 7 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	3. TCOA: IF SIAS not actuated, THEN CHECK ONE facility of CRAC operating, in NORMAL mode, as follows: (C25A/B) **Facility 1** • HV- 203A, Fan F- 21A exhaust damper is open • Fan F- 21A, supply fan running • HV- 206A, Fan F- 31A exhaust damper open • Fan F- 31A, exhaust fan running **Facility 2** • HV- 203B, Fan F- 21B exhaust damper open • Fan F- 21B, supply fan running • HV- 206B, Fan F- 31B exhaust damper open • Fan F- 31B, exhaust fan running
	ATC	4. IF charging pumps suction aligned to the RWST AND boration not required, THEN RESTORE charging pump suction to VCT as follows: a. CHECK BOTH of the following: 1) VCT level between 72% and 86% 2) VCT pressure greater than 15 psig b. CHECK letdown is in service. c. OPEN CH- 501, VCT outlet isolation. d. CLOSE CH- 192, RWST isolation.
	BOP	5. CHECK instrument air pressure greater than 90 psig and stable.
	BOP	6. IF AFAS has actuated, WHEN **BOTH** steam generators are restored to greater than 33%, THEN PERFORM the following: a. PLACE the following switches in "M" (Manual) and ADJUST to obtain desired flow (C- 05): 1) FW- 43A, "AFW- FCV, HIC- 5276A" 2) FW- 43B, "AFW- FCV, HIC- 5279A" b. PLACE **BOTH** of the following switches to "RESET" and ALLOW to spring return to neutral (C- 05): 1) "OVERRIDE/MAN/START RESET" (Facility 1) 2) "OVERRIDE/MAN/START RESET" (Facility 2) c. ADJUST the following switches to obtain desired flow (C- 05): 1) FW- 43A, "AFW- FCV, HIC- 5276A" 2) FW- 43B, "AFW- FCV, HIC- 5279A" d. IF main feedwater pump is supplying steam generators, THEN STOP **BOTH** auxiliary feedwater pumps. **Examiner Note: BOP may place both facilities in override (Pull-To-Lock) once the loss of both MD-AFW pumps is discovered or the SRO directs it.**

Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 7 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	7. CHECK Main Condenser is available, as indicated by ALL of the following: • 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 **RNO** 7.1 IF Main Condenser is not available, PERFORM the following: • CLOSE BOTH MSIVs. • ENSURE BOTH MSIV bypass valves are closed. • OPEN AR-17, condenser vacuum breaker. **Examiner Note: Not available due to the loss of condenser vacuum.**
	BOP	8. OPEN HD-106, subcooling valve.
	BOP	9. ENSURE BOTH heater drain pumps stopped.
	BOP	10. IF MFW is supplying feed to the steam generators, THEN PERFORM the following: a. ENSURE that only **ONE** main feedwater pump is operating. b. ENSURE that **BOTH** main feed block valves are closed: 1) FW- 42A 2) FW- 42B c. ADJUST the operating main feedwater pump pressure to 50 to 150 psi greater than SG pressure. d. ENSURE BOTH main feed reg bypass valves are throttled to control SG level: 1) LIC- 5215 2) LIC- 5216 e. IF Main Feedwater Pump A is secured, THEN CLOSE the following: 1) FW- 38A, main feedwater pump discharge valve 2) FIC- 5237, main feedwater pump mini flow recirc valve f. IF Main Feedwater Pump B is secured, THEN CLOSE the following: 1) FW- 38B, main feedwater pump discharge valve 2) FIC- 5240, main feedwater pump mini flow recirc valve **Examiner Note: Loss of condenser vacuum secures both MFW pumps.**
	BOP	11. IF **BOTH** MFW pumps are secured, THEN PERFORM the following: a. CLOSE BOTH main feedwater pump mini flow recirc valves. • FIC- 5237 • FIC- 5240

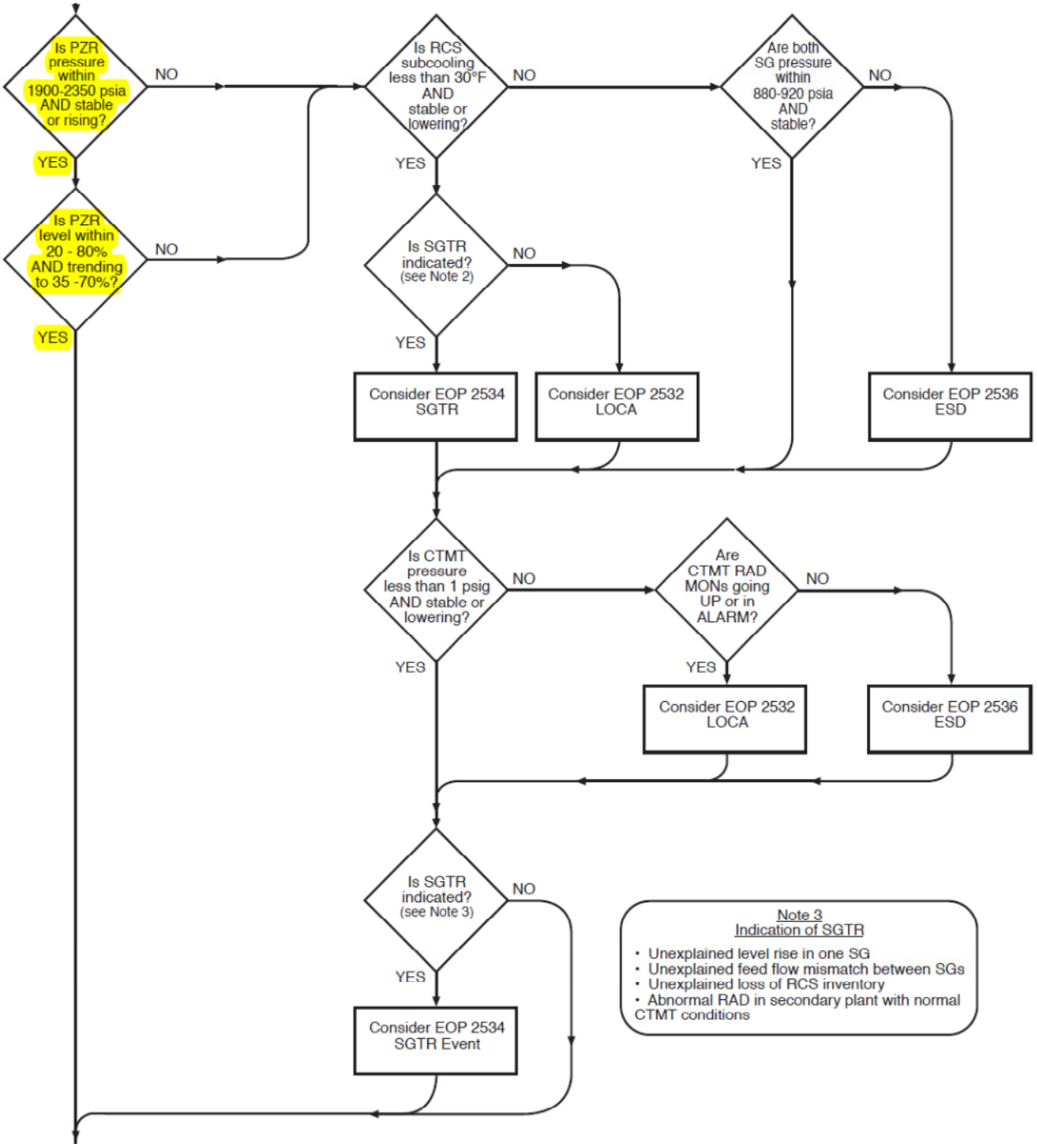
Op-Test No.: __ES18LI1___ Scenario No.: __2__ Event No.: _7__ Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**

	BOP	12. IF 25A OR 25B is energized, THEN ALIGN condensate pumps as follows: a. ENSURE **ONE** pump is running. b. ENSURE **ONE** pump is in "PULL TO LOCK." c. ENSURE **ONE** pump is in "AUTO."
Examiner Note: it is important that at least one condensate pump remain running. If all three are mistakenly secured, the only success path available will be Once-Through-Cooling.		
End of Attachment 4- A		

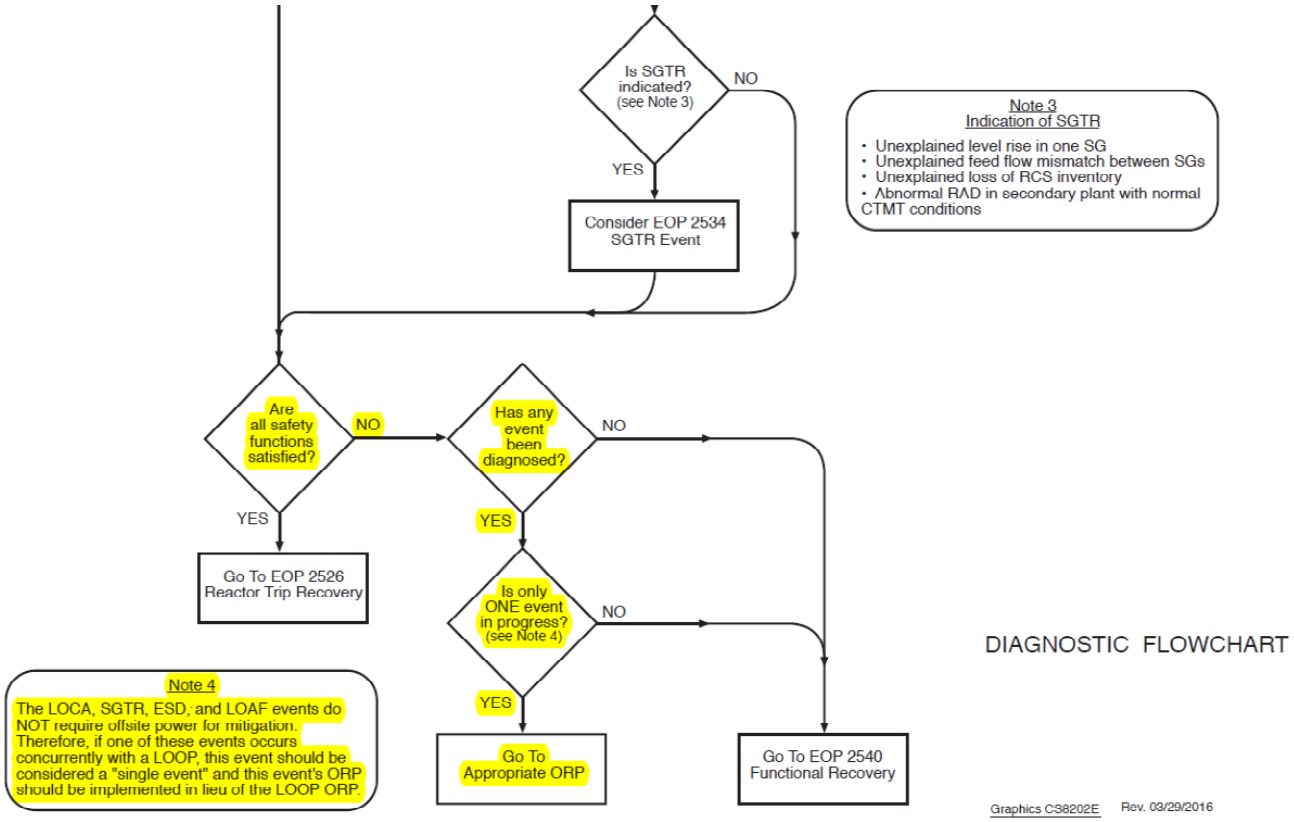
Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 7 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**



Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 7 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**



Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 7 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**



SIMULATOR SCENARIO #3

Facility: Millstone Unit 2 Scenario No.: 3 Op-Test No.: ES18LI1

Examiners: _____ Operators: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: 100% Power IC-21, steady state, No equipment OOS, Ch-Y PZR Level in service.
Ensure "B" Charging Pump is aligned to 22F (Facility 2).

Turnover: 100% Power, steady state, no equipment OOS. 24E is aligned to 24C.

Critical Tasks:

1. [SPTA-5] Manually shut down the reactor (ATC).
2. [RC-3] Perform a plant cooldown (BOP).
3. [RC-3] Establish Reactivity Control (ATC).

Event No.	Malf. No.	Event Type*	Event Description
1	CC01A, C06-A6	C (TS) (BOP/S)	'A' RBCCW pump trip & alarm. Requires 'B' RBCCW pump put in service.
2	RC04	C (TS) (ATC/S)	RCS leak of ~20 gpm, Tech. Specs. requires a plant shut down.
3	N/A	R (ALL)	Plant shutdown required due to RCS leakage.
4	RX12C	I (BOP/S)	#2 SG "Main" Level Transmitter (LT-5273) fails low.
5	ES02D, ED06E, RD0206, RD0207	M (ALL)	Inadvertent MSI Fac. 2, both MSIVs go closed causing a plant trip. On the trip, 480 VAC bus 22E de-energizes causing loss of "A" Chg. Pump and 2 CEAs fail to insert, requiring Emergency Boration.
6	CV04C	C (ATC/S)	30 seconds after the plant trip, "C" charging pump trips, requiring "B" charging pump be manually started for Emergency Boration.
7	CV04B, C02-C13	M (All)	Trip of remaining ("B") charging pump & alarm. Requires transition to EOP 2540/2540A, to recover Reactivity Safety Function.

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

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

Scenario 3 Summary:

The crew will take the shift with the unit at 100% power, steady state, no equipment OOS (IC-21).

Event 1: "A" RBCCW pump will trip, requiring the crew to start the "B" RBCCW pump and place it in service on the "A" RBCCW Header IAW AOP 2564, ***Loss of RBCCW***. The applicable Tech. Spec. entry will be made based on the initial loss of an operable Fac. 1 RBCCW pump.
Once flow on the "A" RBCCW Header is restored, or at the examiners discretion, Event 2 is triggered.

Event 2: An RCS leak into containment of about 20 gpm will occur, requiring the crew to enter AOP 2568, ***Reactor Coolant System Leak***, and perform the applicable actions. The crew should commence a plant shutdown based on the rate exceeding the administrative requirement for continued operation.

Event 3: Based on the guidance of AOP 2568, the crew will perform the actions of AOP 2575, ***Rapid Downpower***, to shut down to Mode 5.
Once the power change evaluation is completed, or at the examiners discretion, Event 4 is triggered.

Event 4: Immediately after the crew takes the watch, the #2 SG "Main" control channel level transmitter will fail low. In response to this failure, the #2 Main Feed Regulating Valve (MFRV) will automatically start to open causing #2 SG level to rise. The BOP should perform the required actions per AOP 2585, ***Immediate Operator Actions***, (IOA) to stabilize SG level. This will require taking manual control of the #2 SG MFRV and both main feed pumps to lower #2 SG feedwater flow. Once SG levels have been stabilized, the failed transmitter can be bypassed and the SG Feedwater Control System can be returned to automatic mode.
Once Main Feedwater Control is back in automatic mode, or at the examiners discretion, Event 5 is triggered.

Event 5: An inadvertent MSI actuation will occur, closing both of the MSIVs and causing a plant trip on load reject and a loss of normal feedwater flow. On the trip, Vital 480 VAC bus 22E will de-energize causing the loss of "A" charging pump, and 2 Shutdown CEAs will fail to insert requiring Emergency Boration.

Event 6: Approximately 30 seconds after the plant trip, the "C" charging pump will trip. This will cause a total loss of charging flow and boric acid injection, requiring the manual start of the standby "B" charging pump.
Some time before the US begins the Diagnostic Flow Chart, Event 7 is triggered.

Event 7: The "B" charging pump will trip, causing a loss of the Reactivity Safety Function. This will require the crew to transition to EOP 2540/2540A, ***Functional Recovery of Reactivity Control***, and cooldown and depressurize the RCS to allow use of the HPSI pumps to inject boric acid into the RCS.

The scenario will end when the Reactivity Safety Function is restored, or at the examiners discretion.

INPUT SUMMARY							
Either INPUT or VERIFY the following functions:							
ID Num	Description	Delay Time	Ramp Time	Event Trigger	Severity or Value	Final Value	Relative Order
MALFUNCTIONS							
RD0206	CEA SD-6 Stuck fully withdrawn			E-0	Active		0
RD0207	CEA SD-7 Stuck fully withdrawn			E-0	Active		0
CC01A	"A" RBCCW pump trip			E-1	Active		1
C06-A06	"A" RBCCW Pump Overload Trip			E-1	ON		1
C06-A06	"A" RBCCW Pump Overload Trip			E-10	NORMAL		2
RC04	RCS Leak in CTMT (Rx Head Vent)			E-2	20 gpm		4
RX12C	#2 SG 'Main' Level transmitter failure		5 min	E-4	50%		5
ES02D	Fac. 2 Inadvertent MSI			E-5	Active		6
ED06E	Loss of bus 22E			E-30	Active		6
CV04C	"C" Charging pump trip			E-6	Active		7
C02-C13	"B" Charging Pp Lube Oil Pres Lo			E-7	Cry-Wolf		8
CV04B	"B" Charging pump trip			E-7	Active		8
REMOTE FUNCTIONS							
CCR40	"B" RBCCW Breaker SIAS Block			E-11	NORM		3
OVERRIDES							

Op-Test No.: __ES18LI1___ Scenario No.: __3__ Event No.: _1__ Event Description: "A" RBCCW Pump trip		
Time	**Position**	**Applicant's Actions or Behavior**
Simulator Operator: When directed, initiate Event 1, Overload Trip of the "A" RBCCW Pump.		
Indications: • **RBCCW PUMP A OVERLOAD/TRIP (C-06/7, A-6)** • **RBCCW HDR A PRES LO (C-06/7, B-7)**		
Examiner Note: Although an alarm will alert the crew to the event, AOP 2585, Immediate Operator Actions will be used to mitigate the event. The following steps are from AOP 2585, St. 12, Loss of RBCCW Pump.		
	BOP	**12.0 Loss of RBCCW Pump** [12.1] IF standby pump is available, PERFORM the following: a. ENSURE RBCCW pump suction and discharge header cross- ties closed to opposite facility. b. ENSURE RBCCW pump suction and discharge header cross- ties open to desired facility. c. START standby RBCCW pump. 12.2 Go To AOP 2564, "Loss of RBCCW."
Examiner Note: The following steps are from ARP 2590E-037, RBCCW PUMP A OVERLOAD/TRIP. However, the crew may go to AOP 2564 first. Those steps follow the ARP.		
	BOP	AUTOMATIC FUNCTIONS 1. None
	BOP	CORRECTIVE ACTIONS 1. CHECK the following and DETERMINE if alarm is valid (C-06): • Pump red indicating light is not lit and amber indicating light is lit, with 0 amperage indicated • Pump discharge pressure is low • Low header pressure alarm is present (50 psig) • Low flow on components served by header 2. IF alarm is valid, Go To AOP 2564, "Loss of RBCCW." 3. Refer To OP 2330A, "RBCCW System," and PERFORM applicable actions to place "B" RBCCW Pump in service on Facility 1. 4. SUBMIT Trouble Report to Maintenance Department.

Op-Test No.: __ES18LI1___ Scenario No.: __3__ Event No.: _1__ Event Description: "A" RBCCW Pump trip		
Time	**Position**	**Applicant's Actions or Behavior**
Examiner Note: The following steps are from AOP 2564, "Loss of RBCCW".		
Simulator Operator: If asked to investigate the "A" RBCCW Pump, in ~ 10 minutes report that the pump motor is hotter than normal but nothing else appears unusual.		
	SRO	**3.0 Initial Actions** 3.1 OPEN Attachment 2, "Reactor Trip Criteria" fold out page, for reference.
	SRO	**REACTOR TRIP CRITERIA** Loss of RBCCW Flowgreater than 5 minutes RBCCW HX Outlet Temperature Higreater than 120°F RCP RBCCW Outlet Temperaturegreater than 125°F RCP Lower Seal Temperaturegreater than 170°F RCP Upper/Lower thrust bearing Temperaturegreater than 194°F RCP Bleedoff Temperaturegreater than 195°F RCP Anti Reverse Bearing Temperaturegreater than 250°F RCP Stator Temperature Highgreater than 260°F
	SRO	3.2 IF any RBCCW pump trips, PERFORM the following: a. IF standby pump is aligned electrically AND mechanically, START standby RBCCW pump.
	SRO	3.3 CHECK the following : (Procedure requires verificatin that no RCP high temperature annunciators are in alarm , which would be trip criteria.)
	SRO	3.4 **[Step is N/A]**
	SRO	3.5 **[Step is N/A]**
	SRO	3.6 IF "A" RBCCW pump tripped, Go To Section 4.0, "A RBCCW Trip."
Simulator Operator: When "A" RBCCW pump is placed in P-T-L, trigger E-10 to clear trip alarm.		
	BOP	**4.0 "A" RBCCW Pump Trip** 4.1 IF the "A" RBCCW pump has tripped, PERFORM the following: a. PLACE "A" RBCCW pump in "PULL TO LOCK." b. CHECK ALL the following conditions exist: • "B" RBCCW pump is available • "B" RBCCW HX is not in service on Facility 2

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 1		
Event Description: "A" RBCCW Pump trip		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	c. ENSURE RB-211D, pump "B" header "B" suction, closed. d. ENSURE RB-251B, pump discharge header B/C cross-tie, closed. e. ENSURE RB-211C, pump "B" header "A" suction, open. f. IF "A" RBCCW HX is in service, OPEN RB-251A, pump discharge header A/B cross-tie. g. START RBCCW pump "B". h. CHECK alarm AA20, "RBCCW PUMP B SIAS/LNP START MANUALLY BLOCKED" is lit.

	BOP	4.2 MONITOR the following:
		• Header flow on applicable flow indicator:
		  • "A" header: FI-6035
		  • "B" header: FI-6034
		• Pump discharge pressure
		• Motor amperage
		4.3 SEND operator to "A" RBCCW Pump Breaker A311 (31'6" Switchgear Room) and DETERMINE if there are any relay target drops:
		4.4 Go To Section 7.0, "Plant Assesment."

	SRO	**Review Tech. Specs.**: **LCO 3.7.3.1 (RBCCW):** Two reactor building closed cooling water loops shallbe OPERABLE. **APPLICABILITY**: MODES 1, 2, 3 and 4. **ACTION**: With one reactor building closed cooling water loop inoperable, restore the inoperable loop to OPERABLE status within 72 hours or be in COLD SHUTDOWN within the next 36 hours. **Examiner Note: SRO should recognize the need to momentary log into the TSAS for the time period between the loss of the "A" RBCCW pump and the starting of the "B" RBCCW pump, where the "A" RBCCW Header was not operable.**
Examiner Note: The following steps are from ARP 2590E-097, "RBCCW PUMP B SIAS/LNP START MANUALLY BLOCKED", which will make the "B" RBCCW pump the OPERABLE Facility 1 pump.		
	BOP	**AUTOMATIC FUNCTIONS** 1. None

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 1		
Event Description: "A" RBCCW Pump trip		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	**NOTE:** If "B" RBCCW pump is the only operating RBCCW pump, the facility is *not* **OPERABLE.** **CORRECTIVE ACTIONS** 1. IF "B" RBCCW pump is to remain in service as the OPERABLE pump, PERFORM the following: 1.1 VERIFY pump is operating on same facility 24E is aligned to. 1.2 PLACE "SIAS/LNP ACTUATION SIGNAL HS 6119D," in "NORMAL." (A504)
Simulator Operator: When directed to place SIAS/LNP Block to "NORMAL", wait 2 minutes, then trigger E-11 and report done. **When the trip of the "A" RBCCW Pump has been mitigated and the SRO has finished evaluating Technical Specifications and the TRM, or at lead examiner's direction, proceed to Event 2, Reactor Coolant System Leak.**		

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 2		
Event Description: RCS Leak – AOP 2568, "Reactor Coolant System Leak"		
Time	**Position**	**Applicant's Actions or Behavior**

Simulator Operator: When directed, initiate Event #2, RCS Leak.		
Indications Available: • **Letdown Flow will begin to lower below the normal 40 gpm.**		
	ATC	Letdown flow is lowering, PZR level stable (or lowering slowly).
	SRO	Indications of an RCS leak, entering AOP 2568, Reactor Coolant System Leak.
Examiner Note: The following steps are from AOP 2568.		
	SRO	CONTINUOUS ACTION PAGE (Plant trip criteria) **1. PRESSURIZER LEVEL LOWERING WITH SECOND CHARGING PUMP RUNNING** • **IF** in MODE 1 **OR** MODE 2, **THEN** TRIP Reactor **AND** **GO TO** EOP 2525, Standard Post Trip Actions
	ATC	**NOTE:** Foldout page shall be monitored throughout this procedure. **1. Monitor Loss Of RCS Inventory** a. CHECK Pressurizer Level - LOWERING b. ADJUST LTDN FLOW CNTL, HIC-110, to stabilize Pressurizer level c. CHECK Pressurizer level continuing to lower **RNO** (PZR level stabilized) PROCEED TO step 1.g. g. **INITIATE** Forcing Pressurizer Sprays
	SRO/ATC	**2. Observe Reactor Power and RCS Temperature** a. **CHECK** Reactor Power - STABLE b. **CHECK** RCS temperature – STABLE NOTE: Pumping the Containment Sump with an RCS leak should be avoided. NOTE: ATTACHMENT B, Thumbrules, provides various tank fill rate. NOTE: Stable Pressurizer level supports an accurate leak rate determination.

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 2

Event Description: RCS Leak – AOP 2568, "Reactor Coolant System Leak"

Time	Position	Applicant's Actions or Behavior
	SRO/ATC/ BOP	**3. Determine RCS Leak Rate By Any Of The Following:** • **ACCOUNT** for RCP Bleedoff flow **AND** **CALCULATE** the difference in Charging and Letdown flow • **REFER** to ATTACHMENT B, Thumbrules, **AND** **DETERMINE** RCS leak rate • **OBTAIN** SPDS Sump leak rate
Examiner Note: Based on various indications (letdown/charging mismatch, CTMT sump rise, etc.) the crew should calculate an RCS leak rate of 10 – 20 gpm.		
	SRO	**4. CHECK RCS Leakage Within The Following Limits Of T/S LCO 3.4.6.2, Reactor Coolant System Operational Leakage:** • NO Pressure Boundary Leakage • LESS THAN or EQUAL TO 1 gpm Unidentified Leakage • LESS THAN or EQUAL TO 10 gpm Identified Leakage • LESS THAN or EQUAL TO 75 gpd Primary to Secondary Leakage through any one steam generator
	SRO	**RNO** for Step 4 above. PERFORM the following: 1. USE the following documents to determine reporting requirements, while continuing with this procedure: • MP-26-EPI-FAP06, Classification and PARs • RAC 14, Non-Emergency Station Events 2. **REFER** to T/S LCO 3.4.6.2, Reactor Coolant System Operational Leakage. 3. **IF** Containment Sump level indication is off scale, **THEN REFER** to T/S LCOs 3.4.6.1b, Leakage Detection Systems, and 3.3.3.8, Accident Monitoring **AND** PERFORM applicable actions.
Examiner Note: SRO should inform SM that an RCS leak rate of 10 – 20 gpm is Classifiable as a Delta One (also may state it is reportable due to shutdown required by Tech. Spec. 3.4.6.2, RCS Leakage).		
		5. MAINTAIN VCT Level 72 to 86%

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 2 Event Description: RCS Leak – AOP 2568, "Reactor Coolant System Leak"		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	**Review Tech. Specs.**: **LCO 3.4.6.2 (RCS Leakage):** Reactor Coolant System Operational LEAKAGE shall be limited to: a. No PRESSURE BOUNDARY LEAKAGE, b. 1 GPM UNIDENTIFIED LEAKAGE, c. 75 GPD primary to secondary LEAKAGE through any one steam generator, and d. 10 GPM IDENTIFIED LEAKAGE. **APPLICABILITY**: MODES 1, 2, 3 and 4. **ACTION**: a. 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. b. 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 36 hours. **Examiner Note: SRO should recognize RCS leak exceeds TSAS and a plant shutdown is required.**
	SRO	Enters AOP 2575, Rapid Downpower
Simulator Booth: If asked to investigate RCS leakage outside of CTMT, wait about 15 minutes and report none found.		

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 3 Event Description: AOP 2575, Rapid Downpower (due to RCS leakage)		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following steps are from AOP 2575, *Rapid Downpower*		
	SRO	Enters AOP 2575, Rapid Downpower
	SRO	3.1 PERFORM focus brief on the following: REACTOR TRIP CRITERIA • Parameters associated with automatic reactor or turbine trips are challenged • RCS T cold *not* within 10°F of temperature program and efforts to regain control are unsuccessful RCS TEMPERATURE CONTROL • RCS T cold to be maintained within 5°F of Attachment 5, "Temperature vs. Power program" using Attachment 9, "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 PERFORM notifications of Unit rapid downpower as follows: a. Announce using plant page (extension 810), that Unit 2 is commencing a rapid downpower, including the reason for the downpower. b. CONTACT Unit 3 Control Room (extension 6200), and REQUEST that they make applicable notifications to OMOC, CONVEX, and ISO-New England.
Simulator Booth: When contacted as Unit 3, reply that all requested contacts will be made.		
	ATC	3.3 INITIATE forcing pressurizer sprays.
	ATC	CAUTION In the case of a dropped CEA, rod motion is *not* used to initiate downpower.
	ATC	3.4 IF not downpowering due to a dropped rod, AND Reactor power is greater than 99% (2673 MWTh) INSERT Group 7 CEAs 10 ± 2 steps to initiate downpower.

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 3 Event Description: AOP 2575, Rapid Downpower (due to RCS leakage)		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	3.5 Using the "Load Speed Control" switch, REDUCE turbine load to maintain Tc on program (+/-2 deg).
	SRO/ATC	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.		
	SRO	NOTE Attachment 10 "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 9, "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 9 *Main Turbine Load Set Control*		
	BOP	CAUTION Operation of the "Load/Speed CONTROL" switch will change turbine load at 600%/hour, and cancel any previous load setpoint.
		NOTE Steps provided in this attachment are dependent on plant conditions and may be performed in any sequence, and repeated as necessary.

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 3 Event Description: AOP 2575, Rapid Downpower (due to RCS leakage)		
Time	**Position**	**Applicant's Actions or Behavior**
	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."
	BOP	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). 3. 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." 4. 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. 5. IF desired load has been reached SELECT "Load Hold."
Examiner Note: The following steps are from AOP 2575 *Rapid Downpower*, Section 3.0 *Rapid Downpower*.		
	SRO	3.8 Based on required rate of downpower, START additional charging pumps as necessary and balance charging and letdown.
	ATC	[ATC "Skill-Of-The-Craft" actions if direct to start a second charging pump] • Selects "LVL-1" position on the Charging Pump Override switch (C-02) • Then adjusts the "Bias" on HIC-110 to balance charging and letdown flow, while monitoring letdown parameters.

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 3 Event Description: AOP 2575, Rapid Downpower (due to RCS leakage)		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	3.9 IF desired to borate from the RWST (preferred method), PERFORM the following: 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 **Examiner Note:** Crew should borate from the RWST.
	N/A	3.10 IF desired to borate from the BAST.
	SRO/ATC/ BOP	3.11 During the downpower, Refer To Attachment 1,"Rapid Downpower Parameters," and MAINTAIN parameters as specified throughout downpower: **Examiner Note:** Attachment 1 Rapid Downpower Parameters: • 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 DT 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) • Turbine steam packing rubs can occur at any turbine load. Slow and careful changes in condenser vacuum should be made. (<1 in Hg/hr) • At turbine load >/= 75% (675 MWe), condenser backpressure can be at best available.

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 3 Event Description: AOP 2575, Rapid Downpower (due to RCS leakage)		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO/ATC/ BOP	**Examiner Note:** Attachment 1 Rapid Downpower Parameters (cont.): • Between, 25% turbine load (225 MWe) and 75% turbine load (675 MWe), maintain condenser backpressure 2.0 - 4.0 in Hga. • At turbine load </= 25%, (225 MWe), maintain condenser backpressure 2.5 - 4.0 in Hga. • Turbine bearing vibrations should be monitored during power changes. When vibration changes are observed and the situation allows the power change should be stopped until the monoblock rotor is allowed to stabilize.
	SRO/ATC	NOTE Attachment 10 "Approximate Load Demand vs. Reactor Power," can be used to correlate the desired power level to a turbine load demand setpoint.
Examiner Note: Once the power reduction is complete, or at the lead examiner's direction, proceed to Event 4, #2 SG 'Main' Level Transmitter Failure.		

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 4		
Event Description: #2 SG 'Main' Level Transmitter Failure		
Time	**Position**	**Applicant's Actions or Behavior**
Simulator Operator: When directed, initiate Event #4, #2 SG 'Main' Level Transmitter Failure		
Indications Available: • **SG LEVEL SETPOINT DEVIATION HI/LO (C-05, D-16).**		
Examiner Note: Although an alarm may have alerted the operators to the level event, operator mitigating actions will initially be from AOP 2585, Immediate Operator Actions. The following steps are from AOP 2585, Immediate Operator Actions. Steps in brackets "[4.1]" are done from memory.		
	BOP	**4.0 Abnormal Steam Generator Levels** [4.1] PLACE both SGFPs in manual: • PRESS "A" SGFP "CONTROL" "MANUAL" pushbutton and ENSURE "MANUAL" pushbutton, lit. • PRESS "B" SGFP "CONTROL" "MANUAL" pushbutton and ENSURE "MANUAL" pushbutton, lit. [4.2] SHIFT affected SG Feedwater Flow Control to MANUAL (C- 05): No. 1 SG • "REG VLV, LIC- 5268," controller in manual (red light lit) No. 2 SG • "REG VLV, LIC- 5269," controller in manual (red light lit) [4.3] RESTORE SGFP speeds to normal value (100% Power: 4600 to 4800 rpm). [4.4] STABILIZE affected SG level at current level (Steam Flow and Feed Flow matched). 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 (C-05, D-16)		
	BOP	**AUTOMATIC FUNCTIONS** 1. None **CORRECTIVE ACTIONS** 1. DETERMINE which SG has the level deviation (C-05). 2. OBSERVE PPC S/G transient display to determine if any of the following has caused the deviation: • Level transmitter failure • Steam flow transmitter failure • Feed flow transmitter failure 3. PLACE SGFP controller(s) in "MANUAL" and RESTORE SGFP speeds to Pre-event values (normal 100% value is 4,400 to 4,600 rpm) (C-05).

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 4		
Event Description: #2 SG 'Main' Level Transmitter Failure		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	4. SHIFT affected SG Feedwater Flow Control to Manual (C-05): No. 1 SG • "REG VLV, LIC-5268" (red light, lit) • "MSTR, LIC-5272" (red light, lit) No. 2 SG • "REG VLV, LIC-5269" (red light, lit) • "MSTR, LIC-5274" (red light, lit) 5. STABILIZE affected SG level at 60 to 75%. 6. Using "SPEED" "LOWER" or "RAISE" buttons, MAINTAIN affected FRV D/P at 40 to 150 psid. 7. OBSERVE the affected side green transmitter lights to determine if any of the following has caused the deviation (C-05): • Level transmitter failure **CAUTION** SG level is auctioneered low. Therefore, when selecting "MAIN" or "ALT" level transmitter, Caution must be observed. If the failed-high transmitter is selected, a plant trip may occur. • Steam flow transmitter failure • Feed flow transmitter failure 8. IF 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") (C-05). 9. DETERMINE cause of abnormal SG level and CORRECT. 10. RESTORE affected SG level to normal band. 11. IF 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). 12. IF desired, Refer To OP 2385, "Feedwater Control System Operation," and PLACE Feedwater Control System in Automatic. 13. IF desired, Refer To OP 2321, "Main Feedwater System," and PLACE SGFP 14. controller(s) in "AUTO."

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 4		
Event Description: #2 SG 'Main' Level Transmitter Failure		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following steps are from OP 2385, Feedwater Control System Operation, starting with the step that begins the process of returning Feedwater Control to automatic operation.		
	BOP	4.4.3 IF No. 2 FRV controller is in manual operation and manual operation is no longer required, PLACE 2 FRV controller in "Master Manual" as follows (C-05): a. ADJUST "MSTR, LIC-5274," as necessary to match red and black/white needles on "REG VLV, LIC-5269." b. PRESS "REG VLV, LIC-5269," controller "A" button and ENSURE green light, lit. c. ADJUST "MSTR, LIC-5274," as necessary to maintain S/G level in band.
	BOP	4.4.4 IF desired to place No. 2 FRV controllers in automatic control, PERFORM the following: a. ENSURE the following: 1) No.2 FRV control is in "Master Manual" control 2) S/G level is at desired setpoint b. CHECK the following: 1) "REG VLV, LIC-5269," controller in "AUTO" (green light, lit) 2) "BYPASS LIC-5216," controller in "AUTO" (green light, lit)
	BOP	c. ENSURE the following: 1) "MSTR, LIC-5274," controller level setpoint equal to actual SG level by adjust thumbwheel on "MSTR, LIC-5274," controller as necessary 2) Feed flow and steam flow are matched d. PRESS "MSTR, LIC-5274," controller "A" button and ENSURE green light, lit. e. IF steam flow greater than 945,000 lbm/hr (about 15% power), CHECK yellow "3E" light below "M" button on "MSTR, LIC-5274," controller, lit (3 element control). f. IF steam flow less than or equal to 945,000 lbm/hr (about 15% power) on an up-power CHECK yellow "1E" light below "A" button on "MSTR, LIC-5274," controller, lit (single element control). g. IF steam flow less than or equal to 693,000 lbm/hr (about 11% power) on a downpower, CHECK yellow "1E" light below "A" button on "MSTR, LIC-5274," controller, lit (single element control). h. As necessary, ADJUST "MSTR, LIC-5274," controller level setpoint and MAINTAIN No. 2 SG level within desired operating band with No. 2 FRV.

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 4 Event Description: #2 SG 'Main' Level Transmitter Failure		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following steps are from OP 2321, Main Feedwater System, starting with the step that begins the process of returning Main Feed Pump control to automatic operation.		
	BOP	**4.7 Shifting SGFP Speed Control Mode** **NOTE** 1. Automatic SGFP speed control is accomplished through the use of an algorithm based on Main Steam flow and SGFP suction pressure. Constants in the algorithm are periodically adjusted to maintain FRV position less than 80% at full load. 2. When controlling SGFP speed in manual, if the automatic setting is still functional, the automatic setpoint can be used as a guide for adjustment of the manual speed setpoint. When manually controlling SGFP speed, FRV D/P can be used as a predictor for FRV position and stability. Maintaining a FRV D/P of 50 psid or greater will ensure the Main FRVs have adequate margin available to maintain SG level constants. 3. With SGFP speed in automatic or manual control, the discharge pressure limiter will start to limit discharge pressure when it exceeds approximately 1,300 psig. It will not allow the SGFP to exceed 1,400 psig.
	BOP	4.7.1 IF desired to place "A" SGFP in manual speed control, PERFORM the following (C-05 SGFP A insert): **Examiner Note: This step is N/A**
	BOP	4.7.2 IF desired to place "B" SGFP in manual speed control, PERFORM the following (C-05 SGFP B insert): **Examiner Note: This step is N/A**

Op-Test No.: __ES18LI1___ Scenario No.: __3__ Event No.: _4__ Event Description: #2 SG 'Main' Level Transmitter Failure		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	4.7.3 IF desired to place "A" SGFP in automatic speed control, PERFORM the following (C-05 SGFP A insert): **NOTE** Attachment 1 may be used to determine the "Minimum Discharge Pressure Setpoint." a. ADJUST speed as necessary to achieve one of the following by using the "SPEED" "LOWER" or "RAISE" pushbuttons: • Difference between actual speed and auto speed setpoint less than or equal to 100 rpm AND discharge pressure greater than the "Minimum Discharge Pressure Setpoint" • Actual pump discharge pressure within 25 psig of the "Minimum Discharge Pressure Setpoint"
	BOP	b. PRESS "CONTROL" "AUTO" pushbutton and ENSURE "AUTO" pushbutton, lit.
	BOP	4.7.4 IF desired to place "B" SGFP in automatic speed control, PERFORM the following (C-05 SGFP B insert): **NOTE** Attachment 1 may be used to determine the "Minimum Discharge Pressure Setpoint." a. ADJUST speed as necessary to achieve one of the following by using the "SPEED" "LOWER" or "RAISE" pushbuttons: • Difference between actual speed and auto speed setpoint less than or equal to 100 rpm AND discharge pressure greater than the "Minimum Discharge Pressure Setpoint" • Actual pump discharge pressure within 25 psig of the "Minimum Discharge Pressure Setpoint" b. PRESS "CONTROL" "AUTO" pushbutton and ENSURE "AUTO" pushbutton, lit.
Simulator Operator : Once Main Feedwater Control is back in automatic mode, or at the examiners discretion, proceed to Event 5, Inadvertent MSI Actuation and Plant Trip.		

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 5, 6		
Event Description: Inadvertent MSI Actuation and Plant Trip and Loss of "A" & "C" Charging Pumps		
Time	**Position**	**Applicant's Actions or Behavior**

Simulator Operator: When directed, initiate Event 5, Inadvertent MSI Actuation and Plant Trip.		
Examiner Note: The following steps are from EOP 2525, "*Standard Post Trip Actions*", modified slightly to improve clarity.		
Indications: • **When the MSI actuates, both MSIVs will close causing a plant trip due to "100% load reject". This will trigger numerous alarms indicative of this type of plant trip. Although it will be obvious a major event triggered a plant trip, it will not be obvious what the event was.**		
	ATC	**ACTION/EXPECTED RESPONSE** **Reactivity Control – Reactor Trip** 1. ENSURE Reactor trip by ALL of the following: • ALL CEAs are fully INSERTED. • Reactor power is dropping. • SUR is negative.
CRITICAL TASK: Manually shut down the reactor. [CT-1, SPTA-5] **With more than one CEA not fully inserted on a reactor trip, the ATC is required to ensure boric acid is being injected into the RCS at >/= 40 gpm for the time required to ensure shutdown margin if met.** **TIME of manual reactor trip:_____** **TIME >/= 40 gpm Boric Acid Inj.:_____**		
	ATC	**RESPONSE NOT OBTAINED** PERFORM the following: a. **IF** Reactor trip breakers are CLOSED, THEN INSERT CEAs by ANY of the following methods: 1) PUSH the "RX TRIP TCBS" buttons. 2) OPEN CEDM MG set feeder breakers. 3) OPEN the reactor trip circuit breakers. (Local) b. **IF** more than ONE CEA is not fully inserted, **THEN** USE Appendix 3, "Emergency Boration," and COMMENCE emergency boration.
Examiner Note: The following steps are from EOP 2541, Appendix 3, "Emergency Boration". While the ATC is aligning boric acid injection, the "C" charging pump will be lost.		
		1. IF boric acid storage tanks are available, INITIATE 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.

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 5, 6		
Event Description: Inadvertent MSI Actuation and Plant Trip and Loss of "A" & "C" Charging Pumps		
Time	**Position**	**Applicant's Actions or Behavior**
Simulator Operator: While the ATC is aligning boric acid injection, initiate Event 6, "C" Charging Pump trip.		
	ATC	e. CLOSE BOTH boric acid pump recirc valves: • CH-510 • CH-511 f. OPEN BOTH boric acid gravity feed isolations: • CH-508 • CH-509 g. CLOSE CH-501, VCT outlet isolation. h. ENSURE BOTH of the following are closed: • CH-192, RWST isolation • CH-504, RWST to charging suction. i. IF CH-500, letdown divert handswitch, is in "VCT" position, PLACE handswitch to "RWS" position. j. ENSURE at least one charging pump is operating. k. CHECK charging flow is greater than 40 gpm.
Examiner Note: Due to the loss of power to the "A" charging, the ATC will be required to start the "B" charging pump per the Contingency Actions of App. 3, listed below.		
	ATC	**CONTINGENCY ACTION** (App. 3) j. IF power to charging pump "B" has been lost AND the alternate power source is available, TRANSFER its power supply to the alternate source. Refer To Appendix 31, "Transferring Charging Pump "B" Power Supply."
	ATC	k. PERFORM ANY of the following to restore charging flow: 1) ENSURE electrical power to the charging pumps and valves. 2) ENSURE correct valve lineup. 3) START additional charging pumps as needed until charging flow is greater than 40 gpm.
Examiner Note: The following steps continue with EOP 2525, "SPTA".		

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 5, 6		
Event Description: Inadvertent MSI Actuation and Plant Trip and Loss of "A" & "C" Charging Pumps		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	**Reactivity Control – Turbine Trip** 2. ENSURE Turbine Trip by ALL of the following: a. CHECK main turbine is tripped by ALL of the following conditions: • ALL main stop valves OR ALL control valves are closed. • Generator megawatts indicate zero. • Turbine speed is lowering. b. IF 15G-2XI-4, motor operated disconnect, is closed, THEN CHECK BOTH Main Generator output breakers 15G-8T-2 and 15G-9T-2 are open.
	BOP	**Maintenance of Vital Auxiliaries** 3. ENSURE Maintenance of Vital Auxiliaries met by ALL of the following conditions: a. CHECK vital and non-vital busses energized: • 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 b. CHECK that BOTH facilities of service water are operating. c. CHECK that BOTH facilities of RBCCW are operating with service water cooling.
Simulator Operator: PRIOR to SRO review of Inventory Control, initiate Event 7, loss of the "B" Charging pump.		
	ATC	**RCS Inventory Control** 4. ENSURE RCS Inventory Control met by **ALL** of the following conditions: a. CHECK that **BOTH** of the following conditions exist: • 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: 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.: ES18LI1 Scenario No.: 3 Event No.: 5, 6 Event Description: Inadvertent MSI Actuation and Plant Trip and Loss of "A" & "C" Charging Pumps		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**Reports "B" Charging Pump trip, no longer Emergency Borating.**
	ATC	**RCS Pressure Control** 5. ENSURE RCS Pressure Control met by **BOTH** of the following: • CHECK that pressurizer pressure is 1900 to 2350 psia. • CHECK that pressurizer pressure is trending to 2225 to 2300 psia.
	ATC	**RNO (Pressure Control)** 5.1 IF the Pressurizer Pressure Control System is not operating properly in automatic, THEN RESTORE and MAINTAIN pressurizer pressure between 2225 to 2300 psia by performing ANY of the following: a. OPERATE the Pressurizer Pressure Control System. b. Manually OPERATE pressurizer heaters and spray valves.
	ATC	**Core Heat Removal** 6. ENSURE Core Heat Removal met by **ALL** of the following conditions: a. CHECK at least one RCP is operating and that loop ΔT is < 10°F. b. CHECK that RCS subcooling is greater than or equal to 30°F.
	BOP	**RCS Heat Removal** 7. ENSURE RCS Heat Removal met by ALL of the following conditions: a. CHECK at least one steam generator has **BOTH** of the following conditions met: • Level is 10 to 80%. • Main feedwater or **TCOA** TWO auxiliary feedwater pumps are operating to restore level 40 to 70%. b. CHECK that RCS Tc is being maintained between 530°F to 535"F. c. CHECK **BOTH** steam generator's pressures are 880 to 920 psia.

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 5, 6

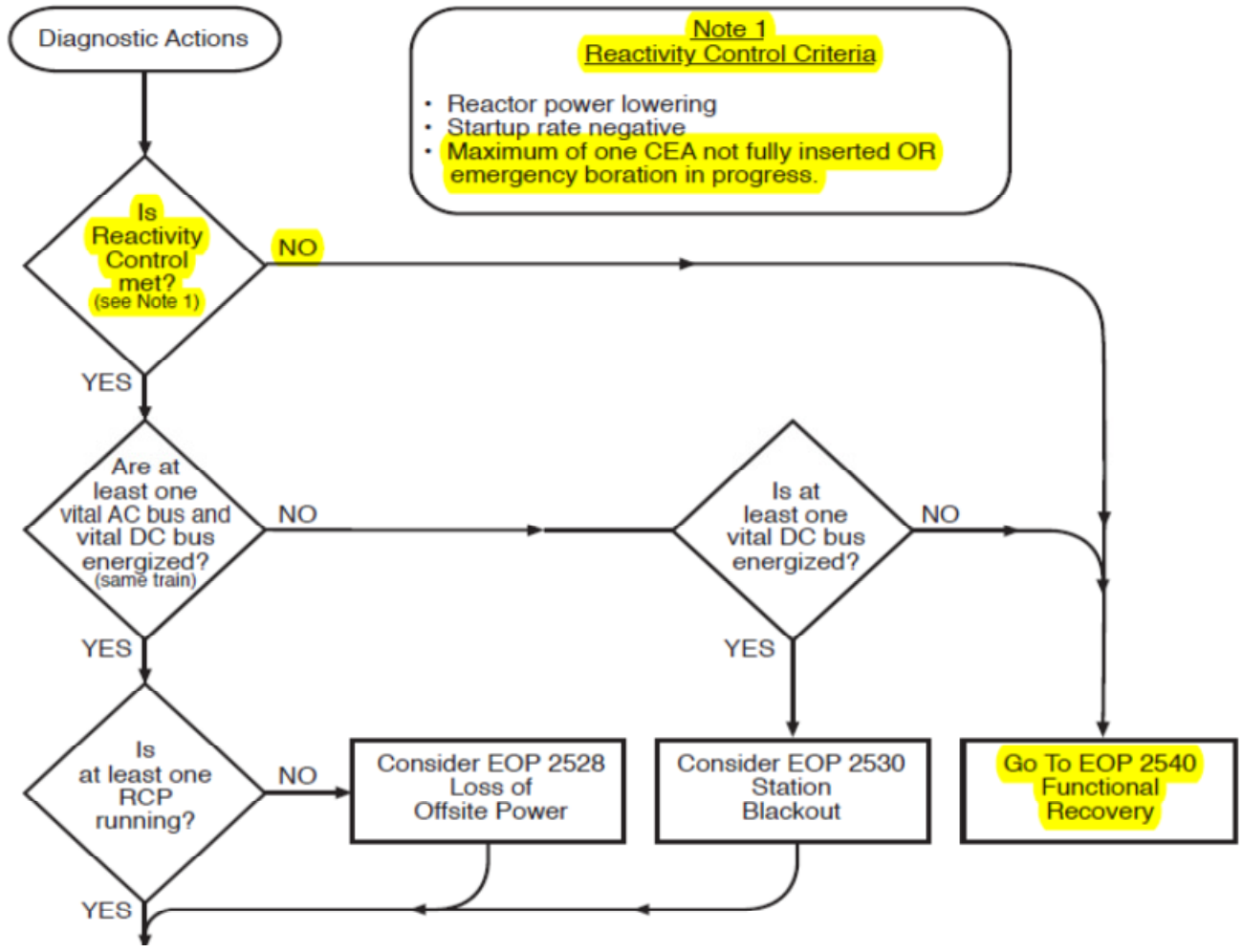
Event Description: Inadvertent MSI Actuation and Plant Trip and Loss of "A" & "C" Charging Pumps

Time	Position	Applicant's Actions or Behavior
	ATC	**Containment Isolation** 8. ENSURE Containment Isolation met by **ALL** of the following: a. CHECK containment pressure is less than 1.0 psig. b. CHECK **NONE** of the following primary plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity: **Radiation Monitors Inside Containment** 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
	ATC	**Containment Isolation** (cont.) c. CHECK that NONE of the following steam plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity: **Steam Plant Radiation Monitors** 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	**Containment Temperature and Pressure Control** 9. ENSURE Containment Temperature and Pressure Control met by **BOTH** of the following conditions: a. CHECK containment temperature is less than 120°F. (PPC or avg. of Points 5 and 6) b. CHECK containment pressure is less than 1.0psig.

Examiner Note: The loss of the last available charging pump causes a loss of Emergency Boration and a loss of the Reactivity Safety Function, requiring a transition to EOP 2540/2540A, "Functional Recovery of Reactivity Control".

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 5, 6 Event Description: Inadvertent MSI Actuation and Plant Trip and Loss of "A" & "C" Charging Pumps		
Time	**Position**	**Applicant's Actions or Behavior**

	SRO	**Event Diagnosis** 10. PERFORM the following: a. DIAGNOSE the event. Refer To Appendix 1, "Diagnostic Flowchart." b. INITIATE Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions." **[See page 30]** c. Go To the appropriate EOP
Examiner Note: Diagnostic Flow Chart Decision Steps.		



Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 7 Event Description: EOP 2540/2540A, Functional Recovery of Reactivity Control using HPSI Injection.		
Time	**Position**	**Applicant's Actions or Behavior**
Examiner Note: The following steps are from EOP 2540, "Functional Recovery".		
Indications: • **Two CEAs not fully inserted post-trip.** • **Charging Flow = 0 gpm.** • **Safety Injection Flow = 0 gpm.**		
	SRO	1. CLASSIFY the event. Refer To MP-26-EPI-FAP06, "Classification and PARs" • IF classification requires RCS sampling, Refer To Appendix 46, "Sampling for EAL Determination" and DIRECT Chemistry as required. 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".
	SRO	3. IF pressurizer pressure is less than 1714 psia AND SIAS has initiated, PERFORM the following: **Examiner Note: Step is N/A**
	SRO/BOP	4. SAMPLE steam generators that are available for RCS heat removal as follows: a. CHECK "B" train RBCCW in service. b. ENSURE 2-RB-210 "Degasifier Effluent Cooler Return Outlet" is open. c. OPEN appropriate steam generator sample valves: • MS-191A • MS-191B d. DIRECT Chemistry to perform **ALL** of the following: • Sample **ANY** steam generator that is available for RCS Heat Removal • Frisk the samples • Report frisk results • Analyze samples for boron and activity
Simulator Operator: When called to sample the SGs, wait 10 minutes then report samples drawn and both frisk less than MDA.		
	SRO/ATC	5. PLACE the hydrogen analyzers in service. Refer To Appendix 19, "Hydrogen Analyzer Operation."

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 7 Event Description: EOP 2540/2540A, Functional Recovery of Reactivity Control using HPSI Injection.		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	NOTE If the Safety Function Status Checklist is not satisfied for the selected success path, the US may commence the operator actions for safety functions which are not met based on Safety Function hierarchy. The remaining Safety Functions should be prioritized as time permits. 6. IDENTIFY success paths to be used to satisfy each safety function using **BOTH** of the following: • Resource Assessment Trees • Safety Function Tracking Page
	SRO	**Functional Recovery Resource Assessment Trees** • < 2 Rods Not Fully Inserted – NO • Is Charging Available – NO • RC-3, Boration Using SI (**actions required only if power > 10^{-4}%**)
Examiner Note: The following steps are from EOP 2540A, Functional Recovery of Reactivity Control.		
	SRO	**3.0 SUCCESS PATH: RC-3: BORATION USING SI** **Stabilize RCS Temperature** 1. IF ANY of the following conditions exist: • Reactor power is greater than 10^{-4}% • Reactor power is rising or not stable PERFORM the following: a. STOP the cooldown. b. STABILIZE RCS temperature. **Examiner Note: Step is N/A**
	SRO/ATC	**Ensure HPSI Pump Operating** 2. PERFORM ANY of the following to ensure HPSI injection: a. ENSURE at least one HPSI pump is operating. **(start a HPSI pump)** b. ENSURE that at least one of associated HPSI loop injection valves are open. **(HPSI injection valves are normally open.)**
	SRO/ATC	**Optimize Safety Injection** 3. IF SIAS has initiated, PERFORM the following: a. CHECK at least one train of SIAS, CIAS and EBFAS has properly actuated. (C01X) b. CHECK that safety injection flow is adequate. Refer To Appendix 2, "Figures." **Examiner Note: Step is N/A**

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 7		
Event Description: EOP 2540/2540A, Functional Recovery of Reactivity Control using HPSI Injection.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	c. ENSURE vital switchgear cooling is operating for each operating ECCS train as follows: Facility 1 **[Unavailable due to loss of 480 VAC bus 22E]** Facility 2 • Fan F-52 is running. • Fan F-142 is running. • Fan F-133 is running. • Service water supply, SW-178C is open.
	SRO	**Depressurize the RCS** 4. IF safety injection flow is less than 40 gpm due to high RCS pressure, DEPRESSURIZE the RCS by performing ANY of the following: a. CONTROL RCS heat removal. **(Commence an RCS cooldown)** b. CONTROL pressurizer heaters and main or auxiliary pressurizer spray. **(depressurize RCS using main spray and maintain subcool >30°F)** c. IF HPSI throttle/stop criteria are met, PERFORM ANY of the following: • CONTROL charging and letdown. • THROTTLE HPSI flow. d. OPERATE the PORVs. **Examiner Note: Basically what this step means is to cooldown and depressurize the RCS until HPSI injection flow is >/= 40 gpm.** **HPSI will start to inject when RCS pressure drops below ~ 1200 psia.**
	BOP	Using PIC-4216, Open the "A" condenser steam dump valve and commence cooing down the RCS as necessary to maintain subcooling >/= 30 °F.
	ATC	Using manual control of a PZR spray valve, depressurize the RCS until HPSI injection flow is > 40 gpm.
CRITICAL TASK: Manually shut down the reactor. [CT-2 (BOP) & CT-3 (ATC), RC-3] **With more than one CEA not fully inserted on a reactor trip, the ATC is required to ensure boric acid is being injected into the RCS at >/= 40 gpm for the time required to ensure shutdown margin if met. This requires an RCS cooldown (BOP) and de-pressurizing (ATC) to allow HPSI injection flow.** **TIME SRO direction to perform:_____** **TIME >/= 40 gpm Boric Acid Inj.:_____**		
Examiner Note: Once the ATC has established SI flow of > 40 gpm, or at the lead examiner's direction, the scenario is complete.		

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 6 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following steps are from EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions.		
	ATC	1. IF charging pumps suction is aligned to the VCT, THEN CHECK VCT level is between 72% to 86%: a. IF VCT level is less than 72%, THEN ALIGN charging pump suction to RWST as follows: 1) OPEN CH- 192, RWST isolation. 2) ENSURE CH- 504, RWST to charging suction is open. 3) CLOSE CH- 501, VCT outlet isolation. 4) ENSURE CH- 196, VCT makeup bypass is closed. b. IF VCT level is greater than 88%, THEN PLACE CH- 500, letdown divert handswitch, to the "RWS" position, and divert as required to maintain VCT level 72% to 86%.
	ATC	2. TCOA: IF SIAS actuated, THEN ENSURE **ONE** complete facility of CRAC operating, in RECIRC mode, as follows: (C25A/B) **Facility 1** • HV- 203A, Fan F- 21A exhaust damper open • Fan F- 21A, supply fan running • HV- 206A, Fan F- 31A exhaust damper open • Fan F- 31A, exhaust fan running • HV- 212A, Fan F- 32A exhaust damper, open • Fan F- 32A, filter fan, running • HV- 202, minimum fresh air damper, closed • HV- 207, cable vault exhaust damper, closed • HV- 208, exhaust air damper, closed **Facility 2** • HV- 203B, Fan F- 21B exhaust damper open • Fan F- 21B, supply fan running • HV- 206B, Fan F- 31B exhaust damper open • Fan F- 31B, exhaust fan running • HV- 212B, Fan F- 32B exhaust damper, open • Fan F- 32B, filter fan, running • HV- 495, fresh air damper, closed • HV- 496, exhaust air damper, closed • HV- 497, cable vault exhaust damper, closed

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 6 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	3. TCOA: IF SIAS not actuated, THEN CHECK ONE facility of CRAC operating, in NORMAL mode, as follows: (C25A/B) **Facility 1** • HV- 203A, Fan F- 21A exhaust damper is open • Fan F- 21A, supply fan running • HV- 206A, Fan F- 31A exhaust damper open • Fan F- 31A, exhaust fan running **Facility 2** • HV- 203B, Fan F- 21B exhaust damper open • Fan F- 21B, supply fan running • HV- 206B, Fan F- 31B exhaust damper open • Fan F- 31B, exhaust fan running
	ATC	4. IF charging pumps suction aligned to the RWST AND boration not required, THEN RESTORE charging pump suction to VCT as follows: a. CHECK BOTH of the following: 1) VCT level between 72% and 86% 2) VCT pressure greater than 15 psig b. CHECK letdown is in service. c. OPEN CH- 501, VCT outlet isolation. d. CLOSE CH- 192, RWST isolation.
	BOP	5. CHECK instrument air pressure greater than 90 psig and stable.
	BOP	6. IF AFAS has actuated, WHEN **BOTH** steam generators are restored to greater than 33%, THEN PERFORM the following: a. PLACE the following switches in "M" (Manual) and ADJUST to obtain desired flow (C- 05): 1) FW- 43A, "AFW- FCV, HIC- 5276A" 2) FW- 43B, "AFW- FCV, HIC- 5279A" b. PLACE **BOTH** of the following switches to "RESET" and ALLOW to spring return to neutral (C- 05): 1) "OVERRIDE/MAN/START RESET" (Facility 1) 2) "OVERRIDE/MAN/START RESET" (Facility 2) c. ADJUST the following switches to obtain desired flow (C- 05): 1) FW- 43A, "AFW- FCV, HIC- 5276A" 2) FW- 43B, "AFW- FCV, HIC- 5279A" d. IF main feedwater pump is supplying steam generators, THEN STOP **BOTH** auxiliary feedwater pumps. **Examiner Note: BOP may place both facilities in override (Pull-To-Lock) once the AFW rupture is discovered and the SRO directs AFW be secured.**

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 6 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	7. CHECK Main Condenser is available, as indicated by ALL of the following: • 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 **RNO** 7.1 IF Main Condenser is not available, PERFORM the following: • CLOSE BOTH MSIVs. • ENSURE BOTH MSIV bypass valves are closed. • OPEN AR-17, condenser vacuum breaker. **Examiner Note: Not available due to the loss of condenser vacuum.**
	BOP	8. OPEN HD-106, subcooling valve.
	BOP	9. ENSURE BOTH heater drain pumps stopped.
	BOP	10. IF MFW is supplying feed to the steam generators, THEN PERFORM the following: a. ENSURE that only **ONE** main feedwater pump is operating. b. ENSURE that **BOTH** main feed block valves are closed: 1) FW- 42A 2) FW- 42B c. ADJUST the operating main feedwater pump pressure to 50 to 150 psi greater than SG pressure. d. ENSURE BOTH main feed reg bypass valves are throttled to control SG level: 1) LIC- 5215 2) LIC- 5216 e. IF Main Feedwater Pump A is secured, THEN CLOSE the following: 1) FW- 38A, main feedwater pump discharge valve 2) FIC- 5237, main feedwater pump mini flow recirc valve f. IF Main Feedwater Pump B is secured, THEN CLOSE the following: 1) FW- 38B, main feedwater pump discharge valve 2) FIC- 5240, main feedwater pump mini flow recirc valve **Examiner Note: Loss of condenser vacuum secures both MFW pumps.**
	BOP	11. IF **BOTH** MFW pumps are secured, THEN PERFORM the following: a. CLOSE BOTH main feedwater pump mini flow recirc valves. • FIC- 5237 • FIC- 5240

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 6 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**

	BOP	12. IF 25A OR 25B is energized, THEN ALIGN condensate pumps as follows: a. ENSURE **ONE** pump is running. b. ENSURE **ONE** pump is in "PULL TO LOCK." c. ENSURE **ONE** pump is in "AUTO."
Examiner Note: End of Attachment 4- A		

SIMULATOR SCENARIO #4

Facility: Millstone Unit 2 Scenario No.: 4 Op-Test No.: ES18LI1

Examiners: _____ Operators: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: 100% Power IC-21, steady state. No Equipment OOS, Ch-Y PZR Level in service. 24E aligned to 24C.

Turnover: 100% Power, steady state. No Equipment OOS, Ch-Y PZR Level in service. 24E aligned to 24C.

Critical Tasks:

1. [2260 ESD, CT-1] Secure feed flow to the affected SG within 30 min. (BOP).
2. [ENT-1] Trip 2 RCPs or trip RCPs based on RCS pressure (ATC).
3. [PC-1] Establish RCS Pressure Control (ATC).
4. [CI-1] Establish Containment Isolation (Isolate affected SG) (BOP).

Event No.	Malf. No.	Event Type*	Event Description
1	SI01C	C (ATC/S)	Safety Injection Loop 2A Check Valve Leakage
2	SW09A	C (BOP/S) TS (S)	"A" Service Water Pump strainer failure. Requires swap to "B" SW pump as Fac. 1 pump.
3	SG01B	C (ATC/S) TS (S)	#2 Steam Generator Tube Leak.
4	N/A	R (All)	Plant Shutdown required due to SGTL.
5	SG02B	M	#2 Steam Generator Tube Rupture, requires a plant trip.
6	MS07B	C (BOP/S)	Main Steam Safety Valve fails open on plant trip, requires all feed be secured to #2 SG.
7	FW35B	C (BOP/S)	Aux. Fd. Reg. Valve, FW43B, fails open. Requires closing of FW-44 (and possibly securing of TDAFP) to isolate feed to #2 SG.

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

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

Scenario 4 Summary:

The crew will take the shift with the unit at 100% power, steady state, no equipment OOS (IC-21).

Event 1: Immediately after taking the watch, the Safety Injection Loop 2A Check Valve will begin to leak by, resulting in a high pressure in the SIT Tank #3 Loop Header and triggering alarm C01-C14, "***SIS TO LOOP 2A PRES HI***". The crew will utilize ARP 2590A-055 and take action to manually vent the header to the PDT and restore the header pressure to normal.
Once SIT Header pressure has been restored, or at the examiners discretion, Event 2 is triggered.

Event 2: The "A" Service Water (SW) strainer will clog and fail to automatically backwash, triggering annunciator C06/7-CB4, ***SW PUMP C STNR TROUBLE***. The PEO investigating will report strainer ΔP is 4 psid and slowly rising and the strainer will NOT backwash even after a manual attempt. The crew will be forced to place the standby SW pump in operation on the Facility 1 SW Header IAW OP 2326A, ***Service Water System*** and secure the running pump. The Facility 1 SW Header OPERABLE Tech. Specs. will be briefly entered until the spare SW pump breaker SIAS interlock is cleared.
Once the SW pump swap evolution has been completed, or at the examiners discretion, Event 3 is triggered.

Event 3: A 5 gpm tube leak will occur on the #2 Steam Generator, requiring entry into AOP 2569, ***Steam Generator Tube Leak***. The crew will utilize AOP 2569 to evaluate the tube leaks size, location and need to shutdown the plant.

Event 4: The tube leak exceeds the limit for continued power operation and the crew will commence a plant shutdown using AOP 2575, ***Rapid Downpower***.

Once the power change evaluation is completed, or at the examiners discretion, Event 5 is triggered.

Event 5: The #2 Steam Generator tube leak will degrade to a 600 gpm tube rupture, requiring a plant trip.

EOP 2525, ***Standard Post Trip Actions***, will then be carried out.

Event 6: On the plant trip, a Main Steam Safety Valve will fail full open, requiring all feed be secured to #2 SG.

Event 7: Aux. Feed Reg. Valve, FW43B, will fail full open, requiring FW-44 be closed to isolate AFW flow to the #2 SG. Also, the TDAFP must be secured if it was started.

The ESD from the stuck open MSSV, combined with the SGTR, will require the transition to EOP 2540, ***Functional Recovery***, and EOP 2540E, ***Functional Recovery of Containment Isolation***, to mitigate the event.

The scenario will end when the CTMT Safety Function has been addressed, or at the examiners discretion.

INPUT SUMMARY							
Either INPUT or VERIFY the following functions:							
ID Num	Description	Delay Time	Ramp Time	Event Trigger	Severity or Value	Final Value	Relative Order
MALFUNCTIONS							
SI01C	Safety Inj. Loop 2A check valve leakage			E-1	50%		1
SI01C	Safety Inj. Loop 2A check valve leakage	1 sec.		E-10	DELETE		2
SW09A	"A" SW pump strainer failure		10 min.	E-2	50%		3
SG01B	#2 SG Tube Leak			E-3	10 gpm		5
SG02B	#2 SG Tube Rupture			E-5	600 gpm		6
MS07B	MSSV MS-239 fails full open (100%)			E-30	8E05		7
REMOTE FUNCTIONS							
SWR31	"B" SW Pump SIAS/LNP permissive			E-12	NORM		4
FWR60	FW-43B, Aux. Feed Reg. Valve, Local			E-7	MANUAL		8
FWR64	FW-43B, Aux. Feed Reg. Valve, position			E-7	100%		8
MSR13	MS-202 Disconnect Closed			E-14	RI		9
OVERRIDES							

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 1		
Event Description: Safety Injection Loop 2A Check Valve Leakage		
Time	**Position**	**Applicant's Actions or Behavior**
Simulator Operator: When directed, initiate Event #1, Safety Injection Loop 2A Check Valve Leakage		
Indications Available: • **SIS TO LOOP 2A PRES HI (C-01, C-14).**		
Examiner Note: The following steps are from ARP 2590A-7.		
	ATC	AUTOMATIC FUNCTIONS 1. None CORRECTIVE ACTIONS **NOTE** High safety injection header pressure with HPSI pumps shutdown is indicative of check valve leakage from the RCS. 1. OBSERVE safety injection header "CK VLV LKG PRES, PI---339" indication (C---01) 2. **IF** pressure is greater than 1,100 psig, PERFORM ***one*** of the following: 2.1 IF high pressure is due to check valve leakage that cannot be resolved: 2.1.1 Refer To OP 2306O, "Safety Injection Tanks, RCS > 1750 psi," to utilize the ODM process and Attachments controlling temp mod gauge installation, and manage the high pressure condition. 2.1.2 Go To step 3. **CAUTION** When RCS pressure is low, check valve leakage could occur. Repeated draining of SIS header may result in boron dilution and should be equalized with RWST [PIR #2-93-238]. 2.2 PERFORM the following to reduce pressure of safety injection header to normal: 2.2.1 ENSURE all check valve leakage drain stops are closed (C-01): • "HDR-1A CK VLV LKG DRN STOP, SI-618" • "HDR-1B CK VLV LKG DRN STOP, SI-628" • "HDR-2A CK VLV LKG DRN STOP, SI-638" • "HDR-2B CK VLV LKG DRN STOP, SI-648"

Op-Test No.: __ES18LI1___ Scenario No.: __4__ Event No.: _1__ Event Description: Safety Injection Loop 2A Check Valve Leakage		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	2.2.2 ENSURE all SIT "FILL & DRN" valves closed (C-01): • "SIT 1, SI-611" • S "SIT 2, SI-621" • S "SIT 3, SI-631" • S "SIT 4, SI-641" 2.2.3 OPEN recirculation header "DRAIN, SI-661" (C-01). 2.2.4 THROTTLE open "HDR-2A CK VLV LKG DRN STOP, SI-638" (C-01). 2.2.5 OBSERVE safety injection header pressure and flow indications. 2.2.6 **IF** safety injection header pressure does not decrease rapidly, immediately CLOSE "HDR-2A CK VLV LKG DRN STOP, SI-638" (C-01). 2.2.7 WHEN safety injection header pressure decreases to less than 275 psig, CLOSE "HDR-2A CK VLV LKG DRN STOP, SI-638" (C-01). 2.2.8 CLOSE SIT recirculation header "DRAIN, SI-661" (C-01). 2.2.9 MONITOR safety injection header pressure to ensure check valve is seated. 2.2.10 Refer To SP 2602A, "Reactor Coolant Leakage," as necessary to RESET RCS leakrate calculation (PPC).
	SRO/ATC	3. MONITOR No. 3 SIT level for in---leakage, and PERFORM the following as required: 3.1. **IF** SIT level increases to greater than 59.7%, Refer To OP 2306O, "Safety Injection Tanks, RCS >1750 psi" and PERFORM applicable actions to lower SIT level to between 55.2 and 59.7%. 3.2. **IF** SIT level increases greater than 1%, Refer To OP 2306O, "Safety Injection Tanks, RCS >1750 psi," and sample No. 3 SIT for boron concentration. **Examiner Note: Step 3 is N/A.** 4. **IF** required, SUBMIT Condition Report to Maintenance Department.
Simulator Operator: If asked to submit a TR to Maintenance report that one has been submitted.		
Simulator Operator : When the SIT Check Valve Leakage has been mitigated, or at lead examiner's direction, go to Event 2, "A" Service Water Pump Strainer failure.		

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 2		
Event Description: "A" Service Water Pump Strainer failure		
Time	**Position**	**Applicant's Actions or Behavior**

Simulator Operator: When directed, initiate Event #2, "A" Service Water Pump Strainer failure.		
Indications Available: • **SW PUMP A STNR TROUBLE (C-06/7, BB-4).**		
Examiner Note: The following steps are from ARP 2590E-028.		
	SRO/BOP	**AUTOMATIC FUNCTIONS** 1. For strainer D/P rising to 4 psid: None 2. For Intake Structure air temperature lowering to 40° F: IF Service Water strainer control is in "AUTO", the backwash motor starters will be energized, initiating backwash. **CORRECTIVE ACTIONS** 1. IF "A" Service Water Pump is operating, CHECK "A" Service Water Strainer backwashing: • Service Water Strainer rotating • 2-SW-90A, "Service Water Strainer Blowdown," open 2. CHECK Service Water strainer D/P, PDC-6475. 3. IF strainer D/P is greater than or equal to 3 psid AND Service Water Strainer has not started, PERFORM the following: **NOTE** The associated Service Water strainer that is in "HAND" will not restart without operator intervention when power is restored after an LNP. 3.1 IF in MODE 1, 2, 3, or, 4, LOG entry for applicable ACTIONs of the following: • TSAS 3.7.4.1, "Service Water System" • TRM 7.1.21, "Service Water System" 3.2 PLACE strainer control switch in "HAND" and PRESS "START" pushbutton.
Simulator Operator: When directed to investigate, as Outside Rounds PEO, report "A" SW strainer not rotating but motor is spinning. Looks like a broken shear pin. D/P is 4 psid and rising slowly. If directed to manually backwash (Step 3.2), wait 1 minute, state done, no change. D/P 5 psid, rising.		
	SRO/BOP	4.1 IF strainer cannot be started, Refer To **OP 2326A, "Service Water System"** and PERFORM applicable actions to **place "B" Service Water Pump on associated Facility.** 4.2 Refer To OP 2328A, "Sodium Hypochlorite System," and STOP injection to "A" Service Water Pump. 4.3 SUBMIT CR to applicable department to investigate and repair. 4.4 Refer To AOP 2565, "Loss of Service Water."

Op-Test No.: __ES18LI1___ Scenario No.: __4__ Event No.: _2__ Event Description: "A" Service Water Pump Strainer failure		
Time	**Position**	**Applicant's Actions or Behavior**
Simulator Operator: If asked to submit a TR to Maintenance report that one has been submitted.		
Examiner Note: TRM actions are not required for 72 hours. The following steps are from Tech. Specs. 3.7.4.1, Service Water.		
	SRO	**Review Tech. Specs.**: **LCO 3.7.4.1 (SERVICE WATER SYSTEM):** Two service water loops shall be OPERABLE **APPLICABILITY**: MODES 1, 2, 3 and 4. **ACTION**: With one service water loop inoperable, restore the inoperable loop to OPERABLE status within 72 hours or be in COLD SHUTDOWN within the next 36 hours. **Examiner Note: SRO logs into TSAS 3.7.4.1 until the "B" SW pump has been placed in service on the "A" SW header.**
Examiner Note: The following steps are from OP 2326A, Service Water, Section 4.6, Place "B" SW Pump in Service, Remove "A" SW Pump. Steps for AOP 2565, Loss of Service Water, follows this section, if used.		
	BOP	4.6.1 **IF** in MODE 1, 2, 3, or, 4, LOG entry for applicable ACTIONs of TRM 7.1.21, "Appendix R Safe Shutdown Requirements." **CAUTION** To minimize the possibility of exceeding D/G load limits while shifting Service Water pumps, the following must be observed: • When two ServiceWater pumps are available to start from the same bus (i.e., not in "PULL-TO-LOCK"), the "B" ServiceWater Pump switch "SIAS/LNP ACTUATION SIGNAL HS 6484A" (A502) must be in the "BLOCK" position. 4.6.2 ENSURE the following: • Bus 24E supplied from bus 24C (C-08) • P-5B, "SERVICE WATER PP B," in "PULL-TO-LOCK" (C-06) • A502, "SERVICE WATER PP B," racked up • "SIAS/LNP ACTUATION SIGNAL HS 6484A" (A502) in "BLOCK" position 4.6.3 ENSURE SW-97B, "PP DIS X-TIE," closed (C-06). 4.6.4 OPEN SW-97A, "PP DIS X-TIE" (C-06).
Simulator Operator: When asked, perform any pre-start checks of the "B" SW pump; all normal.		

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 2 Event Description: "A" Service Water Pump Strainer failure		
Time	**Position**	**Applicant's Actions or Behavior**
Simulator Operator: When asked, perform any action required in the Intake Structure. Wait 2 minutes and report Sodium Hypochlorite isolated to the "A" SW pump. When "B" SW pump is started, report pump running normally, packing leakoff normal, flow visible in the flush line flow gage.		
	SRO/BOP	**CAUTION** "B" Service Water Pump and "B" Service Water Strainer must always be supplied by the same engineered safeguards emergency power supply train. 4.6.5 Refer To OP 2328A, "Sodium Hypochlorite System," and SUSPEND sodium hypochlorite flow to "A" Service Water Pump. 4.6.6 **IF** "B" ServiceWater Pump will be started following mussel cooking OR backwash operations, **Step is N/A** **NOTE** With "SIAS/LNP ACTUATION SIGNAL HS 6484A" in "BLOCK" position, the "B" Service Water Pump is considered not OPERABLE 4.6.7 **IF** in MODE 1, 2, 3, or, 4, LOG entry in TSAS 3.7.4.1, "Service Water System." 4.6.8 START P-5B, "SERVICE WATER PP B" (C-06). 4.6.9 CHECK alarm "SW PUMP B SIAS/LNP START MANUALLY BLOCKED" (C06/07, window AA-19) lit. 4.6.10 STOP P-5A, "SERVICE WATER PP A" (C-06).
	PEO	4.6.11 MONITOR the following (Unit 2 Intake Structure): • Packing leakoff from packing gland • Lube water flow through flush line flow gauge • Abnormal noise and vibrations • Proper discharge pressure and strainer D/P
	BOP	4.6.12 **IF** flow is NOT observed in flush line flow gauge, INITIATE Condition Report (Unit 2 Intake Structure). **Step is N/A.**
	BOP	4.6.13 **IF** packing gland leakoff NOT observed, PERFORM the following (Unit 2 Intake Structure): **Step is N/A.**
Simulator Operator: When asked, you have a copy of OP 2326A, Section 4.6. When asked to perform Step 4.6.14; Vent the "B" SW pump strainer D/P gage, wait 2 minutes and report D/P gage vented, strainer control switch in "AUTO", PDC-6481 operating normally.		
	BOP	4.6.14 VENT PDC---6481, "B" Service Water strainer D/P gauge, as follows (Intake Structure): **Directs PEO to perform in the Intake Structure.**

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 2 Event Description: "A" Service Water Pump Strainer failure		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	4.6.15 PLACE P---5A, "SERVICE WATER PP A" in "PULL-TO-LOCK" (C-06). 4.6.16 PLACE "SIAS/LNP ACTUATION SIGNAL HS 6484A" (A502) in "NORMAL" position. 4.6.17 CHECK alarm "SW PUMP B SIAS/LNP START MANUALLY BLOCKED" (C06/07, window AA-19) NOT lit. 4.6.18 **IF** necessary, Refer To SP 2612F, "'B' Service Water Pump Operability Tests," and PERFORM Facility 1 test. **Examiner Note: If asked as SM, inform SRO SP 2612F is within its "window".** 4.6.19 **IF** applicable, LOG exit from TSAS 3.7.4.1., "Service Water System." 4.6.20 Refer To OP 2328A, "Sodium Hypochlorite System," and RESTORE Sodium Hypochlorite Injection to "B" Service Water Pump.
Simulator Operator: When directed to place SIAS/LNP Block to "NORMAL", wait 2 minutes, then trigger E-12 and report done. **Also, when asked to restart sodium hypo. Injection, wait 2 minutes and report done.**		
Examiner Note: The following steps are from OP 2326A, Service Water, Place "B" SW Pp in Service, Remove "A" SW Pump. Steps for AOP 2565, Loss of Service Water (if used) follows this section.		
	SRO	**3.0 Initial Actions** **Examiner Note: Step 3.1 – 3.3 are N/A.** 3.1 IF any SW Pump trips, PERFORM the following: 3.2 IF ALL of the following conditions are met: 3.3 IF SW pipe rupture,
	SRO	3.4 IF "A" SW Pump is lost or degraded, Go To Section 4.0, "Loss or Degradation of "A" SW Pump."
	BOP	4.0 Loss or Degradation of "A" SW Pump 4.1 ENSURE SW-97B, Service Water Pump Discharge Cross-tie, closed. 4.2 ENSURE SW-97A, Service Water Pump Discharge Cross-tie, is open. 4.3 IF "A" ServiceWater Pump tripped or is lost, PLACE Service Water Pump "A" switch in "PULL TO LOCK." 4.4 START "B" Service Water Pump. 4.5 IF "B" Service Water Pump is supplying the "A" SW Header, PERFORM the following: a. STOP "A" Service Water Pump. b. b. PLACE "A" Service Water Pump switch in "PULL TO LOCK."
	SRO	4.6 Refer To OP 2326A, "Service Water System,"and PERFORM actions to complete alignment of the respective service water pump placed in service.
Simulator Operator: When the SW pump swap has been completed, or at lead examiner's direction, proceed to Event 3, #2 SG Tube Leak.		

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 3 Event Description: #2 Steam Generator Tube Leak (10 gpm)		
Time	**Position**	**Applicant's Actions or Behavior**

Simulator Operator: When directed, initiate Event 3, #2 Steam Generator Tube Leak		

Indications Available:
• **N-16 ALERT (C-06/7, CB-19) [*Setpoint = SG Tube Leak >/= 30 GPD*]**
• **N-16 HIGH (C-06/7, CA-19) [*Setpoint is the following:*
  • ***>/= 75 GPD, sustained for 1 hour***
  • ***>/= 75 GPD & 15 GPD increase/30min, sustained for > 30 min***
  • ***>/= 150 GPD***]**
• **Charging/Letdown flow mismatch (~ 10 gpm)**		

Examiner Note: The SGTL is 10 gpm, or over 7,000 GPD. Therefore, both alarms will come in. **The following steps are from ARP 2590E-093, "N-16 HIGH".**		
	BOP **ATC**	**NOTE** **Alarm is enabled at greater than or equal to 50% power, and disabled at less than 50% power.** **AUTOMATIC FUNCTIONS** 1. None **ATC notes the RCS leakage of ~10 gpm on charging/letdown flow mismatch.**
	SRO/BOP	**CORRECTIVE ACTIONS** 1. OBSERVE radiation monitor indication (RC14A, PPC N16 screen). 2. COMPARE with trends from RIT4262, S/G blowdown gross activity and RI5099, steam jet air ejector. 3. REQUEST Chemistry to perform SP 2833, "Secondary Coolant Analysis for Primary to Secondary Leak Rate and Dose Equivalent Iodine Concentration" to aid in accomplishing the following: 3.1. DETERMINE the presence of primary to secondary leakage. 3.2. DETERMINE primary to secondary leak rate. 3.3. IDENTIFY the leaking Steam Generator. 4. IF primary to secondary leak is confirmed by chemistry analysis or independent radiation monitor indications, Refer To AOP 2569, "Steam Generator Tube Leak" and PERFORM applicable actions.
Simulator Operator: If called as Chemistry, wait 10 minutes then report "#1 SG frisked < MDA, #2 frisk showed contamination. Continuing on with analysis to quantify leak."		
	SRO	Entering AOP 2569, Steam Generator Tube Leak

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 3 Event Description: #2 Steam Generator Tube Leak (10 gpm)		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following steps are from AOP 2569, SGTL		
	SRO	**REACTOR TRIP CRITERIA** IF either of the following conditions exist with the plant in MODE 1 or MODE 2: • Annunciator A-30, MAIN STEAM LINE HI RAD / INST. FAIL, on C-01 - ALARMED AND VALID BASED ON OTHER CHANGING RCS INDICATIONS • Primary to Secondary leakage exceeds capacity of two Charging Pumps THEN TRIP Reactor AND GO TO EOP 2525, Standard Post Trip Actions
	SRO	**1. Determine Reactor Trip Criteria - MET** a. CHECK Annunciator A-30, MAIN STEAM LINE HI RAD / INST. FAIL (C-01) - ALARMED **RNO** a. PROCEED TO step 2.
	ATC	**2. Monitor Loss Of RCS Inventory** a. CHECK Pressurizer Level - LOWERING b. ADJUST LTDN FLOW CNTL, HIC-110, to stabilize Pressurizer level
	SRO	**3. Obtain Chemistry Sample** a. REQUEST Chemistry perform SP 2833, Secondary Coolant Analysis For Primary To Secondary Leak Rate And Dose Equivalent Iodine Concentration, to determine the following: • Presence of primary to secondary leakage and leak rate AND • Affected S/G
Simulator Operator: If called as Chemistry, ask if a second sample is desired. **If called to make outside reports, wait 2 minutes then report applicable groups notified.**		
	SRO	**4. Perform Notifications** a. NOTIFY the following of Steam Generator Tube Leak: • Health Physics • OMOC
	SRO	**NOTE:** Due to Main Steam line piping configuration and cross-talk (or shine), a tube leak in #1 Steam Generator may cause a rise in the indicated leakage on the #2 Steam Generator N-16 Radiation Monitor.

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 3 Event Description: #2 Steam Generator Tube Leak (10 gpm)		
Time	**Position**	**Applicant's Actions or Behavior**

	SRO/BOP	**5. Monitor N-16 Radiation Monitors** a. CHECK for either of the following - LIT: • C-06/7 Annunciator, CA-19, N-16 HIGH OR • C-06/7 Annunciator, CB-19, N-16 ALERT
	SRO/ATC	b. CHECK alarm is valid based on any of the following: • R5099, SJAE - UNEXPLAINED RISE OR • R4262, SG Blowdown – UNEXPLAINED RISE OR • RCS Leakrate indications - UNEXPLAINED RISE OR • Chemistry sample results indicate a Steam Generator Tube Leak
	SRO	c. Using PPC N16 Pri/Sec Leakrate Screen, CHECK primary to secondary leak rate meets both of the following: • GREATER THAN OR EQUAL TO 75 gpd AND • Rising by GREATER THAN OR EQUAL TO 15 gpd / 30 minutes
	SRO	d. PERFORM both of the following: 1. Using AOP 2575, Rapid Downpower, LOWER Reactor power to LESS THAN 50% within one hour 2. Within the following two hours, ENTER MODE 3, HOT STANDBY, while continuing with this procedure starting with 5.e e. REFER to the following documents: • MP-26-EPI-FAP06, Classification and PARs • RAC 14, Non-Emergency Station Events • Technical Specification 3.4.6.2, Reactor Coolant System Operational Leakage **Examiner Note: TSAS 3.4.6.2 info on next page.** f. PROCEED TO step 8
	BOP	**8. Observe Blowdown Isolates On High Radiation** a. CHECK at least one of the following Radiation Monitors - ALARMED: (RC-14) • RM-5099, SJAE Radiation Monitor OR • RM-4262, SGBD Radiation Monitor b. CHECK BLDN ISOL VLV, MS-220A - CLOSED (C-05)
	SRO	**Notify SM of need to Classify event and make notification.** **Enter AOP 2575, Rapid Downpower**

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 3 Event Description: #2 Steam Generator Tube Leak (10 gpm)		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following is the RCS Leakage Tech. Spec. 3.4.6.2		
	SRO	**Review Tech. Specs.**: **LCO 3.4.6.2 (RCS Leakage):** Reactor Coolant System Operational LEAKAGE shall be limited to: a. No PRESSURE BOUNDARY LEAKAGE, b. 1 GPM UNIDENTIFIED LEAKAGE, c. 75 GPD primary to secondary LEAKAGE through any one steam generator, and d. 10 GPM IDENTIFIED LEAKAGE. **APPLICABILITY**: MODES 1, 2, 3 and 4. **ACTION**: a. 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. b. 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 36 hours. **Examiner Note: SRO should recognize RCS leak exceeds TSAS and a plant shutdown is required per Tech. Specs as well.**

Op-Test No.: __ES18LI1___ Scenario No.: __4__ Event No.: _4__ Event Description: : AOP 2575, Rapid Downower		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following steps are from AOP 2575, *Rapid Downpower*		
	SRO	Enters AOP 2575, Rapid Downpower
	SRO	3.1 PERFORM focus brief on the following: REACTOR TRIP CRITERIA • Parameters associated with automatic reactor or turbine trips are challenged • RCS T cold *not* within 10°F of temperature program and efforts to regain control are unsuccessful RCS TEMPERATURE CONTROL • RCS T cold to be maintained within 5°F of Attachment 5, "Temperature vs. Power program" using Attachment 9, "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 PERFORM notifications of Unit rapid downpower as follows: a. Announce using plant page (extension 810), that Unit 2 is commencing a rapid downpower, including the reason for the downpower. b. CONTACT Unit 3 Control Room (extension 6200), and REQUEST that they make applicable notifications to OMOC, CONVEX, and ISO-New England.
<u>Simulator Booth</u>: When contacted as Unit 3, reply that all requested contacts will be made.		
	ATC	3.3 INITIATE forcing pressurizer sprays.
		CAUTION In the case of a dropped CEA, rod motion is *not* used to initiate downpower.

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 4 Event Description: : AOP 2575, Rapid Downower		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	3.4 IF not downpowering due to a dropped rod, AND Reactor power is greater than 99% (2673 MWTh) 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.		
	SRO	NOTE Attachment 10 "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 9, "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 9 *Main Turbine Load Set Control*		
	BOP	CAUTION Operation of the "Load/Speed CONTROL" switch will change turbine load at 600%/hour, and cancel any previous load setpoint. NOTE Steps provided in this attachment are dependent on plant conditions and may be performed in any sequence, and repeated as necessary.

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 4 Event Description: : AOP 2575, Rapid Downower		
Time	**Position**	**Applicant's Actions or Behavior**
	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."
	BOP	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). 3. 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." 4. 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. 5. IF desired load has been reached SELECT "Load Hold."
Examiner Note: The following steps are from AOP 2575 *Rapid Downpower*, Section 3.0 *Rapid Downpower*.		
	SRO	3.8 Based on required rate of downpower, START additional charging pumps as necessary and balance charging and letdown.
	ATC	[ATC "Skill-Of-The-Craft" actions if direct to start a second charging pump] • Selects "LVL-1" position on the Charging Pump Override switch (C-02) • Then adjusts the "Bias" on HIC-110 to balance charging and letdown flow, while monitoring letdown parameters.

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 4 Event Description: : AOP 2575, Rapid Downower		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	3.9 IF desired to borate from the RWST (preferred method), PERFORM the following: 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 **Examiner Note:** Crew should borate from the RWST.
	N/A	3.10 IF desired to borate from the BAST.
	SRO/ATC/ BOP	3.11 During the downpower, Refer To Attachment 1,"Rapid Downpower Parameters," and MAINTAIN parameters as specified throughout downpower: **Examiner Note:** Attachment 1 Rapid Downpower Parameters: • 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 DT 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) • Turbine steam packing rubs can occur at any turbine load. Slow and careful changes in condenser vacuum should be made. (<1 in Hg/hr) • At turbine load >/= 75% (675 MWe), condenser backpressure can be at best available.

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 4

Event Description: : AOP 2575, Rapid Downower

Time	Position	Applicant's Actions or Behavior
	SRO/ATC/ BOP	**Examiner Note:** Attachment 1 Rapid Downpower Parameters (cont.): • Between, 25% turbine load (225 MWe) and 75% turbine load (675 MWe), maintain condenser backpressure 2.0 - 4.0 in Hga. • At turbine load </= 25%, (225 MWe), maintain condenser backpressure 2.5 - 4.0 in Hga. • Turbine bearing vibrations should be monitored during power changes. When vibration changes are observed and the situation allows the power change should be stopped until the monoblock rotor is allowed to stabilize.
	SRO/ATC	NOTE 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 D/T power.
Examiner Note: Once the power reduction is complete, or at the lead examiner's direction, proceed to Event 5, Steam Generator Tube Rupture and Manual Plant Trip.		

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 5, 6 & 7 Event Description: Steam Generator Tube Rupture, Plant Trip with Failed Open MSSV and AFRV.		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following steps are from ARP 2590A-117, MAIN STEAM LINE HI RAD/INST. FAIL, (C-01, A-30). Once the alarm is verified as valid (PZR level lowering) the crew will immediately trip the plant and go to EOP 2525, Standard Post Trip Actions.		
	ATC	**NOTE** **If main steam line radiation monitor alarm is due to high radiation, it is indicative of a SG tube rupture.** **AUTOMATIC FUNCTIONS** 1. None
	SRO	**CORRECTIVE ACTIONS** 1. DETERMINE if alarm is due to high radiation and if alarm is valid. **ATC notes PZR level lowering not due to RCS temperature drop.** 2. IF alarm is due to high radiation AND is valid, TRIP reactor and Go To EOP 2525, "Standard Post Trip Actions."
Examiner Note: The following steps are from EOP 2525, *Standard Post Trip Actions*, modified slightly to improve clarity.		
	ATC	**ACTION/EXPECTED RESPONSE** **Reactivity Control – Reactor Trip** 1. ENSURE Reactor trip by ALL of the following: • ALL CEAs are fully INSERTED. • Reactor power is dropping. • SUR is negative.
	BOP	**Reactivity Control – Turbine Trip** 2. ENSURE Turbine Trip by ALL of the following: a. CHECK main turbine is tripped by ALL of the following conditions: • ALL main stop valves OR ALL control valves are closed. • Generator megawatts indicate zero. • Turbine speed is lowering. b. IF 15G-2XI-4, motor operated disconnect, is closed, THEN CHECK BOTH Main Generator output breakers 15G-8T-2 and 15G-9T-2 are open.

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 5, 6 & 7		
Event Description: Steam Generator Tube Rupture, Plant Trip with Failed Open MSSV and AFRV.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	**Maintenance of Vital Auxiliaries** 3. ENSURE Maintenance of Vital Auxiliaries met by ALL of the following conditions: a. CHECK vital and non-vital busses energized: 6.9 kV Electrical Buses energized • 25A, 24B 4.16 kV Non-Vital Electrical Buses energized • 24A, 24B 4.16 kV Vital Electrical Buses de-energized • 24C, 24D Vital DC Buses energized • 201A, 201B, DV-10, DV-20 Vital AC Instrument Buses energized • VA-10, VA-20
	BOP	3. **Maintenance of Vital Auxiliaries** (cont.) b. CHECK that BOTH facilities of service water are operating.
	BOP	3. **Maintenance of Vital Auxiliaries** (cont.) c. CHECK that BOTH facilities of RBCCW are operating with service water cooling.
Simulator Operator: After the BOP and SRO complete their review of Vital Auxiliaries and move on to review of RCS Inventory, initiate Event 7, "B" AFRV, FW-43B, fails full open.		
	ATC	**ACTION/EXPECTED RESPONSE** **RCS Inventory Control** 4. ENSURE RCS Inventory Control are met by ALL of the following conditions: a. CHECK BOTH of the following conditions exist: • Pressurizer level is between 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	**RESPONSE NOT OBTAINED** a.1 IF the Pressurizer Level Control System is *not* operating properly in automatic, THEN RESTORE and MAINTAIN pressurizer level 35 to 70% by performing **ANY** of the following: 1) OPERATE the Pressurizer Level Control System. 2) Manually OPERATE charging and letdown.

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 5, 6 & 7		
Event Description: Steam Generator Tube Rupture, Plant Trip with Failed Open MSSV and AFRV.		
Time	**Position**	**Applicant's Actions or Behavior**

	ATC	**RCS Pressure Control** 5. ENSURE RCS Pressure Control met by BOTH of the following: • CHECK that pressurizer pressure is 1900 to 2350 psia. • CHECK that pressurizer pressure is trending to 2225 to 2300 psia.
Examiner Note: The magnitude of the SGTR combined with the ESD event (MSSV open) may not initially cause the loss of RCP NPSH (requiring secure of ALL RCPS), but should drop RCS pressure enough to warrant SIAS actuation (requiring securing of 2 RCPs).		
CRITICAL TASK: OP 2260, Unit 2 EOP User's Guide, EOP 2525 guidance for tripping RCPs. [CT-2, ENT-1] **TIME SIAS Actuation:_____ AND TIME Two RCPs secured:_____** **TIME RCP NPSH Lost:_____ AND TIME All RCPs secured:_____**		
	ATC	**RESPONSE NOT OBTAINED** 5.1 IF the Pressurizer Pressure Control System is *not* operating properly in automatic, THEN RESTORE and MAINTAIN pressurizer pressure between 2225 to 2300 psia by performing **ANY** of the following: a. OPERATE the Pressurizer Pressure Control System. b. Manually OPERATE pressurizer heaters and spray valves. 5.2 IF **ANY** pressurizer spray valve will *not* close, THEN STOP RCPs as necessary. 5.3 IF any PORV is open AND pressurizer pressure is less than 2250 psia, THEN CLOSE the associated PORV block valve
	ATC	**RESPONSE NOT OBTAINED** (cont.) 5.4 IF pressurizer pressure is less than 1714 psia, THEN ENSURE **ALL** of the following: • SIAS actuated. (C01) • CIAS actuated. (C01) • EBFAS actuated. (C01) 5.5 IF pressurizer pressure is less than 1714 psia AND SIAS actuated, THEN ENSURE **ONE** RCP in each loop is stopped. 5.6 **TCOA:** IF Pressurizer pressure lowers to less than the minimum of Fig. 2 "RCP NPSH Curve" THEN STOP **ALL** RCPs
	ATC	**Core Heat Removal** 6. ENSURE Core Heat Removal met by **ALL** of the following conditions: a. CHECK at least **ONE** RCP is operating, AND loop ΔT is less than 10° F. b. CHECK that RCS subcooling is greater than or equal to 30° F.

Op-Test No.: __ES18LI1___ Scenario No.: __4__ Event No.: _5, 6 & 7__

Event Description: Steam Generator Tube Rupture, Plant Trip with Failed Open MSSV and AFRV.

Time	Position	Applicant's Actions or Behavior
	BOP	**RCS Heat Removal** 6. ENSURE RCS Heat Removal met by ALL of the following conditions: a. CHECK that at least one steam generator has BOTH of the following conditions met: • Level is 10 to 80%. • Main feedwater or **TCOA**: TWO auxiliary feedwater pumps are operating to restore level 40 to 70%.
Examiner Note: BOP may note problem with Aux. Feedwater at this time and mitigate, or wait until ESD is verified based on SGTR effect on SG level.		
	BOP	7. **RCS Heat Removal** (cont.) a. CHECK that RCS Tc is being maintained between 530°F to 535°F. b. CHECK BOTH steam generator's pressures are 880 to 920 psia.
Simulator Operator: If called to check Main Steam Safety Valves, wait about 5 minute then report steam issuing from one MSSV on "B" Main Steam Header, it definitely looks open.		
	BOP	**RCS Heat Removal – RESPONSE NOT OBTAINED** b.1 IF RCS TC is greater than 535°F, THEN PERFORM the following: 1) ENSURE that feedwater is being restored to at least ONE steam generator. 2) OPERATE steam dumps or ADVs to slowly restore RCS TC to between 530°F to 535°F.c. b.2 IF RCS TC is less than 530°F, THEN CONFIRM steam generator steam and feed rates are NOT excessive: 1) ENSURE feed flow is not excessive. 2) STABLIZE RCS Tc using steam dumps or ADVs THEN slowly restore Tc to between 530°F and 535°F. 3) IF MSI has actuated and terminates the cooldown THEN OPERATE ADVs to stabilize RCS TC.
CRITICAL TASK: OP 2260, Unit 2 EOP User's Guide, AFW isolation to the affected SG must be attempted within 15 minutes of a MSIS (time of trip) during an ESD Event. [CT-1, 2260-ESD] **TIME MSIS Actuation:_____ AND TIME AFW Isolated to #2 SG:_____**		

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 5, 6 & 7		
Event Description: Steam Generator Tube Rupture, Plant Trip with Failed Open MSSV and AFRV.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	c.1 IF ANY SG pressure is less than 572 psia, THEN ENSURE MSI actuated. (C01) c.2 **TCOA**: IF ANY SG pressure is less than 572 psia AND an ESDE is in progress, THEN PERFORM the following to isolate AFW to the most affected SG 1) PLACE BOTH auxiliary feed "OVERRIDE/ MAN/START/ RESET" handswitches in "PULL TO LOCK." 2) CLOSE applicable Aux Feed Reg valve: • 2-FW-43A • 2-FW-43B 3) IF necessary, CONSIDER use of 2-FW-44: • IF #1 SG faulted, THEN CLOSE 2-FW-44 and STOP the motor driven AFW pumps • IF #2 SG faulted, THEN CLOSE 2-FW-44 and STOP the TDAFW pump 4) IF necessary, DISPATCH operator to to close applicable AFRV manual isolation valve: • 2-FW-11A • 2-FW-11B
	BOP	c.3 IF ANY steam generator pressure is less than 572 psia AND an excess steam demand event is in progress, THEN PERFORM the following: 1) CLOSE the ADV for the most affected steam generator. 2) IF the most affected steam generator has boiled dry, as indicated by CET temperature rising, THEN OPERATE the ADV for the least affected steam generator to stabilize CET temperature. 3) Proceed To Step 8
	BOP	c.4 IF **ANY** steam generator pressure is less than 800 psia AND lowering, THEN PERFORM the following: **[Note: Step is N/A if Step "c.3" actions taken]** 1) CLOSE **BOTH** MSIVs. 2) ENSURE **BOTH** MSIV bypass valves are closed. 3) IF MSIV closure has terminated the cooldown, **[Step "3)" is N/A]**
Simulator Operator: If called to check Main Steam Safety Valves, wait about 5 minute then report steam issuing from one MSSV on "B" Main Steam Header, it definitely looks open.		
	BOP	c.5 IF **ANY** steam generator pressure is less than 880 psia, THEN PERFORM the following: 1) ENSURE steam dumps are closed. 2) ENSURE affected ADV is closed. 3) CHECK main steam safety valves are closed.

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 5, 6 & 7		
Event Description: Steam Generator Tube Rupture, Plant Trip with Failed Open MSSV and AFRV.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**Containment Isolation** 8. ENSURE Containment Isolation met by ALL of the following: a. CHECK Containment pressure is less than 1.0 psig. b. CHECK that NONE of the following primary plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity: **Radiation Monitors Inside Containment** • 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 c. CHECK that NONE of the following steam plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity: **Steam Plant Radiation Monitors** • 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	**Containment Temperature and Pressure Control** 9. ENSURE that Containment Temperature and Pressure Control met by BOTH of the following conditions: a. CHECK Containment temperature is less than 120°F. (PPC or avg. of Points 5 and 6) b. CHECK Containment pressure is less than 1.0 psig.
	SRO	10. PERFORM the following: a. DIAGNOSE the event. Refer To Appendix 1, "Diagnostic Flowchart." **[See page 34 for Diagnostic Flow Chart info]** b. INITIATE Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions." c. Go To the appropriate EOP
	ATC/BOP	{Step 10.b above} Perform Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions".
Examiner Note: EOP Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions" are attached to the end of the guide, starting on page 30.		

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 7 Event Description: EOP 2540, Functional Recovery with combined Stuck Open MSSV and SGTR		
Time	**Position**	**Applicant's Actions or Behavior**
Examiner Note: The SGTR combined with an ESD requires transitioning to EOP 2540/2540A, Functional Recovery to address "Functional Recovery of Containment Isolation".		
	SRO	**Based on indications of a SGTR with an ESD, transitioning to EOP 2540, Functional Recovery.**
Examiner Note: The following steps are from EOP 2540, "Functional Recovery".		
Indications: • **SGTR #2 SG** • **ESD #2 SG, Outside Containment**		
	SRO	1. CLASSIFY the event. Refer To MP-26-EPI-FAP06, "Classification and PARs" • IF classification requires RCS sampling, Refer To Appendix 46, "Sampling for EAL Determination" and DIRECT Chemistry as required. 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".
	SRO	3. IF pressurizer pressure is less than 1714 psia AND SIAS has initiated, PERFORM the following: Examiner Note: Step is N/A
	SRO/BOP	4. SAMPLE steam generators that are available for RCS heat removal as follows: a. CHECK "B" train RBCCW in service. b. ENSURE 2-RB-210 "Degasifier Effluent Cooler Return Outlet" is open. c. OPEN appropriate steam generator sample valves: • MS-191A • MS-191B d. DIRECT Chemistry to perform ALL of the following: • Sample ANY steam generator that is available for RCS Heat Removal • Frisk the samples • Report frisk results • Analyze samples for boron and activity
<u>Simulator Operator</u>: When called to sample the SGs, wait 10 minutes then report samples drawn and both frisk less than MDA.		
	SRO/ATC	5. PLACE the hydrogen analyzers in service. Refer To Appendix 19, "Hydrogen Analyzer Operation."

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 7 Event Description: EOP 2540, Functional Recovery with combined Stuck Open MSSV and SGTR		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	NOTE If the Safety Function Status Checklist is not satisfied for the selected success path, the US may commence the operator actions for safety functions which are not met based on Safety Function hierarchy. The remaining Safety Functions should be prioritized as time permits. 6. IDENTIFY success paths to be used to satisfy each safety function using BOTH of the following: • Resource Assessment Trees • Safety Function Tracking Page
	SRO	Functional Recovery Resource Assessment Trees **Safety Function = Path – Met [Yes/No]** • Reactivity = RC-1 - Yes • Vital DC = DC-1 – Yes • Vital AC = AC-1 – Yes • Inventory Control = IC-1/2 – Yes • Pressure Control = PC-1/2 – Yes • Heat Removal = HR-2 – Yes • **Containment Isolation = CI-1 – NO** • Containment Pressure/Temperature = CPTC-1 - Yes
Examiner Note: The following steps are from EOP 2540E, Functional Recovery of Containment Isolation.		
	SRO	**Check SIAS/CIAS Actuation** **[Conditions don't exist, step #1 is N/A]** 1. IF ANY of the following conditions exist: • Containment pressure is greater than or equal to 4.42 psig • Radiation monitors inside containment are greater than their alarm setpoint • An unexplained rise in containment radiation level or activity ENSURE ALL of the following: a. ENSURE that SIAS, CIAS, EBFAS, and MSI have actuated.(C01) b. CHECK at least one train of 1.2 SIAS, CIAS, EBFAS and MSI has properly actuated. (C01X) c. ENSURE ONE complete facility of CRACS is operating in the recirc mode:(C25)
	SRO	d. ENSURE vital switchgear cooling is operating for each operating ECCS train as follows: **[Conditions don't exist, step #1 is N/A]**

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 7 Event Description: EOP 2540, Functional Recovery with combined Stuck Open MSSV and SGTR		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	2. IF a SGTR is indicated by ANY of the following: • 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."
Examiner Note: The following steps are from EOP 2541, Appendix 12, "SGTR Response".		
	SRO/BOP	W A R N I N G 1. All Personnel performing tasks in the Unit 2 Auxiliary Building or Unit 2 Enclosure Building associated with a Loss of Coolant Accident (LOCA), are required to wear an ice vest. 2. Ice vests are stored in the Unit 1 Control Room area. **Commence Cooldown to TH Less Than 515° F** 1. CHECK Steam Dumps to Condenser available. 1. COMMENCE an RCS cooldown to a TH of less than 515° F in BOTH loops using the steam dumps. **[Steam Dumps not available due to MSI]**
	BOP	**RESPONSE NOT OBTAINED** 1.1 COMMENCE an RCS cooldown to a TH of less than 515° F in BOTH loops Using EITHER of the following: • Operation of the ADVs from the control room

Op-Test No.: __ES18LI1___ Scenario No.: __4__ Event No.: _7__ Event Description: EOP 2540, Functional Recovery with combined Stuck Open MSSV and SGTR		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**Reduce and Control RCS Pressure** 2. DEPRESSURIZE the RCS in preparation for isolating the affected SG by performing the following: a. CONTROL RCS pressure using pressurizer heaters AND spray. b. ESTABLISH AND MAINTAIN pressurizer pressure to meet ALL of the following criteria: • Less than 920 psia • Within + 50 psi of the most affected steam generator pressure • Within the RCS P/T curve limits. REFER to EOP 2541, Appendix 2, "Figures," Fig. 1 • IF RCPs are operating, THEN MAINTAIN RCS pressure above the NPSH curve. REFER to EOP 2541, Appendix 2, "Figures," Fig. 2
CRITICAL TASK #3: Establish RCS Pressure Control (such that the conditions of Step 2.b are maintained). [CT-3, PC-1] **TIME RCS Pressure Reduction Started:_____ TIME #2 SG Isolated:_____**		
	SRO	**Block MSI Actuation** 3. **[Step #3 to block MSI is N/A because MSI already actuated.]**
	SRO	**Block SIAS Actuation** 4. **[Step #4 to block SIAS is N/A because SIAS already actuated.]**
	SRO	**Close MSIVs on Loss of Offsite Power** 5. **[Step #5 for MSIV closure should already have been accomplished due to MSI actuation earlier in the scenario. Therefore, N/A]**
	SRO	**Determine Most Affected Steam Generator** 6. DETERMINE the most affected steam generator by considering of the following: • Steam generator activities • Main steam piping radiation levels • Steam generator level rise when NOT feeding • Steam generator blowdown activities • 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
	SRO	**Isolate Most Affected Steam Generator TCOA** 7. WHEN BOTH RCS TH temperatures are less than 515° F, THEN ISOLATE the most affected steam generator by performing the following: **Number 1 Steam Generator [Steps for isolating #1 SG are N/A]**

Op-Test No.: __ES18LI1___ Scenario No.: __4__ Event No.: _7__ Event Description: EOP 2540, Functional Recovery with combined Stuck Open MSSV and SGTR		
Time	**Position**	**Applicant's Actions or Behavior**
Simulator Operator: When called to close disconnect for MS-202, use trigger E-14.		
	SRO/BOP	7. **(continued) Isolate Most Affected S/G** **Number 2 Steam Generator** a. RECORD in the placekeeper, time AND TC of the operating loop. a. _____Time b. _____TCF b. ENSURE ALL of the following for the #1 ADV: • ADV controller, PIC- 4223, setpoint at 920 psia • ADV controller, PIC- 4223, is in A • ADV, MS- 190A, is closed c. ENSURE the MSIV, MS- 64A, is closed. d. d. ENSURE the MSIV BYPASS, MS- 65A, is closed e. UNLOCK AND CLOSE "DISC FOR 2- MS- 202" (NS6202) f. CLOSE steam to turbine driven aux feed pump supply valve, MS- 202. g. CLOSE BYPASS VALVE, LIC- 5216, main Feedwater regulating bypass valve. h. ENSURE the main feedwater block valve, FW- 42B is closed. i. PLACE main feed isolation air assisted check valve, FW- 5B to "CLOSE." j. ENSURE the steam generator blowdown isolation valve, MS- 220B is closed. k. PLACE BOTH auxiliary feed "OVERRIDE/MAN/START/ RESET" handswitches in "PULL TO LOCK." l. CLOSE the aux feedwater regulating valve, FW- 43B. m. PLACE aux feed isolation air assisted check valve, FW- 12B to "CLOSE". n. CLOSE main steam leg low point drain, MS- 266B. o. CHECK the main steam safety valves are closed. p. RECORD time #2 steam generator is isolated: _____Time
CRITICAL TASK #4: Establish Containment Isolation (Isolate the #2 SG). [CT-4, CI-1] **TIME Reactor Trip:_____ TIME #2 SG Isolated:_____**		
Examiner Note: Once the #2 SG has been isolated, or at the lead examiner's direction, the scenario is complete.		

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 7		
Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**
Examiner Note: The following steps are from EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions.		
	ATC	1. IF charging pumps suction is aligned to the VCT, THEN CHECK VCT level is between 72% to 86%: 1.1. IF VCT level is less than 72%, THEN ALIGN charging pump suction to RWST as follows: a. OPEN CH- 192, RWST isolation. b. ENSURE CH- 504, RWST to charging suction is open. c. CLOSE CH- 501, VCT outlet isolation. d. ENSURE CH- 196, VCT makeup bypass is closed. 1.2. IF VCT level is greater than 88%, THEN PLACE CH- 500, letdown divert handswitch, to the "RWS" position, and divert as required to maintain VCT level 72% to 86%.
	ATC	2. TCOA: IF SIAS actuated, THEN ENSURE **ONE** complete facility of CRAC operating, in RECIRC mode, as follows: (C25A/B) **Facility 1** • HV- 203A, Fan F- 21A exhaust damper open • Fan F- 21A, supply fan running • HV- 206A, Fan F- 31A exhaust damper open • Fan F- 31A, exhaust fan running • HV- 212A, Fan F- 32A exhaust damper, open • Fan F- 32A, filter fan, running • HV- 202, minimum fresh air damper, closed • HV- 207, cable vault exhaust damper, closed • HV- 208, exhaust air damper, closed **Facility 2** • HV- 203B, Fan F- 21B exhaust damper open • Fan F- 21B, supply fan running • HV- 206B, Fan F- 31B exhaust damper open • Fan F- 31B, exhaust fan running • HV- 212B, Fan F- 32B exhaust damper, open • Fan F- 32B, filter fan, running • HV- 495, fresh air damper, closed • HV- 496, exhaust air damper, closed • HV- 497, cable vault exhaust damper, closed

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 7 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	3. TCOA: IF SIAS not actuated, THEN CHECK ONE facility of CRAC operating, in NORMAL mode, as follows: (C25A/B) **Facility 1** • HV- 203A, Fan F- 21A exhaust damper is open • Fan F- 21A, supply fan running • HV- 206A, Fan F- 31A exhaust damper open • Fan F- 31A, exhaust fan running **Facility 2** • HV- 203B, Fan F- 21B exhaust damper open • Fan F- 21B, supply fan running • HV- 206B, Fan F- 31B exhaust damper open • Fan F- 31B, exhaust fan running
	ATC	4. IF charging pumps suction aligned to the RWST AND boration not required, THEN RESTORE charging pump suction to VCT as follows: a. CHECK BOTH of the following: 1) VCT level between 72% and 86% 2) VCT pressure greater than 15 psig b. CHECK letdown is in service. c. OPEN CH- 501, VCT outlet isolation. d. CLOSE CH- 192, RWST isolation.
	BOP	5. CHECK instrument air pressure greater than 90 psig and stable.
	BOP	6. IF AFAS has actuated, WHEN **BOTH** steam generators are restored to greater than 33%, THEN PERFORM the following: a. PLACE the following switches in "M" (Manual) and ADJUST to obtain desired flow (C- 05): 1) FW- 43A, "AFW- FCV, HIC- 5276A" 2) FW- 43B, "AFW- FCV, HIC- 5279A" b. PLACE **BOTH** of the following switches to "RESET" and ALLOW to spring return to neutral (C- 05): 1) "OVERRIDE/MAN/START RESET" (Facility 1) 2) "OVERRIDE/MAN/START RESET" (Facility 2) c. ADJUST the following switches to obtain desired flow (C- 05): 1) FW- 43A, "AFW- FCV, HIC- 5276A" 2) FW- 43B, "AFW- FCV, HIC- 5279A" d. IF main feedwater pump is supplying steam generators, THEN STOP **BOTH** auxiliary feedwater pumps.

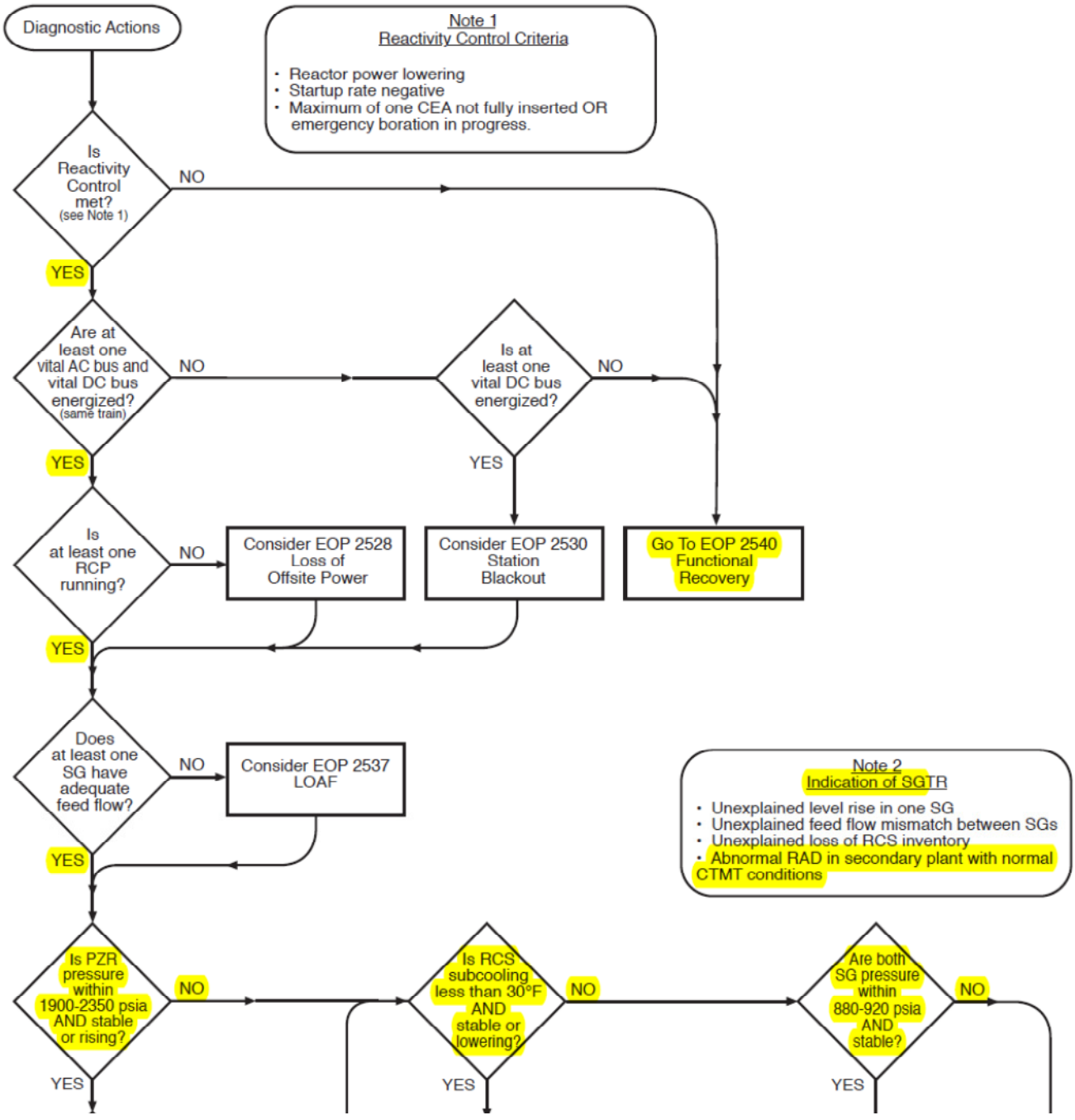
Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 7 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	7. CHECK Main Condenser is available, as indicated by ALL of the following: • At least ONE MSIV 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 **RNO** 7.1 IF Main Condenser is not available, PERFORM the following: • CLOSE BOTH MSIVs. • ENSURE BOTH MSIV bypass valves are closed. • OPEN AR-17, condenser vacuum breaker. **Examiner Note: Not available due to the loss of condenser vacuum.**
	BOP	8. OPEN HD-106, subcooling valve.
	BOP	9. ENSURE BOTH heater drain pumps stopped.
	BOP	10. IF MFW is supplying feed to the steam generators, THEN PERFORM the following: a. ENSURE that only **ONE** main feedwater pump is operating. b. ENSURE that **BOTH** main feed block valves are closed: 1) FW- 42A 2) FW- 42B c. ADJUST the operating main feedwater pump pressure to 50 to 150 psi greater than SG pressure. d. ENSURE BOTH main feed reg bypass valves are throttled to control SG level: 1) LIC- 5215 2) LIC- 5216 e. IF Main Feedwater Pump A is secured, THEN CLOSE the following: 1) FW- 38A, main feedwater pump discharge valve 2) FIC- 5237, main feedwater pump mini flow recirc valve f. IF Main Feedwater Pump B is secured, THEN CLOSE the following: 1) FW- 38B, main feedwater pump discharge valve 2) FIC- 5240, main feedwater pump mini flow recirc valve **Examiner Note: Loss of condenser vacuum secures both MFW pumps.**
	BOP	11. IF **BOTH** MFW pumps are secured, THEN PERFORM the following: a. CLOSE BOTH main feedwater pump mini flow recirc valves. • FIC- 5237 • FIC- 5240

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 7

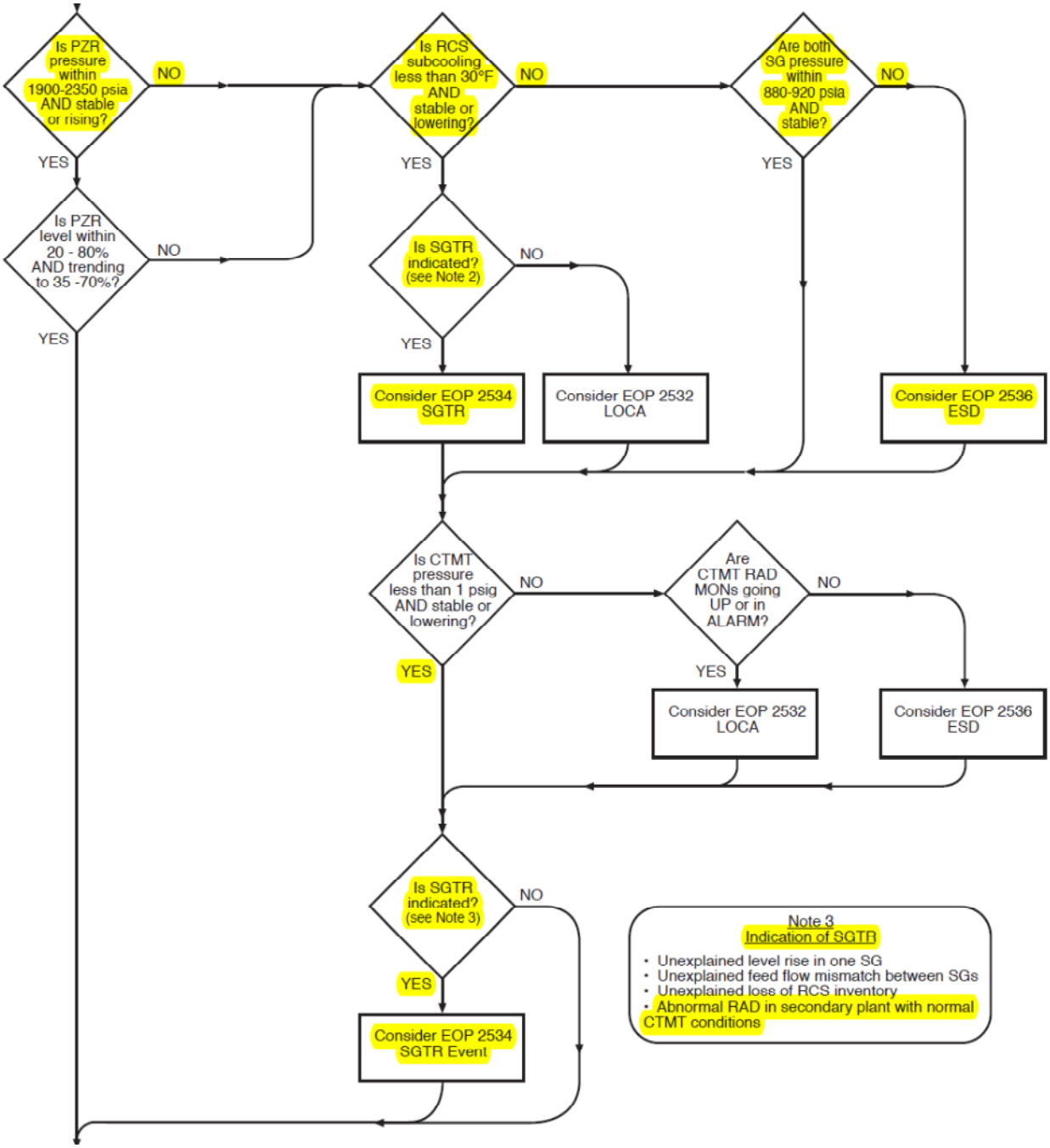
Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**

Time	Position	Applicant's Actions or Behavior
	BOP	12. IF 25A OR 25B is energized, THEN ALIGN condensate pumps as follows: a. ENSURE **ONE** pump is running. b. ENSURE **ONE** pump is in "PULL TO LOCK." c. ENSURE **ONE** pump is in "AUTO."
Examiner Note: End of Attachment 4-A		

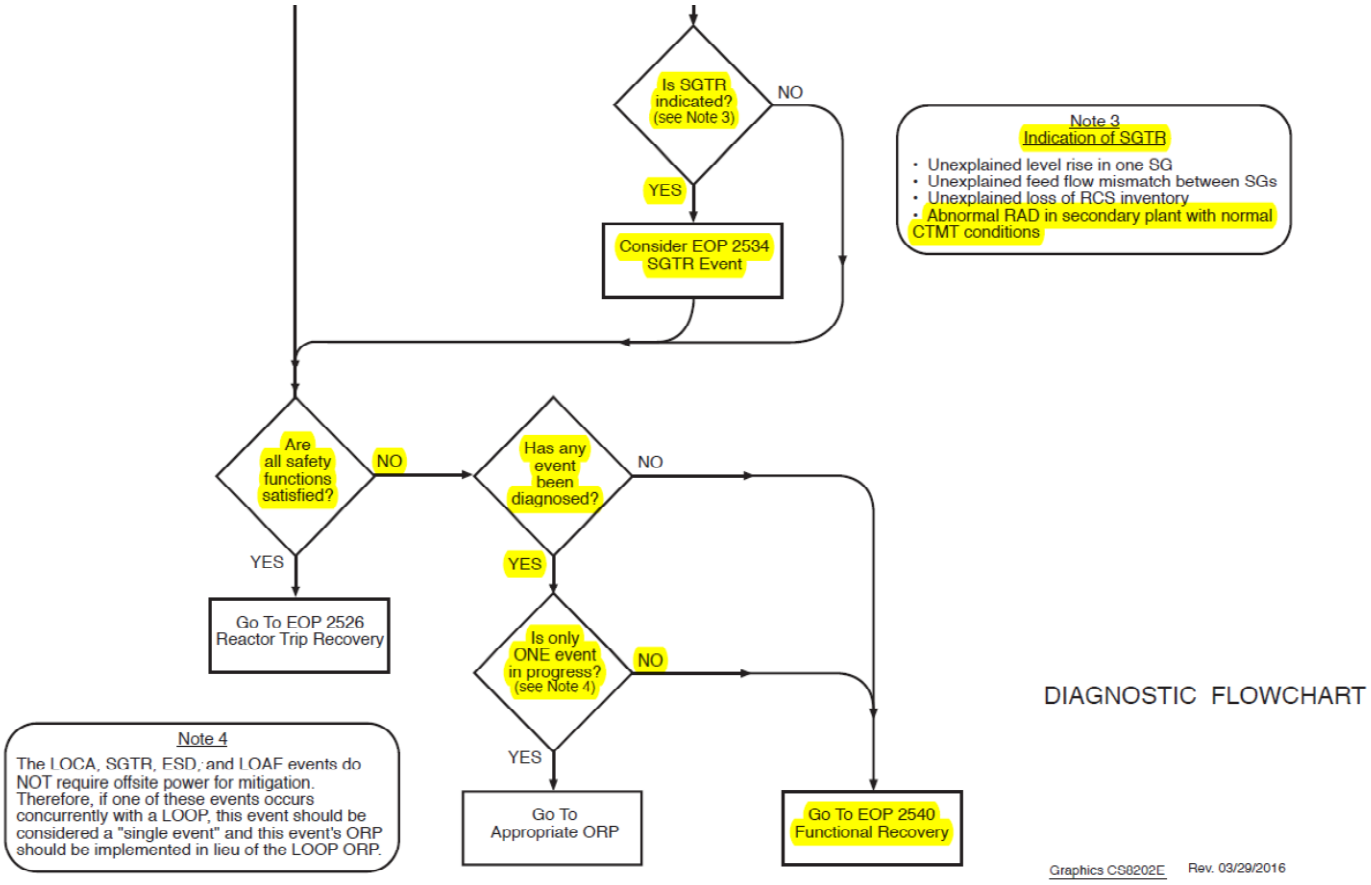
Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 7 Event Description: **EOP 2541, Appendix 1, Diagnostic Flow Chart (from EOP 2525, Step 10)**		
Time	**Position**	**Applicant's Actions or Behavior**



Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 7 Event Description: **EOP 2541, Appendix 1, Diagnostic Flow Chart (from EOP 2525, Step 10)**		
Time	**Position**	**Applicant's Actions or Behavior**



Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 7 Event Description: **EOP 2541, Appendix 1, Diagnostic Flow Chart (from EOP 2525, Step 10)**		
Time	**Position**	**Applicant's Actions or Behavior**



SIMULATOR SCENARIO #5

Facility: Millstone Unit 2 Scenario No.: 5 Op-Test No.: ES18LI1

Examiners: _____ Operators: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: ~76% Power IC-266, steady state. Plant startup following a mid-cycle forced outage due to a major storm. The plant is no longer in AOP 2560, ***Storms, High Winds and high Tides***. All components and equipment aligned per existing plant power level; power ascension will hold at 90% for main turbine control valve testing. No other equipment OOS due to mechanical issues; 24E aligned to 24C.

Turnover: ~76% Power. Plant startup in progress following a mid-cycle forced outage. All components and equipment aligned per existing plant power level. All components and equipment aligned per existing plant power level; power ascension will hold at 90% for main turbine control valve testing. 24E aligned to 24C.

Critical Tasks:

1. [LOCA-9] Manually establish the required minimum safety injection flow (ATC).
2. [LOCA-12] Trip any RCP not satisfying RCP operating limits (ATC).

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R (ALL)	Raise power to approximately 90%.
2	ES02F	I (TS) (ATC/S)	Inadvertent CTMT Spray Actuation, Facility 2
3	WD02B, WD04	C (TS) (BOP/S)	CTMT Sump strainer clogs when pumping the sump and isolation valve SSP-16.2 fails to close when the sump pump is secured.
4	CW02B	C (BOP/S)	"B" Traveling Screen rising ΔP, requires lowering "B" Circulating Water Pump speed.
5	TC01, RC03D	M	Main Turbine trip causes plant trip. LB-LOCA on the plant trip.
6	ES04F, RH01A	C (ATC/S)	Loss of ESAS Actuation Cabinet 6, requires manual actuation of Fac. 2 equipment, and loss of "A" LPSI requires "B" LPSI be started.

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

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

Scenario 5 Summary:

The crew will take the shift with the unit at ~76% power (IC-266), near the end of a mid-cycle power ascension, with all equipment operating as designed for the power level. The crew will be instructed to raise power to ~90% (no restrictions on the rate) and hold there for Main Turbine Control Valve testing.

Event 1: Immediately after taking the watch, the crew will raise power to approximately 90% in preparation for Main Turbine Control Valve testing.
Once the power change evaluation is completed, or at the examiners discretion, Event 2 is triggered.

Event 2: ESFAS Facility 2 Containment Spray will inadvertently actuate, starting the containment spray pump and opening the containment spray isolation valve on that facility. The crew must recognize this as an instrument failure of ESAS and take the actions for the alarm C01-D34, ***CSAS ACTUATION SIG CH 2 TRIP***. ARP 2590A-136 (C01-D34), AOP 2571, ***Inadvertent ESFAS Actuation*** and AOP 2585, ***Immediate Operator Actions***, give guidance to diagnose and mitigate the inadvertent CSAS.
Once CSAS has been returned to a normal configuration, the crew should progress to Event 3.

Event 3: The running of CTMT Spray will fill the CTMT normal sump above the high level alarm, requiring the crew to pump it to lower level. Shortly after the pump is started, the sump pump discharge strainer will clog, triggering annunciator C06/7-BB21, ***CTMT NORM SUMP DIS PRESS HI*** and causing pump flow to go to zero. ARP 2590E-108 (C06/7-BB21) gives guidance to secure the sump pump and have Maintenance check out the strainer. When the sump pump is secured, both pump discharge valves are supposed to close automatically, but one valve will fail open violating the CTMT Isolation Tech. Spec. Manual operation of the valve's control panel switch will fail to close the valve.
Once the Tech. Spec. applicability has been noted, or at the examiners discretion, Event 4 is triggered.

Event 4: "B" Traveling Screen ΔP will begin to rise, eventually triggering alarm C06/7-D10, ***TRAVELING SCREEN ΔP HI.*** ARP 2590E-056 directs the crew to AOP 2517, ***Circulating Water Malfunctions***. The investigating PEO will report the "B" traveling screen is operating fine, but seems to be catching the brunt of the seaweed coming in with the tide. IAW AOP 2517, the crew will lower the "B" Circ. Water pump speed as necessary to maintain traveling screen ΔP below the Circ. Pump trip value of 30 psid.
Once the above actions have been taken, or at the examiners discretion, Event 5 is triggered.

Event 5: The Main Turbine will trip causing a plant trip. On the trip, a Large-Break LOCA will occur.
EOP 2525, ***Standard Post Trip Actions***, will then be carried out.

Event 6: ESAS Actuation Cabinet 6 will lose power on the trip, requiring manual alignment of all Fac. 2 ESAS controlled components. In addition, "A" LPSI pump will trip 2 seconds after PZR pressure drops below 1600 psia, requiring the manual start of "B" LPSI pump to meet Safety Injection requirements.
After the completion of EOP 2525 SPTA, the crew will transition to EOP 2532, ***Loss Of Coolant Accident***.

The scenario will end when an RCS cooldown has been commenced, or at the examiners discretion.

INPUT SUMMARY							
Either INPUT or VERIFY the following functions:							
ID Num	Description	Delay Time	Ramp Time	Event Trigger	Severity or Value	Final Value	Relative Order
MALFUNCTIONS							
ES02F	Inadvertent CSAS Fac. 2			E-2	Active		2
WD02B	CTMT sump isol. SSP-16.2 fails open			E-3	Active		
WD04	CTMT sump pump strainer clog		20 sec.	E-3	100%		
CW02B	"B" Traveling Screen high ΔP		180 sec.	E-4	20 psid		3
TC01	Main Turbine Trip			E-5	Active		4
RC03D	LB-LOCA on trip (Loop 2B Tc **100%**)	2 sec.		E-21	1E05		4
ES04F	ESAS Actuation Cabinet 6 power failure			E-21	Active		4
RH01A	"A" LPSI pump trip	2 sec.		E-27	Active		5
REMOTE FUNCTIONS							
CWR06B	"B" Screen Wash Pump Start			E-10		START	3
CWR07A	"A" Screens to Fast			E-10		FAST	3
CWR07B	"B" Screens to Fast			E-10		FAST	3
CWR07C	"C" Screens to Fast			E-10		FAST	3
CWR07D	"D" Screens to Fast			E-10		FAST	3
OVERRIDES							

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 1 Event Description: Raise Reactor Power from ~76% to ~ 90%		
Time	**Position**	**Applicant's Actions or Behavior**
Examiner Note: The following steps are from OP 2204, "Load Changes". The crew will pre-stage with a review of the applicable procedure and pre-job brief.		
	SRO	4.1.15 PERFORM the following to raise reactor power: a. IF power change is to be accomplished *without* CEA motion, PERFORM the following: **[Step is N/A]** b. IF power change is to be accomplished *with* CEA movement *only*, Refer To OP 2302A, "Control Element Drive System," or Attachment 14 of this procedure and WITHDRAW CEAs as required, such that reactor power leads turbine load slightly. **[Step is N/A]**
	SRO/ATC	c. IF power change is to be accomplished using CEA movement AND dilution of RCS, PERFORM the following: • Refer To OP 2302A,"Control Element Drive System," or Attachment 14 of this procedure and WITHDRAW CEAs as required, such that reactor power leads turbine load slightly • Refer To OP 2304C, "Makeup (Boration and Dilution) Portion of CVCS," and COMMENCE dilution of RCS, such that reactor power leads turbine load slightly • IF desired, Refer To OP 2304E, "Charging Pumps," and START additional charging pumps **[Step is N/A]**
Examiner Note: The following steps are from OP 2204, "Load Changes", Attachment 14, "CEA Motion Checklist". These steps are "Information" Level of Use, meaning they only have to be referred to "as needed" prior to performing the task.		
	ATC	**CAUTION** 1. Critical parameters must be monitored closely to ensure proper reactivity control is maintained. 2. Steps in this attachment require concurrent performance, repeated within an evolution. Successful completion of the evolution requires the steps to be completed in a timely manner without delay. A placekeeping exception is permitted for this attachment to placekeep once after the evolution is completed. 3. The reactor must be tripped if an actual sustained SUR is greater than 1.0 dpm.

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 1 Event Description: Raise Reactor Power from ~76% to ~ 90%		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	1. While using this attachment, MONITOR the following for proper operation of CEAs (C---04): • "CEAPDS MONITOR" • PPC CEA positions display, "CEA" • Core Mimic 2. DETERMINE direction and magnitude of required CEA change. 3. IF desired, SELECT appropriate display on CEAPDS monitor.
	ATC	4. IF inserting any regulating CEA group, PERFORM the following: **[Step is N/A]**
	ATC	5. WHEN withdrawing any CEA group, MONITOR for SUR less than 0.5 dpm (C-04) and PERFORM CHANNEL CHECK of nuclear instruments (RPS).
	ATC	6. IF withdrawing any regulating CEA group, PERFORM the following: 6.1. PRESS "MANUAL SEQUENTIAL, MS" button and CHECK light lit (C-04). 6.2. PLACE and HOLD CEAcontrol switch to "WITHDRAW" to obtain desired rod position (C-04). 6.3. WHEN CEA movement is *no* longer desired, *slowly* RELEASE CEA control switch and ENSURE all movement has stopped. 6.4. PRESS CEDS "OFF" button and CHECK light lit. 6.5. MONITOR for proper response. 6.6. IF further control rod withdrawal is required, REPEAT step 6.
	ATC	7. WHEN *no* longer desired to operate in Manual Sequential, PERFORM the following: 7.1. PRESS CEDS "OFF" button and CHECK light lit. 7.2. PRESS "GROUP SELECTION" button corresponding to controlling group and CHECK light lit. 7.3. RETURN "CEAPDS MONITOR" to desired scale.
Examiner Note: The following steps are from OP 2304C, "Boration and Dilution Portion of CVCS", Section 4.2, Diluting Directly to Charging Pump Suction		
	ATC	4.2 **Diluting Directly to Charging Pump Suction** 4.2.1 As required, Refer To Section 4.20, "Maintaining VCT Level and Pressure During Normal Operation," and PERFORM applicable actions.
	ATC	**NOTE** This method affords a quicker reactivity response than going through the VCT, and may be used as necessary and if conditions warrant. For Chemistry concerns, the preferred path for makeup is to the VCT.

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 1		
Event Description: Raise Reactor Power from ~76% to ~ 90%		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	4.2.2 IF flow path to charging pump suction contains residual boric acid and it is desired to flush to RWST, Refer To Section
	ATC	4.2.3 ENSURE the following: • At least *one* RCP operating (C-03), or *one* LPSI pump operating on SDC providing a flow of greater than or equal to 1,000 gpm through the core • At least *one* charging pump running (C-02) • Available volume in clean Liquid Radwaste System is adequate for letdown flow (C-63) • "MAKEUP MODE SEL" in "DILUTE" (C-04) • PMW pump running (indicating lights on C-02) • "PRI MAKEUP WTR FLOW CONTROLLER FC-210X" "AM" is lit (C-04)
	ATC	4.2.4 IF RCS boron concentration will be changed a specific amount, Refer To OP 2208, "Reactivity Calculations," or PPC. 4.2.5 DETERMINE quantity of PMW needed to reach desired condition. 4.2.6 ENSURE the following are closed: • CH-512, "MAKEUP VLV STOP," (C-04) • CH-196, "VCT MAKEUP BYPASS," (C-02) • CH-192, "RWST ISOL," (C-02)
	ATC	**NOTE** 1. PMW flow rate is limited by charging pump(s) capacity. 2. PMW flow rates of less than 10 gpm and greater than 150 gpm are achievable but are *not* to be exceeded.
	ATC	4.2.7 IF required, ADJUST automatic setpoint of "PRI MAKEUP WTR FLOW CONTROLLER FC-210X" as follows (C-04): a. OBSERVE charging flow on FI-212, "CHG HDR FLOW" (C-02/3) or F212 (PPC). b. RECORD charging flow: _____ c. ENSURE "AM" is lit. d. PRESS "SEL" button until cursor appears above setpoint (left hand bar graph). e. Using "Y" and "B" buttons, ADJUST setpoint to less than or equal to the charging flow rate recorded in step 4.2.7b. 4.2.8 IF desired, Refer to Attachment 3 as required and RESET "PRI MAKEUP WTR FLOW CONTROLLER FC-210X" to 0 total gallons (C-04). 4.2.9 SET "PRI MAKEUP WATER, FQIS-210X" to desired quantity (C-04). 4.2.10 ENSURE CH-504, "RWST TO CHG SUCT," is open (C-02).

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 1 Event Description: Raise Reactor Power from ~76% to ~ 90%		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**NOTE** When CH---196, "VCT MAKEUP BYPASS" is opened, the "M" part of the "AM" light will extinguish, indicating the controller is activated.
	ATC	4.2.11 OPEN CH-196, "VCT MAKEUP BYPASS," (C-02).
	ATC	4.2.12 MONITOR VCT level and pressure as indicated on the following: (C---02 or PPC). • "VCT PRES, PI-225" • "VCT LVL, LI-226"
	ATC	4.2.13 IF desired, ADJUST automatic setpoint of "PRI MAKEUP WTR FLOW CONTROLLER FC-210X" as follows (C-04):
	ATC	4.2.14 IF desired to stop dilution before determined quantity of PMW has been injected, PERFORM the following: a. CLOSE CH-196, "VCT MAKEUP BYPASS," (C-02). b. ENSURE "PRI MAKEUP WTR FLOW CONTROLLER FC-210X" indicates 0 gpm (C-04).
	ATC	4.2.15 IF determined quantity of PMW has been injected, PERFORM the following: a. ENSURE the following (C-04): • "PRI MAKEUP WTR FLOW CONTROLLER FC-210X" indicates 0 gpm • "PRI MAKEUP WATER, FQIS-210X" indicates 0 gallons b. CLOSE CH-196, "VCT MAKEUP BYPASS," (C-02).
Examiner Note: The following steps continue with OP 2204, "Load Changes"		
	SRO	**NOTE** 1. When reactor power is less than 25%, (225 MWe) turbine load changes of 1 to 3 MWe per minute will minimize the chance of developing turbine rubs. 2. When operating at reduced power levels (less than or equal to 55%), condenser hotwell cation conductivity values may be higher than normal due to air in-leakage to the condensate system. The cabon dioxide in the air forms carbonate and bicarbonate which are not removed by cation columns, hence increased conductivity values. High hotwell conductivity annunciators may be in alarm.

Op-Test No.: __ES18LI1___ Scenario No.: __5__ Event No.: _1__ Event Description: Raise Reactor Power from ~76% to ~ 90%		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	4.1.16 PERFORM the following to raise turbine load using Load Set controls (HMI "Load" screen): a. ENSURE "Load Hold" selected. b. SELECT "Load Setpt" and ENTER desired value c. SELECT "Rate Setpt" and ENTER desired value. d. SELECT "Load Resume" to start load change. e. As necessary, Refer To Attachment 15, "Turbine Generator Adjustments, and MAINTAIN TC between program value and program value + 1°F.
	SRO	4.1.17 WHEN desired power level has been achieved, Go To step 4.1.46.
Examiner Note: When plant power level has been raised to approximately 90% and stabilized, or at the lead examiner's direction, proceed to Event #2, Inadvertent CTMT Spray Actuation on Facility 2.		

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 2 Event Description: Inadvertent CTMT Spray Actuation on Facility 2		
Time	**Position**	**Applicant's Actions or Behavior**
Simulator Operator: When directed, initiate Event #2, Inadvertent CTMT Spray Actuation on Fac 2.		
Indications Available: • **CSAS ACTUATION SIG CH 2 TRIP (RED WINDOW) (C-01, D-34).**		
Examiner Note: The following steps are from ARP 2590A-136, *CTMT ACTUATION SIG CH 2 TRIP (RED WINDOW)*.		
	ATC	**AUTOMATIC FUNCTIONS** 1. If actuated, the following occurs (C-01): • "B" CS pump, starts • "CS HDR B ISOL, CS-4.1B," opens **CORRECTIVE ACTIONS** 1. MONITOR Containment pressure and DETERMINE if actual CSAS condition exists. 2. IF an actual CSAS condition exists, PERFORM the following: 2.1 OBSERVE C-01X and control boards and ENSURE all automatic action occur. 2.2 Go To EOP 2525, "Standard Post Trip Actions" and PERFORM applicable corrective actions. 3. IF alarm is due to inadvertent actuation, PERFORM the following: 3.1 PERFORM applicable actions to override and stop "B" CS pump (C-01). 3.2 INVESTIGATE cause of inadvertent actuation. 3.3 IF inadvertent actuation is caused by instrument malfunction, PERFORM the following: 3.3.1 Refer To Technical Specifications LCO, 3.3.2.1, Table 3.3-3 and DETERMINE applicability. 3.3.2 SUBMIT Trouble Report to I&C Department. 3.4 Refer To AOP 2571, "Inadvertent ESFAS Actuation" and PERFORM applicable actions.
Examiner Note: Technical Specifications LCO, 3.3.2.1 info follows AOP 2571 required actions		
Simulator Operator: If called as I&C to investigate the problem with ESAS, inform US that you will get a work order and prepare a troubleshooting plan and be up in about 20 minutes.		

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 2 Event Description: Inadvertent CTMT Spray Actuation on Facility 2		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following steps are from OP 2571, *"Inadvertent ESFAS Actuation"*		
	SRO	**7.0 Inadvertent CSAS Actuation** 7.1 Refer To Attachment 2, "Resetting ESAS," Section 2.0, "Resetting CSAS", and ATTEMPT to reset CSAS.
	SRO	7.2 IF the inadvertent CSAS actuation resulted in flow through the Containment Spray headers, NOTIFY Engineering to determine required actions. 7.3 Go To Section 12.0, "Follow-up Actions."
Examiner Note: The following steps are from OP 2571, *Attachment 2, "Resetting ESAS," Section 2.0, "Resetting CSAS"*		
	ATC/BOP	**2.0 Resetting CSAS** 2.1 PRESS to reset the following bistable module "TRIP" lights: • "CTM PRESSURE CSAS BISTABLE BA10 2" (Sensor Cabinet A) • "CTM PRESSURE CSAS BISTABLE BA30 2" (Sensor Cabinet C) • "CTM PRESSURE CSAS BISTABLE BA40 2" (Sensor Cabinet D) • "CTM PRESSURE CSAS BISTABLE BA20 2" (Sensor Cabinet B) 2.2 PRESS "CSAS ACTUATION RESET" (Actuation Cabinet 5). 2.3 OBSERVE BOTH of the following CSAS actuation module "TRIP" lights extinguished (Actuation Cabinet 5): • "CSAS GROUP 1 AM509" • "CSAS GROUP 2 AM510" 2.4 PRESS "CSAS ACTUATION RESET" (Actuation Cabinet 6). 2.5 OBSERVE BOTH of the following CSAS actuation module "TRIP" lights extinguished (Actuation Cabinet 6): • "CSAS GROUP 1 AM609" • "CSAS GROUP 2 AM610" 2.6 IF CSAS cannot be reset, Go To Step 7.1.1 contingency step. 2.7 IF required to reset ATI, PRESS "ATI FAULT PRESS TO RESET." 2.8 OBSERVE "CSAS ACTUATION SIG CH 1 TRIP" annunciator reset (C-34, C-01). 2.9 OBSERVE "CSAS ACTUATION SIG CH 2 TRIP" annunciator reset (D-34, C-01).

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 2 Event Description: Inadvertent CTMT Spray Actuation on Facility 2		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following is from Tech Specs LCO, 3.3.2.1		
	SRO	**Review Tech. Specs. 3.3.2.1 and Determine applicability**: **Engineered Safety Feature Actuation System Instrumentation** **LCO 3.3.2.1:** The engineered safety feature actuation system instrumentation channels and bypasses shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4. **APPLICABILITY**: As shown in Table 3.3-3. **ACTION**: a. With an engineered safety feature actuation system instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column **[Examiner Note: TSAS "a." is not applicable.]** b. With an engineered safety feature actuation system instrumentation channel inoperable, take the ACTION shown in **Table 3.3-3**
	SRO	**TABLE 3.3-3** Functional Unit / Total No. Of Channels / Channels To Trip / Minimum Channels Operable / Applicable Modes / Action 2. (CSAS) Auto Act. Logic: 2 / 1 / 2 / 1, 2, 3 / 5 ACTION 5 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in at least HOT SHUTDOWN within the following 6 hours. **Examiner Note: SRO may note that TSAS 3.3.2.1, Action 5. would apply if the CSAS did not reset. However, OPERABILITY cannot be determined without knowing the results of the I&C troubleshooting plan.**
Examiner Note: Steps for dealing with the *CTMT NORM SUMP LEVEL HI/LO* (C-06/7, BA-21) and associated Tech. Specs. are in Event 3, which follows.		

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 3 Event Description: CTMT Sump Strainer Clogging and Failure of SSP-16.2 to Close		
Time	**Position**	**Applicant's Actions or Behavior**

Indications Available:

- **CTMT NORM SUMP LEVEL HI/LO (C-06/7, BA-21).**

Examiner Note: The following steps are from ARP 2590E-107.

ATC/SRO

AUTOMATIC FUNCTIONS

1. None

> **NOTE**
>
> On a sump high level alarm due to a high influent flow, the operator should immediately attempt to determine the source of influent.

1. IF level is high, PERFORM the following:
   1.1. IF level is high, due to high influent flow, Refer To AOP 2568, Reactor Coolant System Leak."
   1.2. Refer To TSAS 3.3.3.8 and 3.4.6.1, and DETERMINE applicability.

Examiner Note: TSAS 3.3.3.8 and 3.4.6.1 follow steps to pump the sump.

   1.3. Refer To OP 2336A, "Station Sumps and Drains," and PUMP the sump.
   1.4. IF pumps can not be started, VERIFY the following supply breakers, "ON":
   - B31B04, "CONTAINMENT SUMP PUMP A (P33A)"
   - B41B08, "CONTAINMENT SUMP PUMP B (P33B)"

2. IF level is low AND pump is running, STOP pump.

Examiner Note: The following steps are from OP 2336A, *"Station Sumps and Drains"*.

BOP

4.2 Operation of the Containment Sump

> **CAUTION**
>
> 1. Effluent from Containment Sump must be treated as contaminated liquid.
> 2. The Operator should be aware of the pumping frequency of the Containment Sump. A rise in pumping frequency is indicative of leakage within Containment.

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 3 Event Description: CTMT Sump Strainer Clogging and Failure of SSP-16.2 to Close		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	**NOTE** 1. The Containment Sump pumps will *not* automatically stop on low sump level and must be manually stopped. **2.** The normal pumping time of the CTMT Sump is three minutes, any longer could indicate a clogged strainer basket. 3. 3 Containment Sump pumps discharge to the AWDTs. Normal pumping range, from 78% to 10% CTMT sump level, will raise the level of the on-service AWDT by approximately 6-7%.
Simulator Operator: Initiate Event 3, CTMT Sump Strainer Clogging when level is pumped to ~60%.		
	BOP	4.2.1 IF desired, START containment sump pump "A" or "B" as follows (C---06): a. PLACE "CTMT SUMP PP A" OR "CTMT SUMP PP B," control switch(es) to "START." b. ENSURE the following open: • "CTMT SUMP ISOL INBOARD, SSP-16.1" • "CTMT SUMP ISOL OUTBOARD, SSP-16.2" c. ENSURE associated sump pump starts. 4.2.2 IF desired, STOP containment sump pump "A" or "B" as follows (C---06): a. WHEN CTMT sump level has lowered to 10 percent, PLACE "CTMT SUMP PP A" OR "CTMT SUMP PP B," control switch(es) to "STOP." b. ENSURE the following closed: • "CTMT SUMP ISOL INBOARD, SSP-16.1" • "CTMT SUMP ISOL OUTBOARD, SSP-16.2" **Examiner Note; BOP should inform the US that SSP-16.2 failed to close.**
Examiner Note: Tech. Spec. 3.3.3.8, 3.4.6.1 and 3.6.1.1 follow.		
Simulator Operator: If called to fix SSP-16.2 or fail SSP-16.1 closed, respond as Maintenance or Work Control that the applicable work order will be generated ASAP.		

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 3		
Event Description: CTMT Sump Strainer Clogging and Failure of SSP-16.2 to Close		
Time	**Position**	**Applicant's Actions or Behavior**

	SRO	**Review Tech. Specs.**: **LCO 3.3.3.8 (ACCIDENT MONITORING):** The accident monitoring instrumentation channels shown in Table 3.3-11 shall be OPERABLE. **APPLICABILITY**: MODES 1, 2 and 3. **ACTION**: a. ACTIONS per Table 3.3-11. **ACCIDENT MONITORING INSTRUMENTATION** Instrument / Total No. of Channels / Minimum Ch. OPERABLE / ACTION 8. Containment Water Level (Narrow Range) 1 1 7## ## Refer to ACTION statement in Technical Specification 3.4.6.1. ACTION 7; Restore the inoperable system to OPERABLE status within 7 days or be in COLD SHUTDOWN within the next 36 hours. (See the ACTION statement in Technical Specification 3.4.6.1.). **Examiner Note: SRO logs into TSAS 3.3.3.8, Action 7 until the sump level is on scale.**
	SRO	**Review Tech. Specs.**: **LCO 3.4.6.1 (LEAKAGE DETECTION SYSTEM):** The following Reactor Coolant System leakage detection systems shall be OPERABLE: a. One of two containment atmosphere particulate radioactivity monitoring channels, and b. The containment sump level monitoring system. **APPLICABILITY**: MODES 1, 2, 3 and 4. **ACTION**: b. With the containment sump level monitoring system inoperable, operation may continue for up to 30 days provided: 1. A Reactor Coolant System water inventory balance is performed at least once per 24 hours during steady state operation. Otherwise, be in COLD SHUTDOWN within the next 36 hours. **Examiner Note: SRO logs into TSAS 3.4.6.1, Action b. until the sump level is on scale.**
	SRO	**Review Tech. Specs.**: **LCO 3.6.3.1 (CONTAINMENT ISOLATION VALVES):** Each containment isolation valve shall be OPERABLE.(1) (2) **APPLICABILITY**: MODES 1, 2, 3 and 4. **ACTION**: With one or more of the isolation valve(s) inoperable, either: a. Restore the inoperable valve(s) to OPERABLE status within 4 hours, or b. Isolate the affected penetration(s) within 4 hours by use of a deactivated automatic valve(s) secured in the isolation position(s) **Examiner Note: SRO logs into TSAS 3.6.3.1b., and has SSP-16.1 failed closed.**
Examiner Note: When the Containment Sump event has been addressed, or at lead examiner's direction, go to Event 4, "B" Traveling Screen High D/P.		

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 4		
Event Description: : "B" Traveling Screen High D/P.		
Time	**Position**	**Applicant's Actions or Behavior**

Indications Available: • **TRAVELING SCREEN D/P HI (C-06/7, D-10).**		
Examiner Note: The following steps are from ARP 2590E-056.		
	ATC/SRO	**AUTOMATIC FUNCTIONS** 1. None **CORRECTIVE ACTIONS** 1. Go To AOP 2517, "Circulating Water Malfunctions."
Examiner Note: The following steps are from AOP 2517, "*Circulating Water Malfunctions.*"		
	SRO	**FOLDOUT PAGE ITEMS** 1. REACTOR TRIP CRITERIA IF Reactor Power, as read on RPS Nuclear Instrumentation - GREATER THAN OR EQUAL TO 15%, AND either of the following conditions - MET: • Both Circulating Water Pumps in one Condenser - OFF • Condenser Backpressure GREATER THAN 6.5 in. Hg abs THEN TRIP Reactor AND GO TO EOP 2525, Standard Post Trip Actions, while continuing with this procedure starting with step 2.
	SRO	**NOTE**: Foldout page shall be monitored throughout this procedure. **NOTE**: When power is LESS THAN 15% and linear power bistable light clears (NOT lit) on at least three RPS channels, the Turbine trip is inhibited and Turbine trip will NOT result in an automatic Reactor trip.
	SRO	**ACTION** 1. Determine Reactor Trip Criteria - MET a. CHECK either of the following conditions - MET: • Both Circulating Water Pumps in one Condenser - OFF • Condenser Backpressure – GREATER THAN 6.5 in. Hg abs **RESPONSE NOT OBTAINED** Proceed To step 2.

Op-Test No.: __ES18LI1___ Scenario No.: __5__ Event No.: _4__ Event Description: : "B" Traveling Screen High D/P.		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	**ACTION** 2. Determine Circulating Water Pump Status a. CHECK any Circulating Water Pump - TRIPPED **RESPONSE NOT OBTAINED** Proceed To step 3.
	SRO	**ACTION** 3. MONITOR Condenser Backpressure a. CHECK Condenser Backpressure - LESS THAN 4.5 In Hg Abs
	SRO	4. Using Table 1, PROCEED TO Applicable Attachment For Abnormal Circulating Water Condition **Table 1** Traveling Screen Differential Pressure High (TRAVELING SCREEN DP HI, C-06/07, D-10) **ATTACHMENT D**
Examiner Note: The following steps are from AOP 2517, "*Circulating Water Malfunctions.*", Att. "D"		
	SRO	**NOTE**: Traveling Screen differential level of 30 inches results in the trip of the Circulating Water Pump in the affected bay.
	BOP	D.1___ Determine Affected Traveling Screen • 2B, LI=6499B
	BOP	D.2___Lower Affected Circulating Water Pump Speed a. REDUCE affected Circulating Water Pump speed in increments of 5 to 10% to maintain all of the following: Maximum Quarry Cut temperature - LESS THAN 105°F • Condenser Differential Temperature LESS THAN the limits of ATTACHMENT C, Table 1, Station and Unit 2 Differential Temperature Limits • Condenser backpressure – LESS THAN 4.5 in. Hg abs. • Circulating Water Pump speed - GREATER THAN 60% • Traveling Screen differential pressure LESS THAN 12 inches
	BOP/PEO	D.3___ Start Screen Wash System BOP directs a PEO to start the Screenwash System and verify proper operation.
Examiner Note: When the Hi "B" Screen D/P has been addressed, or at lead examiner's direction, go to Event 5, Main Turbine trip (major transient).		

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: Main Turbine Trip, LB-LOCA, Loss of Fac. 2 ESAS and Loss of "A" LPSI Pump.		
Time	**Position**	**Applicant's Actions or Behavior**

Simulator Operator: When directed, initiate Event #5, Main Turbine trip.		
Examiner Note: The following steps are from EOP 2525, "*Standard Post Trip Actions*", modified slightly to improve clarity.		
	ATC	**ACTION/EXPECTED RESPONSE** **Reactivity Control – Reactor Trip** 1. ENSURE Reactor trip by ALL of the following: • ALL CEAs are fully INSERTED. • Reactor power is dropping. • SUR is negative.
	BOP	**Reactivity Control – Turbine Trip** 2. ENSURE Turbine Trip by ALL of the following: a. CHECK main turbine is tripped by ALL of the following conditions: • ALL main stop valves OR ALL control valves are closed. • Generator megawatts indicate zero. • Turbine speed is lowering. b. IF 15G-2XI-4, motor operated disconnect, is closed, THEN CHECK BOTH Main Generator output breakers 15G-8T-2 and 15G-9T-2 are open.
	BOP	**Maintenance of Vital Auxiliaries** 3. ENSURE Maintenance of Vital Auxiliaries met by ALL of the following conditions: a. CHECK vital and non-vital busses energized: 6.9 kV Electrical Buses energized • 25A, 24B 4.16 kV Non-Vital Electrical Buses energized • 24A, 24B 4.16 kV Vital Electrical Buses de-energized • 24C, 24D Vital DC Buses energized • 201A, 201B, DV-10, DV-20 Vital AC Instrument Buses energized • VA-10, VA-20

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6

Event Description: Main Turbine Trip, LB-LOCA, Loss of Fac. 2 ESAS and Loss of "A" LPSI Pump.

Time	Position	Applicant's Actions or Behavior
	BOP	3. **Maintenance of Vital Auxiliaries** (cont.) b. CHECK that BOTH facilities of service water are operating. c. CHECK that BOTH facilities of RBCCW are operating with service water cooling.
	ATC	**ACTION/EXPECTED RESPONSE** **RCS Inventory Control** 3. ENSURE RCS Inventory Control are met by ALL of the following conditions: a. CHECK BOTH of the following conditions exist: • Pressurizer level is between 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	**RCS Inventory Control - RESPONSE NOT OBTAINED** a.1 IF the Pressurizer Level Control System is *not* operating properly in automatic, THEN RESTORE and MAINTAIN pressurizer level 35 to 70% by performing **ANY** of the following: 1) OPERATE the Pressurizer Level Control System. 2) Manually OPERATE charging and letdown.
	ATC	**RCS Pressure Control** 4. ENSURE RCS Pressure Control met by BOTH of the following: • CHECK that pressurizer pressure is 1900 to 2350 psia. • CHECK that pressurizer pressure is trending to 2225 to 2300 psia.
Examiner Note: The RCP NPSH will be lost immediately, requiring ALL RCPs be secured.		
CRITICAL TASK: Trip any RCP not satisfying RCP operating limits. [CT-2, LOCA-12] **TIME RCP NPSH Lost :_____ TIME All RCPs secured:_____ [</= 10 min. later]**		
	ATC	**RCS Pressure Control - RESPONSE NOT OBTAINED** 5.1 IF the Pressurizer Pressure Control System is *not* operating properly in automatic, THEN RESTORE and MAINTAIN pressurizer pressure between 2225 to 2300 psia by performing **ANY** of the following: a. OPERATE the Pressurizer Pressure Control System. b. Manually OPERATE pressurizer heaters and spray valves. 5.2 IF **ANY** pressurizer spray valve will *not* close, THEN STOP RCPs as necessary. 5.3 IF any PORV is open AND pressurizer pressure is less than 2250 psia, THEN CLOSE the associated PORV block valve

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6

Event Description: Main Turbine Trip, LB-LOCA, Loss of Fac. 2 ESAS and Loss of "A" LPSI Pump.

Time	Position	Applicant's Actions or Behavior
		Examiner Note: The malfunction on ESAS will prevent the auto actuation of ALL Facility 2 Safeguards equipment, but only one facility of equipment is required to cool the core. However, the "A" LPSI pump will automatically trip shortly after auto starting on the event. This will require the ATC to manually start the "B" LPSI pump.
		CRITICAL TASK: Manually establish the required minimum safety injection flow. [CT-1, LOCA-9] **TIME of LOCA:_____ TIME "B" LPSI pump started:_____**
	ATC	**RCS Pressure Control - RESPONSE NOT OBTAINED (cont.)** 5.4 IF pressurizer pressure is less than 1714 psia, THEN ENSURE **ALL** of the following: • SIAS actuated. (C01) **[See CT-1 above]** • CIAS actuated. (C01) • EBFAS actuated. (C01) 5.5 IF pressurizer pressure is less than 1714 psia AND SIAS actuated, THEN ENSURE **ONE** RCP in each loop is stopped. 5.6 **TCOA:** IF Pressurizer pressure lowers to less than the minimum of Fig. 2 "RCP NPSH Curve" THEN STOP **ALL** RCPs **[See CT-2 above]**
	ATC	**Core Heat Removal** 6. ENSURE Core Heat Removal met by **ALL** of the following conditions: a. CHECK at least **ONE** RCP is operating, AND loop ΔT is less than 10° F. b. CHECK that RCS subcooling is greater than or equal to 30° F.
	ATC	**Core Heat Removal - RESPONSE NOT OBTAINED** a.1 IF RCPs are not operating, OR loop ΔT is greater than 10° F, THEN PERFORM the following: 1) PLACE TIC-4165, steam dump TAVG controller, in manual and closed. 2) PLACE BOTH pressurizer spray valve controllers in manual and CLOSE the valves. • HIC-100E • HIC-100F

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6

Event Description: Main Turbine Trip, LB-LOCA, Loss of Fac. 2 ESAS and Loss of "A" LPSI Pump.

Time	Position	Applicant's Actions or Behavior
	BOP	**RCS Heat Removal** 7. ENSURE RCS Heat Removal met by ALL of the following conditions: a. CHECK that at least one steam generator has BOTH of the following conditions met: • Level is 10 to 80%. • Main feedwater or **TCOA**: TWO auxiliary feedwater pumps are operating to restore level 40 to 70%.
Examiner Note: BOP must ensure two Aux. Feedwater Pumps are operating and feeding the SGs. The LOCA caused a High CTMT Pressure MSI, which secures Main Feedwater flow to both SGs.		
	BOP	7. **RCS Heat Removal** (cont.) b. CHECK that RCS Tc is being maintained between 530°F to 535°F. c. CHECK BOTH steam generator's pressures are 880 to 920 psia.
	BOP	**RCS Heat Removal – RESPONSE NOT OBTAINED** a.1 IF RCS TC is greater than 535°F, THEN PERFORM the following: 1) ENSURE that feedwater is being restored to at least ONE steam generator. 2) OPERATE steam dumps or ADVs to slowly restore RCS TC to between 530°F to 535°F.c. a.2 IF RCS TC is less than 530°F, THEN CONFIRM steam generator steam and feed rates are NOT excessive: 1) ENSURE feed flow is not excessive. 2) STABLIZE RCS Tc using steam dumps or ADVs THEN slowly restore Tc to between 530°F and 535°F. 3) IF MSI has actuated and terminates the cooldown THEN OPERATE ADVs to stabilize RCS TC.
	BOP	c.1 IF ANY SG pressure is less than 572 psia, THEN ENSURE MSI actuated. (C01) c.2 **TCOA**: IF ANY SG pressure is less than 572 psia AND an ESDE is in progress, THEN PERFORM the following to isolate AFW to the most affected SG. **[Examiner Note: This step is N/A]**
	BOP	c.3 IF ANY steam generator pressure is less than 572 psia AND an excess steam demand event is in progress, THEN PERFORM the following: **[Examiner Note: This step is N/A]** 1) Proceed To Step 8

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: Main Turbine Trip, LB-LOCA, Loss of Fac. 2 ESAS and Loss of "A" LPSI Pump.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	c.4 IF **ANY** steam generator pressure is less than 800 psia AND lowering, THEN PERFORM the following: 1) CLOSE **BOTH** MSIVs. 2) ENSURE **BOTH** MSIV bypass valves are closed. 3) IF MSIV closure has terminated the cooldown, **Step 3) is N/A**
Simulator Operator: If called to check Main Steam Safety Valves, wait about 5 minute then report all MSSVs indicate closed.		
	BOP	c.5 IF **ANY** steam generator pressure is less than 880 psia, THEN PERFORM the following: 1) ENSURE steam dumps are closed. 2) ENSURE affected ADV is closed. 3) CHECK main steam safety valves are closed.
	ATC	**Containment Isolation** 8. ENSURE Containment Isolation met by ALL of the following: a. CHECK Containment pressure is less than 1.0 psig.
	ATC	**Containment Isolation - RESPONSE NOT OBTAINED** a.1 IF containment pressure is greater than or equal to 4.42 psig, THEN ENSURE ALL of the following: • SIAS actuated. (C01) • CIAS actuated. (C01) • EBFAS actuated. (C01) • MSI actuated. (C01)

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6

Event Description: Main Turbine Trip, LB-LOCA, Loss of Fac. 2 ESAS and Loss of "A" LPSI Pump.

Time	Position	Applicant's Actions or Behavior
	ATC	**Containment Isolation (cont.)** b. CHECK that NONE of the following primary plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity: **Radiation Monitors Inside Containment** • 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 c. CHECK that NONE of the following steam plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity: **Steam Plant Radiation Monitors** • 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	**Containment Temperature and Pressure Control** 9. ENSURE that Containment Temperature and Pressure Control met by BOTH of the following conditions: a. CHECK Containment temperature is less than 120°F. (PPC or avg. of Points 5 and 6)
	ATC	**Containment Temperature and Pressure Control - <u>RESPONSE NOT OBTAINED</u>** a.1 ENSURE ALL available normal cooling and ventilation systems are OPERATING: • CAR fans operating on the facility with an operating train of RBCCW • CTMT Aux Circ fans

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6

Event Description: Main Turbine Trip, LB-LOCA, Loss of Fac. 2 ESAS and Loss of "A" LPSI Pump.

Time	Position	Applicant's Actions or Behavior
	ATC	**Containment Temperature and Pressure Control (cont.)** 9. ENSURE that Containment Temperature and Pressure Control met by BOTH of the following conditions: b. CHECK Containment pressure is less than 1.0 psig. b.1 IF containment pressure is greater than or equal to 4.42 psig, THEN ENSURE ALL of the following: • SIAS actuated. (C01) • CIAS actuated. (C01) • EBFAS actuated. (C01) • MSI actuated. (C01) 1) PLACE ALL available containment aux circ fans in low speed. 2) START ALL available containment post incident recirc fans. b.2 IF containment pressure is greater than or equal to 9.48 psig, THEN ENSURE ALL of the following: • CSAS actuated. (C01) • ALL operating containment spray pumps are delivering at least 1300 gpm each.
	SRO	10. PERFORM the following: a. DIAGNOSE the event. Refer To Appendix 1, "Diagnostic Flowchart." **[See page 36 for Diagnostic Flowchart]** b. INITIATE Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions." c. Go To the appropriate EOP
	ATC/BOP	**[Per step 10.b above]** Perform Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions".

Examiner Note: EOP Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions" are attached to the end of the guide, starting on page 32.

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: EOP 2532, Loss Of Coolant Accident.		
Time	**Position**	**Applicant's Actions or Behavior**

Examiner Note: The following steps are from EOP 2532, *Loss Of Coolant Accident*, modified slightly to improve clarity.		
	SRO	**WARNING** 1. ALL Personnel are required to use ice vests for all tasks associated with a Loss of Coolant Accident (LOCA) and performed in Unit 2 Aux. Building and or Enclosure Building. 2. Ice vests can be found in Unit One Control Room area.
	SRO	**NOTE** 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.
	SRO/BOP	**Confirm Diagnosis** *1. CONFIRM diagnosis of a Loss of Coolant Accident by performing the following: a. CHECK Safety Function Status Check Acceptance Criteria are satisfied. b. CHECK steam generators for primary to secondary leakage by performing the following: 1) CHECK "B" train RBCCW in service. 2) OPEN the steam generator sample valves: • MS- 191A • MS- 191B 3) DIRECT Chemistry to perform the following: • Sample both steam generators • Frisk the samples • Report frisk results • Analyze samples for boron and activity 4) WHEN Chemistry reports that samples have been taken, CLOSE the steam generator sample valves: • MS- 191A • MS- 191B 5) IF SIAS has actuated, AND no other sampling is in progress, CLOSE 2- RB- 210, "Degasifier Effluent Cooler Return Outlet"

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: EOP 2532, Loss Of Coolant Accident.		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO/SM	**Classify the Event** *2. Refer To MP-26-EPI-FAP06, "Classification and PARs," and CLASSIFY the event. • IF classification requires RCS sampling, Refer To Appendix 46, "Sampling for EAL Determination" and DIRECT Chemistry as required.
	SRO	**Implement Placekeeping** *1. PERFORM ALL of the following: • OPEN the placekeeper and ENTER the EOP entry time. • ENSURE the master alarm silence switch is in "NORMAL."
	ATC	**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.
	ATC	**Facility 2** • 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.

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: EOP 2532, Loss Of Coolant Accident.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**Optimize Safety Injection** *5. IF SIAS has initiated, PERFORM the following: a. CHECK at least one train of SIAS, CIAS and EBFAS has properly actuated. (C01X) b. CHECK that safety injection flow is adequate. Refer To Appendix 2, "Figures." c. ENSURE ALL available charging pumps are operating d. ENSURE vital switchgear cooling is operating for each operating ECCS train as follows: Facility 1 • Fan F- 51 is running. • Fan F- 134 is running. • SW- 178A, service water supply is open. • SW- 178B, service water supply is open. Facility 2 • Fan F- 52 is running. • Fan F- 142 is running. • Fan F- 133 is running. • SW- 178C, service water supply is open.
	ATC	**RCP Trip Strategy** *6. IF pressurizer pressure is less than 1714 psia AND 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. IF 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.
	ATC	**Isolate the LOCA** 7. PERFORM the following to isolate the leak: a. IF pressurizer pressure is less 7.2 than 2250 psia, CHECK PORVs closed. b. ENSURE BOTH of the following letdown isolation valves are closed: • CH- 515 • CH- 516

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: EOP 2532, Loss Of Coolant Accident.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	c. ENSURE at least one facility of the following 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
	ATC	7. CHECK no leakage in the RBCCW system by BOTH of the following: • CHECK RM- 6038, "RBCCW Radiation Monitor," is not alarming or trending to alarm. • CHECK RBCCW Surge Tank level not rising.
	ATC	**Check LOCA NOT Outside of Containment** 8. CHECK that the LOCA is not occurring outside of containment: a. CHECK that NONE of the following Radiation Monitors Outside Containment have an unexplained alarm or indicate an unexplained rise in activity: • 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
	BOP	b. CHECK that ALL of the following annunciators are not in alarm: • "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) c. MONITOR Aerated Waste Tank levels for abnormal rise.
	ATC	**Place Hydrogen Analyzers in Service** 9. PLACE the hydrogen analyzers in service. Refer To Appendix 19, "Hydrogen Analyzer Operation."

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: EOP 2532, Loss Of Coolant Accident.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**Ensure CIAS** *10. IF ANY of the following exists: • Containment pressure is greater than or equal to 4.42 psig • Radiation monitors inside containment are greater than their alarm setpoint PERFORM the following: 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)
	ATC	**Ensure CIAS – <u>RESPONSE NOT OBTAINED</u>** b.1 IF ANY component is not in its required position, manually ALIGN the applicable component.
		c. 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.

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: EOP 2532, Loss Of Coolant Accident.		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	Facility 2 • 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. 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
	ATC	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.
	ATC	**Ensure CSAS** *11. IF containment pressure is greater than or equal to 9.48 psig, PERFORM the following: a. ENSURE CSAS actuated. (C01) b. ENSURE ALL available containment spray headers are providing flow greater than or equal to 1300 gpm.

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: EOP 2532, Loss Of Coolant Accident.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	**Close MSIVs on Loss of Offsite Power** *12. IF offsite power has been lost OR the condenser is not available, PERFORM the following: a. CLOSE BOTH MSIVs. b. ENSURE BOTH MSIV bypass valves are closed. c. OPEN AR- 17, condenser vacuum breaker.
	BOP	**Place RBCCW Pump in Pull to Lock** IF ANY of the following conditions exist: • Service water pump is not operating AND the associated RBCCW pump is operating • RBCCW pump is not operating AND containment pressure is greater than or equal to 20 psig PERFORM ALL of the following: a. PLACE the associated RBCCW pump in "PULL TO LOCK." b. IF RBCCW cooling is lost to an RCP, PERFORM the following: 1) STOP affected RCPs. 2) PLACE associated pressurizer spray valve controller RC- 100E or RC-100F in manual and CLOSE the valve. 3) IF ALL RCPs are stopped, PLACE TIC- 4165, steam dump TAVG controller, in manual and closed.
	BOP	**Align Instrument Air** *14. CHECK instrument air pressure greater than 90 psig and stable.

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6 Event Description: EOP 2532, Loss Of Coolant Accident.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	**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: 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. j. PLACE AC- 59, Outside air makeup damper to "MID" position.
	SRO	**Go To Isolated LOCA Section** *16. IF the LOCA has been isolated,Go To Step 65. **NOTE** 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 40F/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.
	SRO	**Perform Controlled Cooldown** *17. INITIATE a controlled cooldown using the steam dumps to establish shutdown cooling entry conditions.

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**

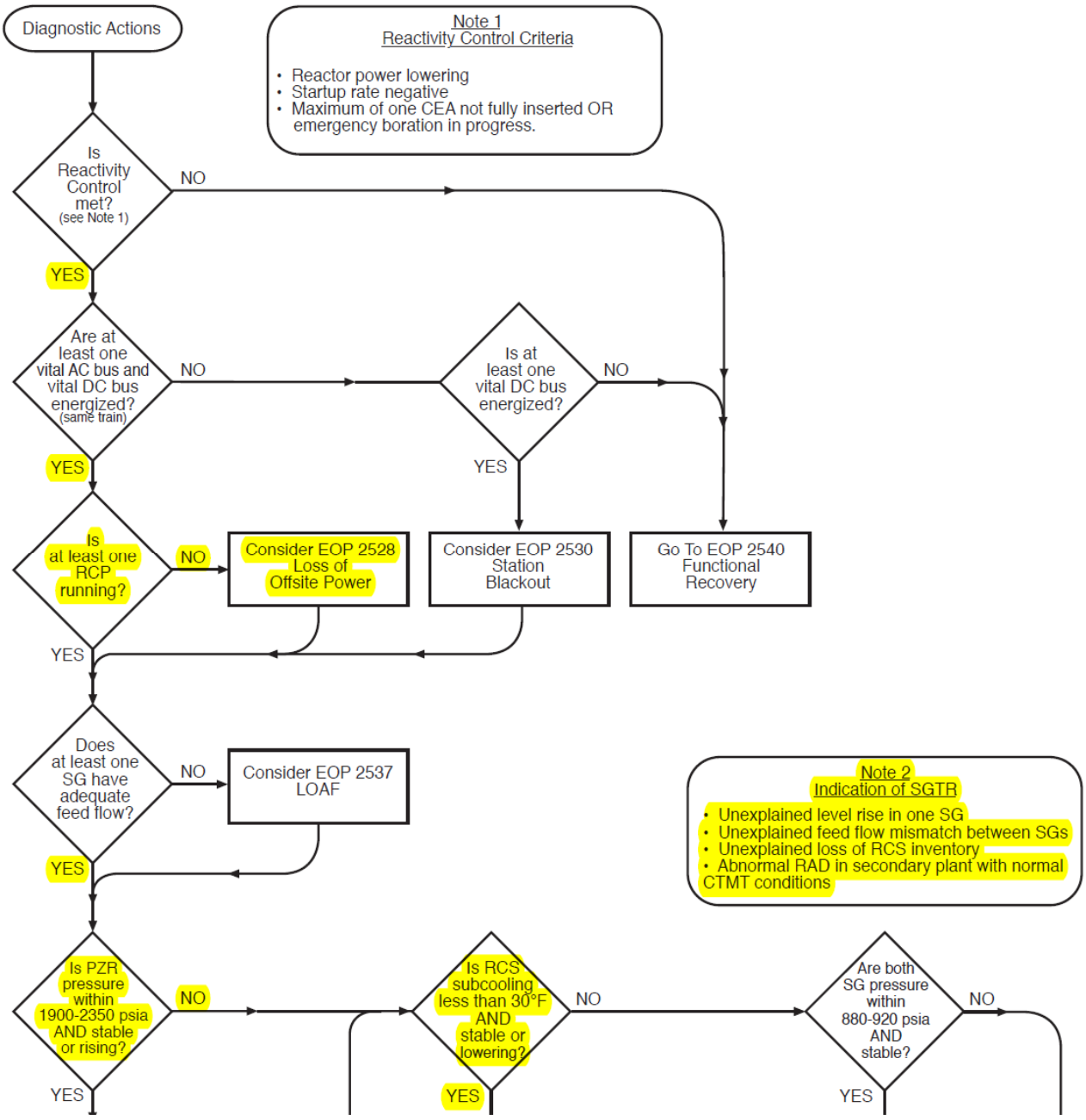
Examiner Note: The following steps are from EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions.		
	ATC	1. IF charging pumps suction is aligned to the VCT, THEN CHECK VCT level is between 72% to 86%: a. IF VCT level is less than 72%, THEN ALIGN charging pump suction to RWST as follows: 1) OPEN CH- 192, RWST isolation. 2) ENSURE CH- 504, RWST to charging suction is open. 3) CLOSE CH- 501, VCT outlet isolation. 4) ENSURE CH- 196, VCT makeup bypass is closed. b. IF VCT level is greater than 88%, THEN PLACE CH- 500, letdown divert handswitch, to the "RWS" position, and divert as required to maintain VCT level 72% to 86%.
	ATC	2. TCOA: IF SIAS actuated, THEN ENSURE **ONE** complete facility of CRAC operating, in RECIRC mode, as follows: (C25A/B) **Facility 1** • HV- 203A, Fan F- 21A exhaust damper open • Fan F- 21A, supply fan running • HV- 206A, Fan F- 31A exhaust damper open • Fan F- 31A, exhaust fan running • HV- 212A, Fan F- 32A exhaust damper, open • Fan F- 32A, filter fan, running • HV- 202, minimum fresh air damper, closed • HV- 207, cable vault exhaust damper, closed • HV- 208, exhaust air damper, closed **Facility 2** • HV- 203B, Fan F- 21B exhaust damper open • Fan F- 21B, supply fan running • HV- 206B, Fan F- 31B exhaust damper open • Fan F- 31B, exhaust fan running • HV- 212B, Fan F- 32B exhaust damper, open • Fan F- 32B, filter fan, running • HV- 495, fresh air damper, closed • HV- 496, exhaust air damper, closed • HV- 497, cable vault exhaust damper, closed

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	3. TCOA: IF SIAS not actuated, THEN CHECK ONE facility of CRAC operating, in NORMAL mode, as follows: (C25A/B) **Facility 1** • HV- 203A, Fan F- 21A exhaust damper is open • Fan F- 21A, supply fan running • HV- 206A, Fan F- 31A exhaust damper open • Fan F- 31A, exhaust fan running **Facility 2** • HV- 203B, Fan F- 21B exhaust damper open • Fan F- 21B, supply fan running • HV- 206B, Fan F- 31B exhaust damper open • Fan F- 31B, exhaust fan running
	ATC	4. IF charging pumps suction aligned to the RWST AND boration not required, THEN RESTORE charging pump suction to VCT as follows: a. CHECK BOTH of the following: 1) VCT level between 72% and 86% 2) VCT pressure greater than 15 psig b. CHECK letdown is in service. c. OPEN CH- 501, VCT outlet isolation. d. CLOSE CH- 192, RWST isolation.
	BOP	5. CHECK instrument air pressure greater than 90 psig and stable.
	BOP	6. IF AFAS has actuated, WHEN **BOTH** steam generators are restored to greater than 33%, THEN PERFORM the following: a. PLACE the following switches in "M" (Manual) and ADJUST to obtain desired flow (C- 05): 1) FW- 43A, "AFW- FCV, HIC- 5276A" 2) FW- 43B, "AFW- FCV, HIC- 5279A" b. PLACE **BOTH** of the following switches to "RESET" and ALLOW to spring return to neutral (C- 05): 1) "OVERRIDE/MAN/START RESET" (Facility 1) 2) "OVERRIDE/MAN/START RESET" (Facility 2) c. ADJUST the following switches to obtain desired flow (C- 05): 1) FW- 43A, "AFW- FCV, HIC- 5276A" 2) FW- 43B, "AFW- FCV, HIC- 5279A" d. IF main feedwater pump is supplying steam generators, THEN STOP **BOTH** auxiliary feedwater pumps.

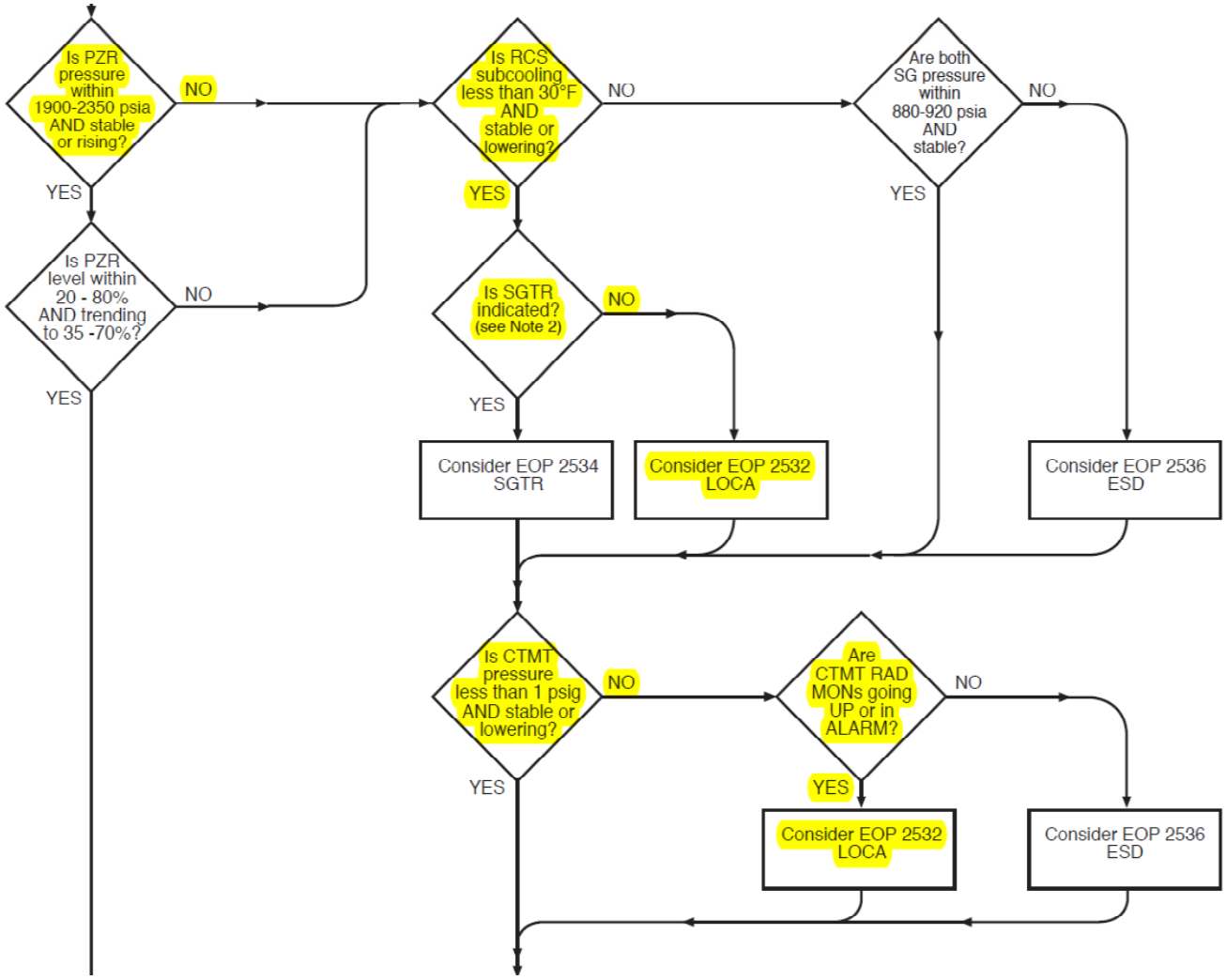
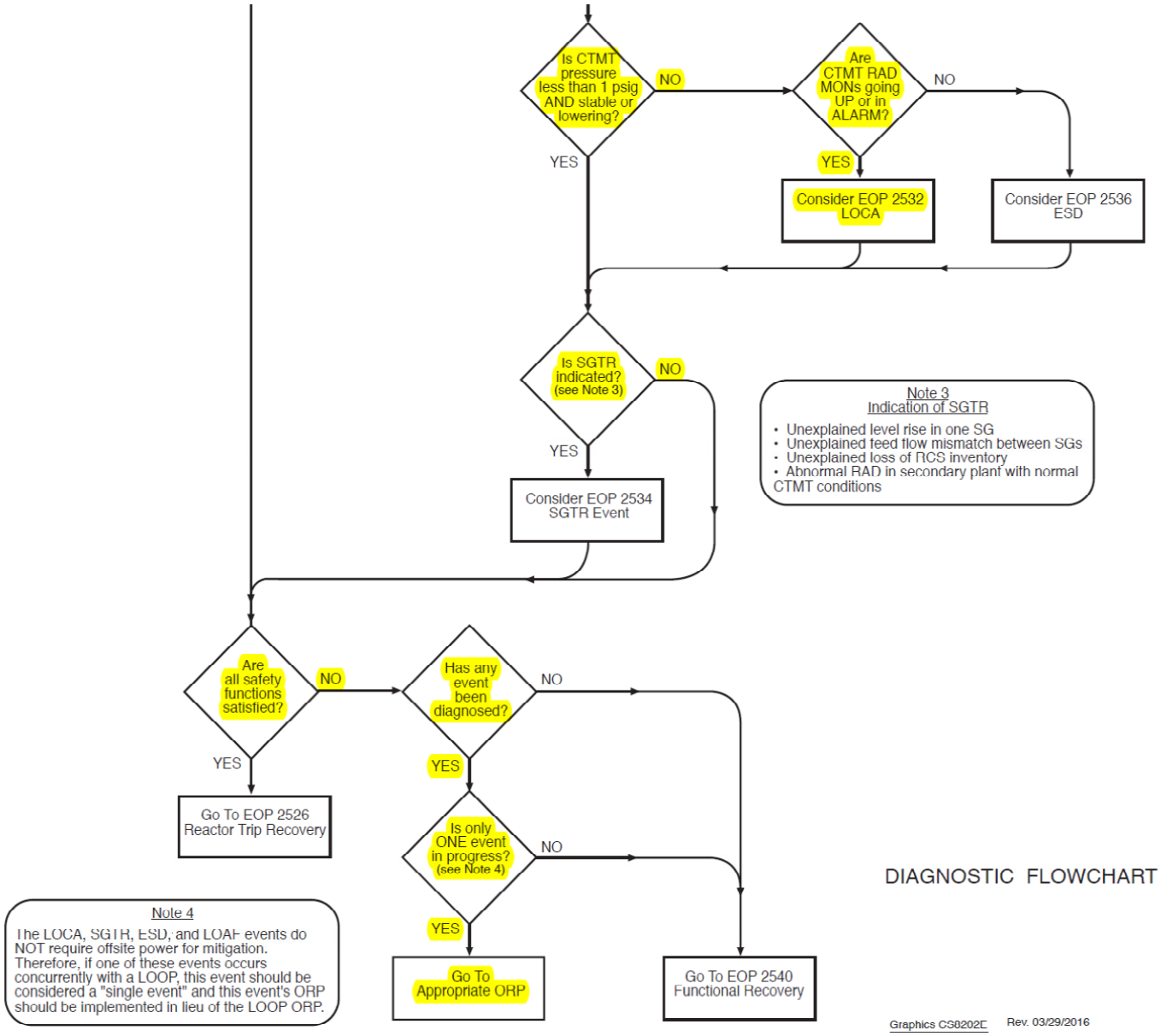
Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	7. CHECK Main Condenser is available, as indicated by ALL of the following: • At least ONE 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 **RNO** 7.1 IF Main Condenser is not available, PERFORM the following: • CLOSE BOTH MSIVs. • ENSURE BOTH MSIV bypass valves are closed. • OPEN AR-17, condenser vacuum breaker. **Examiner Note: Not available due to the loss of condenser vacuum.**
	BOP	8. OPEN HD-106, subcooling valve.
	BOP	9. ENSURE BOTH heater drain pumps stopped.
	BOP	10. IF MFW is supplying feed to the steam generators, THEN PERFORM the following: a. ENSURE that only **ONE** main feedwater pump is operating. b. ENSURE that **BOTH** main feed block valves are closed: 1) FW- 42A 2) FW- 42B c. ADJUST the operating main feedwater pump pressure to 50 to 150 psi greater than SG pressure. d. ENSURE BOTH main feed reg bypass valves are throttled to control SG level: 1) LIC- 5215 2) LIC- 5216 e. IF Main Feedwater Pump A is secured, THEN CLOSE the following: 1) FW- 38A, main feedwater pump discharge valve 2) FIC- 5237, main feedwater pump mini flow recirc valve f. IF Main Feedwater Pump B is secured, THEN CLOSE the following: 1) FW- 38B, main feedwater pump discharge valve 2) FIC- 5240, main feedwater pump mini flow recirc valve **Examiner Note: MSI on CTMT pressure secures both MFW pumps.**

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	11. IF **BOTH** MFW pumps are secured, THEN PERFORM the following: a. CLOSE BOTH main feedwater pump mini flow recirc valves. • FIC- 5237 • FIC- 5240
	BOP	12. IF 25A OR 25B is energized, THEN ALIGN condensate pumps as follows: a. ENSURE **ONE** pump is running. b. ENSURE **ONE** pump is in "PULL TO LOCK." c. ENSURE **ONE** pump is in "AUTO."
Examiner Note: End of Attachment 4- A		

Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: **Diagnostic Flow Chart used in EOP 2541, Appendix 1, Diagnostic Flow Chart**		
Time	**Position**	**Applicant's Actions or Behavior**



Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6		
Event Description: **Diagnostic Flow Chart used in EOP 2541, Appendix 1, Diagnostic Flow Chart**		
Time	**Position**	**Applicant's Actions or Behavior**



Op-Test No.: ES18LI1 Scenario No.: 5 Event No.: 5 & 6 Event Description: **Diagnostic Flow Chart used in EOP 2541, Appendix 1, Diagnostic Flow Chart**		
Time	**Position**	**Applicant's Actions or Behavior**