JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Maximum Rate of Change of Power

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

Initiated:

John W. Riley – Signature on File	08/10/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	08/15/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	08/20/2018
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
8/9/18 jwr	Incorporated NRC comments from NRC prep week.	2/1

JPM WORKSHEET

Facility: MP2 Examinee: _____

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

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 : 2/1

Initial Conditions: The plant's operating history 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 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(s) 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: 2/1

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" Provide a calculator.			
	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: 2/1

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: 2/1

Task Title: Maximum Rate of Change of Power

S T E P # 4	Performance: 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.	Standard: Examinee calculates the minimum amount of time required to achieve 100% power: <u>64 – 90%</u> Target 4% per hour (no more than 13% in 3 hours) **6.0** to **6.5 hours** $90 - 64\% = 26\%$ $(26\% \div 4\frac{\%}{hr} = 6.5\ hrs)$ <u>90 – 100%</u> Target 3% every hour (no more than 10% in 3 hours) **3.0 to 3.5 hours** $100 - 90\% = 10\%$ $(10\% \div 3\frac{\%}{hr} = 3.3\ hrs)$ **Acceptance criteria 9.0 to 10 hours.** The examinee states that the amount of time per the target rate required to achieve 100% power is 9.0 to 10.0 hours.	Critical: Y ☒ N ☐	Grade: 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: 2/1

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: 2/1

Initial Conditions: The plant's operating history 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 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(s) required to achieve 100% power.

  _____

MILLSTONE POWER STATION

GENERAL OPERATING PROCEDURE

Load Changes

OP 2204

Rev. 040

Multiple Level of Use

Attachments 14, 15 and 16, in this procedure are *not* **R**eference Level of Use and may be used as **I**nformation Level of Use.

STOP THINK ACT REVIEW

Approval Date: 6/14/18

Effective Date: 6/15/18

Level of Use
Reference

4.1.4 IF *both* of the following conditions are *not* met, ENSURE an additional operator is assigned for feedwater control:

- Both SGFPs are in service
- Both Heater Drain Pumps are in service

4.1.5 ENSURE the following conditions exist:

- One Condensate Pump is operating
- One Condensate pump is in standby
- One SGFP is operating
- IF possible, Regulating Group 7 CEAs have been positioned above the LTSSIL of 135 steps, prior to exceeding 20% power (minimizes cumulative CEA insertion time)

4.1.6 Refer To OP 2208 (Att), "Precautions and Limitations on Reactivity Predictive Tools," for Reactivity Calculator Program, Reactivity Thumb Rules and Reactivity Plans as provided by Reactor Engineering Department.

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."

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:

a. DETERMINE fuel condition category.

b. ENSURE the applicable fuel condition category is selected on the PPC, "Maximum Rate of Change of Power" display.

c. MAINTAIN ramp rate within specified limits.

Attachment 7
Maximum Rate of Change of Power

(Sheet 1 of 1)

Fuel Condition Category	Category Definition	Applicable Range of Power Level	Maximum Rate of Power Change (*Note 1*)
Major Shutdown or Refueling	Reactor shutdown (zero power), greater than 45 days OR a shutdown which involves handling of fuel assemblies in reactor core	50 to 90% of RATED THERMAL POWER	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*)
		90 to 100% of RATED THERMAL POWER	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*)
Minor Shutdown	Reactor shutdown (zero power), less than or equal to 45 days	60 to 90% of RATED THERMAL POWER	15% every hour
		90 to 100% of RATED THERMAL POWER	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*)
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	80 to 100% of RATED THERMAL POWER	6% every hour
Extended Operation at Reduced Power	Power level less than 70% of RATED THERMAL POWER for more than 30 days of power operation	50 to 90% of RATED THERMAL POWER	Target 4% every hour, but less than 13% in 3 hours (*Note 3*) until 72 hours of operation at greater than 70% power has been attained (*Note 2*)
		90 to 100% of RATED THERMAL POWER	Target 3% every hour, but less than 10% in 3 hours (*Note 4*) until 72 hours of operation at greater than 70% power has been attained (*Note 2*)
Operation with Failed Fuel	Reactor Engineer has determined that there are failed fuel rods which require ramp rate restrictions	40 to 80% of RATED THERMAL POWER	4% every hour (*Note 2*)
		80 to 100% of RATED THERMAL POWER	3% every hour (*Note 2*)

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

Note 2: CEA withdrawal should be limited to 4 steps every hour for applicable power levels. There are *no* CEA restrictions below the applicable power levels specified. CEAs may be withdrawn as required for ASI control as specified in OP 2393, "Core Power Distribution Monitoring and Control."

Note 3: Maximum Rate of Power Increase in 5% per hour.

Note 4: Maximum Rate of Power Increase is 3% per hour.

JOB PERFORMANCE MEASURE APPROVAL SHEET

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

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

Initiated:

John W. Riley – Signature on File	8/10/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/2018
Technical Reviewer	Date

Approved:

Michael John Cote– Signature on File	8/20/2018
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
8/10/18 jwr	Incorporated minor NRC comments from NRC prep week.	2/1

JPM WORKSHEET

Facility: MP2 Examinee: _____

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

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 : 2/1

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. Show your 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: A1.2R Revision: 2/1

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: 2/1

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: 2/1

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: 2/1

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: 2/1

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

S T E P # 7	Performance: Instructions:	Standard:	Critical:	Grade:
	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).	Examinee reads the note and applies it to the determination of a SFP heatup rate.	Y ☐ N ☒	S ☐ U ☐
	3. Record SFP Heatup Rate from Table 1 based on SFP Offload Condition.	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.	Y ☒ N ☐	S ☐ U ☐
	Cue:			
	Comments:			
S T E P # 8	Performance: Instructions:	Standard:	Critical:	Grade:
	4. Calculate and record SFP Time to 150ºF. **Calculation:** $\text{SFP Time to 150°F} = \frac{150°F - \text{SFPTemperature}(°F)}{\text{SFPHeatupRate}(°F/\text{hour})}$	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.**	Y ☒ N ☐	S ☐ U ☐
	Cue:			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

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

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: 2/1

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. Show your work.

Calculation: **SFP Time to 150°F= {(150°F-SFP Temperature (°F)/ SFP Heatup Rate (°F/Hour)}**

Date/Time	Time From Shutdown (Days)	SFP Temperature (°F)	SFP Heatup Rate (°F/hour)	SFP Time to 150 °F	Performed by	Checked by
Today/now	12	93	17.7	~ 3.2	examinee	

JPM –A1.2R Answer Key

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Shift Staffing Based on Administrative Requirements

JPM Number: A1S Revision: 1/1

Initiated:

John W. Riley – Signature on File	8/10/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/2018
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
8/10/18 jwr	Incorporated NRC comments from NRC prep week.	1/1

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A1S Revision: 1/1

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 : 1/1

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 (provided the individual called in works the remaining hours of the shift and they work the schedule provided in this JPM)?
  - 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: 1/1

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 (if requested): • 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: 1/1

Task Title: Shift Staffing Based on Administrative Requirements

STEP # 2	Performance:	Standard:	Critical:	Grade:
	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	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.	Y ☒ N ☐	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: 1/1

Task Title: Shift Staffing Based on Administrative Requirements

<table>
<tr><td rowspan="3">S T E P
3</td><td>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</td><td>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)</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: A1S Revision: 1/1

Task Title: Shift Staffing Based on Administrative Requirements

S T E P # 4	Performance: **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.	Standard: 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)	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: A1S Revision: 1/1

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: 1/1

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 (provided the individual called in works the remaining hours of the shift and they work the schedule provided in this JPM)?
  - 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

3.3 Work Hours, Breaks, and Days Off

Cognizant Supervisor

3.3.1 **APPLY** the following limits to individuals regardless of unit status:

- No more than 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

3.3.2 **REFER** to Subsection 3.2, Calculating Work Hours, and **CALCULATE** weekly average work hours over averaging period (not to exceed six weeks) by dividing total hours worked by number of full weeks (Sunday through Saturday) in rolling averaging period.

NOTE: During first 60 days of unplanned security system outage or increased threat condition, security personnel need **NOT** meet minimum days off requirements specified in Table 2 or maximum average work hour requirements specified in Step 3.3.3.

NOTE: Non-outage maximum average work hour limit could allow individuals to work every day and remain less than limit. Responsibility is with Dominion to schedule hours consistent with objective of preventing impairment from fatigue consistent with requirements of 10 CFR 26.205(c) and Section 3.7 of this procedure.

3.3.3 **IF** during online operations and without issuance of a waiver, **THEN ENSURE** individual does **NOT** work more than weekly average of 54 hours, calculated using averaging period of up to six weeks, which advances by seven consecutive calendar days at finish of every averaging period.

3.3.4 **IF** during actual conduct of force-on-force exercises evaluated by NRC, **THEN EXCLUDE** hours worked over weekly 54-hour limit by Security personnel for purposes of compliance with maximum average work hours requirements.

Nuclear Fleet

Administrative Procedure

Title: Fatigue Management and Work Hour Limits for Covered Workers

Procedure Number	Revision Number	Effective Date and Approvals On File
LI-AA-700	13	

Revision Summary

- Made the following changes in accordance with CA3025107:
  - Added text 'a new schedule, or to work' to Step 3.7.5 and also in Note before Step 3.7.5.
  - Added new Step 3.7.7 and Step 3.7.8.
  - Added new Reference Step 5.4.6.
- Made the following changes in accordance with markup provided by Corporate Nuclear Operations Support group in response to CR1027430:
  - Added new Reference Step 5.4.7.
  - Revised Attachment 3.
  - Re-worded Step 3.11.2.a through 3.11.2.c to more clearly defined required portion of Attachment 3 to be completed for formal self-declaration.
  - Moved 'For a self-declaration' on Attachment 4 from below third block and up to first block on attachment.
- Deleted reference to 8 hour break throughout based on discussion with NRC.
- Made editorial and administrative changes as necessary to bring procedure up to current standards and Writers Guide requirements (no change bars used). Examples of editorial/administrative changes are:
  - Deleted unnecessary articles such as 'a', 'an', and 'the' from action steps.
  - Deleted pronouns such as 'it', 'they', 'you', and 'them' from action steps.
  - Separated steps with multiple actions/items into substeps or bulleted lists as necessary (for example, 2nd note following Step 2.5 and Step 3.2.2).
  - Deleted attachment titles in procedure body.
  - Reworded conditional steps using correct IF/THEN formatting (for example, Step 3.1.2).
  - Changed substeps into bullets where applicable (for example, responsibilities in Subsection 5.2 steps).
  - Re-worded 'conditional' steps using correct (e.g., IF/THEN and WHEN/THEN) terminology.

Functional Area Manager: Director Nuclear Station Safety and Licensing

INFORMATION USE

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1.0 PURPOSE

1.1 Implement requirements for managing fatigue and controlling work hours in accordance with 10 CFR 26, Subpart I, Managing Fatigue. Requirements are intended to provide reasonable assurance worker fatigue will be avoided and all individuals will be able to safely perform duties and maintain public health and safety.

1.2 To describe the following:

- Process for implementing controls required for individuals performing duties under this rule
- Process for conducting fatigue assessments
- Process to be followed by any individual covered by this rule who makes self-declaration he or she is not fit to safely and competently perform job duties for any part of a working shift as a result of fatigue
- Individual and Licensee rights and responsibilities related to self-declaration
- Requirements for establishing controls and conditions under which an individual may be permitted or required to perform work after individual declares he or she is not fit due to fatigue
- Process to be followed if individual disagrees with results of a fatigue assessment
- Disciplinary actions Licensee may impose on an individual following a fatigue assessment and conditions and considerations for taking those disciplinary actions

2.0 SCOPE

2.1 This procedure addresses fatigue management and work hour controls. Fatigue management applies to all individuals (Dominion and supplemental work force) granted unescorted access (UA) to protected areas and individuals required to physically report to Technical Support Center (TSC) or Emergency Operations Facility (EOF) in accordance with site Emergency Plan and procedures. Work hour controls apply only to individuals with UA who will perform or direct covered work. See Table 1 below:

Table 1: Applicability

Applicable Requirements		Individual Status (Includes Licensee employees, visiting Licensee personnel from other sites, contractors/vendors, other)		
Section Number in Rule	**Section Title (and Topics)**	**Maintains UA, No Covered Job Duties**	**Maintains UA, Performs Covered Job Duties**	**Escorted to PA, Performs Any Job Duties**
26.203	General (policy, procedures, including self-declarations, training	X	X	N/A
26.205	Work Hours (limits and rest breaks)	N/A	X	N/A
26.207	Waivers and Exceptions	N/A	X	N/A
26.209	Self-Declarations (specific process for covered workers)	N/A	X	N/A
26.211	Fatigue Assessment	X	X	N/A

2.2 This procedure addresses the following:

- Fatigue management and self-declarations
- Scoping of personnel and activities
- Calculation of work hours
- Reviews and reporting

2.3 In accordance with 10 CFR 26.205(d)(8) Dominion, through this procedure, complies with maximum average work hour requirements in § 26.205(d)(7).

2.4 In accordance with 10 CFR 26.205(d)(7)(iii), work hour counting system for Dominion will use work week starting 0000 Sunday and ending 2400 Saturday. When a shift starts on one calendar day and concludes during next calendar day, work date for all time will be assigned on day shift started.

2.5 Work hours for non-covered workers are controlled by LI-AA-7000, Work Hour Limits for Non-Covered Workers.

NOTE: Work hour calculations and limits imposed in this procedure apply only to workers performing covered duties.

NOTE: Attachment 11 contains examples of the following:

- Determining covered/non-covered work
- Directing work
- Work hour calculations

3.0 INSTRUCTIONS

3.1 Determining Covered Status

Cognizant Supervisor

3.1.1 **REFER** to Attachment 1 as necessary.

3.1.2 **IF** guidance is needed on systems, structures, and components (SSCs) is significant to public health and safety as shown through a risk informed evaluation process, **THEN PERFORM** the following (as necessary) to determine covered status:

a. **REFER** to Maintenance Rule Function tab in CRS or Maximo**.**

b. **CONTACT** Maintenance Rule Coordinator.

3.2 Calculating Work Hours

3.2.1 **WHEN** individuals who direct and perform covered work, **THEN APPLY** work hour limits and associated work hours calculation and tracking.

3.2.2 **INCLUDE** the following in work hour calculations:

- Covered work performed on-site
- On-site directing of covered work
- Break times and rest periods (e.g., lunch period, vacation, doctor appointment) occurring between work periods with no reasonable opportunity or accommodations for restorative sleep (i.e., 10-hour break)
- Incidental duties (unplanned) required by Licensee exceeding a nominal cumulative 30 minutes performed off-site in any single break period
- Time spent at lunch, regardless of productivity
- Shift holdovers to cover for late arrivals of incoming shift members
- Early individual arrivals Licensee required meetings, training, or pre-shift briefings for special evolutions (these activities are not considered shift turnover activities)
- Holdovers for interviews needed for event investigations
- Call-in work periods
- Turnovers between individuals within a shift period due to rotations or relief with a shift
- Call-in intervening (intervening time between call-in and normal work period must be included if break is less than 10 hours)
- Travel time outside normal commute when required by Dominion (see Attachment 10 for further guidance)

NOTE: Turnover may include time required for security personnel to arm and disarm.

NOTE: For purpose of calculating break times between shifts, only on-coming or off-going shift turnover may be excluded, not both.

3.2.3 **EXCLUDE** the following from work hour calculations:

- Primary and Secondary shift turnover (See Attachment 9 for further guidance)
- Incidental duties where cumulative duration is no more than a nominal 30 minutes in any single break period
- Hours worked above normal scheduled work hours for purpose of participating in actual conduct of unannounced emergency preparedness exercise or drill, as applicable (if individual is on day off, day is still considered a day off.)
- Paid hours during which individual is not expected to perform work (e.g., vacation time, sick days, personal leave)
- Changing to and from Daylight Savings Time (DST).
  - When working during change from standard time to DST, shift being worked during time change may be counted as a 7-hour, 9-hour, or 11-hour shift.
  - When working shift during change from DST to standard time, additional hour worked does not have to be included in work hour calculation.
- Common defense and security when informed in writing by NRC
- Declared plant emergencies as defined in Emergency Plan
- Hours worked offsite voluntarily (reading logs or other administrative duties referred to as professional time)
- Portion of a break or rest period during which there is a reasonable opportunity and accommodation for restorative sleep (e.g., nap of at least 30 minutes) in a designated area
- Partial weeks in calculation of weekly average work hours

3.3 Work Hours, Breaks, and Days Off

Cognizant Supervisor

3.3.1 **APPLY** the following limits to individuals regardless of unit status:

- No more than 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

3.3.2 **REFER** to Subsection 3.2, Calculating Work Hours, and **CALCULATE** weekly average work hours over averaging period (not to exceed six weeks) by dividing total hours worked by number of full weeks (Sunday through Saturday) in rolling averaging period.

NOTE: During first 60 days of unplanned security system outage or increased threat condition, security personnel need **NOT** meet minimum days off requirements specified in Table 2 or maximum average work hour requirements specified in Step 3.3.3.

NOTE: Non-outage maximum average work hour limit could allow individuals to work every day and remain less than limit. Responsibility is with Dominion to schedule hours consistent with objective of preventing impairment from fatigue consistent with requirements of 10 CFR 26.205(c) and Section 3.7 of this procedure.

3.3.3 **IF** during online operations and without issuance of a waiver, **THEN ENSURE** individual does **NOT** work more than weekly average of 54 hours, calculated using averaging period of up to six weeks, which advances by seven consecutive calendar days at finish of every averaging period.

3.3.4 **IF** during actual conduct of force-on-force exercises evaluated by NRC, **THEN EXCLUDE** hours worked over weekly 54-hour limit by Security personnel for purposes of compliance with maximum average work hours requirements.

NOTE: Departments may or may not choose to place all or some individuals on outage schedules during outage.

3.3.5 **IF** during outage, **THEN APPLY** outage schedules and work hours starting with first shift after reactor unit is disconnected from electrical grid and ending with first shift after reactor unit is connected to electrical grid.

NOTE: Table 2 applies to first 60 days of unit outage and planned security system outage (for Security personnel only). After 60-day period expires, normal online work hour limits apply.

NOTE: Step 5.3.1, 5.3.2, and 5.3.3 contain definition of 8-hour, 10-hour, and 12-hour shift.

3.3.6 **IF** during outage, **THEN** during first 60 days of outage without issuance of a waiver, **ENSURE** individual who performs outage activities adheres to requirements of Table 2 for minimum days off.

Table 2: Required Minimum Days Off (Outage)

Covered Individual	8-Hour Shift**	10-Hour Shift	12-Hour Shift
Maintenance	1 day/week*	1 day/week*	1 day/week*
Operations, RP, Chemistry, Fire Brigade	1 day/week*	3 days/each successive (i.e., non-rolling) 15-day period	3 days/each successive (i.e., non-rolling) 15-day period
Security	1 day/week*	4 days/each successive (i.e., non-rolling) 15-day period	4 days/each successive (i.e., non-rolling) 15-day period

* Weeks are defined as any 7-day period (rolling).

** Alternative exists to leave 8 hour shift workers on normal non-outage work hour restrictions during outage period.

3.3.7 **IF** individual works 48 hours or less in non-overlapping 7-day block **AND IF** desired, **THEN EXTEND** 60-day period 7 days.

3.3.8 **IF** during outage, **THEN PERFORM** the following:

NOTE: Unit outage is defined as duration during which reactor unit is disconnected from electrical grid (breaker open to breaker close). Security system outage is defined in Step 5.3.31.

a. **APPLY** outage minimum days off to individuals assigned outage activities, except those designated in Table 3.

NOTE: For purposes of Table 3, nuclear power unit is considered to be operating when connected to grid.

NOTE: Table 3 is to be used at multi-unit sites, with one unit in outage.

Table 3: Minimum Number of Individuals Per Shift Working Non-Outage Schedules for On-Site Staffing of Operating Nuclear Power Units During Outages

Number Operating Nuclear Power Units	Position	One Control Room	Two Control Rooms
One	Senior Operator	2	2
	Operator	2	2

Outage Operators

b. **RELIEVE** required operators working non-outage minimum days off on operating unit for short-term relief (less than 2 hours) as necessary.

Non-Outage Operators

c. **SUPPORT** outage activities as required.

Cognizant Supervisor

d. **ENSURE** workers meet the following criteria to be eligible to work outage hours:

- Covered workers at single sites working on outage activities
- Covered workers at multi-unit sites, with one unit in outage, working on outage activities
- Covered workers, due to on-site RP or Chemistry Emergency Response Organization, Fire Brigade Leader, or Security duties, at multi-unit sites with unit in outage
- Covered workers at multi-unit sites working on both outage activities and operating unit activities

NOTE: Step 3.3.9 does not apply to Operator assigned to outage unit being returned-to-service.

3.3.9 **IF** multi-unit site **AND** transitioning operators from outage activities to minimum required operators listed in Table 3, **THEN ENSURE** requirement of Step 3.5.5 is met **BEFORE** transitioning.

3.4 Accounting

NOTE: Work hour rule accounting practices may be different from record keeping for payroll purposes. Also, gate logs may not be appropriate measure of 10 CFR 26 compliance since these measures may not be representative of work activities.

NOTE: Vendors may use own version of EmpCenter to track hours of vendor workers following requirements of this procedure, however, vendors are required to supply record keeping required in Subsection 3.18 and records in Section 4.0.

NOTE: Time periods listed below are considered rolling time periods. Rolling means period is not re-zeroed or reset following day off or after obtaining authorization to exceed 10 CFR 26 overtime limits. Time periods listed below do not restart after day off; period continues to roll.

- 24 hours
- 48 hours
- 168 hours (7 days)
- 216 hours (9 days)

NOTE: Work hour counting system, which computes individual number of work hours associated with overnight shift which concludes the following day, will treat hours worked during shift as if hours were all worked on day the shift started.

Cognizant Supervisor/ Station Personnel

3.4.1 **ENSURE** work hour records in SAP and EmpCenter show number of hours scheduled to be worked each calendar day, including start and stop time.

3.4.2 **ENSURE** work hour records (SAP, CCS, EmpCenter, SETS) show number of hours worked each calendar day, including start and stop time for both covered and non-covered work.

3.4.3 **RECORD** and **DOCUMENT** work period start and stop time in consistent manner.

3.4.4 **IF** working from home by direction, **THEN REPORT** hours worked to cognizant supervisor upon returning on-site, **NOT** to exceed hours approved by cognizant supervisor.

Cognizant Supervisor

3.4.5 **ENSURE** any hours worked which are exceptions to schedule, including non-productive time, are included in SAP/CCS/SETS before end of shift.

3.4.6 **IF** any hours which are exceptions to schedule are worked, including non-productive time, **THEN ENSURE** those hours are included in SAP/CCS/ SETS before end of shift

3.4.7 **ENSURE** pre-approved exceptions to schedule are included in SAP when approved.

NOTE: When resources are shared between sites, coordination between supervisor and receiving supervisor of individual is important because travel time is included in work hour rule calculation when performed between two covered periods of work. Travel time, when performed on day off, will result in day worked and could result in personnel not meeting minimum break requirements or exceeding maximum work hours. OU-AA-2000, Shared Resources, should be referred too.

3.4.8 **IF** traveling between sites, **THEN ENSURE** travel time is included in work hours **BEFORE** starting work.

3.4.9 **IF** accounting for work hours during call-in, **THEN USE ONE** of the following methods depending on timing and circumstances of the call-in work period:

a. **CONSIDER** call-in hours a separate work period.

1. **COUNT** only hours worked for licensee.

NOTE: Call-ins between shifts can result in work hour violations.

2. **ENSURE** 10-hour break is provided before and after call-in period.

b. **CONSIDER** call-in hours an extension to preceding or succeeding work period. **COUNT** intervening hours of extended work period.

c. **IF** waiver for required 10-hour break between successive work periods is required, **THEN REFER** to Subsection 3.12 and **PROCESS** waiver.

3.4.10 **USE** one of the following methods to begin an on-line rolling averaging period (e.g., a covered worker who was performing covered work under outage MDO, an uncovered worker beginning covered work, a new individual to the site performing covered work):

NOTE: First week after initial averaging period is first rolling week in rolling averaging period.

- Preferred Method: **EVALUATE** initial averaging period as a fixed period which averages 54 hours or less.
- **DETERMINE** averaging period for worker and **CALCULATE** average work hours for past number of weeks and current week to establish history needed to begin rolling averaging period.

3.4.11 **IF** violations, potential deviations, or other exceptions are identified in EmpCenter **AND** dispositioned as **NOT** being violations or deviations **AND** remain recorded in EmpCenter, **THEN PERFORM** the following:

a. **INITIATE** Condition Report (CR) and **ATTACH** sufficient documentation and/or explanation to CR, including the following, to ensure auditable basis exists for issues and issues have been properly identified and reviewed:

   - Why violation/deviation/exception cannot be dispositioned
   - Why EmpCenter identified violation/deviation/exception is not non-compliance of 10 CFR 26, Subpart I

b. **REFERENCE** any of the above CRs generated during period in annual Department Review when completing Attachment 5.

3.5 Transitions

NOTE: Going from outage schedule to online schedule is not considered a transition unless change also involves going from non-covered to covered worker or to one of the required operators on online unit.

Cognizant Supervisor

3.5.1 **IF** transitioning between covered groups or into covered group, **THEN CALCULATE** individual work hours including hours worked performing duties **NOT** defined as covered work.

NOTE: Step 3.5.2 must performed to allow EmpCenter to correctly calculate covered worker compliance.

3.5.2 **IF** personnel are transitioning from non-covered worker to covered worker, **THEN ENSURE** personnel begin entering start and stop time on time sheet nine days before transitioning to covered worker.

3.5.3 **CONTROL** individual work hours, breaks, and minimum days off using EmpCenter and in accordance with the following requirements, except as permitted by waivers and exceptions:

- No more than 16 consecutive hours
- 16 work hours in any 24-hour period
- 26 work hours in any 48-hour period
- 72 work hours in any 168-hour (7-day) period
- 10-hour break between successive work periods
- 34-hour uninterrupted and continuous break in any 216-hour (9 day) period

NOTE: Day off is a calendar day where individual does not start a work shift.

- Minimum 1 day off in preceding 7-day period for individual working 8-hour shift schedule and transitioning from non-covered group into covered group
- Minimum 2 days off in preceding 7-day period for individual working 10-hour or 12-hour shift schedule and transitioning from non-covered group into covered group

3.5.4 **IF** worker fails minimum day off test (in either of the last two bullets in Step 3.5.3), **THEN PERFORM** the following:

a. Using methodology in Step 3.4.10.•, **CALCUATE** weekly average work hours.

b. **IF** weekly average work hours are less than 54 hour average weekly limit, **THEN TRANSITION** worker into covered work.

3.5.5 **IF** transitioning to non-outage unit as required operator working non-outage minimum days off (Table 3), **THEN ENSURE** operator working 10-hour or 12-hour shift has minimum 2 days off in preceding 7-day period, except as permitted by waivers and exceptions.

3.6 Reset from Deviations

NOTE: Unforeseeable events causing averaging period to be truncated prematurely and creating deviation of maximum average work hour limit may be overridden in EmpCenter and is not considered a deviation.

NOTE: Deviation cannot be caused by performing non-covered work, but all maximum work hour limits, minimum breaks, and minimum days off must be within 10 CFR 26, Subpart I, limits before recommencing covered work.

NOTE: This subsection applies when covered workers were excused from work hour limits and must return to covered work.

- Examples are waivers, hurricane exemptions, and plant emergencies.
- Hours worked during these instances may be excused from work hour calculations while events are ongoing, but are included in work hour calculation before resuming regular covered duties after event is over.

Cognizant Supervisor

3.6.1 **IF** individual requires reset from a deviation, whether or not under a waiver, **THEN PERFORM** the following:

a. **ENSURE** individual has less than minimum hour requirements of 16/24 **AND** 26/48 hours **AND** 72/168 hours before returning to work.

b. **ENSURE** 10-hour break since individual was last at work.

c. **BEFORE** returning to work, **ENSURE** individual:

- Has required minimum days off shown in Table 2 for current outage window

AND

- Meets maximum average of 54 hours per week for current averaging period

d. **DOCUMENT** corrective action program the deviation and actions taken.

3.7 Scheduling

NOTE: Attachment 6 contains further guidance on schedules.

Cognizant Supervisor

3.7.1 **SCHEDULE** work hours of individuals with objective of preventing impairment from fatigue due to duration, frequency, or sequencing of successive shifts.

3.7.2 **WHEN** establishing schedules, **THEN CONSIDER** the following factors:

- Work hour limits defined in Subsection 3.3
- Consistent start and stop times for work periods
- Impact of backward shift rotation
- Training requirements
- Vacation scheduling
- Rotating schedules providing suitable transitions between shifts
- Long-range predictability of schedules
- Circadian factors (e.g., fixed versus rotating shift, start times)
- Transitioning into or out of covered work or schedules

3.7.3 **WHEN** establishing schedules of shared resource personnel, **THEN REFER** to OU-AA-2000, Shared Resources, and **CONSIDER** the following factors:

- Personnel schedule at home station before reporting to receiving station. Personnel old schedule may not merge correctly with new schedule in meeting minimum break and maximum work hour limits.
- Personnel travel time before reporting to receiving station. When performing covered work, travel time is included in maximum work hour calculation and could affect minimum break requirements of 10 hours between shifts and 34-hour continuous uninterrupted 34-hour break in any 216-hour (9-day) period.
- Change in shift, if applicable, from nights to days could affect meeting work hour rule requirements.
- When returning to home station, home supervisor must also consider above items before allowing personnel to report back to work.

3.7.4 **IF** new schedule is needed, **THEN PERFORM** the following:

a. **OBTAIN** and **COMPLETE** Work Schedule Request form from HR or IT.

Cognizant Supervisor or Department SME

b. **REVIEW** and **SIGN** Work Schedule Request form to ensure schedule compliance to 10 CFR 26, Subpart I requirements for applicable work function.

c. **FORWARD** Work Schedule Request form to HR for review and approval.

Cognizant Supervisor

d. **WHEN** informed schedule is in SAP by HR, **THEN ASSIGN** personnel as appropriate and **ENSURE** correct schedule is assigned in EmpCenter.

NOTE: Performing test case before allowing individual to work a new schedule, or work in excess of scheduled hours is always done using EmpCenter. SAP should never be used to test work hour rule limits. (Ref. 5.4.6)

3.7.5 **IF** need arises for individual to work a new schedule or be called in to work in excess of scheduled hours, **THEN USE** the following guidelines to determine if any work hour limit will be exceeded: (Ref. 5.4.6)

a. **EVALUATE** hours worked to determine if any limit will be exceeded, based on work schedule, by performing backward look at number of hours which have or will have been worked based on time in future (i.e., if individual works at time T, how many hours will be worked in 24 hours/48 hours/168 hours preceding time T relative to 10 CFR 26 work hour limits, as well as online 54-hour average weekly limit, outage minimum days off, and between shift break requirements).

b. Using EmpCenter, **IDENTIFY** if work hour limit will be exceeded before hours are worked.

c. To determine if maximum weekly average requirement of 54 hours will be met before exceeding limits, **PERFORM** the following:

- **USE** EmpCenter.
- **CALCULATE** maximum work hours allowed in averaging period (54 hours multiplied by number of weeks in averaging period).
- **CALCULATE** total hours worked in preceding averaging period, minus one week, and add number of hours worked so far in current week.
- **SUBTRACT** total hours worked from maximum work hours allowed to determine how many hours remain to be worked in current week.

3.7.6 **REVIEW** overtime for covered workers with respect to expected average of 54 hours per week during periods when unit is not in outage.

3.7.7 **WHEN** schedule change occurs, **THEN RUN** 'Cognos Exception Report Details - Covered Workers' or 'EmpCenter' to ensure no 10 CFR 26 work hour violations are indicated. (Ref. 5.4.6)

3.7.8 **IF** 10 CFR 26 work hour violation has occurred, **THEN SUBMIT** Condition Report (CR) immediately. (Ref. 5.4.6)

3.8 Shared Resources

3.8.1 **WHEN** sharing resources between Dominion plants, whether during outages or online, **THEN REFER** to OU-AA-2000, Shared Resources, and **PERFORM** the following:

a. **COORDINATE** employee's schedule and work hours with receiving supervisor, with the following considerations:

- Travel time between home station and receiving station. Travel during scheduled day off is treated as work day before performing covered work at receiving station.
- Travel time could affect minimum day off requirements; 10-hour break before reporting for shift, 34-hour break in 216-hour (9-day) period, and maximum work hour requirements.
- New schedule at receiving station might not be compatible with home station schedule and may not allow for minimum day off requirements, maximum work hour, or minimum break requirements to be met when schedules are combined.
- Dominion employees working 'Nuclear-9' schedule need to be placed on 8-hour schedule well in advance of being placed on outage schedule so as not to interfere with pay, etc.
- Additional day off or late reporting time could be required to ensure employee meets requirements of this procedure.
- Moving from night shift schedule at home station to day shift schedule at receiving station could be problematic as transition could affect 34-hour required break.
- In all cases, test employee in EmpCenter using past work hours, travel time if applicable, and new schedule **BEFORE** allowing employee to perform covered work at receiving station.

3.9 Fatigue Management

Fatigue Assessor

3.9.1 **IF** needed in response to the following, **THEN CONDUCT** fatigue assessment per Subsection 3.10:

NOTE: Fatigue assessment shall be conducted when observed condition is believed to be due to impaired alertness with no other behaviors or physical conditions creating reasonable suspicion of possible substance abuse, for cause, self-declaration, or post-event.

NOTE: Individual who observed condition may not conduct for cause fatigue assessment.

- For Cause - Observed condition of impaired individual alertness creating reasonable suspicion individual is not fit to safely and competently perform assigned duties, except if condition is observed during break period
- Self-Declaration - Per Dominion policy following self-declaration, individual is required to take break of at least 10 hours before returning to duty. Therefore no fatigue assessment is required following self-declaration.
- Post-Events - Events requiring post-event drug and alcohol testing
- Follow-up - Following fatigue assessment conducted For Cause and following individual return to duty following break of less than 10 hours in duration, reassessment for fatigue as well as need to implement controls and conditions before permitting individual to resume performing any duties (If no break occurs, only one assessment is required.)
- Waiver (covered workers only)

3.9.2 **IF** conducting post-event fatigue assessment, **THEN CONDUCT** assessment as follows:

a. **DO NOT DELAY** medical treatment in order to conduct fatigue assessment or any post-event testing.

b. Before conducting fatigue assessment, **ENSURE** fatigue assessor did **NOT**:

- Perform or direct (on-site) work activities during which event occurred.
- Perform fatigue assessment within 24 hours before event for individuals performing or directing (on-site) work activities during which event occurred.
- Evaluate or approve waiver of limits for any individual performing or directing (on-site) work activities during which event occurred, if event occurred while such individuals were performing work under waiver.

3.9.3 **PERFORM** post-event follow-up fatigue assessment at earliest opportunity.

3.10 Conducting Fatigue Assessment

NOTE: Attachment 4 contains process for performing fatigue assessment.

NOTE: Fatigue assessments should not conclude individual is fit for duty solely based on either of the following:

- Individual work hours have not exceeded any work hour limits
- Individual has had minimum breaks or minimum days off, as applicable

Assessed Individual

3.10.1 **IF** self declaration of fatigue is required, **THEN REFER** to Subsection 3.11.

3.10.2 **PROVIDE** complete and accurate information that may be required to address required factors.

3.10.3 **ENSURE** fatigue assessments address the following at minimum:

- Acute and cumulative fatigue considering work history of individual for at least past 14 days
- Potential degradations in alertness and performance due to circadian variations (particularly with respect to time of day when assessing for a waiver)
- Potential degradations in alertness and performance to affect risk-significant functions
- Whether any controls and conditions must be established under which individual will be permitted to perform work

Fatigue Assessor

3.10.4 **LIMIT** inquiries of individual to information necessary to assess required factors and review individual performance, if applicable.

3.10.5 Following fatigue assessment, **DETERMINE** and **IMPLEMENT** necessary controls and conditions, if any, to permit individual to resume performance of assigned duties for licensee, including need for a break.

3.10.6 **IF** individual is to be sent home in lieu of, or as result of, fatigue assessment, **THEN ENCOURAGE** individual to accept transportation home.

3.10.7 **DOCUMENT** on Attachment 3, circumstances necessitating fatigue assessment and any controls and conditions implemented and **FORWARD** copy to site FFD Coordinator.

3.10.8 **ENSURE** fatigue assessments have initiating Condition Report (CR), using appropriate anonymity.

3.10.9 **TRANSMIT** fatigue assessment records to Site FFD Coordinator, including the following:

- Conditions under which each fatigue assessment was conducted (e.g., self-declaration, for cause, post-event, follow-up)
- Documentation of whether or not individual was working outage activities at time of self-declaration or condition resulting in fatigue assessment
- Category of duties the individual was performing
- Management actions, if any, resulting from each fatigue assessment

Access Services/FFD

3.10.10 **MAINTAIN** fatigue assessment records for at least three years or until completion of all related legal proceedings, whichever is later.

3.11 Self-Declaration of Fatigue

NOTE: Responsibility belongs to individual to make clear self-declaration of fatigue.

NOTE: Any individual covered by FFD program can self-declare fatigue.

Cognizant Supervisor

3.11.1 **ENCOURAGE** and **RESPECT** self-declarations of fatigue as all individuals have right to self-declare.

Station Personnel

3.11.2 **IF** unfit to safely and competently perform assigned duties because of fatigue, **THEN PERFORM** the following:

a. **INFORM** supervisor of self-declaration of fatigue in accordance with 10 CFR 26.211. (Ref. 5.4.7)

NOTE: If Self-Declaration section of Attachment 3 is completed, Section 1 and Section 2 completion is not required. (Ref. 5.4.7)

b. Complete **ONLY** the self-declaration section of Attachment 3. (Ref. 5.4.7)

c. **TRANSMIT** Attachment 3 to Site FFD Coordinator. (Ref. 5.4.7)

Cognizant Supervisor

3.11.3 Once informed of self-declaration of fatigue, **INSTRUCT** individual to take rest break of at least 10 hours before individual returns to duty.

3.11.4 **ENCOURAGE** transportation home for individual who self-declares fatigue.

3.11.5 **IF** individual refuses transportation, **THEN REFER** to SY-AA-FFD-101, Fitness For Duty Program, for follow-up action.

3.11.6 **IF** individual is required to continue performing duties under other requirements, **THEN PERFORM** immediate action to relieve individual.

3.12 Waivers

NOTE: For purpose of calculating maximum average work hours, averaging period may **NOT** exceed 6 weeks.

Cognizant Supervisor

3.12.1 **IF** condition adverse to safety or security has been identified, **THEN REQUEST** waivers before exceeding limits on individual basis and only to address circumstances which could **NOT** have been reasonably controlled and are adverse to safety or security.

3.12.2 **INITIATE** process of obtaining approval for 10 CFR 26 Limits Waiver (Attachment 2) and **DOCUMENT** the following:

- Circumstances necessitating waiver
- Statement of work scope
- Time period for which waiver is approved
- Bases for waiver approval

3.12.3 **CONDUCT** face-to-face fatigue assessment in accordance with Subsection 3.10 and Attachment 3 within 4 hours before individual begins each new work period under waiver.

3.12.4 **IF NO** supervisor qualified to direct work in on-site, **THEN REQUEST** fatigue assessment be performed by trained supervisor qualified to provide oversight of work to be performed by individual.

NOTE: Unless otherwise specified by Site Vice President, Site Senior-Level Manager with requisite signature authority is either of the following:

- Site Vice President
- Plant Manager
- Director Nuclear Station Safety and Licensing

Site Senior-Level Manager

3.12.5 **IF** both of the following requirements are met, **THEN APPROVE** waiver:

- Determination is made by either of the following waiver is necessary to mitigate or prevent a condition adverse to safety or security:
  - Operations Shift Manager
  - Security Shift Supervisor
  - Security Shift Operations Supervisor (Millstone)
- Result of face-to-face fatigue assessment conducted in Step 3.12.3 determined reasonable assurance individual will be able to safely and competently perform assigned duties under waiver.

Cognizant Supervisor

3.12.6 **TRACK** waivers by initiating Condition Report (CR) and **DOCUMENT** in narrative log.

NOTE: Attachment 2 shall not be attached in EmpCenter.

3.12.7 **OVERRIDE** violation(s) in EmpCenter ensuring CR Number, basis for waiver, and cognizant supervisor are detailed in comment section of override.

3.12.8 After waiver period, **COMPLETE** Attachment 2, Section 5.

3.12.9 **FORWARD** copy of completed Attachment 2 to station Records Management.

3.13 Conflict Resolution

Cognizant Supervisor

3.13.1 **IF** individual was determined to be fit for duty per fatigue assessment, **THEN PERFORM** the following:

a. **CONSIDER** options of individual, including any potential safety and company-related risks.

b. **DISCUSS** options and trending with management.

Assessed Individual

3.13.2 **IF NOT** in agreement with result of fatigue assessment, **THEN REQUEST** second assessment by another trained supervisor or FFD assessor **OR PURSUE** other management and oversight paths for resolution.

Cognizant Supervisor

3.13.3 **IF** medical evaluation is needed for employee self-declaration of fatigue, **THEN FOLLOW** company formal medical evaluation process, and **COMPLETE** management referral to Employee Assistance Program (EAP) concurrent with medical evaluation process.

3.14 Personnel Actions

Cognizant Supervisor

3.14.1 **IF** individual exhibits chronic self-declaration or positive fatigue assessment **AND** is considered **NOT** being fit for duty as result of fatigue, **THEN** P**ERFORM** the following:

- **CONTACT** local HR representative.
- **CONTACT** Site FFD Coordinator.
- **CONSIDER** referral to EAP and medical evaluation.
- **FOLLOW** site disciplinary policies as appropriate.

3.14.2 **IF** individual refuses fatigue assessment, **THEN REFER** individual to Site FFD Coordinator and **FOLLOW** FFD disciplinary procedures.

3.15 Reviews

NOTE: If any plant or security system outage or increased threat condition occurred since most recent review, evaluation of control of work hours during outages or increased threat conditions shall be included in subsequent review.

Department Manager

3.15.1 Once per calendar year, **REVIEW** the following and **COMPLETE** Attachment 5 within 30 days (i.e., not later than January 30):

a. Actual work hours and performance of covered individuals for consistency with work hours scheduling requirement objective of preventing impairment from fatigue due to duration, frequency, and sequencing of hours worked. Review shall encompass:

- Covered individuals whose actual hours worked during review period exceeded average of 54 hours per week in any averaging period up to 6 weeks, using same averaging period durations used to control individuals work hours.
- Covered individuals granted more than one waiver during review period.
- Covered and non-covered individuals assessed for fatigue during review period.

b. Individuals hours worked and waivers under which work was performed to evaluate staffing adequacy for all jobs subject to work hour controls.

c. Station performance in adhering to work schedules for covered work groups and evaluate whether or not schedule is effectively being implemented.

3.15.2 **DOCUMENT** methods used to conduct reviews and results of reviews.

3.15.3 **RECORD**, **TREND**, and **CORRECT**, under Corrective Action Program, any problems identified in maintaining control of work hours consistent with specific requirements and performance objectives of 10 CFR 26, Subpart I.

3.15.4 **OBTAIN** concurrence, by signature and date, from Director Nuclear Safety and Licensing.

3.15.5 **TRANSMIT** Attachment 5 to station Records Management.

3.16 Reporting

Director Nuclear Safety and Licensing

3.16.1 **INCLUDE** the following information in a standard format in annual FFD program performance report required by 26.717 before March 1 (Attachment 7).

a. **DOCUMENT** all instances during previous calendar year in which work hour controls were waived for covered individuals under which work was performed.

b. **IF** more than one work hour control was waived during any single extended work period, **THEN INCLUDE** each work hour control waived.

c. For each category of duties covered individuals are performing, **REPORT** the following:

- Number of instances in which each work hour control was waived for individuals working on non-outage activities
- Number of instances in which each work hour control was waived for individuals working on outage activities
- Summary showing distribution of waiver use among individuals within each category of individuals (e.g., table showing number of individuals receiving only one waiver during reporting period, number of individuals receiving total of two waivers during reporting period)
- Summary of corrective actions, if any, resulting from analyses of data, including fatigue assessments

3.16.2 **RETAIN** for three years all records of data, analyses, and corrective actions resulting from Annual Performance Data Report.

3.16.3 **REPORT** significant FFD policy violations and programmatic failures to NRC Operations Center by telephone within 24 hours after discovery of violation per 10 CFR 26.719.

3.17 Audits

Nuclear Oversight Department

3.17.1 **CONDUCT** audit nominally every 24 months of FFD Program with focus on effectiveness of FFD program element, Managing Fatigue, as required by 10 CFR 26.41.

3.17.2 **ENSURE** audits are conducted by individuals qualified in subject being audited.

3.17.3 **DOCUMENT** result of audits, along with any recommendations, and **IDENTIFY** the following:

- Conditions adverse to proper FFD program performance
- Cause of conditions and recommended corrective actions as appropriate

3.17.4 **REPORT** results of audit to senior corporate and site management.

3.17.5 **REVIEW** audit findings, including re-auditing of deficient areas where indicated.

3.18 Recordkeeping

Department Manager

3.18.1 **GENERATE** records required to be retained in accordance with 10 CFR 26.205(e) within 60 days of review period end.

3.18.2 **RETAIN** records for at least 3 years or until completion of all related legal proceedings, whichever is later, including the following:

- Records of work hours for individuals subject to work hour controls
- Records of shift schedules and records showing beginning and end time and dates of all averaging periods
- Documentation of waivers including bases for granting waivers
- Documentation of work hour reviews
- Documentation of fatigue assessments
- Documentation related to any department review (e.g., Attachment 5)
- Records of data, analyses, and corrective actions resulting from analyses of Annual Performance Data Report

4.0 RECORDS

4.1 The following record(s) completed as a result of this procedure are required to be transmitted to Nuclear Document Management (NDM). The records have been identified and retention requirements established for the Nuclear Records Retention Schedule (NRRS) per RM-AA-101, Record Creation, Transmittal, and Retrieval.

4.1.1 **Quality Assurance Records**

None

4.1.2 **Non-Quality Assurance Records**

- 10 CFR 26 Limits Waiver (Attachment 2)
- Department Review (Attachment 5)
- Annual FFD Program Performance Report (Attachment 7)

4.2 The following record(s) completed as a result of this procedure are **NOT** required to be transmitted to NDM, but are required to be retained as indicated below. NRRS has been updated and Alternate Storage approved per RM-AA-101 for Quality Assurance Records.

4.2.1 **Quality Assurance Records**

None

4.2.2 **Non-Quality Assurance Records**

- Fatigue Assessment (Attachment 3) - Maintained by Site FFD Coordinator
- Employee and Supplemental Employee time sheet records of individual work hours for those who are subject to work hour rules - Maintained by Responsible Department
- Employee and Supplemental Employee time sheet records of the shift schedules and shift cycles for those who are subject to work hour controls - Maintained by Responsible Department

4.3 The following item(s) completed as a result of this procedure are **NOT** records and are **NOT** required to be transmitted to NDM.

None

5.0 ADMINISTRATIVE INFORMATION

5.1 Commitments

None

5.2 Responsibilities

5.2.1 Site Vice-President

Site Vice-President is responsible for:

- Monitoring fatigue and work hour controls to ensure employees are fit for duty and not adversely affecting public health and safety.
- Approving 10 CFR 26 Limits Waiver to mitigate or prevent condition adverse to safety or security.
- Ensuring individual work hours are managed with objective of preventing impairment from fatigue due to duration, frequency, or sequencing of successive shifts.

5.2.2 Plant Manager

Plant Manager is responsible for:

- Monitoring fatigue and work hour controls to ensure employees are fit for duty and not adversely affecting public health and safety.
- Approving 10 CFR 26 Limits Waiver to mitigate or prevent condition adverse to safety or security.
- Ensuring individual work hours are managed with objective of preventing impairment from fatigue due to duration, frequency, or sequencing of successive shifts.

5.2.3 **Station Director Nuclear Safety and Licensing (or designated manager)**

Director Nuclear Safety and Licensing is responsible for:

- Ensuring review is performed at least once per year, such that entire year is reviewed, to evaluate effectiveness of control of work hours, to include:
  - Evaluating staffing levels to ensure individual work hours are managed with objective of preventing impairment from fatigue due to duration, frequency, or sequencing of successive shifts.
  - Evaluating performance of individuals to ensure individual work schedules prevent impairment from fatigue, including evaluating duration, frequency, and sequencing of hours worked by each individual relative to worker performance.
  - Reviewing station performance in adhering to work schedules for covered work groups: evaluate number of schedule changes and reasons for changes and assess whether or not schedule is effectively being implemented.
  - Ensuring issues identified in annual review are addressed in Corrective Action Program.
- Approving 10 CFR 26 Limits Waiver to mitigate or prevent condition adverse to safety or security.

5.2.4 **Department Manager**

Department Manager is responsible for:

- Providing guidelines for overtime selection process, including guidelines required by union contracts and FFD requirements outlined in this procedure as well as other procedures related to FFD.
- Communicating requirements of this procedure to appropriate personnel within department.
- Evaluating staffing levels and efficiency to ensure individual work hours are managed and impairment from fatigue is prevented due to duration, frequency, or sequencing of successive shifts.
- Ensuring production of a report in accordance with Subsection 3.15 and Subsection 3.16, documenting the department:
  - Adherence to rule
  - Rule violations
  - Waivers (non-outage/outage)
  - Exceptions
  - Fatigue assessments
- Ensuring individuals transitioning include all hours worked in work hour calculations.
- Ensuring overtime monitoring report in accordance with Subsection 3.15 and Subsection 3.16 is generated and contains sufficient information to assess whether excessive overtime is being worked and report is submitted to Director Nuclear Safety and Licensing for review.

5.2.5 **Operations Shift Manager**

Operations Shift Manager is responsible for:

- Determining if 10 CFR 26 Limits Waiver is necessary to mitigate or prevent condition adverse to safety.
- Ensuring individual work hours are managed with objective of preventing impairment from fatigue due to duration, frequency, or sequencing of successive shifts.

5.2.6 **Cognizant Supervisor**

Cognizant Supervisor is responsible for:

- Ensuring no personnel exceed 10 CFR 26 limits without appropriate prior authorization.
- Performing face-to-face assessment of each employee being supervised for fatigue and mental alertness before employee exceeds 10 CFR 26 limit and performs covered work.
- Assessing each employee being supervised to reconfirm mental alertness during course of overtime deviation period. Assessment is not documented.
- Initiating 10 CFR 26 Limits Waiver (Attachment 2) as appropriate.
- Monitoring personnel coming from Dominion work location to ensure 10 CFR 26 limits will not be exceeded without appropriate waiver.
- Monitoring and reporting concerns related to individual Fitness For Duty (FFD) based on impairment from fatigue (e.g., Behavior Observation Program).
- Submitting Condition Report for work hour rule deviations and required paperwork to records.
- Managing work hours to ensure limits specified in 10 CFR 26 are not exceeded.
- Ensuring work hours are correctly documented regardless of whether hours worked are paid.

5.2.7 **Security Shift Supervisor or Security Shift Operations Supervisor (Millstone)**

Security Shift Supervisor or Security Shift Operations Supervisor (Millstone) is responsible for:

- Determining if 10 CFR 26 Limits Waiver is necessary to mitigate or prevent condition adverse to security.
- Ensuring individual work hours are managed with objective of preventing impairment from fatigue due to duration, frequency, or sequencing of successive shifts.

5.2.8 **Each Individual**

Each Individual is responsible for:

- Evaluating own personal fitness-for-duty based on impairment from fatigue.
- Managing own work hours to ensure limits specified in 10 CFR 26 are not exceeded.
- Ensuring work hours are correctly documented regardless of whether hours worked are paid.
- Making self-declaration of fatigue and discussing concerns with supervision or management in cases when individual feels performance may be impaired.
- Maintaining awareness of total hours worked in previous 14 days and notifying management if work hour limits will be exceeded if asked to work additional hours.

5.2.9 **Outage and Planning Department**

Outage and Planning Department is responsible for ensuring site scope determination is in alignment with risk-significance of activities and SSCs and does not encourage assignment of excessive work hours.

5.2.10 **Records Management**

Records Management is responsible for maintaining records required by 10 CFR 26.205(e) for at least past three years for individuals who are subject to work hour controls. Records may be retained longer than three years if legal proceedings are ongoing.

5.2.11 **Nuclear Oversight Department (NOD)**

Nuclear Oversight Department is responsible for auditing management of worker fatigue as required by 10 CFR 26.41 in accordance with current NOD Internal Audit Program. It should be noted that an audit of gate times or payroll times may not be appropriate measure of 10 CFR 26 compliance since these measures may not be representative of risk-significant work activities.

5.2.12 **Nuclear Training Department**

Nuclear Training Department is responsible for ensuring training and examination requirements in 10 CFR 26.203(c) and 26.29 are satisfied.

5.3 Definitions

5.3.1 **8-Hour Shift Schedule**

Schedule averaging not more than 9 hours per workday over entire shift cycle.

5.3.2 **10-Hour Shift Schedule**

Schedule averaging more than 9 hours, but not more than 11 hours, per workday over entire shift cycle.

5.3.3 **12-Hour Shift Schedule**

Schedule averaging more than 11 hours, but not more than 13 hours, per workday including shift turnover over entire shift cycle.

5.3.4 **Acute Fatigue**

Fatigue from causes (e.g., restricted sleep, sustained wakefulness, task demands) occurring within past 24 hours.

5.3.5 **Averaging Periods**

Duration over which 54 hour average is calculated and may be consistent with standard shift schedules but may not be greater than six weeks.

5.3.6 **Break**

Interval of time falling between successive work periods, during which individual does not perform any duties for licensee other than one period of shift turnover at either beginning or end of shift, but not both.

5.3.7 **Call-in**

Returning on-site due to licensee request when not normally scheduled for work.

5.3.8 **Call-in Intervening Time**

Time between call-in and preceding or succeeding work period. If less than 10 hours, time could be counted as extension to work period.

5.3.9 **Circadian Variation in Alertness and Performance**

Increases and decreases in alertness and cognitive/motor functioning caused by human physiological processes (e.g., body temperature, release of hormones) varying on approximately 24-hour cycle.

5.3.10 **Condition Adverse to Safety or Security**

Unforeseen conditions which, in informed opinion of Operations Shift Manager or Security Shift Supervisor or Security Shift Operations Supervisor (Millstone), could jeopardize safety of public, station, personnel, or environment. Waivers are considered appropriate if required to mitigate conditions adverse to safety or security. If rule compliance would result in the following type conditions, using waiver process would be appropriate:

- Violate NRC requirements such as minimum on-site staffing
- Jeopardize industrial or radiological safety of public or plant personnel
- Delay recovery from challenge to a safety system function
- Delay in recovering from actual or potential loss of reactor core cooling capability during outages
- Cause unforeseen forced Reactor shutdown, power reduction, or similar action as a result of having entered into or exceeding a Technical Specification time limit
- Result in an increase in Core Damage Frequency of greater than 1.0E-6
- Cause or prevent mitigation of an environmental permit violation
- Compromise ability to maintain site secure from actions of malicious groups or persons
- Force undue risk to on-site or off-site station personnel as a consequence of an external event (e.g., security, fire, severe weather)
- Delay recovery from any situation pacing unit in orange or red risk classification
- Involves maintenance rule High Risk Significant Functions

5.3.11 **Covered Work**

- Operating or on-site directing operation of systems and components when risk-informed evaluation process has shown to be significant to public health and safety
- Performing maintenance or on-site directing of maintenance on structures, systems, and components (SSCs) when risk-informed evaluation process has shown to be significant to public health and safety
- Performing Radiation Protection or Chemistry duties required as a member of on-site emergency response organization minimum shift complement
- Performing duties of Fire Brigade member responsible for understanding effects of fire and fire suppressants on safe shutdown capability
- Performing security duties as either of the following herein after referred to as security personnel
  - Armed security force officer
  - Alarm station operator
  - Response team leader
  - Watchperson

5.3.12 **Covered Work Hours**

Amount of time individual performs duties for licensee, including all work hours except the following:

- Shift turnover time
- Unscheduled work hours for purpose of participating in unannounced emergency preparedness exercise and drill may be excluded. During declared emergencies as defined by site emergency plan, work hour limitations need not be met.
- Incidental duties, performed off-site provided total cumulative duration of work does not exceed nominal 30 minutes during any single break period, may be excluded
- For security personnel, during actual conduct of force-on-force tactical exercises evaluated by NRC, if security personnel work on day off, work day may be counted as day off in calculation of minimum days off.
- For security personnel, during periods defined in writing by NRC when security personnel are required to work to ensure common defense and security
- Personal time in which individual is on-site but off duty (i.e., before or after normally scheduled work period in which work activities are performed for licensee) may be excluded. During personal time, individual is not expected to be available to supervision and could be on-site and unavailable to supervision.

5.3.13 **Cumulative Fatigue**

Increase in fatigue over consecutive sleep-wake periods resulting from inadequate rest.

5.3.14 **Day Off**

Calendar day during when individual does not start a work shift.

5.3.15 **Deviation**

Departure from requirements included in 10 CFR Part 26 Subpart I.

5.3.16 **Directing**

Exercise of control over work activity by individual directly involved in execution of the work activity and makes technical decisions for activity without subsequent technical review or is ultimately responsible for correct performance of work activity. See Attachment 8 for examples of tasks generally considered **NOT** directing.

5.3.17 **EmpCenter**

Computer program used to monitor and track schedules and work hours against requirements of 10 CFR 26, Subpart I. EmpCenter also initiates and tracks waivers. If EmpCenter is unavailable, Business Continuity Plan available from IT shall be used.

5.3.18 **Fatigue**

Degradation in individual cognitive and motor functions as result of inadequate rest.

5.3.19 **Follow-up Fatigue Assessment**

Fatigue assessment conducted before permitting individual to resume performing any duties. Assessment is conducted after either of the following:

- For cause
- In response to self-declaration and individual returns to duty following break of less than 10 hours

5.3.20 **For Cause**

Observed condition of impaired individual alertness creating reasonable suspicion individual is not fit to safely and competently perform assigned duties, except if condition is observed during break period.

5.3.21 **Incidental Duties**

Unplanned work activities, required by licensee, performed off-site.

5.3.22 **Individual**

Any individual granted unescorted access to nuclear power plant protected areas and performs work.

5.3.23 **Maintenance**

Maintenance activities resulting in a change of condition or state of structure, system, or component (SSC).

5.3.24 **Nominal**

Limited flexibility permitted in meeting a scheduled due date for completing recurrent activity required under 10 CFR 26; at a nominal frequency means activity may be completed within period 25 percent longer or shorter than period required in 10 CFR 26. Next scheduled due date would be no later than current scheduled due date plus required frequency for completing activity.

5.3.25 **Off-site**

Any area not considered on-site.

5.3.26 **On-site**

Owner-Controlled Area and Protected Area.

5.3.27 **Post-Events**

Events requiring post-event drug and alcohol testing.

5.3.28 **Protected Area**

Area encompassed by physical barriers and access is controlled.

5.3.29 **Restorative Sleep or Nap**

Brief opportunity and accommodations for restorative, uninterrupted sleep of at least one half hour in designated area.

5.3.30 **Risk-Informed Evaluation Process**

Evaluation based on probabilistic risk analyses approach such as Maintenance Rule (10 CFR 50.65(a)(4)) or other similar process. List of risk significant components/systems can be found in Corrective Action Program or by contacting site MR Coordinator for guidance.

5.3.31 **Security System Outage**

Condition in which security system or structure (e.g., Security Computer System, Perimeter Intrusion Detection System) is degraded, resulting in impact on security resources to implement required compensatory measures to ensure compliance with physical security and safeguards contingency plans. These planned or unplanned outages could be result of the following:

- Equipment maintenance
- Degradation/failure
- Adverse weather
- Loss of power
- Structural damage to system or structure

5.3.32 **Self-Declaration**

Individual self-declaration of being unfit to safely and competently perform assigned duties for any part of work shift because of fatigue.

5.3.33 **Shift Cycle**

Series of consecutive work shifts and days off planned by licensee to repeat regularly, thereby constituting continuous shift schedule. Shift cycle cannot exceed 6 weeks for purposes of calculating days off.

5.3.34 **Shift Turnover**

Only those activities necessary to safely transfer information and responsibilities between two or more individuals between shifts. Shift turnover activities may include, but are not limited to, discussions of plant equipment status and status of ongoing activities, such as extended tests of safety systems and components. Turnover may also include time required for security personnel to arm and disarm.

- Primary Turnover - Initial or only period of shift turnover for work shift. Period of shift turnover is excluded from work hour calculations and calculation of break times.
- Secondary Turnover - Second period of shift turnover for work shift. Period of shift turnover is excluded from work hour calculations, but is included in calculation of break times.

5.3.35 **Supplemental Work Force**

Any company or any individual not employed by Dominion and providing work or services to Dominion either by contract, purchase order, oral agreement, or other arrangement.

5.3.36 **Unit Outage**

Duration during when reactor unit is disconnected from electrical grid.

5.4 References

5.4.1 10 CFR Part 26, Fitness for Duty Programs - Final Rule

5.4.2 NEI 06-11, Managing Personnel Fatigue at Power Reactor Sites

5.4.3 NRC Regulatory Guide 5.73, Fatigue Management for Nuclear Power Plant Personnel

5.4.4 SY-AA-FFD-101, Fitness For Duty Program

5.4.5 OU-AA-2000, Shared Resources

5.4.6 CA3025107, Revise guidance in LI-AA-700 for reviewing schedules for compliance with 10 CFR 26 work hour rules prior to start of a work schedule or overtime and clarify requirement for submitting Condition Report when a violation is indicated by EmpCenter.

5.4.7 CR1027430, Consider revising LI-AA-700 to include defining responsibilities and training/qualification requirements of Fatigue Assessor and revising Attachment 3 to include clearly defined instructions and terminology more readily understood

ATTACHMENT 1

(Page 1 of 2)

Examples of Covered and Non-Covered Work

Examples of Generally Covered Work

1. Maintenance or directly supervising maintenance of risk significant equipment in Owner Controlled Area
2. Preventive Maintenance activities resulting in change of condition or state of risk significant equipment
3. On-the-Job Training (OJT) where trainee is operating or maintaining risk significant equipment
4. Insulation activities inside containment
5. Applying paintings and coatings inside containment
6. Supervising any above activity (Item 1 through 5)
7. Operating or directly supervising operation of risk significant equipment
8. For RP and Chemistry only, on-site ERO minimum shift complement
9. Security personnel

ATTACHMENT 1

(Page 2 of 2)

Examples of Covered and Non-Covered Work

Examples of Generally Non-covered Work

1. Maintenance activities outside Owner Controlled Area
2. Training in classroom or off-site
3. Office activities
4. Scaffold activities
5. Housekeeping, cleaning, and decontamination
6. Radiological surveys, air sampling, and job coverage activities by Radiation Protection
7. Visitor escort
8. Fire Watch
9. FME Watch/Monitor
10. Chemistry sampling
11. QA and QC activities
12. Insulation activities outside containment
13. Painting outside containment
14. Shielding activities
15. Preventive Maintenance activities not resulting in change of state or condition of SSC (for example, NDE, vibration analysis, and data collection)
16. Tool crib activities
17. Shop support activities including use of hand and power tools
18. Material handling in shops and storage areas
19. Operation of trucks and forklifts
20. Confined Space Attendant
21. Aspects of tagging

ATTACHMENT 2

(Page 1 of 2)

10 CFR 26 Limits Waiver

10 CFR 26 Limits Waiver

Section 1 – Request **(To be completed by cognizant supervisor)**	
Cognizant Supervisor	Date/Time Waiver Initiated

1. Identify individual who will exceed 10 CFR 26 limit:
   Name: Site/Department:
   Date/Time Waiver to Start: / Date/Time Waiver to End: /
   Waiver Duration (hours beyond limits):

2. Identify limits to be exceeded (check all that apply)
   - ☐ > 16 work hours in any 24-hour period
   - ☐ > 26 work hours in any 48-hour period
   - ☐ > 72 work hours in any 168-hour (7-day) period
   - ☐ < 10-hour (consecutive) break between successive work periods
   - ☐ < 34-hour (consecutive) break in any 216-hour (9-day) period
   - ☐ Minimum Days Off (Outage):
   - ☐ Maximum average work hours > 54 per week

3. Identify work activity for which waiver will be issued:
   Description:

   Circumstances causing need for exceeding limits:

   Is waiver required to address conditions adverse to safety or security? ☐ Yes ☐ No

ATTACHMENT 2

(Page 2 of 2)

10 CFR 26 Limits Waiver

10 CFR 26 Limits Waiver

Section 2 – Supervisor Face-to-Face Fatigue Assessment
(To be completed no more than 4 hours before exceeding 10 CFR 26 limits by trained Cognizant Supervisor or designee qualified to oversee work or related work required to be performed)

1. Based on review of Section 1 and fatigue assessment of individual who will be exceeding 10 CFR 26 limits, should any controls or conditions be placed on individual being assessed?
   - ☐ No, individual may continue to work with no controls or conditions
   - ☐ Yes, describe work allowed, break given and/or oversight, if necessary:

2. Conclusion (Statement of how the following were considered – acute/cumulative fatigue, circadian factors, observation/statements of individuals, nature of work to be performed, and affect of fatigue on work quality):

   Is there reasonable assurance individual will be able to safely and competently perform duties during additional work period for which waiver is to be granted?
   ☐ Yes ☐ No (If no, waiver is not authorized)

Completed By (print name and sign)	Date	Time

Section 3 – Determination to Exceed 10 CFR 26 Limits
(To be completed by Operations Shift Manager or Security Shift Supervisor with requisite signature authority)

Basis for determination:

Completed By (print name and sign)	Date	Time

Document Condition Report and issuance of waiver in narrative log: _____ (initials)

Section 4 – Approval to Exceed 10 CFR 26 Limits
(To be completed by Site Vice President, Director Nuclear Safety and Licensing, Plant Manager or designee)

Authorized By (print name and sign)	Date	Time

Section 5 – Supervisor Closeout Review
(To be completed by cognizant supervisor after waiver period)

Time actually worked beyond limits under this waiver: to (time) on (time) (date)

Generate Condition Report (CR) and record CR Number:

Document waiver on Work Order: (if applicable) Waiver documented on Work Order ☐

Document waiver in EmpCenter Waiver documented in EmpCenter ☐

Did individual perform satisfactorily? ☐ Yes ☐ No (If no, initiate separate condition report)

Completed By (print name and sign)	Date

Form No. 730638(May 2016)

ATTACHMENT 3

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Fatigue Assessment

Fatigue Assessment

LI-AA-700 – Attachment 3 **Page 1 of 4**

Employee Name (Print)	Site/Department	Date	Time

Completed assessments shall be maintained as confidential.

Self-Declaration Section

☐ Individual check this box and sign below **IF** choosing formal self-declaration of fatigue. Otherwise, Section 1 and Section 2 shall be completed (Section 1 and Section 2 not required if this Self-Declaration Section is completed). (Ref. 5.4.7)

Signature:	Date	Time

Section 1 **Assessment of Fatigue and Work Hours** **To be completed by individual being assessed**

Section 1 and Section 2 is intended to determine if degradation in individual cognitive and motor functioning has occurred due to lack of rest, and where fatigue is identified, establish appropriate controls and conditions to ensure individual can safely and competently perform assigned duties. As requested, individual shall provide complete and accurate information necessary to address acute and cumulative fatigue and circadian variations in alertness and performance.

1. Work history of last 14 days to assess circadian variation in alertness and performance:

		Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Shift schedule	Record: D for days, N for nights (12 or 10-hour shifts), S for swings, M for midnights (8-hour shift)															
Hours worked	Do not include both shift turnover durations for one period, only one turnover.															
34-hour break	Check boxes for days with a break of at least 34 hours before shift	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

2. Have you had break of at least 10 hours between successive work periods in past 14 days? ☐ Yes ☐ No
3. Have all duties you performed off-site, if applicable, met definition of incidental (e.g., technical assistance provided by telephone from individual's home)? ☐ Yes ☐ No
4. How many hours of sleep have you had in last 24 hours?
5. How many hours have you been awake?
6. How many hours of sleep have you averaged each day in last 9 days?
7. Describe work activity you are performing:
8. Do you feel work activity can be performed without oversight (e.g., intermittent supervisor or independent reviews)? ☐ Yes ☐ No

   If No, describe oversight necessary:
9. Are you mentally alert? ☐ Yes ☐ No
10. Did factors outside work keep you from obtaining adequate and regular rest (e.g., illness, family/personal obligations)? ☐ Yes ☐ No

Completed by: (Individual print name and sign)	Date	Time

Form No. 730641(May 2016)

ATTACHMENT 3

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Fatigue Assessment

Fatigue Assessment

Section 2	**Supervisor Face-to-Face Fatigue Assessment**

1. Assessment Type (check one) (Ref. 5.4.7)

☐ For Cause	☐ Post-Event	☐ Follow-up	☐ Waiver
(Include description of observed behavior and name of individual who observed condition in comments.)	(Include description and Condition Report Number of event and individual's involvement in comments.)	(Required when assessment was conducted For Cause or for self-declaration upon return to work with break less than 10 hours; describe in comments.)	(Assessment cannot be conducted more than 4 hours before individual begins performing any work under waiver.)

2. Assessment Guidelines
   a. Only supervisor and FFD program personnel current on FFD/BOP and Nuclear Fatigue Management and Work Hours Training may conduct fatigue assessment.
   b. When fatigue assessment is conducted For Cause, individual who observed condition of impaired alertness may not conduct fatigue assessment (individual listed in Item 5 cannot be same as individual listed in Item 4).
   c. In case of post-event fatigue assessment, refer to Step 3.9.2.b of LI-AA-700 for limits on individual conducting fatigue assessment.
   d. For Item 6-13 below, as appropriate, interview/observe individual and review individual to determine whether controls and conditions are necessary to address fatigue.

3. Supervisor directing or overseeing assessed individual (print name):

4. As applicable, individual observing condition of impaired alertness (print name):

5. Supervisor/FFD Program Administrator performing fatigue assessment (print name):

6. **Fatigue Assessment Basis** (describe observed behavior and/or self-declared conditions leading to assessment, minimally state category of duties individual was performing and whether individual was performing outage activities):

7. **Acute Fatigue Indicators** (fatigue cause occurring within last 24 hours)

a. Was sleep restricted within last 24 hours?	☐ Yes	☐ No	b. Has individual been awake greater than 16 hours?	☐ Yes	☐ No
c. Did tasks at or away from work require physical exertion?	☐ Yes	☐ No	d. Does individual appear intoxicated?	☐ Yes	☐ No
e. Sleepiness-yawning, tired eyes, legs?	☐ Yes	☐ No	f. Rubs face with hands often?	☐ Yes	☐ No
g. Poor communication/decisions?	☐ Yes	☐ No	h. Bad mood, apathetic, fixated?	☐ Yes	☐ No

ATTACHMENT 3

(Page 3 of 4)

Fatigue Assessment

Fatigue Assessment

8. **Cumulative Fatigue Indicators** (increases in fatigue over consecutive sleep-wake periods resulting from inadequate rest)
   a. Was sleep restricted between any changes in shift schedules within last 14 days? ☐ Yes ☐ No
   b. Did individual experience sustained wakefulness within last 14 days (were length of individual sleep periods reduced as work week progressed)? ☐ Yes ☐ No
   c. If individual has sleep debt, was individual able to catch up on depleted sleep or bank additional hours between shifts or on off periods? ☐ Yes ☐ No
   d. Has individual, within last month, experienced any personal issues or other factors that may impact ability to obtain adequate sleep? If so, when? Describe impact. ☐ Yes ☐ No
   e. Has individual lacked initiative and/or creativity (going through motions like a zombie)? ☐ Yes ☐ No
   f. Has individual work schedule during past 14 days allowed adequate opportunity to obtain sufficient rest? ☐ Yes ☐ No

9. **Circadian Rhythm Considerations** (changes in alertness and cognitive/motor functioning related to approximate 24-hour cycle)
   a. Is individual experiencing or exhibiting fatigue symptoms during physiological alertness low points, 0100-0300 or 1330-1530? ☐ Yes ☐ No
   b. Is individual rest/sleep being interrupted by external time cues such as light and social activity? ☐ Yes ☐ No

NOTE: Completion of Item 10 is only required for a Waiver. (Ref. 5.4.7)

10. **Potential Effect of Fatigue on Work Quality** (what risk significant function could be impacted during activity (i.e., reactivity management, radiological release, pressure boundary, containment isolation/integrity, off-site power, core cooling, decay heat removal) - Consider quality barriers such as post-modification testing, independent verifications, hold points, and/or surveillance testing.) (Ref. 5.4.7)

NOTE: Completion of Item 11 is only required for a Waiver. (Ref. 5.4.7)

11. **As applicable, Nature of Work to be Performed** (what environmental conditions exist that could increase fatigue? Is task repetitive? Does task demand high mental focus of attention? Will there be social interaction?) (Ref. 5.4.7)

ATTACHMENT 3

(Page 4 of 4)

Fatigue Assessment

Fatigue Assessment

12. **Assessment Findings** (additional information on Yes responses and fatigue concerns requiring controls and conditions)
Ensure review of individual's work history as documented by station records as well as work history provided by assessment. (Review should include what individual has worked on, hours worked, and any performance issues identified in past 14 days).
Describe findings including observations of assessor and statements of assessed individual:

Check applicable assessment outcome:

- ☐ Individual does not exhibit impairment due to fatigue and may continue to work with no additional fatigue controls and conditions (individual cannot be returned to covered work if removed due to self-declaration of fatigue under waiver).
- ☐ Individual **is exhibiting impairment** and must be provided break of at least 10 hours and may be returned to work under controls and conditions identified in Item 13. For Cause Drug and Alcohol Testing must be considered in accordance with SY-AA-FFD-101, Fitness For Duty Program, unless determined observed behavior or physical condition is solely due to fatigue.
- ☐ Worker may continue working under controls and conditions identified in Item 13.

13. **Fatigue Controls and Conditions** (to address fatigue concerns identified in Item 7-12, as applicable)

a. Prior conditions and controls satisfied and no longer needed? ☐ N/A ☐ Yes ☐ No

b. If individual requested 10-hour break before performing covered duties under waiver, individual has completed requested break? ☐ N/A ☐ Yes ☐ No

c. Individual advised of one or more of the following strategies for obtaining adequate rest or countering fatigue (check if applicable and describe below) ☐ N/A ☐ Yes ☐ No

- ☐ Adequate sleep. Methods to minimize sleep loss through routine approach ensuring sufficient sleep in controlled environment.
- ☐ Use of compensatory and sleep banking for shift changes
- ☐ Use of caffeine (e.g., to increase alertness during circadian lows)
- ☐ Napping to address uncontrolled circumstances
- ☐ Work schedule/planning
- ☐ Sleep environment effects on restorative sleep

d. Describe specific controls and conditions addressing fatigue and any additional measures taken (e.g., medical assessment), as applicable:

14. Results of fatigue assessment have been provided to individual. ☐ Yes ☐ No

15. Initiate Condition Report (CR) and record CR Number: CR No.: _____

16. Individual performing fatigue assessment:

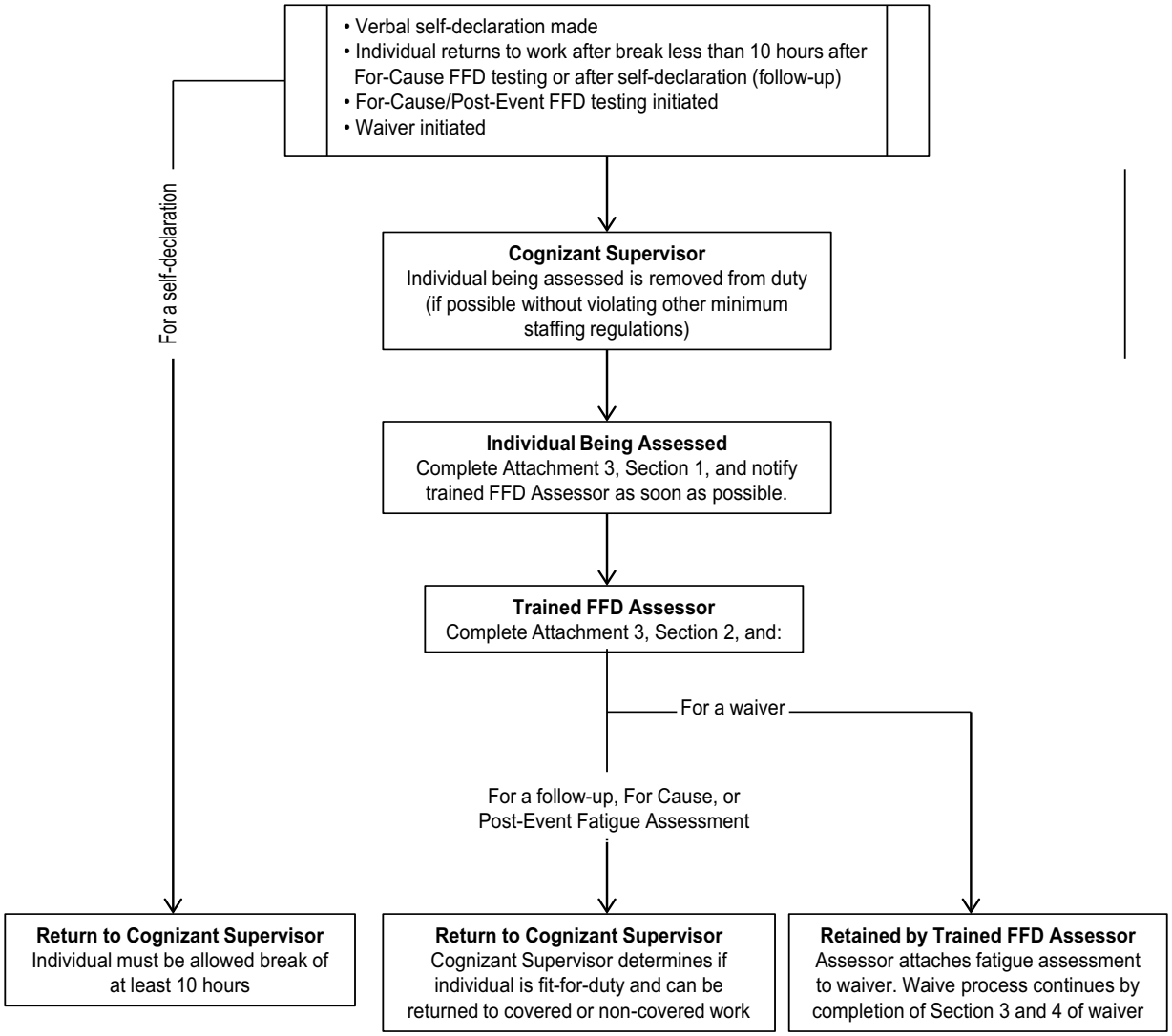
_____ Signature/Date: _____/_____

Transmit Fatigue Assessment, including all information in Step 3.10.9 of LI-AA-700, to Site FFD Coordinator. (Ref. 5.4.7)

ATTACHMENT 4

(Page 1 of 1)

Fatigue Assessment Process Map



ATTACHMENT 5

(Page 1 of 3)

Department Review

Department Review

LI-AA-700 – Attachment 5 **Page 1 of 3**

Site/Working Group Reviewed	Review Period to
Reviewer	

1. Review actual work hours and performance of covered workers with requirements of 10CFR26.205(c) Work Hours Scheduling. At a minimum:

   a. Review and document actual work hours and performance of covered workers whose work hours exceeded average of 54 hours per week in any averaging period of up to 6 weeks, using same averaging period durations used to control individuals work hours. Are there any common causes or declining trends for individuals exceeding 54 hours in any averaging period?

   b. Review and document individuals who were assessed for fatigue. Were there any fatigue-related incidents associated with fatigue assessments conducted? Based on fatigue assessments and any related fatigue-related incidents, attach list or discussion of any recommendations for staffing or scheduling.

   c. Review and document instances and causes of individuals who were granted one or more waivers. Based on number of and reasons for waivers issued in review period, attach list or discussion of any recommendations for staffing or scheduling. Are there any instances where overtime or waiver processes was not being effectively used or followed?

ATTACHMENT 5

(Page 2 of 3)

Department Review

Department Review

2. Review individuals hours worked and waivers under which work was performed to evaluate staffing adequacy for all jobs subject to work hour controls. Include:

   a. Review and document instances and causes of individuals exceeding 10CFR26 limits without appropriate prior authorization. Ensure Condition Report was submitted for each occurrence and corrective actions were adequate. This also applies to Condition Reports as referenced in Step 3.4.10 of LI-AA-700.

   b. Determine if increase in fatigue-related incidents or excessive work hours exist.

   c. Examine scheduling practices to determine efficiency and adherence to work scheduling.

   d. Review performance of individuals that worked under waiver (any errors, human performance issues, etc.).

ATTACHMENT 5

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Department Review

Department Review

3. Are there any Condition Reports indicating lack of understanding or training in fatigue management program or work hour limits?
4. Are there any Condition Reports indicating lack of supervisor engagement or focus on management? This could include frequent excessive work schedules, deficient fatigue assessments, or dismissal of declining trends.
5. Review key performance indicators, Condition Reports, and root causes for fatigue-related human performance issues. Exceptions during which work hours controls are not applicable, such as force-on-force drills and ERO drills, should also be reviewed.
6. Record, trend, and correct any problems identified in maintaining control of work hours consistent with specific requirements and performance objectives of 10CFR26, Subpart I.
7. Document methods used to conduct review and results of review.

Completed by: (Print name and sign)	Date
Department Manager: (Print name and sign)	Date
Director Nuclear Safety and Licensing: (Print name and sign)	Date

Attach any forms, Condition Reports, or recommendations generated to this form.

Form No. 729423(May 2016)

ATTACHMENT 6

(Page 1 of 3)

Shift Schedule Guidance

Schedules of employees and supplemental personnel are assigned through SAP. Schedule assignments are used to designate individual as being covered or not. All covered schedules have the following attributes:

1. Designated as covered.
2. Designated with the job function (not department): Maintenance, Operations, Radiation Protection, Chemistry, Fire Brigade, or Security.
3. Designated as online, unit planned outage, unit unplanned outage, security system planned outage, security system unplanned outage, plant emergency, or Defense and Security.
4. Designated as either having a rolling (on-line or outage) or fixed (outage only) evaluation type.
5. Designated with the shift cycle length. For outages, this is 7 days for Maintenance and 15 days for all others. For online periods, they cannot exceed 42 days (6 weeks).

Non-covered schedules have two attributes - non-covered and 'Other' for job function type.

For purposes of compliance with maximum work hour limits and required minimum breaks, type of covered schedule does not matter. Those ceiling and break limits apply at all times to covered employees, whether on an outage or online schedule or include periods encompassing both schedules.

Maximum Average Work Hours (Online)

Maximum average work hour limit is 54 hours per week regardless of job function. Work hours are calculated based on rolling averaging period of up to 6 weeks. Work hour limit of 54 hours per week averaged over rolling averaging period of 6 weeks results in maximum work hour limit of 324 hours over 6 week period. If worker is on 5 week rolling averaging period, maximum work hour limit is 270 hours over that 5 week period.

Averaging Period

Averaging period starts ‘rolling’ after work history for a worker has been established equal to the length of the averaging period. Averaging period rolls by one week at a time.

For example, an operator has a 6 week rolling averaging period. Their first rolling averaging period begins at 0000 on Sunday and encompasses weeks 1 through 6 and ends at 2400 Saturday. Their second averaging period starts as soon as they start week 7 (week 1 drops off) and encompasses weeks 2 through 7.

ATTACHMENT 6

(Page 2 of 3)

Shift Schedule Guidance

Partial Averaging Periods

Partial averaging periods occur when worker will not be working a full averaging period.

There are two cases of partial averaging periods. First is a partial week in which worker will not be working a full week (i.e., from 0000 Sunday to 2400 Saturday). Work hour limits that apply to a partial week are the maximum work hour and minimum break limits (16/24, 26/48, 72/168, 34/9, 10 hours). Because this is not a full work week, hours worked in this partial week are not included in calculation of maximum work hour average.

EXAMPLE: Outage ends on a Wednesday, therefore, first shift after breaker closes is Thursday (on-line schedule starts). Maximum work hour and minimum breaks limits apply. Hours worked on Thursday, Friday and Saturday do not apply to maximum average work hour limit of 54 hours per week. Hours starting at 0000 on Sunday begins maximum work hour calculation.

Second partial averaging case is a worker that will not work a full averaging period. In this case, they must meet 54 hour average over limited time on an online schedule.

EXAMPLE: Outage worker arrives on site and begins covered work 2 full weeks prior to outage. For those 2 full weeks, worker is limited to 54 hours per week or 108 total hours.

EXAMPLE: Beginning a Rolling Averaging Period

Operator just returned to online schedule from working unit outage. Schedule for initial averaging period of 6 weeks is evaluated as a fixed schedule for first 6 weeks after outage. Operator limit during this time is 324 hours (6 weeks x 54 hours/week). (See Step 3.4.9.a.)

Maintenance worker has been working uncovered schedule. On Sunday, worker is to begin covered work schedule. Worker meets transition rules of Subsection 3.5. Worker begins work on Sunday and is evaluated on a fixed schedule for first 6 weeks. Worker must average 54 hours per week. (See Step 3.4.9.a.)

Operator is returning to shift work after working as uncovered procedure writer for last year. New averaging period will be 6 weeks. Since hours in previous 5 weeks are known, Operator work history for last 5 weeks can be used to determine limit for maximum weekly average in current week. Operator is already being evaluated on a rolling schedule. (See Step 3.4.9.b.)

ATTACHMENT 6

(Page 3 of 3)

Shift Schedule Guidance

Truncated Periods

Truncated averaging periods due to unforeseen events will cause averaging period to end prematurely. If workers schedule for averaging period would have met maximum average work hour limit had it not been truncated, worker shall be considered in compliance and deviations in EmpCenter for this event can be overridden. Examples of events that could lead to unforeseeable truncation are:

Unexpected unit outage

Declared emergency

Job is terminated

For Security, an unplanned security system outage or increased threat condition

Minimum Days Off (MDO) (Outage)

MDO requirements are very dependent upon attributes of each schedule. Type of schedule assigned, along with actual and scheduled hours worked, is used by EmpCenter to determine which MDO requirements individual must comply with. Outage MDO requirements are only applicable when unit output breaker is open. Security personnel can also apply outage MDO requirements if definition of Security System Outage is met.

Generally, a rolling evaluation period for MDO evaluations takes into account current day and looks back at previous 6 days for Maintenance outage schedules. A fixed evaluation period is chosen for rest of outage schedules. For 15 day evaluation period, worker needs 3 days off. These 15 day periods start with day 1 of outage to day 15 and then day 16 to day 30, and so on.

For online or outage periods, actual time entry is made in SAP/CCS/SETS only. EmpCenter imports time from these three systems and does not export time to any system. Only test entries can be input directly into EmpCenter to determine if individual can work time outside their normal schedule. These test entries are not exported to any system. Once test determines someone can work outside their schedule, actual time entry must be entered into SAP/CCS/SETS.

Dominion

Annual FFD Program Performance Report

Station: ☐ Millstone ☐ North Anna ☐ Surry

Reporting Period (Year):

Was station in an outage for any part of reporting period? ☐ Yes ☐ No

Did any single outage last more than 60 days in total? ☐ Yes ☐ No

Did any of first 60 days of an outage occur during reporting period? ☐ Yes ☐ No ☐ NA

Did any outage days after day 60 occur during reporting period? ☐ Yes ☐ No ☐ NA

Summary of Waivers Issuance – 26.203(e)(1)(i-ii)

Work Hour Controls		Operating or On Site Directing Operations as Described in 26.4(a)(1)			Performing HP or Chemistry Duties as Described in 26.4(a)(2)			Performing Duties as a Fire Brigade Member as Described in 26.4(a)(3)		
		Online	Outage (Days 1-60)	Outage (Days >60)	Online	Outage (Days 1-60)	Outage (Days >60)	Online	Outage (Days 1-60)	Outage (Days >60)
Work Hours 26.205(d)(1)	>16 hrs/24 hrs									
	>26 hrs/48 hrs									
	>72 hrs/7 days									
Rest Breaks 26.205(d)(2)	<10 hr break									
	<34 hrs/9 days									
Online MDOs 26.205(d)(3) (Prior to 7/29/12)	Avg 1 day/wk 8-hour shift									
	Avg 2 days/wk 10-hour shift									
	Avg 2 days/wk 12-hour shift									
	Avg 2.5 days/wk 12-hour shift									
	Avg 3 days/wk 12-hour shift									
Outage MDOs (Days 1-60) 26.205(d)(4) and 26.205(d)(5)	3 days/15 days									
	1 day/7 days									
	4 days/15 days									
Maximum Average Work Hours 26.205(d)(7) (Effective 7/29/12)	> 54 hrs/week									
Total										

NOTE: For individuals performing fire brigade duties and other duties, count them only under fire brigade column. Do not double count.

ATTACHMENT 7
(Page 2 of 4)
Annual FFD Program Performance Report

Annual FFD Program Performance Report

Work Hour Controls		Maintenance or On Site Directing Maintenance as Described in 26.4(a)(4)			Performing Security Duties as Described in 26.4(a)(5)			Operating Total (All Work Groups)	Outage Total (Days 1-60) (All Work Groups)	Outage Total (>60 days) (All Work Groups)	Combined Total (All Work Groups)
		Online	Outage (Days 1-60)	Outage (Days >60)	Online	Outage (Days 1-60)	Outage (Days >60)				
Work Hours 26.205(d)(1)	>16 hrs/24 hrs										
	>26 hrs/48 hrs										
	>72 hrs/7 days										
Rest Breaks 26.205(d)(2)	<10 hr break										
	<34 hrs/9 days										
Online MDOs 26.205(d)(3) (Prior to 7/29/12)	Avg 1 day/wk 8-hour shift										
	Avg 2 days/wk 10-hour shift										
	Avg 2 days/wk 12-hour shift										
	Avg 2.5 days/wk 12-hour shift										
	Avg 3 days/wk 12-hour shift										
Outage MDOs (Days 1-60) 26.205(d)(4) and 26.205(d)(5)	3 days/15 days										
	1 day/7 days										
	4 days/15 days										
Maximum Average Work Hours 26.205(d)(7) (Effective 7/29/12)	> 54 hrs/week										
Total											

Form No. 730679(May 2016)

Distribution of Waivers for Individuals in Each Category – 26.203(e)(1)(iii)

Number of Individuals that Received 1, 2, 3, etc., Waivers Based on Number of Waivers Issued

Number of Waivers	Operating or On Site Directing Operations as Described in 26.4(a)(1)	Performing HP or Chemistry Duties as Described in 26.4(a)(2)	Performing Duties as Fire Brigade Member as Described in 26.4(a)(3)	Maintenance or On Site Directing Maintenance as Described in 26.4(a)(4)	Performing Security Duties as Described in 26.4(a)(5)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11-20					
>20					
Total employees issued waivers					
The most waivers provided to a single individual.					

NOTE: For individuals performing fire brigade duties and other duties, count them only under fire brigade column. Do not double count.

NOTE: Total number of waivers listed on previous table must equal sum of all waivers in this table. **For example:** There were 3 maintenance personnel that required waivers for > 16 hrs/24 hrs and > 26 hr s/48 hrs. Previous page lists total of 6 waivers. In above table, in fifth column, 3 is placed in row that list 2. Total in this table is 6 (2 waivers x 3 personnel).

Annual FFD Program Performance Report

Analysis of Waiver Assessment Data (Use separate sheet if necessary):
Analysis of Fatigue Assessment Data (Use separate sheet if necessary):
Conclusions (Use separate sheet if necessary):
Summary and Status of Corrective Actions (Use separate sheet if necessary):

Completed By (print name and sign)	Date

Form No. 730679(May 2016)

ATTACHMENT 8

(Page 1 of 1)

Examples of Task Generally Considered NOT Directing Covered Work

1. Engineering tasks
2. Directing maintenance on a non-covered (non-risk significant) SSC
3. Supervision of a supervisor directing a covered activity

> **NOTE:** Position alone should not be deciding factor for determining covered work. For example, Shift Manager is second level supervisor but, in practice and as defined in 10 CFR, Shift Manager has authority to direct covered activities. Careful analysis, evaluating all criteria, should occur before determining applicability or exclusion.

4. Writing work procedure
5. Preparing work or modification package
6. Review of work plans by senior management
7. Training personnel during which time trainee is not operating or performing maintenance activities
8. Providing recommendations from vendors and engineers on test performance, component and system operation, or other similar technical inputs
9. Review and approval of documents
10. Any work not maintaining or operating risk-significant SSCs
11. Technical Staff providing only recommendation to Control Room staff

ATTACHMENT 9

(Page 1 of 1)

Shift Turnover Guidance

1. Turnover is defined as only those activities necessary to safely transfer information and responsibilities between two or more individuals between shifts. Shift turnover activities may include, but are not limited to, discussions of plant equipment status, and status of ongoing activities.
2. Turnovers for supervisors may be more extensive than for workers due to job functions.
3. Turnover may also include time required for security personnel to arm and disarm.
4. The following types of turnovers cannot be excluded:
   - Within shift period due to rotations or relief during shift
   - Shift holdovers to cover late arrivals of incoming shift members
   - Early arrivals of individuals for meetings, training, or pre-shift briefings for special evolutions
   - Holdovers for interviews needed for event investigations
5. Two periods of shift turnover can be excluded from calculation of individual work hours.
6. Shift turnover is classified as either primary or secondary turnover:
   a. Primary Turnover - Initial or only period of shift turnover for work shift. Period of shift turnover is excluded from work hour calculations and calculation of break times.
   b. Secondary Turnover - Second period of shift turnover for work shift. This period of shift turnover is excluded from work hour calculations, but is included in calculation of break times.
7. Total time allowed to be considered as turnover (primary plus secondary) cannot exceed 60 minutes per shift and is applicable to Dominion and supplemental employees.

ATTACHMENT 10

(Page 1 of 1)

Travel Time Guidance

When required by Dominion, travel time outside normal commute is to be considered non-covered work per work hour rule.

1. Commute time between normal work location and place of residence will be excluded from work hour calculation.
2. Travel time required by Dominion, other than normal commute, is work performed for Dominion and included in work hour calculation as non-covered work.
3. Initial and final travel time to alternate work location is calculated subtracting normal commute time from actual travel time to new work location.
4. Interim travel time not required by Dominion, occurring between work and home, is excluded from work hour calculation.
5. All time spent on required travel, excluding normal commute time, should be captured in SAP with appropriate travel time code(s). This information will be tracked in EmpCenter.
    a. Travel time between work locations occurring during individuals scheduled shift is treated as work time performed during scheduled shift.
    b. Travel time starting during individuals scheduled shift and continues past normal end of scheduled shift is considered extension of work period during which travel was initiated. Before resuming covered work, individual is required to take 10-hour break at completion of travel time.
    c. Travel time starting before scheduled shift and continuing into normal start of scheduled shift is considered extension of work period.
6. Travel time occurring outside individuals scheduled shift may be considered separate work period or extension to preceding or succeeding work period, depending upon when travel occurs.
    a. Travel time can be considered separate work period. Under this method, only hours worked (or traveled minus normal commute) for licensee will be counted. This method requires 10-hour break after travel period.
    b. For required travel including voluntary stopovers or diversions (e.g., leisure travel), covered individual shall record in SAP, with appropriate travel time code(s), amount of time to travel from point of origin to destination as if there were no stopovers or diversions. This amount of time is what will be included in work hour calculation.

If travel time results in violation of any fatigue rule work hour controls, covered individual must meet transition requirements before resuming covered work.

ATTACHMENT 11

(Page 1 of 5)

Scope Determination and Work Hour Calculation Examples

SCOPE DETERMINATION EXAMPLES

1. If un-badged contractor is brought into plant to do emergent critical specialty work on risk-significant SSC, is contractor subject to work hour limitations?

   - No, personnel under escort are not subject to work hour limitations. Unless assigned escort is actually working on risk-significant SSCs with escorted un-badged individual, escort duties are not covered work under 10 CFR 26, Subpart I.

2. Risk-significant SSC is shipped off-site to be refurbished or repaired. Is work off-site on this component considered covered work?

   - No, once SSC is outside owner-controlled area, SSC not considered risk-significant. Work for removal, installation, and testing component is covered work.

3. Diesel Generator (DG) System Engineer is called to site to provide technical advice to supervisor responsible for work on a problem developed while running DG. Is System Engineer covered individual?

   - No, DG System Engineer is not directing or performing covered work. Engineer is advising and, therefore, not conducting covered work.

4. DG System Engineer is supporting DG system work window by providing technical decisions directly to workers acting on this input without subsequent review or challenge by job supervisor. Is DG System Engineer covered individual?

   - Yes, DG System Engineer is directing.

5. Reactor Engineer is present for fuel moves. Is Reactor Engineer covered individual?

   - Reactor Engineer is not directing; he/she is advising and, therefore, not conducting covered work.

6. During refueling outage, fuel is being moved and supervised by licensed SRO. Is SRO covered individual?

   - Licensed SRO would be directing. SRO is covered individual.

ATTACHMENT 11

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Scope Determination and Work Hour Calculation Examples

WORK HOUR CALCULATION EXAMPLES

7. John Doe normally works 12-hour shift schedule. He is requested to perform covered work on his day off from 0700 to 1900 on Friday. What needs to be considered prior to working additional hours?

   The following five items need to be considered:

   - Review all hours worked during 24-hour period before stop time Friday as reflected in request to work additional hours to ensure no more than 16 hours in any 24-hour period will be worked.
   - Review all hours worked during 48-hour period before stop time Friday as reflected in request to work additional hours to ensure no more than 26 hours in any 48-hour period will be worked.
   - Review all hours worked during 7-day period before stop time Friday (i.e., T-168 hours) as reflected in request to work additional hours to ensure no more than 72 hours in any 7-day period will be worked.
   - Review break period(s) between last day of work before Friday and 0700 on Friday to ensure 10-hour break has been taken.
   - Review break period(s) during last nine days before stop time Friday to ensure break of at least 34 consecutive hours has been taken.
   - Review MDOs, if in outage.
   - Review all hours worked in averaging period to ensure he remains less than maximum average work hour limit of 54 hours/week.

8. Jane Doe is a Staff Engineer in Operations Department and holds active license. Jane works nominal 8-hour day. Jane's normal work duties are not covered by work hour rule. Over last six (6) weeks, Jane has had weekends off except for sixth week; Jane came in on Saturday and Sunday during sixth week and worked four hours on each day. Jane resumed her normal duties on following Monday. On Tuesday, Jane is asked to stand SRO watch. Assuming she meets all watch-standing requirements, can she stand watch although Tuesday is ninth day in a row Jane will be working?

   - No, Jane has not had 34-hour break in last 9-calendar day period. If Jane had not worked one day in last seven days, she would be eligible to stand watch. She would have met 34-hour break in last nine days requirement and look back over last seven days would have shown she does meet minimum one-day off requirement.

9. John Doe's normal schedule is from 0700 to 1500 and he is called back to work at 1900 and works until 2100. Can he return to work and perform covered work next day for his normal work period?

   - Yes, John will have had 10-hour break since last break period because he left work at 2100. Total time is counted (including time off-site) as single work period (14 hours). Without approved waiver, John may not work more than hourly limitations, such as 26 hours in 48-hour period.

ATTACHMENT 11

(Page 3 of 5)

Scope Determination and Work Hour Calculation Examples

10. John Doe's normal schedule is from 0700 to 1500 and he is called back to work at 0200. Can he remain on-site and fulfill his normal work period?

    - Yes, John had break greater than 10 hours since leaving site at 1500. Because break was greater than 10 hours, time off-site is not counted. John may work from 0200 to 1500 (his call-in and normal shift). This amounts to 13 hours in 24-hour period. Without approved waiver, John may not work more than hourly limitations, such as 26 hours in 48-hour period.

11. If Crew A works from 0700 to 1900 on Friday and outage starts (unit is disconnected from electrical grid) at 1800 on Friday, Crew A is working non-outage day. Although performing duties to support commencing shutdown, Crew A is subject to normal operations work hour limits. When Crew B comes in at 1900 on Friday, Crew B is working outage day and may apply outage work hour limits.

12. Jane Doe performs covered work for 10 hours (0700 – 1700) and goes home. At 2200, she receives call from work and talks for 1 hour until 2300. Can she return to work at 0700 next day?

    - Jane did not have 10-hour break before receiving call. Hours from 1700 through 2200 do not count with respect to calculating hours worked. Jane worked total of 11 hours with work period ending at 2300. However, Jane cannot return to work at 0700 next day; she would not meet 10-hour break requirement. Jane could begin work at 0900 next day.

13. John Doe has day off and is required to talk with on-site personnel on three occasions. Each call lasts 20 minutes, therefore, he spends one hour on phone. Can day still be considered day off?

    - If on outage schedule, total time spent on phone must be counted since total time exceeds nominal 30 minutes during single break period; therefore, total time spent on phone must be documented as hour worked. Day is considered work day because it exceeds nominal 30 minutes and is now no longer considered incidental duties. If on online schedule, include hour in calculation of maximum average work hours.

14. What work-related activities may be done at home on day off without violating day off intent or being included in calculation of maximum average work hour?

    - Activities initiated by individual (not required by Dominion) may be performed at home on day off or after scheduled shift and not be considered work (e.g., studying, reading work-related material, reading e-mail). These activities would not be counted toward work hour total.

    - Work performed while working from home (i.e., work required by Dominion) does count towards work hour total. It is individual responsibility to communicate these work hours to supervisor.

ATTACHMENT 11

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Scope Determination and Work Hour Calculation Examples

15. Crew is on 8-hour, 40-hour workweek shift schedule. Crew is entering fifth week of 6-week averaging period. At end of 6-week period, unit will be entering outage. In preparation for outage, crew is working four hours overtime each workday for fifth and sixth week. Crew has met all required work hour requirements. Is crew meeting maximum average work hour limit of 54 hours or less per week in averaging period?

    - Yes, crew has met limit of 54 hours or less per week in averaging period. Frst four weeks, crew worked 40 (5x8s) hours each week and last two weeks 60 (5x8s plus five 4-hour periods of periodic overtime) hours per week. Average for 6-week averaging period was 47 hours per week. If crew average for 6-week period was over 54 hours, crew would have violated limit specified in 10 CFR 26.205(d)(7).

16. If during first 60 days of outage, covered worker gets 7-day block where he works not more than 48 hours, you can extend 60-day period by seven (7) days. If worker gets two 7-day blocks where he does not work more than 48-hours and two periods do not overlap, can 60-day period be extended by 14 days?

    - Yes, 60-day period can be extended by 14 days. This extension can be made anytime in outage period after 48-hour workweek.

17. John Doe has not worked on Dominion nuclear unit outage with work hour limitations for 14 days. John starts work Outage Day 15. Can he be placed under outage work hour limitations only for period of 45 days?

    - 60-day period is defined by start of outage. John can be placed under outage work hour controls only for period of 45 days. He may also be available for 14-day extension if he did not work more than 48 hours during each prior week. Dominion employee on vacation during 14-day period would be eligible for 14-day extension as they were employed by Dominion and worked less than 48 hours per week over two-week period.

18. Jane Doe is in General Employee Training (GET), which is eight (8) hours per day for three (3) days. She then starts performing covered work on unit in outage on fourth day (unit is disconnected from electrical grid before fourth day). Jane is now on 12-hour shift schedule. What is her minimum day off requirement?

    - Jane may work under outage work hour controls. Minimum day off requirement of normal schedule (12-hour shift schedule) applies.

ATTACHMENT 11

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Scope Determination and Work Hour Calculation Examples

19. John Doe works six (6) days per week, eight (8) hours per day. His manager approves his request to work from home on Friday so he can attend wedding. John is scheduled for 8-hour shift on Friday (0700 to 1500), but actually works 0700 to 1200 and 2100 to 2400 at home. Can he work on Saturday at 0700 with his normal crew?

    - No, he has not had 10-hour break since last work period.
    - Also, John has violated limitation of no more than 16 hours in 24-hour period. Break period from 1200 to 2100 was less than 10 hours and, therefore, counted in work period. He worked from 0700 to 2400 while working from home on Friday and cannot work on Saturday at 0700. John must report time to cognizant supervisor upon returning on-site and cognizant supervisor is responsible for initiating Condition Report for violation of 10 CFR 26, Subpart I.

20. Jane Doe works ten (10) hour shift from 0700 to 1700 directing covered work. Jane's supervisor (Dominion) requires her to take home and read package in preparation for meeting next day. She reads package from 1800 to 2000. Can she return to work at 0700 next day?

    - Yes, Jane will have had 10-hour break since completing her work required by Dominion and, including breaks of less than 10 hours, she worked from 0700 to 2000, which is less than 16 hours in 24-hour period. Jane must report her time to cognizant supervisor upon returning on-site.

21. John Doe performs covered work for 5 hours and then non-covered work for 8 hours. His supervisor would like him to direct covered work for next four hours. Can John do this?

    - No, both covered and non-covered work count towards fatigue. John has worked thirteen hours total and could support work for next 3 hours, but would exceed 16 hours in any 24-hour period limit with fourth hour. All of his time, covered and non-covered, also counts towards average work shift and total work hours per week.

22. Saturday morning and Jane Doe has worked 60 hours in past 6-day period (Sunday through Friday on 10-hour shifts). Today, she performs non-covered work for 4 hours and then covered work for 4 hours. Her supervisor would like her to perform non-covered work for next 5 hours. Can Jane do this?

    - Yes, work hour limitations only apply when performing covered work. She cannot return to covered work unless she is given 10-hour break and she has met all other work hour limitations

Nuclear Fleet

Administrative Procedure

Title: Fitness For Duty Program

Procedure Number	Revision Number	Effective Date and Approvals On File
SY-AA-FFD-101	10	

Revision Summary

- Functional Area Manager- changed title from “Manager Nuclear FFD & Access Programs” to “Manager Corporate Security- Safety & Health”
- 2.6, 3rd bullet- replaced “or” with “including”
- 3.1.2- added 2nd and 3rd NOTE prior to step
- 3.3.5(a)(2)- added “Nuclear In-Processing X-Press”
- 3.4.5- changed “CONSIDER” to “CONTACT” and added “the FFDA for possible testing at the Dominion facility. IF the FFDA is not available, THEN CONTACT Security who will contact the FFD Program Supervisor.”
- 3.5.3- added “Medical Review Officer”
- 3.8.1- added “Substance Abuse Expert”
- 3.8.5- added “methods” and removed “or oral fluid as needed”
- 3.10.3(a)- added NOTE prior to step and “FFD Program personnel and/or Reviewing Official”
- 3.10.3(b)- moved previous “b” to “c” and added new step
- 3.10.5- added “THEN PERFORM a Determination of Fitness in accordance with section 3.19.” and moved rest of wording in step to new step (3.10.6)
- 3.11.1- added NOTE prior to step
- 3.15.4- changed “Manager Nuclear FFD & Access Programs” to “Manager Corporate Security- Safety and Health”
- 3.15.5- changed Performer from “Manager Nuclear FFD & Access Programs” to “Manager Corporate Security- Safety and Health”
- 3.18.1- added to CAUTION prior to step- “on site or off site”
- 3.18.6- added “suspected substance use, or impairment from any cause”
- 3.19.1, 2nd NOTE preceding step- added 2nd sentence.
- 3.21.1(a)(1)- added “legal actions to Supervisor, who will”
- 3.23.1- added “assuming nuclear duties” at end of sentence and added 3rd NOTE prior to step
- 3.23.2(a)- added NOTE prior to step and “if the individual has expressed the desire to report directly to FFD program personnel.”
- 3.23.2(b)- changed “prescription chart” to “Drugs of Concern chart”
- 4.2.2- added “violations of the FFD program, Determination of Fitness”
- 5.2.3- changed “Manager Nuclear FFD & Access Programs” to “Manager Corporate Security- Safety and Health”
- 5.2.4- changed “Supervisor Fitness for Duty and Access Programs” to “Supervisor Security Services”
- 5.3.10- changed “Supervisor FFD and Access Programs” to “Supervisor Security Services”
- Attachments 2, 3, and 4- added to the bottom of the form “Form to be utilized only when Nuclear In-Processing X-Press (NIX) is inoperable.”

Functional Area Manager: Manager Corporate Security- Safety & Health

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1.0 PURPOSE

This procedure describes the requirements and standards for the establishment, implementation, and maintenance of Fitness For Duty (FFD) programs.

2.0 SCOPE

2.1 This procedure applies to Dominion employees and applicants who apply for access authorization, contractor/vendor (C/V) personnel, visiting licensee peers, and INPO granted unescorted access at Dominion's nuclear facilities or required to physically report to the Technical Support Center (TSC) or the Emergency Operations Facility (EOF) in accordance with emergency plans and procedures.

2.2 This procedure does **NOT** apply to Nuclear Regulatory Commission (NRC) employees, law enforcement, offsite emergency fire or medical, or state emergency services response personnel while responding on-site.

2.3 This procedure does **NOT** apply to individuals who are not granted UAA or do not have a continuing need to obtain and/or maintain UAA, except under conditions stated in Section 3.13, Management Actions and Sanctions - Owner Controlled Area Personnel.

2.4 Personnel who present as impaired from any cause while on company property for any work related reason are subject to For Cause and Post Event testing.

2.5 The following requirements are applicable in regards to fatigue management [10 CFR 26.205(d)(7)(iii) and (8)]:

- In accordance with 10 CFR 26.205 (d)(7)(iii) the work hour counting system for Dominion will utilize a work week that starts at 0000 on Sunday and ends at 2400 on Saturday. When a shift starts on one calendar day and concludes during the next calendar day, the work date for all that time will be assigned on the day the shift started.
- Maximum average work hours requirements in 26.205(d)(7)

2.6 The Employee Assistance Program (EAP) is included as a part of the FFD Program to assist personnel with the following:

- Assessment, short-term counseling, referral services, and treatment monitoring for employees with problems which could adversely affect the ability to perform assigned duties in a safe and competent manner.
- Personal referrals for early intervention and confidential assistance may not be disclosed to program personnel or management except under the provisions of 10 CFR 26.35 (2) (i,ii,iii).
- All personnel who are referred to EAP for mandated counseling/treatment must comply with all EAP mandates. Personnel who fail to comply with EAP mandates, including those who test positive during substance abuse monitoring while in treatment, will be subject to denial of unescorted access.

3.0 INSTRUCTIONS

3.1 Fitness For Duty Program Administration

Fitness For Duty Administrator (FFDA)

3.1.1 **DEVELOP** and **MAINTAIN** the FFD Program to achieve the following objectives:

- Provide reasonable assurance that individuals are trustworthy and reliable as demonstrated by avoiding substance abuse.
- Provide reasonable assurance that individuals are not under the influence of any substance, legal or illegal, or mentally or physically impaired from any cause, which in any way adversely affects the ability to safely and competently perform assigned duties.
- Provide reasonable measures for the early detection of persons who are not fit to perform assigned duties and prevent them from assuming and/or continuing in those duties.
- Provide reasonable assurance that the workplace is free of the presence of illegal drugs and alcohol and the effects of such substances that may impair performance, including prescription and/or over-the-counter drugs.
- Provide reasonable assurance that the effects of fatigue and degraded alertness on individuals' abilities to safely and competently perform assigned duties are managed commensurate with maintaining public health and safety.

NOTE: Quest Diagnostics may be contacted by Dominion FFD Program personnel to collect specimens at remote sites in rare instances when Dominion personnel cannot complete the collection. (Refer to 3.5.2(c) for additional contact information.)

NOTE: Donors that fail to follow collector instructions will be subject to review to determine intent to subvert. Personnel who are determined to have engaged in acts to purposely subvert a chemical test will be subject to denial of unescorted access authorization. Donor’s actions (including but not limited to flushing toilets, in conflict with collectors instructions) that after review, where intent cannot be established, may be subject to hydration and recollection.

NOTE: The collection process begins when the donor arrives at the collection facility. A donor may NOT leave the collection area except under direct observation of the collector.

3.1.2 **CONDUCT** drug and alcohol tests under the following conditions:

- Pre-Access
- For Cause
- Post-Event
- Follow Up
- Random

3.2 Pre-Access Testing

FFDA

3.2.1 **IF** the following conditions exist, **THEN DESIGNATE** personnel for Pre-Access Testing:

- Individual has **NOT** held unescorted access within the past 30 days.
- Individual has **NOT** been tested within the last 30 days at a licensed utility or approved screening company.

3.2.2 **ENSURE** Pre-Access testing is conducted within 30 days prior to granting access.

CAUTION: A confirmed subversion attempt will result in permanent denial of unescorted access.

FFDA/ Supervision

3.2.3 **INVESTIGATE** personnel who do **NOT** report as directed for attempts to subvert.

NOTE: Events stemming from fatigue assessments where the cause for the observed behavior cannot be readily determined require further evaluation (e.g., FFD Testing, Determination of Fitness, EAP). LI-AA-700, Fatigue Management and Work Hour Limits for Covered Workers, or SY-KW-700, Fatigue Management and Work Hour Limits for Security Personnel, contains details.

3.3 For Cause Testing

Supervision

3.3.1 For observed behaviors, including a physical condition resulting in on-duty impairment, symptoms that may indicate possible substance abuse, or credible information received that an individual is abusing drugs or alcohol, **PERFORM** the following:

NOTE: FFD program personnel who observe and/or detect signs and/or symptoms of substance abuse are not required to confirm the observation with supervisor.

a. **IF** uncertain of the observed behavior, **THEN REQUEST** a second supervisor to observe the individual and confirm the observation.

b. **SUSPEND** the individual's work assignment.

c. **IF** during core working hours**, THEN CONTACT** the **FFDA** to initiate For Cause testing as soon as possible.

d. **IF** during back shift or weekend hours **OR** unable to contact FFDA, **THEN REQUEST** Security to contact a FFDA.

FFDA

3.3.2 **IF** a behavioral condition exists that reveals impairment from any cause, **THEN INITIATE** For Cause testing.

Supervision

3.3.3 **ENSURE** Fatigue Assessment requirements have been accomplished as outlined in LI-AA-700 or SY-KW-700.

CAUTION: A confirmed subversion attempt will result in permanent denial of unescorted access.

FFDA/ Supervision

3.3.4 **INVESTIGATE** personnel who do **NOT** report as directed for attempts to subvert.

Supervision

3.3.5 Upon completion of the fitness for duty specimen collection process and any assessment or evaluation, **PERFORM** the following:

a. **IF** the individual's unescorted access has been suspended, **THEN PERFORM** the following:

1. **ARRANGE** transportation to the individual's place of lodging.

2. **IF** the individual refuses transportation, **THEN DOCUMENT** actions on the Nuclear In-Processing X-Press (NIX) FFD Evaluation Form and **SUBMIT** to FFDA as soon as practical following the event.

FFDA

b. **FACILITATE** a Determination of Fitness as applicable.

Supervision

c. **IF** the individual's unescorted access has **NOT** been suspended **AND** there is **NO** valid reason to question the individual's fitness for duty status, **THEN DIRECT** the individual to return to work.

3.3.6 **DOCUMENT** the following information on the NIX FFD Evaluation Form and **SUBMIT** to station management and the FFDA as soon as practical following the event:

- An evaluation of the individual's behavior
- An assessment of the individual's fitness for duty
- A record of any safety related work performed by the individual that was unsupervised or directly involved the incident resulting in the for cause test, as determined by the supervisor or cognizant manager

FFDA/ Supervision

3.3.7 **IF** a Licensed Operator, Security Officer, or Fire Brigade member is involved in an alcohol or drug related issue through For Cause testing, **THEN NOTIFY** the Medical Department.

3.4 Post-Event Testing

NOTE: Medical treatment shall not be delayed in order to conduct a fatigue assessment or any Post-Event testing.

NOTE: Individuals who were affected by the event, but whose actions did not likely cause or contribute to the event, are not subject to testing.

NOTE: Fatigue assessments are required for all Post-Event testing. Completion of the NIX FFD Evaluation Form is required to document actions taken.

Supervision

3.4.1 **IF** an event occurs where human error may have caused or contributed to the event **AND** resulted in any of the following, **THEN CONTACT** FFDA to initiate Post-Event testing as soon as possible:

- Death
- Medical treatment beyond first aid, including loss of consciousness or significant injury or illness as diagnosed by a physician or other licensed health care provider
- A radiation exposure or release of radioactivity in excess of Dominion limits
- Actual or potential substantial degradation of the level of safety of the plant

NOTE: Minor insignificant vehicle or property damage, as determined by supervision, does not require Post-Event testing. A Fatigue Assessment is not required under these circumstances.

- Significant company property damage as determined by Dominion supervision
- Vehicle accidents involving company owned or leased vehicles operated on company time that result in significant damage to the vehicle and/or property

Affected Individual

3.4.2 **IF** involved in a vehicle accident away from assigned work station while on company time, **THEN PERFORM** the following:

a. **CONTACT** supervision as soon as possible following the accident.

Supervision

b. **DETERMINE** if testing is warranted based on an evaluation of failure in individual performance.

NOTE: Quest Diagnostics will give direction as to where the employee should report for testing or dispatch a mobile unit to the employee's location.

c. **IF** operating a company owned or leased vehicle after core business hours, **AND**, as a result of an accident, testing is deemed necessary, **THEN CONTACT** Quest Diagnostics at 866-731-5996 to report the incident and **IDENTIFY** the individual as a nuclear employee.

3.4.3 **IF** the event occurs during core business hours, **THEN CONTACT** the FFDA as soon as possible.

3.4.4 **IF** the event occurs during backshift or weekend hours **OR** unable to contact a FFDA, **THEN REQUEST** Security to contact a FFDA.

3.4.5 **IF** the event occurs during backshift or weekend hours near a Dominion nuclear facility, **THEN CONTACT** the FFDA for possible testing at the Dominion facility. **IF** the FFDA is not available, **THEN CONTACT** Security who will contact the FFD Program Supervisor.

3.4.6 **IF** event requires a Post-Event drug and alcohol test, **THEN ENTER** the following information on the NIX FFD Evaluation Form and **SUBMIT** to station management and FFDA as soon as practical following the event:

- An evaluation of the individual's behavior
- An assessment of the individual's fitness for duty
- A record of any safety related work performed by the individual that was unsupervised or directly involved the incident resulting in the post- event test, as determined by the supervisor or cognizant manager

CAUTION: A confirmed subversion attempt will result in permanent denial of unescorted access.

3.4.7 **INVESTIGATE** personnel who do **NOT** report as directed for attempts to subvert.

3.4.8 **IF** an individual’s access is suspended due to FFD issues as determined by the FFDA, **THEN NOTIFY** station management as soon as possible.

3.4.9 For individuals tested post-event under the FFD program whose fitness for duty is **NOT** otherwise questionable **AND** the employee has **NOT** shown any signs of apparent substance abuse, **THEN DIRECT** individual to return to work following completion of the collection process.

3.4.10 **ENSURE** fatigue assessment requirement has been accomplished as outlined in LI-AA-700 or SY-KW-700 and **SUBMIT** to FFDA as soon as practical following the event.

FFD/ Supervision

3.4.11 **IF** a Licensed Operator, Security Officer, or Fire Brigade member is involved in an alcohol or drug related issue through Post-Event testing, **THEN NOTIFY** the Medical Department.

3.5 Follow Up Testing

CAUTION: Follow Up testing is established to verify an individual's abstinence from substance abuse following an FFD-related event, including self-reported legal actions. Personnel who violate the terms of the follow up agreement will be subject to management actions and sanctions up to and including denial of UAA and termination.

Medical Review Officer (MRO)

3.5.1 **ASSIGN** personnel to the Follow Up testing program.

3.5.2 **DETERMINE** duration of time to be assigned and **NOTIFY** FFDA.

FFDA

3.5.3 **GENERATE** Follow Up testing schedule and **CONDUCT** testing in accordance with Medical Review Officer (MRO) direction.

CAUTION: A confirmed subversion attempt will result in permanent denial of unescorted access.

FFDA/ Supervision

3.5.4 **INVESTIGATE** personnel who do **NOT** report as directed for attempts to subvert.

FFDA

3.5.5 **IF** a Dominion employee violates the terms of the Follow Up testing program **AND** the employee has been subject to EAP referral on two occasions, **THEN TERMINATE** access.

3.5.6 **IF** a Supplemental vendor violates the terms of the Follow Up testing program, **THEN TERMINATE** access.

MRO

3.5.7 **WHEN** personnel meet the mandated testing requirement, **THEN REMOVE** from the Follow Up testing program.

3.6 Random Testing

FFDA

3.6.1 **ADMINISTER** Random testing in a manner that provides reasonable assurance that individuals are unable to predict the time periods during which specimens will be collected.

FFDA/ Supervision

3.6.2 **ENSURE NO** more than a two hour notice is given to selected individuals when notified.

3.6.3 **ENSURE** individuals selected for Random testing report to the collection facility at the scheduled time after notification.

FFDA

3.6.4 **WHEN** necessary, **THEN FACILITATE** collections at an approved remote collection site.

3.6.5 **IF** a Licensed Operator, Security Officer, or Fire Brigade member is involved in an alcohol or drug related issue through random testing, **THEN NOTIFY** the Medical Department.

CAUTION: A confirmed subversion attempt will result in permanent denial of unescorted access.

FFDA/ Supervision

3.6.6 **IF** selected individuals fail to report for scheduled testing, **THEN EVALUATE** for failure to comply with testing procedure and possible subversion.

3.7 Department of Transportation (DOT) Random Testing

NOTE: DOT testing applies to all personnel who maintain a license to operate motor vehicles in compliance with 49 CFR 40. Site FFD personnel are not responsible for the daily management of the DOT program.

Supervision

3.7.1 **WHEN** notified by Corporate Safety, **THEN FACILITATE** scheduling of testing with Corporate Safety Coordinator.

3.7.2 **ENSURE** affected individual is notified of time and location of DOT test.

3.7.3 **IF** any problems are experienced when attempting to schedule the individual, **THEN NOTIFY** Corporate Safety Coordinator.

Affected Individual

3.7.4 **ARRIVE** and **COMPLY** with testing as directed by supervision.

Supervision

3.7.5 **IF** Individuals do **NOT** comply by **NOT** arriving for a scheduled test **OR** are non-cooperative with collection personnel, **THEN DISPOSITION** as a refusal to test and **NOTIFY** Designated Employee Representative.

Designated Employee Representative

3.7.6 **IF** notified of personnel who have **NOT** complied with DOT testing requirements, including a positive test, **THEN PERFORM** the following:

a. **NOTIFY** the FFDA.

FFDA

b. **TERMINATE** unescorted access.

NOTE: Personnel who are determined to violate DOT requirements will be referred to the Medical Review Officer/Substance Abuse Professional for a formal evaluation to determine access eligibility.

3.7.7 **NOTIFY** Corporate FFDA.

3.8 Drug Cut-off Limits

FFDA

3.8.1 **IF** it is determined through self disclosure, EAP reporting, or substance abuse evaluation that an individual has abused substances **NOT** listed in the standard panel for the purposes of Follow Up testing, **THEN OBTAIN** MRO/ Substance Abuse Expert (SAE**)** approval for expanded panel testing for specific panel associated with the identified drug of abuse. In all conditions of testing For Cause and Post Event, expand the testing panel to test for substances contained in Table 1.

Table-1: Cutoff Levels for Expanded Panel

Drug Class	Initial Test Level	Confirmatory Test Level
Benzodiazepines	**100 ng/mL**	**100 ng/mL**
- Alprazolam Metabolite	100 ng/mL	100 ng/mL
- Clonazepam Metabolite	100 ng/mL	100 ng/mL
- Flurazepam Metabolite	100 ng/mL	100 ng/mL
- Flunitrazepam Metabolite	100 ng/mL	100 ng/mL
- Lorazepam	100 ng/mL	100 ng/mL
- Midazolam Metabolite	100 ng/mL	100 ng/mL
- Nordiazepam	100 ng/mL	100 ng/mL
- Oxazepam	100 ng/mL	100 ng/mL
- Temazepam	100 ng/mL	100 ng/mL
- Triazolam Metabolite	100 ng/mL	100 ng/mL
Opiates	**300 ng/mL**	**300 ng/mL**
- Morphine	300 ng/mL	300 ng/mL
- Codeine	300 ng/mL	300 ng/mL
- Hydromorphone	300 ng/mL	300 ng/mL
- Hydrocodone	300 ng/mL	300 ng/mL
Oxycodones	**100 ng/mL**	**100 ng/mL**
- Oxymorphone	100 ng/mL	100 ng/mL
- Oxycodone	100 ng/mL	100 ng/mL

MRO

3.8.2 **IF** the HHS lab report indicates the presence of a drug metabolite, **THEN PERFORM** the following:

a. **CONSULT** with the donor.

NOTE: In accordance with 10 CFR 26, the MRO may not consider the use of any drug contained in Schedule 1 of section 202 of the Controlled Substances Act as a legitimate medical explanation for a positive confirmatory drug test result, even if the drug may be legally prescribed and used under State Law.

b. **CONSIDER** the following based on results reported by the HHS lab:

- There is legitimate medical explanation for the presence of the drug(s) or drug metabolite(s) in the specimen.
- Whether the individual possesses a valid prescription for substance tested.

c. **IF** there is **NO** valid prescription or medical explanation for the presence of the drug metabolite, **THEN DETERMINE** if the positive result constitutes substance abuse and whether the drug test results have violated the FFD policy.

d. **IF** there is a valid prescription for the tested drug metabolite, **THEN PERFORM** the following:

1. **DETERMINE** if the individual has violated the self-reporting requirement.
2. **EVALUATE** for referral to SAE for further evaluation.

FFDA

3.8.3 **PERFORM** tests for substances at the cut-off levels indicated in Table-2:

Table-2: Substances and Cut-off Levels

Substance	Initial Test	Confirmatory Test
Marijuana	50 ng/mL	15 ng/mL
Cocaine	300 ng/mL	150 ng/mL
Opiate	2000 ng/mL	2000 ng/mL
Phencyclidine	25 ng/mL	25 ng/mL
Amphetamines	1000 ng/mL	500 ng/mL

MRO

3.8.4 **EVALUATE** donor's inability to satisfy chemical testing requirements.

3.8.5 **IF** there is a medical determination that a donor is not capable of satisfying chemical testing requirements, **THEN CONSIDER** alternate testing methods such as blood.

3.8.6 **REVIEW** the results of alternate testing, as reported by the HHS lab, and report results to FFDA.

3.9 Special Analysis/Dilute Specimen Testing

NOTE: Dominion policy stipulates that specimens that are determined to be diluted shall be screened to the lowest limits of detection under the following conditions:

- If initial validity testing indicates that a specimen is dilute, the HHS-certified laboratory shall compare the responses of the dilute specimen to the cutoff calibrator in each of the drug classes;
- If any response is equal to or greater than 50 percent of the cutoff, the HHS-certified laboratory shall conduct confirmatory testing of the specimen down to the Limits of Detection (LOD) for those drugs and/ or drug metabolites; and
- The laboratory shall report the numerical values obtained from this special analysis to the MRO.

MRO

3.9.1 **CONSULT** with the donor regarding HHS lab report concerning the presence of a drug metabolite at LOD.

3.9.2 **CONSIDER** the following based on results of special analysis (LOD) reported by the HHS lab:

- There is legitimate medical explanation for the presence of the drug(s) or drug metabolite(s) in the specimen.
- Whether the positive and dilute specimen is a refusal to test.

3.9.3 **IF** there is **NO** sufficient reason to believe the positive and dilute specimen is a subversion attempt, **THEN DETERMINE** the drug test results as positive and the donor has violated the FFD policy.

3.10 Alcohol Cut Off Limits

FFDA

3.10.1 **IF** any of the conditions in Table-3 exist, **THEN DECLARE** confirmed positive test for alcohol:

Table-3: Alcohol Cut Off Limits

Initial Test	Confirmatory Test	Time at Work
0.02% or higher	0.04% or higher	N/A
0.02% or higher	0.03% or higher	At least 1 hour
0.02% or higher	0.02% or higher	At least 2 hours

3.10.2 **IF** the initial test result is between 0.01 percent and 0.019 percent BAC, **THEN PERFORM** the following:

a. **DECLARE** the test result as negative.

b. **REFER** individual to the MRO/Substance Abuse Expert (SAE) for evaluation and **INFORM** their supervisor.

c. **PROVIDE** information to the MRO for evaluation.

d. **SUSPEND** unescorted access until the MRO indicates the donor is fit to safely and competently perform assigned duties.

3.10.3 **IF** initial test result is less than 0.01, **THEN PERFORM** the following:

> **NOTE:** Dominion personnel are expected to report for nuclear duties with no detectable levels of alcohol. Any level of alcohol detected may result in an interview with FFD Program Personnel and/or Reviewing Official.

a. **DECLARE** the test result as negative. FFD Program Personnel and/ or Reviewing Official may review the access authorization file, interview management personnel, and gather information that may constitute potentially disqualifying information (PDI). Any PDI may be referred to the licensed professional for further assessment at the discretion of the Reviewing Official. (Refer to section 3.19, Determinations of Fitness.)

b. Personnel who are referred for further assessment/evaluation, treatment, and/or education by FFD Program Personnel, Reviewing Official, or MRO/ SAE, must **SIGN** an EAP letter (Refer to Attachment 4 of SY-AA-FFD-102) stipulating agreement to comply with EAP mandates. Failure to comply with EAP mandates (i.e., refusal to participate in counseling, uncooperative with licensed professional, test positive during treatment) will likely result in termination of access and possible termination of employment.

c. **IF** the test type is Follow Up, For Cause, or Post Event, **THEN CONTACT** management and **DETERMINE** further action as appropriate.

3.10.4 **IF** the initial test result is 0.02 percent BAC or higher, **THEN PERFORM** the following:

a. **ENSURE** the time at which the test was concluded (i.e., the time at which the test result was known) is recorded.

b. **NOTIFY** the donor that a confirmatory test for alcohol is required.

c. **IF** the results of the confirmatory test reveal alcohol readings that meet or exceed the concentrations contained in Table-3, **THEN DECLARE** a positive test.

3.10.5 **IF** initial test result is between 0.01 and 0.019 BAC **THEN PERFORM** a Determination of Fitness in accordance with section 3.19.

3.10.6 **IF** the individual is currently in the Follow Up testing program (Section 3.5), **THEN PERFORM** determination of fitness or appropriate actions as determined in Section 3.5. For Dominion employees who are referred to EAP and are not compliant with all EAP mandates (treatment, education, testing), **TERMINATE** access.

3.10.7 **IF** the result of the confirmatory test for alcohol is greater than or equal to 0.01 percent BAC but less than 0.02 percent BAC **AND** the donor has been in a work status for three or more hours at the time the initial test was concluded (including any breaks for rest, lunch, appointments, etc.), **THEN PERFORM** the following:

a. **DECLARE** the result as negative.

b. **SUSPEND** unescorted access.

c. **PROHIBIT** from performing any duties until a determination of fitness conducted by the Medical Review Officer (MRO) indicates that the donor is fit to safely and competently perform assigned duties.

3.11 Management Actions and Sanctions - Dominion Employees

NOTE: Personnel referred for FFD or medical evaluation must sign consents (refer to Attachment 5 or Attachment 6 of SY-AA-FFD-102), as appropriate. Failure to provide consent for FFD evaluation will result in termination and denial of unescorted access.

Dominion Management

3.11.1 **ENSURE** proper preventive actions, corrective actions, and sanctions are imposed to maintain the integrity of the Fitness For Duty Program.

3.11.2 **IF** a Dominion supervisor is determined to have a confirmed positive test for illegal drugs, **THEN TERMINATE** employment.

NOTE: An intern who violates the requirements of the FFD program must complete a drug/alcohol program that meets the requirements of 10 CFR 26. Interns may be considered for reinstatement after successful completion of the substance abuse program within the next calendar year following the event. Interns who violate the FFD program on a second occasion will be subject to permanent Dominion denial.

3.11.3 **IF** a Dominion intern is determined to have a confirmed positive test for alcohol or illegal drugs, **THEN** terminate assigned intern duties, if appropriate, **THEN** perform the following:

a. **DENY** access authorization and terminate unfavorably if the individual is maintaining unescorted access. **IF** the individual is not maintaining unescorted at the time of the positive test, **THEN** deny access authorization.

b. **CONTACT** HR and advise appropriate personnel of the event.

c. **REFER** the intern to appropriate counseling and/or drug/alcohol treatment at intern's expense.

d. **OBTAIN** a written determination from the MRO that the individual is fit to assume duties.

3.11.4 **IF** Dominion Security personnel are determined to have a confirmed positive test for illegal drugs or alcohol, **THEN TERMINATE** employment.

3.11.5 **IF** a Dominion employee, other than a supervisor or security personnel, is determined to have a confirmed positive test for illegal drugs, **THEN PERFORM** the following:

a. **PLACE** employee on 30-day disciplinary suspension.

b. **CONTACT** HR and **ENSURE** the disciplinary letter outlining sanctions is signed by the employee.

FFDA

c. **DENY** unescorted access unfavorably.

d. **CONTACT** Corporate Access Services.

> **NOTE:** Treatment duration may exceed mandatory suspension period.

e. **REFER** individual to EAP for assessment and counseling during the suspension period.

f. **IF** the individual fails to contact EAP within 48 hours **OR** fails to comply with EAP mandates, **THEN PERFORM** the following:

1. **REPORT** non-compliance to Dominion management.

Dominion Management

2. **TERMINATE** the individual's employment.

FFDA

g. **ENSURE** plans for treatment, Follow-up testing, and appropriate rehabilitation programs are initiated during the suspension period.

h. **ENSURE** an observed Pre-Access test is conducted within 10 business days prior to granting unescorted access.

i. **ENSURE** the individual participates in a Follow-up testing program for abstinence verification.

j. Prior to return to work following an FFD program violation, **PERFORM** the following:

1. **ENSURE** the elements of initial background screening and investigation are completed.

2. **OBTAIN** a written determination from the MRO that the individual is medically fit to perform duties safely and competently.

Dominion Management

3.11.6 **IF** a Dominion employee is determined to have a confirmed positive test for alcohol, **THEN PERFORM** the following:

a. **PLACE** employee on 14-day disciplinary suspension.

FFDA

b. **DENY** unescorted access unfavorably.

c. **CONTACT** Corporate Access Services.

> **NOTE:** Treatment duration may exceed mandatory suspension period.

d. **REFER** individual to EAP for assessment and counseling during the suspension period.

e. **IF** the individual fails to contact EAP within 48 hours, **THEN PERFORM** the following:

1. **REPORT** non-compliance to Dominion management.

Dominion Management

2. **TERMINATE** the individual's employment.

FFDA

f. **ENSURE** plans for treatment, Follow-up testing, and appropriate rehabilitation programs are initiated during the suspension period.

g. **IF** the individual fails to comply with EAP program mandates (treatment, education, testing), **THEN TERMINATE** access.

h. **ENSURE** an observed Pre-Access test is conducted within 10 days prior to granting unescorted access.

i. **ENSURE** the individual participates in a Follow-up testing program for abstinence verification.

j. **IF** the individual fails to comply with Follow Up program mandates, **THEN TERMINATE** access.

k. **IF** there is a second confirmed positive test for alcohol, illegal drugs, or abuse of legal drugs, **THEN PERFORM** the following:

1. Permanently **DENY** access.

Dominion Management

2. **TERMINATE** employment.

3.11.7 **IF** a Dominion employee contributes to a fatality **AND** is determined to have a confirmed positive test, **THEN TERMINATE** employment.

FFDA

3.11.8 **IF** a Dominion employee is determined to have been involved in any of the following, **THEN DETERMINE** if permanent denial is required:

- Use of illegal drugs on duty
- Intentional abuse of prescription drugs on duty
- Use of alcohol on duty
- Possession, distribution, manufacturing, or selling illegal drugs, on or off duty

3.11.9 **IF** a Dominion employee refuses to cooperate during the FFD testing process, **THEN TERMINATE** employment and **DETERMINE** if permanent denial is required.

3.12 Management Actions and Sanctions - Contractor/Vendor (C/V)

FFDA

3.12.1 **IF** a C/V is determined to have a confirmed positive test for illegal drugs, alcohol, or abuse of legal drugs, **THEN DENY** unescorted access.

3.12.2 **IF** a C/V refuses to cooperate during the FFD testing process or fails to comply with Follow Up testing, **THEN TERMINATE** access and **DETERMINE** if permanent denial is required.

NOTE: Responsibility for payment of rescreening samples is the sole responsibility of the individual. Upon receipt of payment, the MRO may order the rescreening of a sample.

Affected Individual

3.12.3 **WHEN** notified of a positive result, and, **IF** desired, **THEN SUBMIT** to the MRO a basis for the rescreening of the specimen.

3.13 Management Actions and Sanctions - Owner Controlled Area Personnel

NOTE: Owner Controlled Area (OCA) workers/visitors (i.e., a person working on site that is not granted unescorted access), except NRC personnel, are subject to FFD For Cause/ Post-Event testing and management sanctions while on Dominion property.

Dominion Management

3.13.1 **IF** an OCA worker is determined to be impaired for any cause **OR** fitness for duty is questionable, **THEN PERFORM** the following:

a. **NOTIFY** FFDA.

FFDA

b. **REMOVE** from duties and **SUSPEND** OCA site access.

c. **CONDUCT** For Cause testing. (A fatigue assessment is not required.)

Dominion Management

3.13.2 **IF** an event occurs involving OCA personnel where human error may have caused or contributed to the event **AND** resulted in any of the following, **THEN CONTACT** FFDA to initiate Post-Event testing as soon as possible:

- Death
- Medical treatment beyond first aid, including loss of consciousness or significant injury or illness diagnosed by a physician or licensed health care provider
- Radiation exposure or release of radioactivity in excess of Dominion limits
- Actual or potential substantial degradation of the level of safety of the plant
- Significant company property damage as determined by Dominion supervision
- Vehicle accidents involving company owned or leased vehicles or accidents involving vendor vehicles resulting in significant damage to Dominion property and/or vehicle.

3.13.3 **SUBMIT** NIX FFD Evaluation Form to the FFDA as soon as practical following the event.

FFDA

3.13.4 **IF** OCA personnel have tested positive for illegal drugs, alcohol, or are determined to have abused legal drugs, **THEN DENY** OCA access.

3.13.5 **IF** the OCA individual is found to be impaired, presents with aberrant behavior, or presents with presence of alcohol, but does not reach administrative limits for a positive test, **THEN REFER** individual to the MRO/SAE for an evaluation (substance abuse, medical, physical, psychological) as necessary to determine future site access eligibility.

3.14 NRC Personnel

NRC Personnel

3.14.1 **IF** there is a reasonable belief, based on observed behavior, that an NRC employee may be under the influence of any substance, or otherwise unfit for duty, **THEN PERFORM** the following:

a. Immediately **NOTIFY** the NRC Regional Administrator during normal working hours or NRC Operations Center during off hours by telephone.

b. **ENSURE** the individual is escorted until a determination is reached concerning continued access eligibility and/or fitness for duty.

3.15 Management Sanction Appeal

NOTE: All personnel have the right to appeal FFD sanctions and/or access denials.

FFDA

3.15.1 **REFER** to SY-AA-FFD-102 and **NOTIFY** the individual in writing of the denial and revocation of unescorted access and the right to appeal the denial or sanctions imposed using Notice of Appeal Rights form.

3.15.2 **INSTRUCT** individual to provide additional information for review.

3.15.3 **NOTIFY** the individual's employer of the denial or revocation.

Affected Individual

3.15.4 To initiate an appeal, **REFER** to SY-AA-FFD-102, Attachment 3, Determination of Fitness, and **SUBMIT** a Notice of Appeal Rights form in person upon notification of decision to deny access or through mail service to the Manager Corporate Security- Safety & Health for appeal and review within 10 business days of receipt of the denial or revocation notification.

Manager Corporate Security- Safety & Health

3.15.5 **WHEN** a request for appeal is received from an affected individual, **THEN CONVENE** a review panel by personnel that are equal to or greater than the position of the reviewing official making the original access decision.

3.15.6 **ENSURE** the individuals who conduct the review are **NOT** associated with the administration of the FFD program.

3.15.7 **NOTIFY** affected individual of appeal/grievance and final determination.

3.16 Protection of Information

NOTE: The requirements of this section do not authorize employees or C/V personnel to withhold evidence of criminal conduct from law enforcement officials.

NOTE: Only designated MRO staff members may view quantitative results.

NOTE: Specific detailed information that is obtained as a result of FFD determination of fitness, medical assessments, and return to duty evaluations shall not be released to any third party without the expressed written permission from the subject.

FFDA

3.16.1 **MAINTAIN** information collected during the administration of the Fitness For Duty Program in a system which protects the confidentiality of the information.

3.16.2 **ENSURE** personal information is disclosed only to the following individuals:

- The subject individual or representative, when the individual has designated the representative in writing for specified FFD matters
- Assigned MROs and MRO staff

- NRC representatives
- Appropriate law enforcement officials, under court order
- A licensee's or other entity's representatives who have a need to have access to the information to perform their assigned duties under the FFD program, including determinations of fitness, FFD program audits, or some human resources functions
- The presiding officer in a judicial or administrative proceeding that is initiated by the subject individual in writing to the FFDA
- Persons deciding matters under appeal
- Other persons, pursuant to court order

3.16.3 Upon presentation of a written request from the subject individual or representative, **RELEASE** specific information requested by the individual.

3.17 Nuclear FFD Program Training

NOTE: The Nuclear FFD training program includes training requirements for individuals who seek or hold unescorted access, or assignment as EOF/TSC emergency responder.

CAUTION: Individuals who fail to comply with FFD program mandates may be subject to training remediation and/or access authorization suspension.

Manager Nuclear Training

3.17.1 **ENSURE** individuals subject to FFD training have the following knowledge and abilities:

- Knowledge of the policy and procedures that apply to the individual, the methods that will be used to implement them, and the consequences of violating the policy and procedures
- Knowledge of the individual's role and responsibilities under the FFD program
- Knowledge of the roles and responsibilities of others, such as the MRO, human resources, FFD, and EAP staffs
- Knowledge of the EAP services available to the individual
- Knowledge of the personal and public health and safety hazards associated with abuse of illegal and legal drugs and alcohol

- Knowledge of the potential adverse effects on job performance of prescription and over-the-counter drugs, alcohol, dietary factors, illness, mental stress, and fatigue
- Knowledge of the prescription and over-the-counter drugs and dietary factors that have the potential to affect drug and alcohol test results
- Ability to recognize illegal drugs and indications of the illegal use, sale, or possession of drugs
- Ability to observe and detect performance degradation, indications of impairment, or behavioral changes
- Knowledge of the individual's responsibility to report an FFD concern and the ability to initiate appropriate actions, including referrals to the EAP and person(s) designated by the licensee or other entity to receive FFD concerns

NOTE: The minimum passing score required must be 80 percent. Remedial training and testing are required for individuals who fail to answer correctly at least 80 percent of the test questions.

3.17.2 **ENSURE** individuals subject to FFD training demonstrate the successful completion of training by passing a comprehensive examination.

3.17.3 **ENSURE** individuals complete refresher training on a nominal 12-month frequency or more frequently where the need is indicated.

3.17.4 **ACCEPT** training of individuals who have been subject to another training program that meets the requirements of this section and who have, within the past 12 months, either had initial or refresher training or have successfully passed a comprehensive examination.

3.17.5 **ENSURE** training is completed before the licensee or other entity grants initial authorization.

3.17.6 On an annual basis, **REVIEW** the FFD program information with the Corporate FFDA.

3.18 Behavioral Observation Program

CAUTION: Observed behavior, on site or off site, that raises a concern regarding the possible use, sale, or possession of illegal drugs, the possible possession or consumption of alcohol on site, or impairment from any cause which in any way could adversely affect the individual's ability to safely and competently perform his or her duties, must be immediately reported to FFD program personnel. Failure to report a known FFD concern may result in disciplinary action up to and including termination of unescorted access.

FFDA

3.18.1 **ENSURE** individuals subject to the FFD program are subject to behavioral observation performed by individuals trained to detect behaviors that may indicate the following:

- Possible use, sale, or possession of illegal drugs or abuse of prescription drugs
- Use or possession of alcohol on site or while on duty
- Impairment from fatigue or any cause that, if left unattended, may constitute a risk to public health and safety or the common defense and security
- Behavior that is observed as disruptive, distracting, or otherwise disturbs the performance of nuclear duties on a level that causes concern regarding safe orderly operation.

Supervision

3.18.2 **PERFORM** continued observation of assigned individuals.

3.18.3 **DOCUMENT** and **INITIATE** actions for degraded behavior that could affect the safety and reliability of the plant on the FFD evaluation form in the NIX database.

3.18.4 **SUBMIT** NIX FFD Evaluation Form to FFDA as soon as practical following the event.

NOTE: The intent of the workplace violence policy is to ensure a work environment free from threats, intimidation, and acts of violence. Workplace violence is defined by any verbal or physical conduct occurring in the workplace or affecting the workplace that causes personnel to reasonably fear for their personal safety or that of their family, friends, or property.

Nuclear Training Manager

3.18.5 **PROVIDE** training to personnel on behavioral detection techniques designed to detect symptoms of potential substance abuse, physical problems, psychological disorders such as Post Traumatic Stress Disorder (PTSD), or workplace violence caused by factors such as mental or emotional stress, anxiety, and fatigue, including the following:

- Job Performance
  - •• Change in individual's quality or quantity of work
  - •• Decrease in individual's decision making capability
  - •• Decrease in individual's efficiency
  - •• Decrease in individual's ability to concentrate, experiences flashbacks, relives traumatic events, speaks of bad dreams or frightening thoughts
  - •• Increase in individual's absenteeism
  - •• Increase in individual's lack of presence in work area for long, unexplained periods
  - •• Exhibits disregard for company policies and procedures
  - •• Exhibits overcautious behavior
  - •• Exhibits overzealous behavior
  - •• Decrease in individual's cooperation with fellow workers
  - •• Exhibits lack of respect for supervision or authority
- Social Relationships
  - •• Exhibits unsociable behavior
  - •• Exhibits harassing, bullying, or intimidating acts or statements in verbal, written, or electronic communication
  - •• Exhibits excessive socializing
  - •• Changes in individual's choice of friends
  - •• Changes in manner that fellow workers treat individual
  - •• Changes in individual's financial activities
  - •• Exhibits violent reactions toward others

- •• Exhibits attempts to manipulate others
- •• Holds grudges, has the inability to handle criticism, blames others, talks of retaliation, or constant expressions of perceived injustice
- •• Changes in speech patterns or content
- •• Increase in individual's complaints (temper tantrums, physical violence, emotional outbursts, mood swings)
- •• Direct conditional or implied threats of physical violence, such as stalking, including obsessive behaviors, and obsessive talk of inappropriate use of weapons

• Personal Health

- •• Exhibits signs of emotional or mental stress; feeling emotionally numb, strong guilt, depression, or worry
- •• Reports or shows signs of fatigue
- •• Change in individual's opinions on alcohol or drugs
- •• Increase in lingering or unusual illness
- •• Exhibits confusion frequently
- •• Changes in daily habits or routines
- •• Change in individual's energy level; losing interest in activities that were enjoyable in the past
- •• Change in individual's overall physical condition or appearance (shaky hands, twitching, nail biting, etc)
- •• Exhibits cardiovascular or pulmonary difficulties
- •• Avoiding places, events, objects that are reminders of traumatic experiences; having trouble remembering traumatic, dangerous events
- •• Being easily startled
- •• Feeling tense or on edge
- •• Having difficulty sleeping

Dominion Management/ Station Personnel

3.18.6 **IF** any individual’s behaviors are suspected to present an immediate threat to personnel safety and security, suspected substance use, or impairment from any cause, **THEN** immediately **CONTACT** FFDA and station Security.

Dominion Management

3.18.7 **DOCUMENT** all degraded behaviors on the NIX FFD Evaluation form and **SUBMIT** to the FFDA as soon as practical following the event.

NOTE: Reviews must be conducted by a supervisor who has completed the FFD/BOP training course. Include a description of any condition that may have resulted in the employee acting or behaving in an unconventional manner to include any circumstances which may indicate a need to refer the employee for additional medical or psychological review.

NOTE: Any information developed over the review period, regarding the behavioral characteristics of the employee supervised, either first hand or reported by others, must be included in this annual review, even if the event has been previously reported.

Supervision

3.18.8 On a nominal annual basis, **CONDUCT** a supervisory review for each individual with UAA/UA maintained for 365 consecutive days based on interactions with the individual over the review period and **INCLUDE** the following:

- Any behavior that would indicate that the individual cannot perform their duties in a safe, competent, and reliable manner.
- A description of any condition that may have resulted in the employee acting or behaving in an aberrant/unconventional manner, including discipline and actions taken.
- Any circumstances which may indicate a need to refer the employee for additional medical or psychological review.
- Any information developed over the review period, regarding the behavior characteristics of the employee supervised, either first hand or reported by others.

NOTE: FFDA is responsible for soliciting a threat assessment.

- Any behavior that indicates that the individual may be a threat to self or others, thus requiring a threat assessment

3.18.9 **DOCUMENT** a supervisory review of current behaviors and include any behaviors that have been previously reported on the annual Supervisor Behavior Observation Program (BOP) form found in the NIX database and **SUBMIT** to Access Services/FFDA.

Supervision/ FFDA

3.18.10 **IF** any of the following events or situations occur, **THEN NOTIFY** FFDA:

- Supervisor will be absent from normal duties for 30 or more consecutive days
- Employee will be absent from normal duties for 30 or more consecutive days
- Supervisor is terminated or transferred to another department

- Employee is terminated or transferred to another department
- Employee is promoted into supervisory position

FFDA

3.18.11 **ENSURE** Annual Supervisory Review is reviewed by a Reviewing Official when Potentially Disqualifying Information (PDI) is noted. Ensure PDI is maintained in the record.

3.18.12 **IF** any individual granted unescorted access, including a licensee's approved supplemental personnel, is away from a licensee's or approved supplemental personnel's behavioral observation program for more than 30 continuous days, **THEN TERMINATE** Unescorted Access Authorization until UAA requirements are met.

3.19 Determinations of Fitness

NOTE: The Determinations of Fitness process applies to individuals who apply for, or maintain current, unescorted access or who have a need for continuing unescorted access.

NOTE: A Determination of Fitness must be performed by a licensed or certified professional (e.g., SAE, MRO, psychologist, psychiatrist, physician) who is appropriately qualified and has the expertise. The Personality Assessment Index (PAI)/Minnesota Multiphasic Personality Inventory (MMPI) may be administered at any time during the Determination of Fitness (DOF) process or after any self reported PDI, as determined by the licensed professional, to assist the licensed professional in the evaluation determination. The MRO directs the Determination of Fitness process and may consult with other licensed professionals to reach a determination of fitness decision.

NOTE: Neither the individual or Dominion may seek a second Determination of Fitness if one has already been performed by a qualified professional employed under contract to perform the Determination of Fitness.

NOTE: No employee shall work impaired from any cause.

NOTE: Fitness for Duty potentially disqualifying information (PDI), developed during a background investigation, may be referred to a licensed professional for further evaluation. Evaluations, for New Hires and/or Interns, that require more than 10 business days to complete may result in termination of background processing.

Supervision

3.19.1 **IF** personnel exhibit symptoms of aberrant behavior, substance abuse, or psychological conditions or any behaviors or conditions that impede any individual’s ability to perform their duties safely and competently, **THEN COMPLETE** the FFD Evaluation Form found in the NIX database and **SUBMIT** to the FFDA.

NOTE: Substance abuse can often mimic symptoms of every day medical conditions. Medical conditions that are debilitating and impair an individual's ability to perform duties safely and competently, that are not determined to be FFD related, should be referred to medical personnel for prompt medical attention and possible transport to a medical facility as determined by medical personnel. Consider the HR Medical Evaluation Process in cases where medical impairment may be affecting the individual's ability to perform duties safely and competently.

3.19.2 **IF** medical conditions are observed that exceed routine illness and are determined to be unusual for an individual in consideration for what is known about the individual's everyday work habits **THEN COMPLETE** the FFD evaluation form found in the NIX database and **SUBMIT** to the FFDA.

FFDA

3.19.3 Upon receipt of FFD Evaluation form, **INITIATE** FFD testing to eliminate drugs or alcohol as contributing factors.

3.19.4 **IF** individual is believed to be impaired from any cause, except for routine medical conditions determined not to be FFD in nature, **THEN SUSPEND** unescorted access.

3.19.5 **NOTIFY** MRO/SAE Licensed Professional provider to assess the need for a Determination of Fitness.

a. **INFORM** MRO/SAE if event involves a Licensed Operator.

NOTE: The reviewing official may determine that maintaining the individual's authorization is warranted or not warranted based on the result or any potentially disqualifying information developed during the interview.

3.19.6 **IF** any individual is maintaining unescorted access when potentially disqualifying FFD information is disclosed or discovered, in order to maintain the individual's authorization, **ENSURE** that the reviewing official completes a review of the circumstances associated with the information (i.e., FFD events, substance abuse, legal actions, disqualifying information).

3.19.7 **IF** the reviewing official concludes that a determination of fitness is required, **REFER** the individual to a professional with the appropriate qualifications who will determine that the individual is fit to safely and competently perform his or her duties.

3.19.8 The Reviewing Official shall **IMPLEMENT** any recommendations for treatment and follow-up drug and alcohol testing from the determination of fitness, which may include the collection of urine specimens under direct observation, and **ENSURE** that the individual complies with and successfully completes the treatment plans.

Licensed Professional/ MRO

3.19.9 **PERFORM** a Determination of Fitness for the following conditions:

- When there is an acceptable explanation for a positive, adulterated, substituted, or invalid test result, but there is a basis for believing that the individual could be impaired while on duty
- Before making return-to-duty recommendations after an individual's UAA/ UA has been terminated unfavorably or denied under Dominion's or another licensee's FFD Program

CAUTION: A Determination of Fitness conducted "For Cause" in conjunction with observed behavior or physical condition **MUST** be conducted **FACE-TO-FACE** between the professional making the determination and the individual.

- In response to an individual's observed behavior, as determined by a face-to-face
- In response to pre-access conditions where personnel present with legal actions, psychological, medical, or substance abuse issues that require further evaluation
- When potential disqualifying FFD information is otherwise identified and Dominion's Reviewing Official concludes that a determination of fitness is warranted
- When there is a basis for believing the individual could be impaired while on duty

NOTE: MRO/SAE is a Medical Review Officer that is also a determining Substance Abuse Expert.

MRO/SAE

3.19.10 **EVALUATE** recommendations from treating professionals and **DETERMINE** individual's ability to perform duties safely and competently.

3.19.11 **FACILITATE** referrals and further evaluations and **EVALUATE** the need to maintain suspension of unescorted access or to terminate access authorization.

3.19.12 **NOTIFY** FFDA of individual's duty status using Determination of Fitness form (SY-AA-FFD-102).

MRO

3.19.13 **IF** a Licensed Operator evaluated under the Determination of Fitness process, **SUBMIT** a copy of the completed Determination of Fitness form (SY-AA-FFD-102) to the affected station's site medical department.

FFDA

3.19.14 **WHEN** processing Licensed Operators for return to duty, **THEN ENSURE** the medical department has received a copy of the completed Determination of Fitness form (SY-AA-FFD-102) from the MRO.

3.20 Disposition and Actions for Suspected Drug Abuse

FFDA 3.20.1 **PROVIDE** advice and guidance relative to the Behavioral Observation Program and apparent drug use.

Supervision 3.20.2 **IF** supervised individuals exhibit symptoms of aberrant behavior suggestive of substance abuse, medical, physical or psychological condition, or impairment from any cause, thus resulting in the need for further evaluation, **THEN COMPLETE** the NIX FFD Evaluation Form and **CONTACT** the FFDA.

FFDA 3.20.3 **INITIATE** corrective actions that may include but are not limited to the following and **DOCUMENT** on the NIX FFD Evaluation Form for future reference if the behavior is repeated and For-Cause Testing is again necessary.

- Discussions between individual and supervisor
- For Cause testing under Fitness For Duty Program
- Referral to EAP
- Suspension of duties and unescorted access for predetermined period

3.21 Self Reporting Legal Actions

NOTE: Legal action is defined in step 5.3.15.

NOTE: The NIX Database is to be used for all FFD reporting. The attached forms shall be used in the event the NIX Database is unavailable.

NOTE: Minor traffic violations are those when an individual is released after signing a summons (i.e., ticket) are not required to be reported. Reckless driving offenses, evading responsibilities such as hit and run offenses are not considered minor traffic violations and shall be self reported.

NOTE: Any legal action submitted, including abuse of alcohol or drugs, and drug events such as involving sale or possession of illegal drugs, including controlled substances determined to be illegal under federal law, such as marijuana, but deemed legal under a state law, must be evaluated for its impact on trustworthiness and reliability in accordance with NEI 03-01, 10 CFR 26, and internal FFD adjudication guidelines. Unescorted access may be terminated while further reviews and assessments are conducted. Section 3.19, Determination of Fitness, contains further information.

All Personnel 3.21.1 On the first working day following the incident, **PERFORM** the following:

a. **IF** during core business hours, **THEN PERFORM** the following:

1. **REPORT** legal actions to a Supervisor, who will report directly to the FFDA.

Supervision

2. **COMPLETE** NIX FFD Evaluation Form and **SUBMIT** to Site Access Services/FFDA.

b. **IF** after core business hours, **THEN PERFORM** the following:

1. **REPORT** directly to station Security, who will contact the FFDA.

2. **COMPLETE** NIX FFD Evaluation Form and **SUBMIT** to Site Access Services/FFDA.

3. **CONTACT** Security Shift Supervisor or Security Shift Operations Supervisor (MPS) at the respective site.

Security Shift Supervisor or Security Shift Operations Supervisor (MPS)

4. **NOTIFY** the FFDA to determine the status of the individual's badge.

5. **IF** unable to contact site FFDA, **THEN CONTACT** the Corporate FFD Supervisor or another fleet FFDA.

6. **IF** badge is deactivated, **THEN NOTIFY** all other known sites where the individual holds an active badge.

Supervision

3.21.2 Immediately **REPORT** to the FFDA any behavior or self report that questions an individual's fitness for duty, trustworthiness, or reliability, or otherwise raises concerns regarding an individual's fitness.

All Personnel

3.21.3 **REPORT** the following to supervision utilizing the NIX FFD Evaluation Form:

- Any threat of harm to the public, Company, and/or co-workers, including illegal acts and observed symptoms of substance abuse.
- Any previous unescorted access denial, positive chemical test, and/or involuntary participation in a substance abuse treatment program.
- Any mental or physical factors, stress, impairment from any cause or other factors that could adversely affect fitness for duty.

Supervision/ FFDA

3.21.4 **IF** a Licensed Operator, Security Officer, or Fire Brigade member self reports a drug or alcohol related issue, **THEN CONTACT** the Medical Department.

3.22 Foreign Travel

All Personnel

WHEN completing the Personal History Questionnaire for reinvestigation or application for unescorted access, **THEN DOCUMENT** periods of foreign travel.

3.23 Self Reporting Prescription Drugs

NOTE: Individuals are required to self report prescription and over the counter drugs which may adversely affect performance, such as indicated on Attachment 3. Drugs listed on Attachment 3 are not to be taken at work or 5 hours prior to work. These drugs have been determined to be performance impairing and must be self reported. Additionally, all medications that have an adverse affect on safe, competent performance must be self reported. Additional specific medications and their reportability is provided on the Access Services web site entitled “Drugs of Concern”.

NOTE: Any self reported drug or alcohol event or prescription or over the counter drug event may be referred to the MRO and may result in temporary termination of unescorted access while further reviews and assessments are conducted. Section 3.19, Determination of Fitness, contains further information.

NOTE: All medications must be properly labeled in their original containers. The NIX database is to be used for all prescription drug reporting. Attachment 3 is to be used in the event the NIX database is unavailable.

Station Personnel

3.23.1 **IF** the legitimate use of prescription or over-the-counter drugs may adversely affect performance, **THEN REPORT** use to supervision prior to assuming nuclear duties.

Supervision

3.23.2 **IF** notified of the legitimate use of prescription or over-the-counter drugs which may adversely affect an individual’s ability to perform work duties, **THEN PERFORM** the following:

NOTE: The reporting individual must disclose to supervision the desire to report prescription medications. Failure to report impairing medications may result in remediation of FFD reporting requirements and suspension of unescorted access or termination of unescorted access for a determined program violation as determined by the MRO and/or Reviewing Official.

a. **REFER** the reporting individual to the FFDA for prescription drug disclosure and evaluation if the individual has expressed the desire to report directly to FFD Program Personnel.

b. **IF** the individual discloses the medication, **THEN REFER** to Drugs of Concern chart located on the Access Services web site for each station/ location.

FFDA

c. **REFER** self-reported medication to the MRO for evaluation, if needed.

MRO/Corporate FFDA

d. **DETERMINE** impact of medication on performance and suspend unescorted access as necessary.

FFDA

e. **IF** it is determined that personnel are taking impairing medications while on duty or within 5 hours of reporting, without self reporting medications to FFD personnel for an evaluation on the medications impact on performance, **THEN TERMINATE** unescorted access and **SUBMIT** case to corporate FFDA and MRO for an evaluation of FFD program violation.

f. **PERFORM** appropriate recommendations, including the following:

- Return to work, no actions taken
- Restricted work assignment
- Restricted site access
- Medical evaluation
- Restriction on medical usage while performing nuclear duty or at home performing nuclear duty while convalescing if medication is deemed impairing

Supervision

3.23.3 **IF** an employee reports the inability to report for regularly scheduled work **OR** reports the inability to continue work while in a work status due to mental, physical, or emotional factors, stress, impairment from any cause, or other factors that are affecting FFD, **THEN DOCUMENT** the self-reporting event in the NIX FFD evaluation form and **SUBMIT** to FFDA as soon as practical following the event.

All Personnel

3.23.4 **IF** unfit to safely and competently perform assigned duties because of fatigue, **THEN SELF-DECLARE** in accordance with the guidelines established in LI-AA-700 or SY-KW-700.

Supervision

3.23.5 **ASSESS** personnel who declare themselves fatigued and **ENCOURAGE** to accept transportation to their place of dwelling.

a. **IF** personnel refuses transportation, **THEN DOCUMENT** actions taken on the NIX FFD Evaluation Form and **SUBMIT** to FFDA as soon as practical following the event.

3.24 Fitness For Duty Call-Out Process

NOTE: The consumption of alcohol during the 5-hour abstinence period may not by itself preclude the supervisor from using individuals who are needed to respond to an emergency.

NOTE: The Fitness For Duty Call-Out process is utilized in the event that an extraordinary, unanticipated need arises where a particular individual's skill or knowledge mandates that station supervisors request the individual to work. Call-Outs usually occur outside of normal working hours, which places the primary responsibility upon the supervisor to determine if the individual should report to and perform work.

All Personnel

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 counter medications) that may affect ability to perform normal duties.
- Whether alcohol has been consumed within the mandatory five-hour abstinence period.

Supervision

3.24.2 **IF** an employee being called in for unscheduled work reports mental, physical, or emotional factors, stress, impairment from any cause, or other factors that could affect FFD **AND** the employee is instructed to report to work, **THEN PERFORM** the following:

a. **CONDUCT** an evaluation to determine if the individual is impaired.

b. **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.

c. **DOCUMENT** the decision on the NIX FFD Evaluation Form and **SUBMIT** to the FFDA as soon as practical following the event.

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.

3.24.4 **IF** the individual has consumed alcohol within the previous five hours, but feels capable of performing the work, **THEN PERFORM** the following:

a. **REFER** the individual to the FFD program personnel, or if unavailable, Security Supervision, upon arrival.

FFDA

b. **CONDUCT** a breath alcohol analysis to determine the individual’s fitness for duty status.

Supervision

c. **IF** the results of the breath alcohol analysis indicate that the individual is fit to safely and competently perform duties, **THEN ASSIGN** the individual to duties.

d. **IF** the individual is **NOT** required to respond to an emergency **AND** the results of the breath alcohol analysis indicate that the individual may be impaired, **THEN DO NOT ASSIGN** the individual to duties.

e. **ENSURE** no sanctions are imposed on an individual who is called in to perform any unscheduled working tour for having consumed alcohol within the pre-duty abstinence period stated in the policy.

3.24.5 **IF** the Determination of Fitness indicates that an individual who has been called in for an unscheduled working tour to respond to an emergency may be impaired, **THEN ESTABLISH** controls and conditions under which the individual can perform work, if necessary.

3.24.6 **IF** the individual considers them self to be unfit for duty for other reasons, including illness, or other potentially impairing conditions, **AND** the individual is called in, **THEN ESTABLISH** controls and conditions under which the individual can perform work, if necessary.

3.24.7 **IF** an individual's behavior raises a concern regarding impairment from any cause which in any way could adversely affect the individual's ability to safely and competently perform duties, **THEN CONTACT** the FFDA during core business hours or Nuclear Protection Services during back shift or weekend hours.

3.25 Emergency Response Fitness For Duty Requirements

NOTE: Individuals required to respond to the EOF or the Station in the event of an emergency shall not be prohibited from reporting simply due to alcohol consumption during the five hour abstinence period.

All Personnel

3.25.1 Prior to responding to an emergency, **USE** discretion and **CONSIDER** if fit for duty based upon the amount of alcohol consumed.

3.25.2 **COMPLETE** Attachment 6, Preliminary Alcohol Concentration Chart, and **PERFORM** the following:

a. **IF** BAC is less than 0.04, **THEN RESPOND** to the emergency.

b. **IF** BAC is equal to or greater than 0.04, **THEN CONTACT** management for further evaluation.

3.25.3 **IF** responding to the emergency, **THEN** immediately **REPORT** alcohol consumption to the facility lead upon arrival.

Supervision

3.25.4 **CONTACT** FFDA and **ARRANGE** a breath alcohol analysis test to determine the individual's fitness for duty.

3.25.5 **IF** an FFD trained collector is **NOT** readily available, which adversely affects emergency response, **THEN PERFORM** an interim assessment of the individual's fitness for duty utilizing Attachment 6, Preliminary Alcohol Concentration Chart, until a breath alcohol analysis test can be performed.

3.25.6 **IF** the results of the Determination of Fitness indicate the individual is fit to safely and competently perform duties, **THEN ASSIGN** duties.

NOTE: The consumption of alcohol during the five-hour abstinence period may not by itself preclude the supervisor from using individuals who are needed to respond to an emergency.

NOTE: As emergencies may last for several hours, an individual originally determined to be unfit for duty, may participate in the emergency after a subsequent determination by breath analysis determines that the individual is fit for duty.

NOTE: Individuals responding to an emergency who acknowledge alcohol consumption are exempt from management sanction due to alcohol consumption.

3.25.7 **IF** the Determination of Fitness indicates that an individual who has responded for an emergency may be impaired, **THEN ESTABLISH** controls and conditions the individual can perform work, if necessary.

3.25.8 **RECORD** the determination of fitness for duty on the NIX FFD Evaluation Form.

3.25.9 **SUBMIT** the NIX FFD Evaluation Form and Attachment 6 to the FFDA as soon as practical following the event.

4.0 RECORDS

NOTE: Due to the Protection of Information requirements associated with the FFD Program, FFD records are maintained in the FFD files, not by records management.

4.1 The following record(s) completed as a result of this procedure are required to be transmitted to Nuclear Document Management (NDM). The records have been identified and retention requirements established for the Nuclear Records Retention Schedule (NRRS) per RM-AA-101, Record Creation, Transmittal, and Retrieval.

4.1.1 Quality Assurance Records

None

4.1.2 Non-Quality Assurance Records

None

4.2 The following record(s) completed as a result of this procedure are **NOT** required to be transmitted to NDM, but are required to be retained as indicated below. The NRRS has been updated and Alternate Storage approved per RM-AA-101 for Quality Assurance Records.

4.2.1 **Quality Assurance Records**

None

4.2.2 **Non-Quality Assurance Records**

- Participant's FFD file, violations of the FFD Program, Determinations of Fitness
- Contractor/Vendor FFD Program commitments, requests, and approvals
- Collection Site and Testing Facility qualification and training files

4.3 The following item(s) completed as a result of this procedure are **NOT** records and are **NOT** required to be transmitted to NDM.

None

5.0 ADMINISTRATIVE INFORMATION

5.1 Commitments

None

5.2 Responsibilities

5.2.1 **Director Nuclear Protection Services**

The Director Nuclear Protection Services is responsible for the overall administration of the Fitness for Duty (FFD) Programs.

5.2.2 **Nuclear Protection Services**

Nuclear Protection Services is responsible for escorting personnel requiring for cause FFD testing due to Observed Behavior or receipt of Credible Information, and for escorting personnel off site if required.

5.2.3 **Manager Corporate Security- Safety & Health**

The Manager Corporate Security- Safety & Health is responsible for implementing the FFD Program as directed by the Director Nuclear Protection Services.

5.2.4 **Supervisor Security Services**

The Supervisor Security Services is responsible for supervising the Coordinator Nuclear Site FFD and Access and Fitness for Duty Testing Supervisor in the performance of their duties. Responsibilities include collecting performance data and summaries of corrective actions, coordinating regulatory submittals, and assessment activities.

5.2.5 **Fitness For Duty Administrator (FFDA)**

The FFDA is responsible for coordination of activities required to achieve effective implementation of the FFD Program at each respective site.

5.2.6 **Medical Review Officer (MRO)**

The MRO is responsible for:

a. Reviewing and confirming presumptive positive chemical testing results, providing liaison with Employee Assistance Program administrators.

b. Determining frequency of Follow-up testing, evaluating personnel returning to work following FFD Program violations.

c. Other duties as required in support of the FFD Program.

5.2.7 **Substance Abuse Expert (SAE)**

The SAE is responsible for:

a. Evaluating individuals who have violated the substance abuse provisions of the FFD policy.

b. Evaluating individuals for possible impairment due to substance abuse or abuse issues.

c. Making recommendations and determinations concerning education, treatment, return to duty, Follow-up drug and alcohol testing, and aftercare.

5.2.8 **Director Nuclear Training**

The Director Nuclear Training is responsible for providing FFD training to all personnel who have unescorted access to Dominion nuclear stations and FFD Supervisor Training to all personnel required to perform the Behavior Observation Program on workers with unescorted access to Dominion nuclear stations.

5.2.9 **Supervisors**

Supervisors are responsible for enforcing the FFD and Behavioral Observation Program requirements.

5.2.10 **Employee Assistance Program Administered by Harris, Rothenberg International**

The Employee Assistance Program Administered by Harris, Rothenberg International is responsible for:

a. Providing supervisor consultation, confidential assessment, short-term counseling, referral services, and treatment monitoring to employees with problems related to fitness for duty.

b. Notifying Dominion management and the MRO when a determination has been made that an individual's condition constitutes a hazard to himself or herself or others, when a determination has been made that an individual who has been removed from duty for fitness for duty reasons is fit to return to duty, and any follow-up recommendations related to a person returning to work.

c. Making required reports to FFD Program Management.

5.2.11 **Station Personnel**

All Dominion employees and C/V personnel requiring unescorted access to protected areas of nuclear stations or who must physically report to the Technical Support Center (TSC) or Emergency Operations Facility (EOF) during an emergency, must comply with FFD Program requirements, including the following:

a. Report to work with no detectable presence of alcohol or prohibited drugs in their system.

b. Abstain from alcohol for at least five hours preceding scheduled work.

c. Notify supervision of any problems including mental stress, fatigue, or illness that may affect fitness for duty.

d. Seek assistance for any problems which may affect the ability to safely and competently perform duties.

e. Report to supervisor the use of prescription or over-the-counter (OTC) drugs that may adversely affect the ability to perform the duties.

f. Report actions of others which threaten harm to the company or co-workers.

g. Fully comply with the Dominion FFD Program.

h. Recognize symptoms of potential drug and alcohol abuse in co-workers and report symptoms to Station management.

i. Report the use of alcohol or the use or presence of illegal drugs on company premises.

j. Report legal actions to supervision and Nuclear Protection Services, utilizing the NIX FFD Evaluation Form on the first working day following the incident.

5.3 Definitions

5.3.1 **Blood Alcohol Concentration (BAC)**

The mass of alcohol in a volume of blood.

5.3.2 **Chain of Custody**

Process to account for the integrity of each specimen or aliquot by tracking its handling and storage from the point of specimen collection to final disposition of the specimen and its aliquots. "Chain of custody" and "custody and control" are synonymous and may be used interchangeably.

5.3.3 **Confirmatory Drug or Alcohol Test**

A second analytical procedure to identify the presence of alcohol or a specific drug or drug metabolite in a specimen. The purpose of a confirmatory test is to ensure the reliability and accuracy of an initial test result.

5.3.4 **Confirmed Positive Test Result**

A test result that demonstrates that an individual has used drugs and/or alcohol in violation of the requirements of 10 CFR 26 or has attempted to subvert the testing process by submitting an adulterated or substituted urine specimen. For drugs, adulterants, and substituted specimens, a confirmed test result is determined by the MRO, after discussion with the donor subsequent to the MRO's receipt of a positive confirmatory drug test result from the HHS-certified laboratory and/or a confirmatory substituted or adulterated validity test result from the HHS-certified laboratory for that donor. For alcohol, a confirmed test result is based on a positive confirmatory alcohol test result from an evidential breath testing device (EBT) without MRO review of the test result.

5.3.5 **Contractor/Vendor (C/V)**

Any company, or any individual not employed by a licensee who is providing work or services to a licensee or other entity either by contract, purchase order, oral agreement, or other arrangement that supports UAA/UA or FFD related requirements.

5.3.6 **Cut-off Level**

The concentration or decision criteria established for designating and reporting a test result as positive, of questionable validity (referring to validity screening or initial validity test results from a licensee testing facility), or adulterated, substituted, dilute, or invalid (referring to initial or confirmatory test results from an HHS-certified laboratory).

5.3.7 **Determination of Fitness**

A process entered to evaluate an individual when there are indications that the individual may be in violation of the licensee's or C/V's FFD policy or is otherwise unable to safely and competently perform his or her duties.

5.3.8 **Donor**

The individual from whom a specimen is collected.

5.3.9 **Fatigue**

The degradation in an individual's cognitive and motor functioning resulting from inadequate rest.

5.3.10 **Fitness for Duty Administrator (FFDA)**

Generic title used to identify individuals who are responsible for the administration of the fitness for duty program. This grouping includes Supervisor Security Services, Coordinator Nuclear Site FFD and Access, and Nuclear Access Program Administrator.

5.3.11 **Follow Up Testing**

Increased frequency drug and alcohol testing applied to personnel following a positive test, program violation, or otherwise have been evaluated by the Substance Abuse Expert (SAE) and determined to require increased frequency testing to ensure abstinence.

5.3.12 **Health and Human Services (HHS)-Certified Laboratory**

A laboratory that is certified to perform urine drug testing under the Department of Health and Human Services Mandatory Guidelines for Federal Workplace Drug Testing Programs (the HHS Guidelines),

5.3.13 **Illegal Drugs**

Those drugs included in Schedules I through V of the Controlled Substances Act, but not when used in accordance with a valid prescription or when used as otherwise authorized by law.

5.3.14 **Initial Drug Test (or Screening Test)**

A test to differentiate "negative" specimens from those that require confirmatory drug testing.

5.3.15 **Legal Action**

A formal action taken by a law enforcement authority or court of law, including being held, detained, taken into custody, charged, arrested, indicted, fined, forfeited bond, cited, or convicted for a violation of any law regulation, or ordinance (e.g., felony, misdemeanor, traffic, or military criminal history, etc.), or the mandated implementation of a plan for treatment or mitigation to avoid a permanent record of an arrest or conviction, in response to any of the following activities:

- The use, sale, or possession of illegal drugs
- The abuse of legal drugs or alcohol
- The refusal to take a drug or alcohol test

5.3.16 **Medical Review Officer (MRO)**

A licensed physician who is responsible for receiving laboratory results generated by a Part 26 drug testing program and who has the appropriate medical training to properly interpret and evaluate an individual's drug and validity test results together with his or her medical history and any other relevant biomedical information.

5.3.17 **Nominal**

The limited flexibility that is permitted in meeting a scheduled due date for completing a recurrent activity. Completing a recurrent activity at a nominal frequency means that the activity may be completed within a period that is 25 percent longer or shorter than the period required. The next scheduled due date would be no later than the current scheduled due date plus the required frequency for completing the activity.

5.3.18 **Oral Fluid Testing**

A method by which an applicator is utilized to extract saliva from the mouth of the donor. This sample is then sent to an HHS lab for analysis for the presence of a drug metabolite.

5.3.19 **Owner Controlled Area**

The area outside of a restricted area, but inside the site boundary, to which the licensee can limit access for any reason.

5.3.20 **Potentially Disqualifying FFD Information**

Information demonstrating that an individual has:

- Violated a licensee's or other entity's FFD policy;
- Had authorization denied or terminated unfavorably under §§ 26.35(c)(2), 26.53(i), 26.63(d), 26.65(g), 26.67(c), 26.69(f), or 26.75(b) through (e);
- Used, sold, or possessed illegal drugs
- Abused legal drugs or alcohol
- Subverted or attempted to subvert a drug or alcohol testing program
- Refused to take a drug or alcohol test
- Been subjected to a plan for substance abuse treatment (except for self-referral)
- Had legal action or employment action, as defined in this section, taken for alcohol or drug use.

5.3.21 **Presumptive Positive Test Result**

The result of an initial test for drugs and drug metabolites that indicated the presence of some drug or drug metabolite and that could be confirmed through gas chromatography/mass spectrometry by an HHS-certified laboratory as a laboratory confirmed positive test result.

5.3.22 **Reviewing Official**

An employee of a licensee or other entity specified in § 26.3(a) through (c), who is designated by the licensee or other entity to be responsible for reviewing and evaluating any potentially disqualifying FFD information about an individual, including, but not limited to, the results of a determination of fitness, as defined in § 26.189, in order to determine whether the individual may be granted or maintain authorization.

5.3.23 **Special Analysis Testing**

The testing of FFD specimens at Limits of Detection (LOD). Specimens that are dilute at half of the initial screening cutoff are subjected to the lowest limit of detection by the HHS lab.

5.3.24 **Substance Abuse**

The use, sale, or possession of illegal drugs, or the abuse of prescription and over-the-counter drugs, and/or the abuse of alcohol.

5.3.25 **Substance Abuse Expert (SAE)**

The SAE is the designated certified professional assigned to evaluate individuals who have violated the substance abuse provisions of an FFD policy and/or conduct evaluations in cases where an individual's fitness for duty is questionable relative to substance use or abuse issues. The SAE makes recommendations and determinations concerning education, treatment, return to duty, Follow-up drug and alcohol testing, and aftercare.

5.3.26 **Substituted Specimen**

A specimen with creatinine and specific gravity values that are so diminished or so divergent that they are not consistent with normal human physiology.

5.3.27 **Subverting the Testing Process**

A willful act to avoid being tested or to bring about an inaccurate drug or alcohol test result for oneself or others at any stage of the testing process (including selection and notification of individuals for testing, specimen collection, specimen analysis, and test result reporting), and adulterating, substituting, or otherwise causing a specimen to provide an inaccurate test result.

5.3.28 **Suspension of Unescorted Access**

Access is suspended when the badge is placed on hold in the security system.

5.3.29 **Termination of Unescorted Access**

Access is terminated when the badged is deactivated and the clearance is removed.

5.3.30 **Threat Assessment**

A formal process conducted by Corporate Security to determine the level of threat that may exist from personnel that may be exhibiting signs and symptoms of work place violence.

5.3.31 **Work Status**

The condition that exists when personnel are performing work or a work related activity, usually in conjunction with a work schedule. Personnel are considered in a work status when arriving on company property for the purposes of performing any work related activity (in-processing, delivering or picking up materials) or reporting for scheduled work.

5.4 References

5.4.1 10 CFR 26, Fitness-For-Duty Program

5.4.2 10 CFR 73.56, Personnel Access Authorization Requirements for Nuclear Power Plants

5.4.3 29 CFR 1904.7, Department of Labor Occupational Safety and Health Administration (OSHA) Standard

5.4.4 NRC Regulatory Issue Summary 2005-28 dated November 22, 2005

5.4.5 NEI 03-01, Nuclear Power Plant Access Authorization Program

5.4.6 SY-AA-UAA-101, Unescorted Access Authorization Program

5.4.7 LI-AA-700, Fatigue Management and Work Hour Limits for Covered Workers

5.4.8 SY-AA-FFD-102, Fitness For Duty Program Administration

5.4.9 SY-KW-700, Fatigue Management and Work Hour Limits for Security Personnel

ATTACHMENT 1

Policy Statement

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The Dominion Fitness For Duty (FFD) Policy applies to all personnel who are granted unescorted access to a nuclear protected area or who are required to physically report to a Technical Support Center (TSC) or Emergency Operations Facility (EOF) as required by the site's emergency plan and procedures. Additionally, the policy applies to FFD program personnel and, in part, to individuals who are applying for unescorted access.

The FFD Policy includes the following elements:

1. Fitness For Duty potentially disqualifying information (PDI), developed during a background investigation, may be referred to a licensed professional for further evaluation. Evaluations requiring more than 10 business days may result in termination of background processing.
2. The use, sale, or possession of illegal drugs, the abuse of legal drugs and alcohol; and the misuse of prescription and/or over-the-counter medications while on duty may result in disciplinary action up to, and including, termination. The abuse of legal drugs and alcohol and the misuse of prescription drugs or over-the-counter medications will be determined by the Medical Review Officer (MRO).
3. Individuals who are notified to report for Random testing must arrive at the collection facility at the scheduled time and comply with all FFD test requirements. Failure to meet this requirement may result in disciplinary action up to, and including, termination. Personnel who are assigned pre-access testing are expected to report when directed. Failure to meet this requirement may result in denial of unescorted access.
4. Any act, or attempted act, to subvert the testing process including, but not limited to, refusing to provide a specimen, avoiding collection, or providing, or attempting to provide, a substituted or adulterated specimen will result in the immediate unfavorable termination of unescorted access and permanent denial of access authorization thereafter. All samples submitted under the provisions of Dominion's FFD program are subject to dilute specimen testing in accordance with 10 CFR 26.163. Any specimen screened to Lowest Limits of Detection (LOD) where the results are positive for any drug, and the MRO cannot determine a legitimate medical explanation, shall be determined to be positive and a violation of the FFD program.
5. All personnel working at Dominion Nuclear Power Stations shall report to work with no detectable presence of alcohol. FFD tests that fall below the Code of Federal Regulations 10 CFR 26 requirements, while technically a negative test result, do not comply with Dominion's policy of reporting to work with no detectable presence of alcohol. Individuals found to have a detectable level above 0.01 BAC during FFD testing will be subjected to a substance abuse evaluation. Unescorted access will be terminated pending review by the Substance Abuse Expert (SAE). Supplemental vendors or their companies are responsible for this cost.
6. Personnel in the Follow Up program who violate the terms of the signed Follow Up letter will be subject to unescorted access denial and termination of employment. Personnel who are known to have abused substances not covered in Dominion's standard panel will be screened for the substance determined to have been abused while in the Follow Up program.

ATTACHMENT 1
Policy Statement
(Page 2 of 3)

7. Individuals shall not consume alcohol or any impairing substance (i.e., medication) a minimum of five hours prior to reporting to work and shall not consume alcohol during any tour of duty. The five hour abstinence period is a minimum and may not be sufficient for everyone to ensure that they report to work fit for duty. It is the individual worker's responsibility to report to work fit for duty.
8. Drug and/or alcohol use are not the only factors that determine a person's fitness for duty. Other factors include mental stress, fatigue, medical illness, and the legitimate use of prescription and over-the-counter medications. Any of these factors, either in combination or individually, can affect a person's capability to safely and effectively perform his or her job functions. It is the individual's responsibility to evaluate these factors and only report to work when truly fit for duty.
9. Dominion employees who are referred to EAP, who fail to comply with EAP mandates, will have their unescorted access terminated. Dominion employees who are seeking assistance in dealing with drug, alcohol, fatigue, stress, or other problems that could adversely affect their ability to safely and competently perform their job duties can contact the Employee Assistance Program (EAP) for confidential and professional assistance. EAP will report to FFD program personnel under the following conditions:
   - Individual poses or has posed an immediate hazard to themselves or others
   - Individual has been impaired from drugs or alcohol while in a work status or is likely to be impaired while in a work status in the future.
   - Individual has engaged in acts that are reportable under 26. 719(b) through (b)(3)

   Non-Dominion personnel should contact their employer for information and referral to a comparable program.
10. Individuals who are subject to the FFD Policy are required to report any legal action to their supervisor and Access Services or Security. Legal action means a formal action taken by a law enforcement authority or court of law, including an arrest, an indictment, the filing of charges, a conviction, or the mandated implementation of a plan for substance abuse treatment to avoid a permanent record of an arrest or conviction in response to any of the following:
    - The use, sale, or possession of illegal drugs
    - The abuse of legal drugs or alcohol
    - The refusal to take a drug or alcohol test
11. It is the responsibility of all nuclear workers, managers, supervisors, and escorts to be observant of the behaviors of personnel and to report any suspected drug or alcohol activity, fatigue, stress, work place violence, or aberrant behaviors to Access Services or Security.
12. It is every individual's responsibility to immediately report any fitness for duty concerns that may affect the individual's trustworthiness or reliability, either their own or someone he or she has observed, whether that concern be drug or alcohol related, fatigue related, stress related, or related to any indications of aberrant behavior or impairment from any cause to Access Services or Security. Failure to report a known FFD concern will result in one or both of the following actions: (1) Termination of unescorted Access; (2) Remedial training.

ATTACHMENT 1
Policy Statement
(Page 3 of 3)

13. Individuals are responsible for ensuring they get adequate rest thus ensuring they are not fatigued and are expected be knowledgeable of causes and the impact of fatigue in the work place as well as methods to counter symptoms. Knowledge of these topics is necessary to ensure that individuals are responsible for:
    - Self managing fatigue that is caused by shift work and factors other than work hours.
    - Taking actions to maintain their alertness at work.
    - Self reporting and seeking treatment for any condition that may be exacerbating fatigue.
    - Ensuring they get adequate rest thus ensuring they are not fatigued.
    - Self declaring fatigue indicating they are not fit for duty.
14. Personnel have a responsibility to self declare fatigue indicating that they are not fit for duty.
15. An individual who exhibits chronic fatigue will be referred for further evaluations including FFD, Determination of Fitness, EAP. Access authorization will be terminated pending the outcome of these evaluations.
16. Individuals who are covered under the FFD Policy and who violate provisions of this policy are subject to disciplinary action. This disciplinary action could include suspension of unescorted access, unfavorable termination of unescorted access, and/or denial of unescorted access depending on the circumstances.

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Management Action Report

SY-AA-FFD-101 – Attachment 2 **Page 1 of 1**

Name of Individual Involved			Last Four Digits of SSN
Name of Company			Date
Assigned Duties as a Licensed Nuclear Operator?	☐ Yes ☐ No	Assigned Duties as a Nuclear Security Officer?	☐ Yes ☐ No
Assigned Duties as a Fire Brigade Member?	☐ Yes ☐ No	If Yes, notify the site Medical Department.	

Description of Fitness For Duty Event

Fitness For Duty For Cause/Post Event testing requested? ☐ Yes ☐ No

Event Category

- ☐ Observed behavior
- ☐ Receipt of credible information
- ☐ Event involves worker fatigue or mental stress
- ☐ Event involves actual or potential degradation to level of safety
- ☐ Death
- ☐ Medical treatment beyond first aid
- ☐ Other (explain):

Dominion Supervisor to provide evaluation of behavior and assessment of individual's fitness for duty

Individual offered transportation?	☐ Yes	☐ No
Transportation provided?	☐ Yes	☐ No
Transportation refused?	☐ Yes	☐ No

Has Dominion Supervisor performed a review of any safety related work performed immediately prior to the incident that was not supervised? ☐ Yes ☐ No

Has Fatigue Assessment been submitted? ☐ Yes ☐ No

Corrective Action Taken

Dominion Supervisor (Print name and sign)	Date
Assessed Individual (Print name and sign)	Date

*** Form to be utilized only when Nuclear In-Processing X-Press (NIX) is inoperable.**
*** Submit to FFDA prior to the end of the working shift.**

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Fitness For Duty Self Reporting Form

SY-AA-FFD-101— Attachment 3 **Page 1 of 1**

Requirement: SY-AA-FFD-101 requires that all personnel holding unescorted access at a Dominion Nuclear Facility report to their supervisor and the Site Access Services/FFD Administrator any of the following events. Normally this report must be made on the first day back to work, however, for events involving a threat to a worker or illegal activities or drug abuse, it should be immediately reported to a Dominion Supervisor.

Name of Person Self-Reporting		Last Four Digits of SSN
Department	Dominion Supervisor	Date of Event

Assigned Duties as a Licensed Nuclear Operator? ☐ Yes ☐ No	Assigned Duties as a Nuclear Security Officer? ☐ Yes ☐ No
Assigned Duties as a Fire Brigade Member? ☐ Yes ☐ No	If Yes, notify the site Medical Department.

Type of Event

☐ Individual reported actions that threaten harm to Dominion or coworkers.

☐ Individual reported information regarding another individual who may be abusing drugs or alcohol or involved in illegal activities.

☐ Individual reported mental stress, illness, or any other issues which may affect fitness for duty.

☐ Individual reported legitimate use of a prescription or over-the-counter medication which may adversely affect their ability to perform duties. If taking medications prescribed solely for antibiotic, allergies, anti-inflammatory, high cholesterol, or diabetes, no additional action is required.

Personnel shall report the use of prescription drugs administered by a physician or over-the-counter medications which are psychotropic or motor skill impairing.

Psychotropic medications are designed to have an effect on the mind by modifying the user's mental activity or state. These drugs are commonly classified or referred to as anti-depressants, anti-psychotics, anti-anxiety, and tranquilizers. They are used to treat a variety of conditions such as depression, manic, episodes, bipolar disorder, schizophrenia, anxiety, severe tension, phobias, and neurosis. Some of the commonly prescribed drugs are Xanax, Valium, Librium, Klonopin, Ativan, Seroquel, Cymbalta, Elavil, Prozac, Lexapro.

Motor skill impairing drugs have an effect on the muscles and nerves that control or produce simple and complex movement or motor skills. These drugs are commonly referred to as muscle relaxants, anti-spasmodic, and analgesics (pain relievers). They are used for treatment of a variety of conditions such as muscle cramps or spasms and injuries or pain. Some of the commonly prescribed drugs are Vicodin, Hydrocodone, Oxycodone, Percocet, Lortab, Darvocet, Demerol, Flexeril, and Fentanyl.

Description of Event

Disposition instructions: The Dominion Supervisor shall immediately notify the Site Access Services/FFD Administrator and provide the completed form prior to the end of the working shift. If the incident is reported after core business hours, and involves any incident other than reporting the use of prescription medications, the Dominion supervisor will notify the Site Security Manager and provide a copy of this form.

*** Form to be utilized only when Nuclear In-Processing X-Press (NIX) is inoperable.**

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Report of Pending Legal Action

SY-AA-FFD-101 – Attachment 4 **Page 1 of 1**

Requirement: SY-AA-FFD-101 requires that all personnel holding unescorted access at a Dominion Nuclear Facility report to their supervisor and the Site Access Services/FFD Administrator any arrest or pending legal action taken against them. This report must be made on the first day back to work after this legal action.

Legal Action is defined as a formal action taken by a law enforcement authority or court of law, including being held, detained, taken into custody, charged, arrested, indicted, fined, forfeited bond, cited, or convicted for a violation of any law, regulation or ordinate (e.g., felony, misdemeanor, traffic, military criminal history, etc.), or the mandated implementation of a plan for treatment or mitigating in order to avoid a permanent record of an arrest or conviction in response to the following activities:

- The use, sale, or possession of illegal drugs
- The abuse of legal drugs or alcohol
- The refusal to take a drug or alcohol test

Minor traffic violations are those when an individual is released after signing a summons. Tickets are not required to be reported. Reckless driving offenses, evading responsibilities, such as hit and run offenses are not considered minor traffic violations and shall be self reported.

Name of Person Self-Reporting			Last Four Digits of SSN
Department		Dominion Supervisor	
Assigned duties as a Licensed Nuclear Operator?	☐ Yes ☐ No	Assigned duties as a Nuclear Security Officer?	☐ Yes ☐ No
Assigned Duties as a Fire Brigade Member?	☐ Yes ☐ No	If Yes, notify Medical Department.	
Date of Legal Action		Agency/Police Department	
Location-City/State		Hearing or Trial Date	
Charges/Action Pending			
Details of Legal Action (Legal documents detailing the legal actions must be attached.)			
Reporting Individual Signature			Date
Dominion Supervisor Signature			Date

Disposition instructions: The Dominion Supervisor shall immediately notify the Site Access Services/FFD Administrator by telephone and provide the completed form on the first working day following the incident. If the incident is reported after core business hours, the Dominion supervisor will notify the site Security Shift Supervisor and submit this form. Upon notification, the Security Supervisor will contact the Site Security Manager and Site Access/FFD Administrator via telephone for disposition instructions.

*** Form to be utilized only when Nuclear In-Processing X-Press (NIX) is inoperable.**

ATTACHMENT 5
Drugs of Abuse
(Page 1 of 2)

Drugs affect individuals in various ways with signs and symptoms that may manifest themselves in an individuals speech, appearance, behavior, speech or odor. Drugs that contribute to these conditions include the following:

1. Narcotics

   Narcotics or opiates are substances that decrease the user's physical senses. Individuals who are under the influence of narcotics or opiates may exhibit one or more of the following symptoms:

   - Drowsiness
   - Nausea
   - Constricted pupils
   - Clammy skin
   - Needle marks/track marks

2. Depressants

   Depressants or sedatives are substances that slow down and relax the user's central nervous system. Individuals who are under the influence of depressants or sedatives may exhibit one or more of the following symptoms:

   - Disorientation
   - Drowsiness
   - Slurred speech
   - Lethargy
   - Unsteady walk
   - Fainting
   - Memory loss

3. Stimulants

   Stimulants are substances that speed up the user's central nervous system. Individuals who are under the influence of stimulants may exhibit one or more of the following symptoms:

   - Hyperactivity
   - Sudden mood swings
   - Very talkative
   - Profuse sweating
   - Dilated (enlarged) pupils

ATTACHMENT 5
Drugs of Abuse
(Page 2 of 2)

4. Hallucinogens

   Hallucinogens are substances that radically distort the user's perception of reality. Individuals who are under the influence of hallucinogens may exhibit one or more of the following symptoms:

   - Hallucinations (visual or auditory)
   - Distorted sense of time or distance
   - Dilated (enlarged) pupils
   - Psychotic behavior

5. Cannabis

   Cannabis or marijuana are substances that distort the user's perceptions of time, space, or distance. Individuals who are under the influence of cannabis or marijuana may exhibit one or more of the following symptoms:

   - Drowsiness
   - Loss of memory
   - Confusion
   - Reddened eyes

6. Inhalants

   Inhalants are substances that cause sudden loss of control over the user's thought process and motor activities. Individuals who are under the influence of inhalants may exhibit one or more of the following symptoms:

   - Confusion
   - Slurred speech
   - Dizziness
   - Loss of muscle control
   - Loss of coordination

7. Alcohol

   Alcohol is a substance that slows down and relaxes the user's central nervous system. Individuals who are under the influence of alcohol may exhibit one or more of the following symptoms:

   - Slurred speech
   - Unsteady walk
   - Reddened eyes
   - Impaired coordination
   - Exhibit the odor of alcohol

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Preliminary Alcohol Concentration Chart

SY-AA-FFD-101 – Attachment 6 **Page 1 of 1**

Completed by Supervisor	
Call-Out Individual (Print Name)	Supervisor (Print Name)
Date	Time of Day ☐ A.M. ☐ P.M.

Supervisor shall ask the Call-Out individual the questions in Section A and perform the calculations in Section B.

A. Questions

1. How many drinks has the individual consumed?
   NOTE: One drink equals 1.25 oz. of hard liquor, 12 oz. of beer, or 4 oz. of wine.
2. How much does the individual weigh (in pounds)?
3. How many hours have elapsed since the individual **started** drinking?

B. Calculations

Blood Alcohol Concentration (BAC) Table

Number of Drinks (From Question A.1)	100	120	140	160	180	200	220	240
1	.04	.04	.03	.03	.02	.02	.02	.02
2	.09	.07	.06	.06	.05	.04	.04	.04
3	.13	.11	.09	.08	.07	.07	.06	.06
4	.18	.15	.13	.11	.10	.09	.08	.07
5	.22	.18	.16	.14	.12	.11	.10	.09
6	.26	.22	.19	.17	.15	.13	.12	.11
7	.31	.26	.22	.19	.17	.15	.14	.13
8	.35	.29	.25	.22	.20	.18	.16	.15
9	.40	.33	.28	.25	.22	.20	.18	.17
10	.44	.37	.31	.28	.24	.22	.20	.18

Body Weight (Pounds) (From Question A.2)

NOTE: BAC is reduced by .01 for each hour that has passed since the individual began drinking.

1. BAC from table above (Number of Drinks/Body Weight):
2. Multiply answer to Question A.3 by .01:
   (e.g., 1 hour = .01; 2 hours = .02; 3 hours = .03)
3. Subtract B.2 from B.1 to determine Preliminary BAC*:

Supervisor Signature

*For individual to be Fit for Duty, BAC must be less than .04.
Submit to FFDA prior to the end of the working shift.

TABLE 6.2-1[3]

MINIMUM SHIFT-CREW COMPOSITION[2]

	APPLICABLE MODES	
LICENSE CATEGORY	1, 2, 3 & 4	5 & 6
Senior Reactor Operator	2	1[1]
Reactor Operator	2	1
Non-Licensed Operator	2	1
Shift Technical Advisor	1[4]	None Required

(1) Does not include the licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling individual supervising CORE ALTERATIONS after the initial fuel loading.

(2) The above shift crew composition and the qualified radiation protection technician of Section 6.2.2 may be less than the minimum requirements for a period of time not to exceed 2 hours in order to accommodate unexpected absence provided expeditious actions are taken to fill the required position.

(3) Requirements for minimum number of licensed operators on shift during operation in MODES other than COLD SHUTDOWN or REFUELING are contained in 10CFR50.54(m).

(4) The Shift Technical Advisor position can be filled by either of the two Senior Reactor Operators (a dual-role individual), if he meets the Shift Technical Advisor qualifications of the Commission Policy Statement on Engineering Expertise on Shift.

PACKAGE INFORMATION

DIRECTIONS

- Take only as directed
- Only use the dose cup provided
- Do not exceed 4 doses per 24 hours

Adults and children 12 years and over	30 mL every 4 hours
Children 4 to under 12 years	Ask a doctor
Children under 4 years	Do not use

When using other DayQuil™ or NyQuil™ products, carefully read each label to ensure correct dosing.

INGREDIENTS

Active Ingredients (in each 30 mL) (Purpose)

Acetaminophen 650 mg (Pain reliever/fever reducer)
Dextromethorphan HBr 20 mg (Cough suppressant)
Doxylamine succinate 12.5 mg (Antihistamine)
Phenylephrine HCl 10 mg (Nasal decongestant)

Inactive Ingredients

alcohol, citric acid, D&C Yellow No. 10, FD&C Yellow No. 6, FD&C Green No. 3, flavor, glycerin, propylene glycol, purified water, saccharin sodium, sodium benzoate, sodium chloride, sodium citrate, sorbitol, sucralose

Other Information

- **Each 30 mL contains**: sodium 81 mg
- Store at room temperature
- Do not refrigerate

Vicks NyQuil FAQ

Q: What is NyQuil?

A: NyQuil is an over-the-counter medication that treats nighttime symptoms of the common cold and flu such as sneezing, sore throat, headache, minor aches and pains, fever, runny nose, and cough.

Q: What does NyQuil do?

A: NyQuil relieves your sneezing, sore throat, headache, minor aches and pains, fever, runny nose, and cough, so you can get the rest you need.

Q: How often can I take NyQuil?

A: Adults and children 12 years of age or older can take NyQuil every six hours

Q: How much NyQuil can I take?

A: If you are taking NyQuil LiquiCaps, you can take two LiquiCaps with water every six hours. If you are taking NyQuil Liquid, you can take 30 mL every six hours.

Q: How long does it take for NyQuil to work?

A: This depends on many factors but it usually takes 30 minutes for NyQuil to start working.

Q: How much NyQuil is safe?

A: You should not exceed four doses of NyQuil in a 24-hour period.

Q: How much alcohol is in NyQuil?

A: NyQuil Liquid contains 10 percent alcohol. NyQuil LiquiCaps does not contain alcohol. Alcohol-Free NyQuil Cold & Flu Nighttime Relief Liquid does not contain alcohol.

Q: Can I give NyQuil to a child?

A: No, children under the age of 12 should not take NyQuil. However, children ages six to 11 may take Children's NyQuil. Use as directed (15 mL every six hours). Do not exceed four doses within 24 hours. Children ages four to six may take Children's NyQuil if prescribed by a doctor. Children under four years old should not take Children's NyQuil.

Q: Can I take NyQuil while pregnant or breast-feeding?

A: If you are pregnant or breast-feeding, check with your health professional before taking NyQuil. He or she can determine if it is safe for you.

Q: What is the active ingredient in NyQuil?

A: NyQuil has three active ingredients: acetaminophen (a pain reliever/fever reducer), dextromethorphan HBr (a cough suppressant) and doxylamine succinate (an antihistamine).

Q: Does NyQuil expire?

A: Yes. Do not use NyQuil beyond the expiration date on the package.

Q: What are the side effects of NyQuil?

A: NyQuil may cause marked drowsiness. It is important to avoid alcoholic drinks when taking NyQuil and be careful when driving a motor vehicle or operating machinery. In children, NyQuil may cause excitability.

Q: Will NyQuil make me sleepy?

A: Yes. NyQuil may cause marked drowsiness.

Q: What are the different types of NyQuil?

A: NyQuil comes as a liquid or gel caps. NyQuil relieves your sneezing, sore throat, headache, minor aches and pains, fever, runny nose, and cough, so you can get the rest you need. NyQuil SEVERE delivers maximum symptom-fighting ingredients to relieve your worst cold symptoms at night. NyQuil Cough Suppressant relieves your cough so you can get the sleep you need.

Q: What's the difference between NyQuil and NyQuil *SEVERE*?
A: NyQuil *SEVERE* delivers maximum symptom-fighting ingredients* to relieve your worst cold symptoms. Besides the active ingredients in NyQuil, NyQuil *SEVERE* contains 10 mg of phenylephrine HCl, a nasal decongestant.

*Among OTC cold & flu medicines

Q: Are there any warnings I should be aware of when taking NyQuil?

A: NyQuil contains acetaminophen. Severe liver damage may occur if you: take more than four doses of NyQuil within 24 hours, take NyQuil with other drugs containing acetaminophen, consume three or more alcoholic drinks every day while taking NyQuil. If you have a severe sore throat and it persists for more than two days and is accompanied or followed by fever, headache, rash, nausea, or vomiting, consult a doctor promptly. Be sure to read the label carefully, and use NyQuil as directed.

Learn more about the active ingredients in NyQuil and NyQuil *SEVERE*.

Q: Can I take NyQuil if I have high blood pressure?

A: In patients with hypertension, the use of certain medications may raise their blood pressure. Decongestants provide relief by narrowing blood vessels to reduce nasal stuffiness, but this can potentially affect other blood vessels, which may increase blood pressure. NyQuil™ HBP is free of decongestants for people with high blood pressure. To learn more, click here.

3.24 Fitness For Duty Call-Out Process

NOTE: The consumption of alcohol during the 5-hour abstinence period may not by itself preclude the supervisor from using individuals who are needed to respond to an emergency.

NOTE: The Fitness For Duty Call-Out process is utilized in the event that an extraordinary, unanticipated need arises where a particular individual's skill or knowledge mandates that station supervisors request the individual to work. Call-Outs usually occur outside of normal working hours, which places the primary responsibility upon the supervisor to determine if the individual should report to and perform work.

All Personnel

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 counter medications) that may affect ability to perform normal duties.
- Whether alcohol has been consumed within the mandatory five-hour abstinence period.

Supervision

3.24.2 **IF** an employee being called in for unscheduled work reports mental, physical, or emotional factors, stress, impairment from any cause, or other factors that could affect FFD **AND** the employee is instructed to report to work, **THEN PERFORM** the following:

a. **CONDUCT** an evaluation to determine if the individual is impaired.

b. **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.

c. **DOCUMENT** the decision on the NIX FFD Evaluation Form and **SUBMIT** to the FFDA as soon as practical following the event.

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.

3.24.4 **IF** the individual has consumed alcohol within the previous five hours, but feels capable of performing the work, **THEN PERFORM** the following:

a. **REFER** the individual to the FFD program personnel, or if unavailable, Security Supervision, upon arrival.

FFDA

b. **CONDUCT** a breath alcohol analysis to determine the individual's fitness for duty status.

Supervision

c. **IF** the results of the breath alcohol analysis indicate that the individual is fit to safely and competently perform duties, **THEN ASSIGN** the individual to duties.

Nuclear Fleet

Administrative Procedure

Title: Shutdown Safety Assessment Checklist

Procedure Number	Revision Number	Effective Date and Approvals On File
OU-M2-201	22	

Revision Summary

Revised to credit the SBO if TTB is > 30 minutes with a qualifier of a 60 minute target. This will allow for a more manageable RCS temperature band such that TTB < 60 minutes would not drive a SDR RED condition.

- Attachment 8, Power Availability Requirements, item 1.b., added note of March 2015 time validation of SBO alignment, changed 60 minutes to 30 minutes, added for TTB > 30 minutes and < 60 minutes
- Attachment 1, SSA Checklist (730867(Apr 2017)), revised Section 7, Power Availability, On-Site Power Source SBO Diesel via 24E and Required Equipment; added footnote for Unit 3 operator to support SBO operation per EOP 35 GA-27 if TTB < 60 minutes

Functional Area Manager: Manager Nuclear Operations

INFORMATION USE

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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.

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

3.2 Heatup Calculations

Licensed Operator/STA

3.2.1 **IF** a Time to Core Boil determination is desired, **THEN PERFORM** the following:

a. **REFER** to Attachment 2, Millstone Unit 2 RCS Heatup Calculations, and **FOLLOW** instructions.

b. **RECORD** results on Attachment 2.

3.2.2 **IF** a time to 200°F determination is desired, **THEN PERFORM** the following:

a. **REFER** to Attachment 2, Millstone Unit 2 RCS Heatup Calculations, and **FOLLOW** instructions.

b. **RECORD** results on Attachment 2.

3.2.3 **IF** a time for an uncontrolled 10°F heatup determination is desired, **THEN PERFORM** the following:

a. **REFER** to Attachment 2, Millstone Unit 2 Heatup Calculations, and **FOLLOW** instructions.

b. **RECORD** results on Attachment 2.

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.

3.3 Shutdown Safety Assessment (SSA) Checklist Preparation

Licensed Operator/STA

3.3.1 Using the following detailed information for each KSF, **COMPLETE** Attachment 1:

a. Section 1

1. **CIRCLE** appropriate Protected Train.
2. **CHECK** box if single train exception in effect.
3. **RECORD** date and time assessment is being performed.
4. **RECORD** date and time of reactor shutdown.
5. **INDICATE** if assessment is being performed for Actual or Predicted Conditions.
6. **CALCULATE** and **RECORD** number of Days Shutdown between the date/time (Actual or Predicted) and shutdown date/time.
7. **ENTER** a brief description of the reason assessment is being performed.

ATTACHMENT 3
Millstone Unit 2 SFP Heatup Calculations

(Page 1 of 3)

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.

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).
3. Record SFP Heatup Rate from Table 1 based on SFP Offload Condition.
4. Calculate and record SFP Time to 150ºF
5. Sign Performed by (STA or Licensed Operator).
6. Obtain Independent Check (SRO).

Calculation:

$$\text{SFP Time to 150°F} = \frac{150°F - \text{SFP Temperature}(°F)}{\text{SFP Heatup Rate}(°F/\text{hour})}$$

Date/Time	Time From Shutdown (Days)	SFP Temperature (°F)	SFP Heatup Rate (°F/hour)	SFP Time to 150°F	Performed by	Checked by

ATTACHMENT 3
Millstone Unit 2 SFP Heatup Calculations

(Page 2 of 3)

SFP Time to 200°F

Instructions:

1. Record time after reactor shutdown (in days), and current SFP temperature (ºF).
2. IF NO fresh fuel assemblies have been transferred to the SFP, using RE-G-16, determine the Time to 200°F and record SFP heatup Time to 200°F.
3. IF core reload is complete, using RE-G-16, determine the Time to 200°F and record SFP heatup Time to 200°F.
4. IF fresh fuel assemblies have been transferred to the SFP AND core reload is NOT complete, perform the following:
   a. Record SFP Heatup Rate from Table 1 based on SFP Offload Condition.
   b. Calculate and record SFP Time to 150ºF.
5. Sign Performed by (STA or Licensed Operator).
6. Obtain Independent Check (SRO).

Calculation:

$$\text{SFP Time to 200°F} = \frac{200°F - \text{SFP Temperature}(°F)}{\text{SFP Heatup Rate}(°F/\text{hour})}$$

Date/Time	Time From Shutdown (Days)	SFP Temperature (°F)	SFP Heatup Rate (°F/hour)	SFP Time to 200°F	Performed by	Checked by

ATTACHMENT 3
Millstone Unit 2 SFP Heatup Calculations
(Page 3 of 3)

Table 1

SFP Heatup Rates

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).

End-of-Cycle Core Offload[1]	
Time from Shutdown (days)	**SFP Heatup Rate (°F/hour)**
6	21.2
7	20.1
8	19.1
9	18.4
10	17.7
15	15.4
20	14.0
25	13.0
30	12.3
40	11.1

Emergency Full Core Offload[2]	
Time from Shutdown (days)	**SFP Heatup Rate (°F/hour)**
5	25.8
6	24.6
7	22.8
8	22.2
9	21.6
10	20.4
15	18.6
25	16.2
50	13.2
90	11.4
130	10.2
180	9

(1) *End-of-Cycle (EOC) Core Offload* - Any core off load after reaching end of cycle conditions, typically associated with a scheduled refueling outage. For assessing SFP heatup, a full core off load begins when the first fuel bundle is transferred to the SFP and ends when fewer than 81 freshly discharged fuel bundles remain in the SFP.

(2) *Emergency Core Offload* - Any full core off load prior to reaching end of cycle conditions, typically associated with an unplanned shutdown or equipment malfunction. For assessing SFP heatup, a full core off load beings when the first fuel bundle is transferred to the SFP and ends when fewer than 81 freshly discharged fuel bundles remain in the SFP.

ATTACHMENT 4
Decay Heat Removal Requirements

(Page 1 of 7)

NOTE: At least two SW pumps from independent power supplies and two RBCCW pumps from independent power supplies must be available, since reliance on a single active component, to support redundant trains, is not acceptable for meeting defense in depth.

NOTE: A SDC train (including all required support systems) is available assuming it is either in service or can be placed in service or realigned prior to the calculated time to boil.

NOTE: In the event of a loss of SDC, containment spray will be aligned as a back up consistent with AOP 2572, Loss of Shutdown Cooling.

NOTE: All components listed may not be required as available or OPERABLE at all times.

NOTE: Additionally, dependent upon plant conditions, support systems or components required to support availability may not be limited to those listed. Refer to the associated procedure section to determine which components listed are required for the current conditions.

NOTE: In MODEs 5 and 6, if RCS is vented and Refuel Pool is less than full (35'6"), an Operator must be stationed in the vicinity of the SW/Fire Water Supply valves to the EDG to be ready to take action to shift cooling water to Fire Water if directed by the SM.

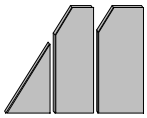
RCS DECAY HEAT REMOVAL REQUIREMENTS

1. For RCS Decay Heat Removal (except RIO), **MAINTAIN** at least one of the following:
   a. Two trains of SDC are available.
      1) **IF** SDC is used for RCS decay heat removal, **THEN ENSURE** all the following systems and components are available for associated train:
         - Flowpath from RCS to available LPSI pump
         - The in-service SDC train's emergency AC bus is energized from an off-site power source.
         - The associated 125 VDC bus is energized from its respective battery and at least one (1) associated battery charger OR the associated 125 VDC bus is energized (cross-tied) from the opposite train's 125 VDC bus.
         - An RBCCW pump, powered from the same Train as the SDC pump, and RBCCW heat exchanger capable of cooling the associated SDC heat exchanger
         - A SW pump, powered from the same Train as the SDC pump, and capable of supplying cooling water to the associated RBCCW heat exchanger

Form Approval

Approval Date	Effective Date
7/2/2015	9/15/2015

Form Cover Sheet



Generic Information

Form Title	Rev. No.
CS System Valve Alignment Verification, Facility 1	001

Reference Procedure	Applicable TS/TRM	Applicability (TS/TRM)	Frequency
OP 2309	N/A	N/A	N/A

Specific Information

Schedule Start Date		AWO Number	Mntc Restoration ☐ Yes ☐ No
Performance Modes: N/A	Prerequisites Completed (Initials)	Precautions Noted (Initials)	
Test Authorized By		Date	Partial Surveillance ☐ Yes ☐ No
Performed By		Date	
Accepted By		Date	Acceptance Criteria Satisfied ☐ Yes ☐ No
Approved By (Department Head or Designee)		Date	

Comments

CR# _____

CS System Valve Alignment Verification, Facility 1

NOTE

Common ECCS suction valves on Facility 1 are aligned by OP 2307−003.

Notes

1. Pipe downstream is required to be capped or blank flanged.

CS System Valve Alignment Verification, Facility 1

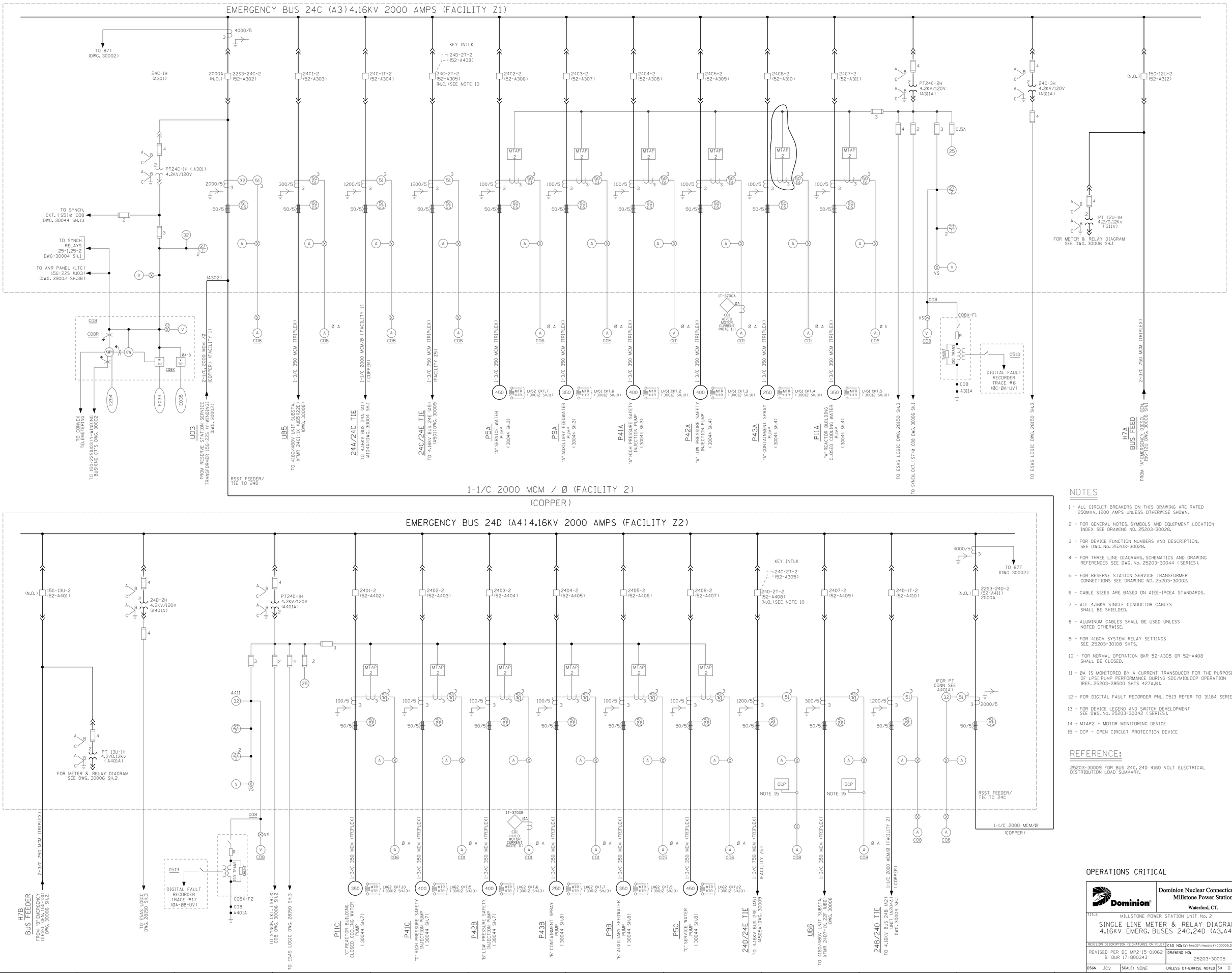
VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
Control Room								
SI−663	MO	SDC HX A X−TIE	CL					
CS−4.1A	MO	CS HDR A ISOL	CL					
−5′ West Piping Penetration Area								
2−CS−051	H	'A' CS HEADER TO SIS TEST HEADER	CL					
2−CS−4A	H	'A' CS HEADER ISOLATION	LO					
2−CS−103	H	'A' CS HEADER TEST CONNECTION	SC					
2−CS−053	H	'A' CS HEADER UPSTREAM VENT	CL					
2−CS−049B	H	'A' CS HEADER UPSTREAM DRAIN	LC					
2−CS−049A	H	'A' CS HEADER DOWNSTREAM DRAIN	LC					
2−CS−049C	H	'A' CS HEADER DOWNSTREAM VENT	LC	Note 1.				
−25′ 6″ General Area								
2−SI−459	H	SIS TEST HEADER DOWNSTREAM ISOLATION	LC					
"A" Safeguards Room								
2−CS−1A	H	'A' CS PUMP SUCTION	LO					
2−CS−032	H	'A' CS PUMP SUCTION PI−3055 ISOLATION	OP					
2−CS−36A	H	'A' CS PUMP CASING DRAIN TO CLRW	CL					
2−CS−36B	H	'A' CS PUMP CASING DRAIN TO ARW	CL					
2−SI−455	H	'A' CS PUMP DISCHARGE PT−303X ISOLATION	OP					
2−CS−023A	H	'A' CS PUMP CASING VENT	CL					
2−CS−107	H	'A' CS PUMP SEAL COOLER INLET	OP					

CS System Valve Alignment Verification, Facility 1

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
"A" Safeguards Room								
2–CS–106	H	'A' CS PUMP SEAL COOLER OUTLET	OP					
2–CS–3A	H	'A' CS PUMP DISCHARGE	LO					
2–CS–091	H	'A' SDC HEAT EXCHANGER INLET HEADER VENT	CL					
2–SI–452	H	LPSI DISCHARGE TO 'A' SDC HEAT EXCHANGER	LC					
2–CS–008A	H	'A' SDC HEAT EXCHANGER TUBE DRAIN TO CRW	CL					
2–CS–071	H	'A' SDC HEAT EXCHANGER TUBE DRAIN TO ARW	CL					
2–CS–073	H	'A' SDC HEAT EXCHANGER TUBE VENT	CL					
2–SI–456	H	'A' SDC HEAT EXCHANGER DISCHARGE TO SDC SYSTEM	LC					
2–SI–060	H	'A' SDC HEAT EXCHANGER DISCHARGE HEADER TO HPSI DRAIN	CL					
2–CS–047	H	'A' SDC HEAT EXCHANGER FT–3023 LOW ISOLATION	OP					
2–CS–048	H	'A' SDC HEAT EXCHANGER FT–3023 HIGH ISOLATION	OP					
2–SI–460	H	LPSI/CS TEST HEADER ISOLATION	LC					
2–SI–036	H	LPSI/CS TEST HEADER DRAIN	CL					
2–SI–037	H	LPSI/CS TEST HEADER VENT	CL					

CS System Valve Alignment Verification, Facility 1

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
"B" Safeguards Room								
2–CS–7A	H	'A' CS PUMP MINIMUM FLOW RECIRCULATION	LO					
2–SI–084	H	ESF PUMP'S MINIMUM FLOW RECIRCULATION HEADER SAMPLE	OP					
2–SI–066	H	ESF PUMP'S MINIMUM FLOW RECIRCULATION HEADER DRAIN	CL					
2–SI–070	H	'B' HPSI PUMP SUCTION ON 'A' HEADER VENT	CL					
Top of RWST								
2–CS–062	H	RWST RETURN HEADER VENT	SC					
Containment								
2–CS–066	H	'A' CONTAINMENT SPRAY HEADER ISOLATION	LO					
2–CS–110	H	'A' CONTAINMENT SPRAY HEADER DRAIN	LC	Note 1.				



NOTES

1 - ALL CIRCUIT BREAKERS ON THIS DRAWING ARE RATED 250MVA, 1200 AMPS UNLESS OTHERWISE SHOWN.

2 - FOR GENERAL NOTES, SYMBOLS AND EQUIPMENT LOCATION INDEX SEE DRAWING NO. 25203-30028.

3 - FOR DEVICE FUNCTION NUMBERS AND DESCRIPTION, SEE DWG. No. 25203-30028.

4 - FOR THREE LINE DIAGRAMS, SCHEMATICS AND DRAWING REFERENCES SEE DWG. No. 25203-30044 (SERIES).

5 - FOR RESERVE STATION SERVICE TRANSFORMER CONNECTIONS SEE DRAWING NO. 25203-30002.

6 - CABLE SIZES ARE BASED ON AIEE-IPCEA STANDARDS.

7 - ALL 4.16KV SINGLE CONDUCTOR CABLES SHALL BE SHIELDED.

8 - ALUMINUM CABLES SHALL BE USED UNLESS NOTED OTHERWISE.

9 - FOR 4160V SYSTEM RELAY SETTINGS SEE 25203-30108 SHTS.

10 - FOR NORMAL OPERATION BKR 52-A305 OR 52-A408 SHALL BE CLOSED.

11 - ØA IS MONITORED BY A CURRENT TRANSDUCER FOR THE PURPOSE OF LPSI PUMP PERFORMANCE DURING SDC/MIDLOOP OPERATION (REF. 25203-28500 SHTS 427A,B).

12 - FOR DIGITAL FAULT RECORDER PNL. C513 REFER TO 31184 SERIES.

13 - FOR DEVICE LEGEND AND SWITCH DEVELOPMENT SEE DWG. No. 25203-30042 (SERIES).

14 - MTAP2 - MOTOR MONITORING DEVICE

15 - OCP - OPEN CIRCUIT PROTECTION DEVICE

REFERENCE:

25203-30009 FOR BUS 24C, 24D 4160 VOLT ELECTRICAL DISTRIBUTION LOAD SUMMARY.

OPERATIONS CRITICAL

Dominion

Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Waterford, CT.

TITLE: MILLSTONE POWER STATION UNIT No. 2
SINGLE LINE METER & RELAY DIAGRAM
4.16KV EMERG. BUSES 24C,24D (A3,A4)

REVISION DESCRIPTION (SIGNATURES ON FILE)	CAD NO: C:\fms32\tmpplot\C30005.DGN	
REVISED PER DC MP2-15-01062 & DUR 17-800343	DRAWING NO: 25203-30005	REV 25
DSGN JCV	SCALE: NONE UNLESS OTHERWISE NOTED	SH 0

Nuclear Fleet

Administrative Procedure

Title: Equipment Clearance

Procedure Number	Revision Number	Effective Date and Approvals On File
OP-AA-200	30	

Revision Summary

REVISION 30: Administrative Correction

- Converted Attachment 6, Temporary Lift Request to a fillable form.

Made the following changes in accordance with operations provided markup:

- Deleted “A qualified Operator shall:” before Step 3.2.2.a.
- Added Step 3.2.2.a and associated note.
- Added Step 3.2.2.g, 3.2.2.k, and 3.2.2.l.
- Added “including live electrical sources” to Step 3.2.2.s.
- Added reference to TRM in Step 3.2.2.c.
- Added 5th bullet to Step 3.3.7.b.
- Re-wrote the 9th bullet of Step 3.3.7.b.
- Added Reference 5.4.34.
- Deleted Steps, 2, 3, and 11 from Attachment 12.
- Added Attachment 16.

Functional Area Manager: Manager Nuclear Operations

INFORMATION USE

e. **IF** tagging boundary isolates a BDB plant connection, **THEN REFER** to CM-AA-BDB-102, Beyond Design Basis FLEX Equipment Unavailability Tracking, to notify the SITE FLEX Program Owner or the Engineering Manager on Call (EMOC) to determine the effect on equipment availability.

f. **REVIEW** the request carefully using controlled documents. **IF NO** controlled documents exist for the item to be tagged, **THEN** one of the following methods should be used:

Craft/ Supervisor

1. **Method 1**
   - **USE** available references
   - Craft walkdown is required
   - **DOCUMENT** the walkdown on a Tagout request form
   - Two craft persons shall sign the Tagout request, to document verification of the boundaries
   - **DOCUMENT** reliance on the walkdown on the Tagging Record

Qualified Operator

2. **Method 2**

   This method verifies that the power supply identified on the Tagout will electrically isolate power from the component to be worked.

Craft/ Supervisor

   - A supervisor (usually from the tagging office) will accompany the craft involved to the field.
   - With power supply closed, **ENSURE** voltage to the component to be worked.
   - While the voltmeter is still indicating voltage to the component to be worked, **OPEN** the electrical disconnecting device.
   - **ENSURE** voltage goes to “zero”
   - **ENSURE** all phases to ground indicate “no” voltage

g. **CHECK** any drawings used for pending changes and **REVIEW** any pending changes identified.

Qualified Operator

h. **ENSURE** the boundaries for the work are comparable to those submitted by the requesting organization.

i. **ESTABLISH** the tagging sequence. **WHEN** procedural guidance exists, **THEN** the procedure takes precedence over the normal sequence of isolation. The normal sequence of isolation is as follows:

   - **POSITION** control switch
   - **REMOVE** power from component(s)
   - **ISOLATE** component/system from high pressure side to low pressure side
   - **OPEN** drain valve(s)
   - **OPEN** vent valve(s)

w. The walkdown is **NOT** required to be performed for the following:

- Outage Tagouts
- **IF** the component has been recently tagged
- At the discretion of the OMA or designee

3.2.3 **Approval of a Tagout**

Manager Nuclear Operations

a. **DETERMINE** the qualification level and number of approvals required to approve a Tagout. (**SEE** Qualification Levels and Reviews Process for Writing and Approving Danger Tagouts (ATTACHMENT 9))

Tagout Preparer and Approver

b. **ENSURE** the person approving the Tagout is different than the preparer.

NOTE: Reviewer shall be independent from preparer.

SRO or designee

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.
- **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.

d. **ENSURE** all required supporting documentation is included in the Tagout package.

e. **SIGN** for Reviewed By and **RETURN** to Supervisor for review.

f. **IF** applicable, **THEN HAVE** a controlled copy of the work package for review of the Tagout.

g. **UTILIZE** appropriate human performance tools (checklists) in conjunction with the approval process.

JOB PERFORMANCE MEASURE APPROVAL SHEET

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

JPM Number: A2R Revision: 0/1

Initiated:

John W. Riley – Signature on File	8/10/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/2018
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
08/10/18 jwr	Incorporated NRC comments from NRC Prep week. Changed revision number on OP-AA-200.	0/1

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A2R Revision: 0/1

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 30.
- OP 2309X11, "A" CS Pump Maintenance. Revision 001, effective 12/14/17.
- OP 2309-001, "CS System Valve Alignment Verification, Facility 1, R001, effective 9/15/15
- 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 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: A2R Revision : 0/1

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 30.
- OP 2309X11, "A" CS Pump Maintenance. Revision 001, effective 12/14/17.
- OP 2309-001, "CS System Valve Alignment Verification, Facility 1, R001, effective 9/15/15
- 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: 0/1

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: 0/1

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: 0/1

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: 0/1

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 30.
- OP 2309X11, "A" CS Pump Maintenance. Revision 001, effective 12/14/17.
- OP 2309-001, "CS System Valve Alignment Verification, Facility 1, R001, effective 9/15/15
- 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)).

Tagout Tag List — *Dominion*

Tagout Group: 2R25 — *Millstone Power Station*

Tagout: 2309X00-0100 *Answer Key* *Answer Key* *5/31/2018 09:19:23*

Tag Type Serial No.	Equipment *Equipment Description *Equipment Location	Ver Req	Pla Seq	Placement Configuration	Place. 1st Verif Date/Time	Place. 2nd Verif Date/Time	Ver Req	Rest. Seq	Rest. Config. *As Left (If Diff.)	Rest. 1st Verif Date/Time	Rest. 2nd Verif Date/Time
Yellow	P43A-HS *HANDSWITCH – CS PP A – P43A *2_CB _03606_CNTRL RM_C01	IV	1	* BREAKER RACKED DOWN			IV				
RED	A310 *P43A CONTAINMENT SPRAY PUMP (24C6-2) * 2_TB _3106_LWR SWGR	IV	2	RACKED DOWN			CV		RACKED UP		
RED	2-CS-3A * “A” CS PUMP DISCHARGE * 2_AB _ -4506_A ESF RM DISCH “A” CS PUMP	IV	3	CLOSED			IV		LOCKED OPEN		
RED	2-CS-1A * “A” CS PUMP SUCTION * 2_AB _ -4506_A ESF RM ABOVE “A” CS PUMP	IV	4	CLOSED			IV		LOCKED OPEN		
RED	2-CS-7A * “A” CS PUMP MINIMUM FLOW RECIRC * 2_AB -4506_B ESF RM BEHIND “B” SDC HX	IV	4	CLOSED			IV		LOCKED OPEN		
RED	2-CS-36A * “A” CS PUMP CASING DRAIN TO CLRW * 2_AB -4506 A ESF RM UNDER “A” CS PP	IV	4	CLOSED			IV		CLOSED		
RED	2-CS-36B * “A” CS PUMP CASING DRAIN TO ARW * 2_AB -4506 A ESF RM UNDER “A” CS PP	IV	5	OPEN			IV		CLOSED		

Tagout Tag List — *Dominion*

Tagout Group: 2R25 — *Millstone Power Station*

Tagout: 2309X00-0100 **Answer Key** **Answer Key** *5/31/2018 09:19:23*

Tag Type - - - - - - - - Serial No.	Equipment - *Equipment Description *Equipment Location	Ver Req	Pla Seq	Placement Configuration - - - - - - - - - - - - - - - - -	Place. 1st Verif Date/Time	Place. 2nd Verif Date/Time	Ver Req	Rest. Seq	Rest. Config. *As Left (If Diff.) - - - - - - - - - - - - -	Rest. 1st Verif Date/Time	Rest. 2nd Verif Date/Time
RED - - - - - - - -	2-CS-023A - * "A" CS PUMP CASING VENT * 2_AB _ -4506_ A ESF RM NEAR THE PUMP	IV	6	OPEN - - - - - - - - - - - - - - - - -			IV		CLOSED - - - - - - - - - - - - -		
No Tag - - - - - - - -	2-CS-032 - * "A" CS PUMP SUCTION INSTRUMENT STOP PI- 3055 * 2_AB _ -4506_ A ESF RM NEAR THE PUMP	IV	7	OPEN - - - - - - - - - - - - - - - - -			IV		OPEN - - - - - - - - - - - - -		

NOTES:

1. FOR NOTES SYMBOLS AND UNIT #2 ABBREVIATIONS SEE 26001 SH. 1, 2, & 3. FOR ALL OTHER ABBREVIATIONS SEE ANSI STANDARD Y1.1
2. PORTABLE FLOW COMPUTER CONNECTED TO THE TRANSDUCER DURING PERIODIC TESTING.
3. PORTIONS OF LINE HCD-3(S.I. TEST HEADER) WAS UPGRADED TO SEISMIC CLASS 1 PER PDCR 2-222-76, THE UPGRADED PORTIONS OF THE LINE TO SEISMIC CLASS 1 ARE NOW REFLECTED AS HCD-3(C)1
4. DELETED.
5. VALVES 2-CS-3A, & 3B ARE BDB FLEX ALTERNATE RCS MODES 5 & 6/ CONTAINMENT SPRAY CONNECTION TIE-IN POINTS. REFERENCE DC MP2-13-01131.

CTMT SPRAY HEADER

S.I. & CTMT SPRAY TEST LINE

SHUTDOWN COOLING HT. EXCH.

SHUTDOWN COOLING HT. EXCH.

CONTAINMENT SPRAY PUMPS

L.P. SAFETY INJECTION PUMPS (SHUTDOWN COOLING)

FSAR FIGURE

OPERATIONS CRITICAL

CHANGES MADE TO THIS P&ID MUST ALSO BE REFLECTED ON THE INSERVICE INSPECTION PROGRAM DRAWING 25203-26700 SH. 11

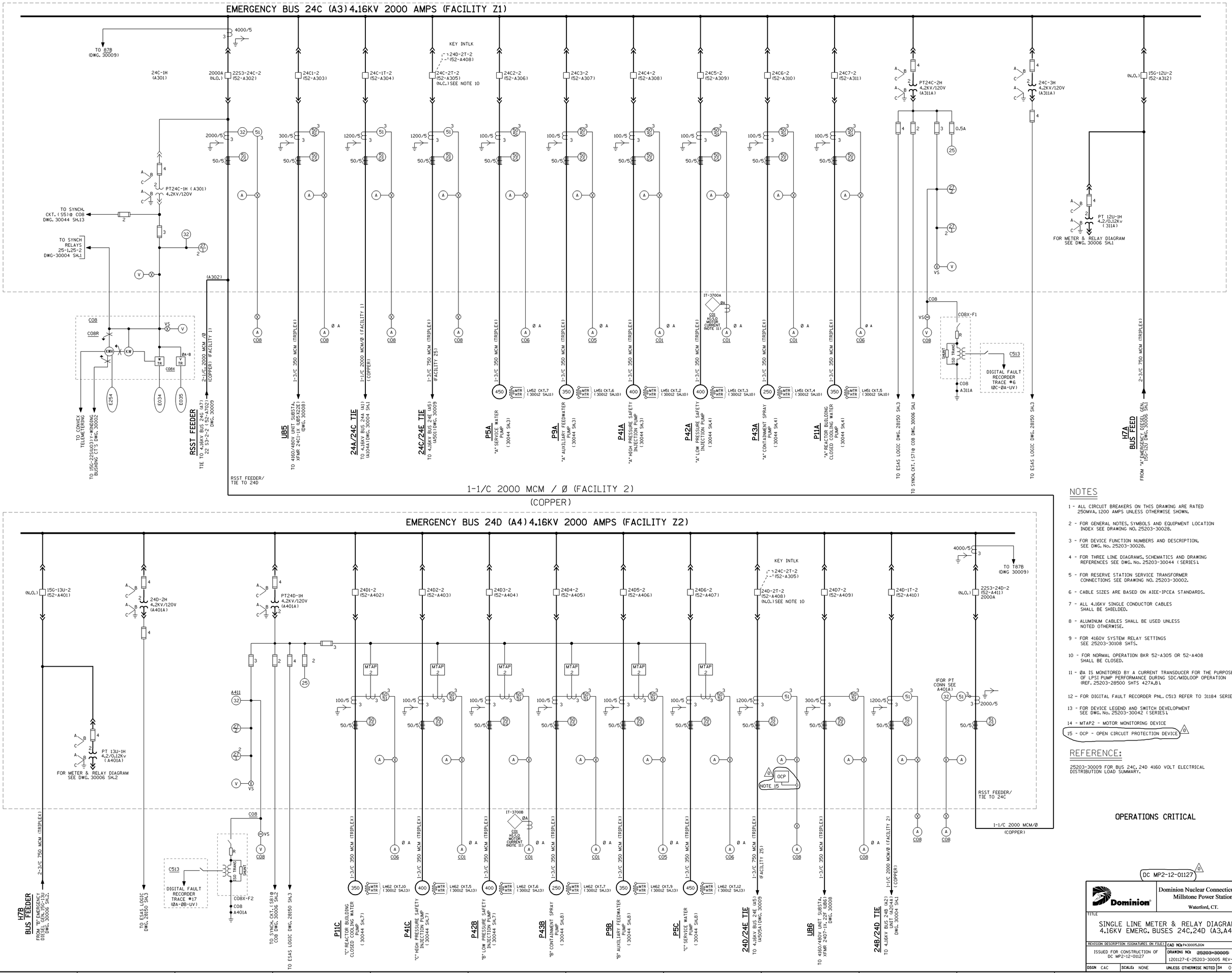
Dominion®

Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Waterford, CT.

TITLE

PIPING & INSTRUMENT DIAGRAM
L.P. SAFETY INJECTION SYSTEM

REVISION DESCRIPTION (SIGNATURES ON FILE)	CAD NO: C:\fms32\tmpplot\C260151.DGN	
REVISED PER MSDUR 17-000128 & DUR 17-800268	DRAWING NO: 25203-26015	REV 50
DSGN EAL	SCALE: NONE	UNLESS OTHERWISE NOTED SH 1



NOTES

1 - ALL CIRCUIT BREAKERS ON THIS DRAWING ARE RATED 250MVA, 1200 AMPS UNLESS OTHERWISE SHOWN.

2 - FOR GENERAL NOTES, SYMBOLS AND EQUIPMENT LOCATION INDEX SEE DRAWING NO. 25203-30028.

3 - FOR DEVICE FUNCTION NUMBERS AND DESCRIPTION, SEE DWG. No. 25203-30028.

4 - FOR THREE LINE DIAGRAMS, SCHEMATICS AND DRAWING REFERENCES SEE DWG. No. 25203-30044 (SERIES).

5 - FOR RESERVE STATION SERVICE TRANSFORMER CONNECTIONS SEE DRAWING NO. 25203-30002.

6 - CABLE SIZES ARE BASED ON AIEE-IPCEA STANDARDS.

7 - ALL 4.16KV SINGLE CONDUCTOR CABLES SHALL BE SHIELDED.

8 - ALUMINUM CABLES SHALL BE USED UNLESS NOTED OTHERWISE.

9 - FOR 416OV SYSTEM RELAY SETTINGS SEE 25203-30108 SHTS.

10 - FOR NORMAL OPERATION BKR 52-A305 OR 52-A408 SHALL BE CLOSED.

11 - ØA IS MONITORED BY A CURRENT TRANSDUCER FOR THE PURPOSE OF LPSI PUMP PERFORMANCE DURING SDC/MIDLOOP OPERATION (REF. 25203-28500 SHTS 427A,B).

12 - FOR DIGITAL FAULT RECORDER PNL. C513 REFER TO 31184 SERIES.

13 - FOR DEVICE LEGEND AND SWITCH DEVELOPMENT SEE DWG. No. 25203-30042 (SERIES).

14 - MTAP2 - MOTOR MONITORING DEVICE

15 - OCP - OPEN CIRCUIT PROTECTION DEVICE 0

REFERENCE:

25203-30009 FOR BUS 24C, 24D 4160 VOLT ELECTRICAL DISTRIBUTION LOAD SUMMARY.

OPERATIONS CRITICAL

DC MP2-12-01127 0

Dominion

Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Waterford, CT.

TITLE

SINGLE LINE METER & RELAY DIAGRAM
4.16KV EMERG. BUSES 24C,24D (A3,A4)

REVISION DESCRIPTION (SIGNATURES ON FILE)	CAD NO: PA30005.DGN	
ISSUED FOR CONSTRUCTION OF DC MP2-12-01127	DRAWING NO: ~~25203-30005~~ 1201127-E-25203-30005 REV-0	REV ~~-~~ 0
DSGN CAC	SCALE: NONE	UNLESS OTHERWISE NOTED SH 0

4. INSTRUCTIONS

4.1 **Drain "A" CS Pump**

NOTE

This section is used to isolate and drain the "A" Containment Spray pump casing in preparation for maintenance and is applicable in all modes.

4.1.1 Refer To OP 2264, "Conduct of Outages," and PERFORM a Shutdown Safety Assessment if applicable.

4.1.2 IF in MODEs 1, 2 or 3 ($\geq$1,750 psia), ENSURE entry into TSAS 3.6.2.1, "Containment Spray and Cooling Systems."

4.1.3 ENSURE breaker A310 "P43A CONTAINMENT SPRAY PUMP, 24C6–2," racked down and tagged (Lower 4160V SWGR Room).

4.1.4 ENSURE the following boundary valves are closed and tagged ("A" Safeguards Room):

- 2–CS–3A, "'A' CS PUMP DISCHARGE"
- 2–CS–1A, "'A' CS PUMP SUCTION"
- 2–CS–36A, "'A' CS PUMP CASING DRAIN TO CLRW"

4.1.5 ENSURE 2–CS–7A, "'A' CS PUMP MINIMUM FLOW RECIRC," closed and tagged ("B" Safeguards Room).

4.1.6 ENSURE proper FME requirements are observed for any open vent and drain valves.

STOP **W A R N I N G** STOP

Failure to properly secure vent and drain tubing can cause radiological spills and personnel hazards.

4.1.7 ATTACH tubing to 2–CS–023A, "'A' CS PUMP CASING VENT," and DIRECT to "A" Safeguards Room sump or floor drain.

4.1.8 ATTACH tubing to 2–CS–036B, "'A' CS PUMP CASING DRAIN TO ARW," and DIRECT to "A" Safeguards Room sump or floor drain.

4.1.9 ENSURE all vent and drain tubing are properly secured.

CAUTION

1. Operator judgement should be used to control the drain rate so as not to exceed the capability of the drain system.
2. Proper FME requirements **must** be observed for all open vent and drain valves.

4.1.10 THROTTLE open 2–CS–036B, "'A' CS PUMP CASING DRAIN TO ARW."

4.1.11 OPEN 2–CS–023A, "'A' CS PUMP CASING VENT."

4.1.12 WHEN draining is complete, POSITION and TAG vent and drain valves as directed by tagging request.

4.1.13 ENSURE Shift Turnover Log is updated with system status.

– End of Section 4.1 –

Tagout Tag List *Dominion*

Tagout Group: 2R25 *Millstone Power Station*

Tagout: 2309X00-0100 *STUDENT COPY* *STUDENT COPY* *5/31/2018 09:19:23*

Tag Type --- Serial No.	Equipment --- *Equipment Description *Equipment Location	Ver Req	Pla Seq	Placement Configuration ---	Place. 1st Verif Date/Time	Place. 2nd Verif Date/Time	Ver Req	Rest. Seq	Rest. Config. *As Left (If Diff.) ---	Rest. 1st Verif Date/Time	Rest. 2nd Verif Date/Time
RED ---	A310 --- *P43A CONTAINMENT SPRAY PUMP (24C6-2) * 2_TB _3106_LWR SWGR	IV	1	RACKED DOWN ---			CV		RACKED UP ---		
Yellow ---	P43A-HS --- *HANDSWITCH - CS PP A – P43A * 2_CB _03606_CNTRL RM_C01	IV	2	--- * BREAKER RACKED DOWN			IV		---		
RED ---	2-CS-3A --- * “A” CS PUMP DISCHARGE * 2_AB _ -4506_A ESF RM DISCH “A” CS PUMP	IV	3	CLOSED ---			IV		LOCKED OPEN ---		
RED ---	2-CS-1A --- * “A” CS PUMP SUCTION * 2_AB _ -4506_A ESF RM ABOVE “A” CS PUMP	IV	4	CLOSED ---			IV		LOCKED OPEN ---		
RED ---	2-CS-7A --- * “A” CS PUMP MINIMUM FLOW RECIRC * 2_AB -4506_B ESF RM BEHIND “B” SDC HX	IV	4	CLOSED ---			IV		LOCKED OPEN ---		
RED ---	2-CS-36A --- * “A” CS PUMP CASING DRAIN TO CLRW * 2_AB -4506 A ESF RM UNDER “A” CS PP	IV	4	OPEN ---			IV		CLOSED ---		
RED ---	2-CS-36B --- * “A” CS PUMP CASING DRAIN TO ARW * 2_AB -4506 A ESF RM UNDER “A” CS PP	IV	5	CLOSED ---			IV		CLOSED ---		

Tagout Tag List *Dominion*

Tagout Group: 2R25 *Millstone Power Station*

Tagout: 2309X00-0100 *STUDENT COPY* *STUDENT COPY* *5/31/2018 09:19:23*

Tag Type - - - - - - - - Serial No.	Equipment - *Equipment Description *Equipment Location	Ver Req	Pla Seq	Placement Configuration - - - - - - - - - - - - - - - - -	Place. 1st Verif Date/Time	Place. 2nd Verif Date/Time	Ver Req	Rest. Seq	Rest. Config. *As Left (If Diff.) - - - - - - - - - - - - -	Rest. 1st Verif Date/Time	Rest. 2nd Verif Date/Time
RED - - - - - - - -	2-CS-023A - * “A” CS PUMP CASING VENT * 2_AB _ -4506_ A ESF RM NEAR THE PUMP	IV	6	OPEN - - - - - - - - - - - - - - - - -			IV		CLOSED - - - - - - - - - - - - -		
No Tag - - - - - - - -	2-CS-032 - * “A” CS PUMP SUCTION INSTRUMENT STOP PI- 3055 * 2_AB _ -4506_ A ESF RM NEAR THE PUMP	IV	7	OPEN - - - - - - - - - - - - - - - - -			IV		OPEN - - - - - - - - - - - - -		

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Review a Power Ascension Plan

JPM Number: A2S Revision: 0/1

Initiated:

John W. Riley – Signature on File	8/13/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/2018
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
08/13/2018 jwr	Incorporated minor NRC comments from prep week. Changed revision number and effective date of referenced procedure.	0/1

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A2S Revision: 0/1

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 040, Effective 6/15/2018

General References: OP 2204, Load Changes, R 040, Effective 6/15/2018

***** 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 : 0/1

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 amount of time, per the maximum rate(s), 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: A2S Revision: 0/1

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". Provide a calculator.			
	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: 0/1

Task Title: Review a Power Ascension Plan

S T E P # 3	Performance: Determine the maximum rate(s) of change in power level. **Maximum Rate of Power Change (Note 1)** <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	Standard: 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,**	Critical: Y ☒ N ☐ Y ☒ N ☐	Grade: S ☐ U ☐ S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A2S Revision: 0/1

Task Title: Review a Power Ascension Plan

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

Determine the amount of time, per the maximum rate(s), required to achieve 100% power.

<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

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

Acceptable 1.16 to 1.5 hours

<u>80 – 100%</u>

Maximum Rate 6% every hour = 3.33 hours

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

Acceptable 3.33 to 3.5 hours

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

Acceptable 4.49 to 5.0 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: 0/1

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: 0/1

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 amount of time, per the maximum rate(s), required to achieve 100% power.

  _____

MILLSTONE POWER STATION

GENERAL OPERATING PROCEDURE

Load Changes

OP 2204

Rev. 040

Multiple Level of Use

Attachments 14, 15 and 16, in this procedure are *not* **R**eference Level of Use and may be used as **I**nformation Level of Use.

STOP THINK ACT REVIEW

Approval Date: 6/14/18

Effective Date: 6/15/18

Level of Use
Reference

4.1.4 IF *both* of the following conditions are *not* met, ENSURE an additional operator is assigned for feedwater control:

- Both SGFPs are in service
- Both Heater Drain Pumps are in service

4.1.5 ENSURE the following conditions exist:

- One Condensate Pump is operating
- One Condensate pump is in standby
- One SGFP is operating
- IF possible, Regulating Group 7 CEAs have been positioned above the LTSSIL of 135 steps, prior to exceeding 20% power (minimizes cumulative CEA insertion time)

4.1.6 Refer To OP 2208 (Att), "Precautions and Limitations on Reactivity Predictive Tools," for Reactivity Calculator Program, Reactivity Thumb Rules and Reactivity Plans as provided by Reactor Engineering Department.

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."

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:

a. DETERMINE fuel condition category.

b. ENSURE the applicable fuel condition category is selected on the PPC, "Maximum Rate of Change of Power" display.

c. MAINTAIN ramp rate within specified limits.

Attachment 7
Maximum Rate of Change of Power

(Sheet 1 of 1)

Fuel Condition Category	Category Definition	Applicable Range of Power Level	Maximum Rate of Power Change (*Note 1*)
Major Shutdown or Refueling	Reactor shutdown (zero power), greater than 45 days OR a shutdown which involves handling of fuel assemblies in reactor core	50 to 90% of RATED THERMAL POWER	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*)
		90 to 100% of RATED THERMAL POWER	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*)
Minor Shutdown	Reactor shutdown (zero power), less than or equal to 45 days	60 to 90% of RATED THERMAL POWER	15% every hour
		90 to 100% of RATED THERMAL POWER	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*)
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	80 to 100% of RATED THERMAL POWER	6% every hour
Extended Operation at Reduced Power	Power level less than 70% of RATED THERMAL POWER for more than 30 days of power operation	50 to 90% of RATED THERMAL POWER	Target 4% every hour, but less than 13% in 3 hours (*Note 3*) until 72 hours of operation at greater than 70% power has been attained (*Note 2*)
		90 to 100% of RATED THERMAL POWER	Target 3% every hour, but less than 10% in 3 hours (*Note 4*) until 72 hours of operation at greater than 70% power has been attained (*Note 2*)
Operation with Failed Fuel	Reactor Engineer has determined that there are failed fuel rods which require ramp rate restrictions	40 to 80% of RATED THERMAL POWER	4% every hour (*Note 2*)
		80 to 100% of RATED THERMAL POWER	3% every hour (*Note 2*)

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

Note 2: CEA withdrawal should be limited to 4 steps every hour for applicable power levels. There are *no* CEA restrictions below the applicable power levels specified. CEAs may be withdrawn as required for ASI control as specified in OP 2393, "Core Power Distribution Monitoring and Control."

Note 3: Maximum Rate of Power Increase in 5% per hour.

Note 4: Maximum Rate of Power Increase is 3% per 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

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

c. CALCULATE discharge flow rate (gpm) as follows and RECORD:

Calculates last discharge flow rate when discharge was stopped.

$\text{Flow rate (gpm)} = \frac{[\text{previous level (\%) - current level (\%)}] \times 320 \text{ gallons/\%}}{\text{Time interval between recording levels (minutes)}}$</td><td>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.

$\text{Flow rate (gpm)} = \frac{[26\ \% - 13\ \%] \times 320 \text{ gallons/\%}}{35 \text{ minutes}} = 119 \text{ gpm}$</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="3">Cue:</td></tr>
<tr><td colspan="3">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.</td></tr>
</table>

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.

EXAM CONFIDENTIAL

ANSWER KEY

Attachment 2
Clean Radioactive Liquid Waste Discharge With Inoperable Flow Recorder

(Sheet 1 of 1)

Date: Today

1. RECORD data at least once every hour:

   a. RECORD time and previous level.

   b. RECORD current CWMT level indication (C–63).

   c. CALCULATE discharge flow rate (gpm) as follows and RECORD:

$$\text{Flow rate (gpm)} = \frac{[\text{Previous level (\%)} - \text{Current level (\%)}] \times 320 \text{ gallons/\%}}{\text{Time interval between recording levels (minutes)}}$$

$\frac{(26-13)\times 320}{35 \text{ min}} = 118.9$

Time	Previous Level	Current Level	Flowrate
1319		82%	
1330	82%	77%	145 gpm
1400	77%	64%	139 gpm
1430	64%	51%	139 gpm
1500	51%	38%	139 gpm
1530	38%	26%	128 gpm
1605	26%	13%	119 gpm

ANSWER KEY

2. CALCULATE gallons discharged as follows and RECORD on SP 2617D–001:

Volume (gal) = (Initial level (%) – Final level (%)) x 320 gal/%

= (82 – 13) x 320

= 69% x 320 gal/%

= 22,080 gals

Level of Use
Continuous

STOP THINK ACT REVIEW

EXAM CONFIDENTIAL

MILLSTONE POWER STATION
SURVEILLANCE PROCEDURE

Clean Radioactive Liquid Waste Discharges

SP 2617D
Rev. 001

STOP THINK ACT REVIEW

Approval Date: 9/20/16

Effective Date: 9/20/16

Level of Use
Continuous

Millstone Unit 2
Surveillance Procedure

Clean Radioactive Liquid Waste Discharges

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ATTACHMENTS AND FORMS

Attachment 1, "Clean Liquid Waste Discharge (% to gpm)" 45
Attachment 2, "Clean Radioactive Liquid Waste Discharge With Inoperable Flow Recorder" 46
Attachment 3, "PIOPS Display Information" 47

SP 2617D-001, "Clean Radioactive Liquid Waste Discharge"

1. PURPOSE

1.1 **Objective**

This procedure provides instructions to ensure during all MODES of operation all requirements are met prior to and during all radioactive discharges from Clean Liquid Radwaste System (CWMTs), to satisfy REMODCM IV.C.1 Surveillance Requirement, Table IV.C–2, items 1.a. and 3.a., "Radioactive Liquid Effluent Monitoring Instrumentation."

1.2 **Discussion**

The objective of this procedure is satisfied by performing the following:

- SOURCE CHECK of radiation monitor RE-9049 prior to discharging CWMT.
- Checking flow recorder "FR-9050, SYSTEM DISCHARGE FLOW RECORDER" OPERABLE (tracking flow and indicating).
- CHANNEL CHECK of radiation monitor, 15 minutes after initiation of discharge.
- If discharge is performed with radiation monitor *not* OPERABLE, ensuring 2 independent samples have been taken and analyzed.
- Performing verification of necessary steps for all discharges.

CHANNEL CHECK, as used in this procedure, refers to the qualitative assessment of applicable radiation monitor behavior during operation, as compared to other similar indications of the same instrumentation.

The Clean Waste radiation monitor has a design range of 10 to 10^6 cpm [FSAR Table 7.5–5]. This radiation monitor and PIOPS are *not* OPERABLE above 10^6 cpm.

One of the following methods shall be used to trend radiation levels during discharges of the Clean Waste Monitor Tank, if possible:

- Process radiation recorder, RJR-9129
- Plant process computer (PPC) trend graph

The Clean Waste radiation monitor may have a signal to RJR-9129 and the PPC if PIOPS screen or keypad are not working. RJR-9129 or PPC are used for recording and monitoring the discharge if possible.

A CWMT has 320 gal/%.

To allow proper mixing prior to obtaining samples, *regardless of level*, CWMT must be recirculated the appropriate time as specified in Table – 1:

Table – 1, "Required Recirculation Times"

Tank	With Mixer	Without Mixer
CWMTs	2 hours	7 hours, 45 minutes OR 63,000 gallons integrated recirc flow

When discharging, the dilution flow requirements of the REMODCM must be met:

- Unit 2 dilution flow above 100,000 gpm

  OR

- Unit 3 dilution flow above 100,000 gpm AND *no* Unit 3 radioactive discharge in progress

  OR

- Chemistry Department Head authorization to discharge at a lower dilution flow

On "PROCESS RADIATION, RJR-9129" recorder (RC–14C) Clean Waste Radiation Monitor, RM–9049, is point "2."

As directed by SM or US, signoff spaces within this procedure may be used for remote component manipulation control. Procedure performer is required to initial for completion of specified steps on a copy of the applicable pages.

2-LRR-32.2, "(HIC 9049B) SYSTEM DISCHARGE ISOLATION VALVE," may stroke closed if variator is adjusted to less than 12.

Radiation Monitor RM−9049 may be considered inoperable due to the following [Ref. 6.7]:

- Inability to be flushed
- Inability to be cleaned
- Inability to achieve a background sufficient to calculate accurate setpoints for tank discharge

When sample low flow and/or high radiation alarm(s) are present the discharge valves are interlocked closed. When these alarms are clear, pressing ACK pushbutton on PIOPS allows the discharge valves to be opened.

2-LRR-127, "SYSTEM RECIRCULATION STOP," is open during recirculation and sampling to ensure complete mixing of discharge piping and filter, preventing a small discharge of activity not accounted for on the present Discharge Permit.

1.3 **Applicability**

This surveillance is performed during *all* MODES.

1.4 **Frequency**

This surveillance is required to be performed for *every* discharge of CWMTs.

2. PREREQUISITES

2.1 **General**

2.1.1 Status of monitors and recorders is known:

	OPERABLE	INOPERABLE
PPC	☐	☐
RJR-9129	☐	☐
PIOPS	☐	☐
RM−9049	☐	☐
FR-9050	☐	☐

2.1.2 Clean Liquid Radwaste System is available.

2.1.3 At least one MP2 Service Water pump is in operation with the flow through at least one TBCCW heat exchanger.

2.1.4 No functional test or calibration of RM−9049 OR PIOPS is being performed.

2.2 **Documents**

2.2.1 OP 2336C, “RBCCW Sump”

2.2.2 OP 2336B, “Aerated Liquid Radwaste System”

2.2.3 OP 2338A, “Solid Radwaste System−Filters”

2.2.4 SP 2864-001, “Millstone Unit #2 Liquid Discharge Permit No. _____”

2.2.5 SP 2852, “Unit 2 Liquid Radwaste Effluent Rad Monitor Inoperative”

2.3 **Personnel**

2.3.1 Personnel performing discharges must be qualified Auxiliary Building watch.

2.4 **Responsibilities**

2.4.1 Chemistry Department is required to perform the following:

- Sample and analyze CWMTs prior to discharge.
- If radiation monitor is *not* OPERABLE, sample and analyze CWMTs prior to discharge using 2 independent samples.

2.5 **Definitions**

2.5.1 CWMT – Clean Waste Monitor Tank

2.5.2 CWRT – Clean Waste Receiver Tank

2.5.3 PIOPS – Programmable Input/Output Processing System

3. PRECAUTIONS

3.1 For all radioactive discharges, to satisfy Technical Specifications requirements, verification by a second Auxiliary Building qualified operator is required for *all* steps associated with initiating radioactive discharges.

3.2 Once recirculation has been initiated, *no* additions (other than incidental PMW addition due to reference leg keep–full system) may be made to the associated tank.

3.3 When CWMT is placed on recirculation for sample, recirculation must *not* be suspended *at any time* following the sample and prior to initiation of the discharge (TSS concern).

3.4 Discharges *must* be terminated for any of the following reasons:

- Dilution flow rate drops to a value lower than that required on SP 2864–001, "Millstone Unit 2 Liquid Discharge Permit Number XXXX."
- Radiation monitor (RM–9049 or PIOPS) becomes *not* OPERABLE.
- Radiation monitor RM–9049 alarm sounds and discharge is *not* automatically terminated.
- Radiation monitor RM–9049 sample pump P–157 stops and discharge is *not* automatically terminated.

3.5 When discharging CWMT, the following requirements of NPDES Permit Discharge Serial No. 001B–3 must be met:

- Maximum daily volume discharged is 90,000 gallons
- Minimum dilution flow rate is administratively controlled to 100,000 GPM.
- If no circulating water pumps are running at Unit 2, Unit 3 dilution may be accounted for, with no radioactive liquid discharge from Unit 3.
- If total station circulating water flow is less than 100,000 gpm, a discharge may be performed, with Chemistry Department Head authorization. A one–time change should be processed to accomplish this.

3.6 When nitrogen overpressure is low in the band, discharging CWMT may lower pressure sufficiently to require nitrogen makeup. Any nitrogen added here will increase gas volume to be discharged. Performers should be aware of desired strategy for gas management when pressures are less than 5 psig.

3.7 When discharging water from either SG chemical cleaning or decontamination process, the following requirements of NPDES Permit Discharge Serial No. 001B–2(a) and 001B–2(b), must be met:

- Maximum daily volume is 60,000 gallons
- Minimum dilution flow rate is administratively controlled to 100,000 GPM.
- If no circulating water pumps are running at Unit 2, Unit 3 dilution may be accounted for, with no radioactive liquid discharge from Unit 3.
- If total station circulating water flow is less than 100,000 gpm, a discharge may be performed, with Chemistry Department Head authorization. A one–time change should be processed to accomplish this.
- Parameters listed in NPDES Permit Discharge Serial No. 001B–2(a) are acceptable

3.8 When discharging water from SG wet layup drainage, the following requirements of NPDES Permit Discharge Serial No. 001B–1(a), the must be met:

- Maximum daily volume is 280,000 gallons

3.9 When discharging water from SG wet layup drainage, the following requirements of the REMODCM must be met:

- Minimum dilution flow rate is administratively controlled to 100,000 GPM.
- If no circulating water pumps are running at Unit 2, Unit 3 dilution may be accounted for, with no radioactive liquid discharge from Unit 3.
- If total station circulating water flow is less than 100,000 gpm, a discharge may be performed, with Chemistry Department Head authorization. A one–time change should be processed to accomplish this.

i. ACKNOWLEDGE annunciators on C−63 and PIOPS.

j. CLOSE the following (RM−9049 skid):

- 2-LRR-410, "RM−9049 OUTLET DRAIN"
- 2-LRR-432, "RM−9049 BOTTOM DRAIN"

k. ENSURE 2-LRR-446, "RM−9049 SAMPLE INLET," is open.

l. Go To step 4.1.43 and PERFORM necessary steps to stop discharge.

4.1.41 WHEN 15 minutes has elapsed since start of discharge, PERFORM the following:

a. IF FR-9050 is OPERABLE, PERFORM the following:

1) OBSERVE "FR-9050, SYSTEM DISCHARGE FLOW RECORDER," indications.

2) IF "FR-9050, SYSTEM DISCHARGE FLOW RECORDER," is tracking flow and indicating, INITIAL SP 2617D-001 for flow recorder being OPERABLE.

b. IF RM−9049 is OPERABLE, PERFORM the following:

1) OBSERVE RM−9049 indications at PIOPS, PPC, and RC−14C.

2) Refer To SP 2617D-001 and RECORD RM−9049 indication from PIOPS.

3) IF *all* available RM−9049 indications tracking AND indicate similar values, INITIAL SP 2617D-001 for CHANNEL CHECK.

4.1.42 IF at any time flow recorder FR−9050 is *not* working, Refer To Attachment 2 and RECORD data as specified.

4.1.43 ENSURE 2-LRR-127, "SYSTEM RECIRCULATION STOP," (−25′6″ Aux Bldg) is closed.

4.1.64 Refer To SP 2617D-001 and RECORD the following into Narrative Log:

Date and time discharge was stopped

"SYSTEM DISCHARGE FLOW FQI–9050," integrator reading at completion of discharge

Discharge flow rate when discharge was stopped

Applicable CWMT level after stopping discharge (in percent)

Clean waste final filter, L-15, maximum steady state D/P

Total gallons discharged

4.1.65 IF PPC trend was used (Ref. Step i.), ATTACH hardcopy of trend to SP 2617D-001 and INITIAL SP 2617D-001.

4.1.66 IF discharge was performed with flow recorder, *not* OPERABLE, ATTACH completed Attachment 2, "Clean Radioactive Liquid Waste Discharge With Inoperable Flow Recorder" to SP 2617D-001.

4.1.67 ATTACH copy of SP 2864–001 (Discharge Permit) to SP 2617D-001 and INITIAL SP 2617D–001 coversheet.

4.1.68 IF Clean Waste Final Filter, L-15, D/P was greater than 20 psid, NOTIFY Radwaste Coordinator for filter change planning.

– End of Section 4.1 –

Attachment 2
Clean Radioactive Liquid Waste Discharge With Inoperable Flow Recorder

(Sheet 1 of 1)

Date:

1. RECORD data at least once every hour:

   a. RECORD time and previous level.

   b. RECORD current CWMT level indication (C−63).

   c. CALCULATE discharge flow rate (gpm) as follows and RECORD:

$$\text{Flow rate (gpm)} = \frac{[\text{Previous level (\%)} - \text{Current level (\%)}] \times 320 \text{ gallons/\%}}{\text{Time interval between recording levels (minutes)}}$$

Time	Previous Level	Current Level	Flowrate

2. CALCULATE gallons discharged as follows and RECORD on SP 2617D−001:

Volume (gal) = (Initial level (%) − Final level (%)) x 320 gal/%

Attachment 2
Clean Radioactive Liquid Waste Discharge With Inoperable Flow Recorder

(Sheet 1 of 1)

Date: Today

1. RECORD data at least once every hour:

   a. RECORD time and previous level.

   b. RECORD current CWMT level indication (C–63).

   c. CALCULATE discharge flow rate (gpm) as follows and RECORD:

Flow rate (gpm) = $\frac{\text{[Previous level (\%) – Current level (\%)] x 320 gallons/\%}}{\text{Time interval between recording levels (minutes)}}$

Time	Previous Level	Current Level	Flowrate
1319		82%	
1330	82%	77%	145 gpm
1400	77%	64%	139 gpm
1430	64%	51%	139 gpm
1500	51%	38%	139 gpm
1530	38%	26%	128 gpm
1605	26%	13%	

2. CALCULATE gallons discharged as follows and RECORD on SP 2617D–001:

Volume (gal) = (Initial level (%) – Final level (%)) x 320 gal/%

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Approve a Clearance Boundary

JPM Number: A3S Revision: 3/1

Initiated:

John W. Riley – Signature on File	8/13/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/2018
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
08/13/2018 jwr	Incorporated NRC comments from NRC prep week.	3/1

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A3S Revision: 3/1

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 : 3/1

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.
- Procedures and drawings associated with this clearance have been verified as the latest approved revisions.
- OP-AA-200, Attachment 16, Tag-Out Preparation and Review Check List, is not required to be completed for this JPM.

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: 3/1

Task Title: Approve a Clearance Boundary

START TIME: _____

S T E P # 1	Performance: 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.	Standard: 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.	Critical: Y ☐ N ☒	Grade: 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: 3/1

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: 3/1

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: 3/1

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: 3/1

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.
- Procedures and drawings associated with this clearance have been verified as the latest approved revisions.
- OP-AA-200, Attachment 16, Tag-Out Preparation and Review Check List, is not required to be completed for this JPM.

Tagout Tag List
Tagout Group: 2C25
Tagout: 2326A11-002A

Dominion
Millstone Power Station

08/13/18 1935

Tag Serial No.	Tag Type	Equipment * Equipment Description * Equipment Location	Ver Req	Pla Seq	Placement Configuration * Notes	Place. 1st Verif Time/Date	Ver Req	Pla Seq	Restoration Configuration * Notes	As Left Configuration	Rest. 1st Verif Time/Date	Rest. 2nd Verif Time/Date
	Yellow	P5A-HS * SERVICE WATER PP A * 2_CB _03606_CNTRL RM _C06	IV	1	* **BREAKER RACKED DOWN**			5	**P-T-L**	P-T-L		
	Red	A407 * 4.16V BREAKER - P5C SERVICE WATER PUMP 24D6-2 * 2_TB _05606_UPR SWGR _BUS 24D	IV	2	**RACKED DOWN**			4	**RACKED UP**	RACKED UP		
	Yellow	L1A-HS * A SERVICE WATER PUMP DISCH STRAINER CONTROL PANEL L1A (HANDSWITCH) * 2_INTAKE 01406_SW/CW PPS _ AUTO-OFF-HAND HNDSWTCH ON PNL	IV	3	***BREAKER IS OFF**			3	**AUTO**	AUTO		
	Red	B5153 * 480 BREAKER – L1A SERVICE WATER PUMP A DISCHARGE STRAINER A * 2_AB 01406_B61_ WEST / RIGHT CENTER, NEAR EXIT	IV	4	**OFF**			2	**ON**	ON		
	Red	2-SW-2A * "A" SERVICE WATER PUMP DISCHARGE STOP * 2_INTAKE _01406_SW/CW PPS _'A' SW STRAINER ASSEMBLY (L1A)		5	**OPEN**			1	**OPEN**	OPEN		

Wrong Breaker
Should be A306

Wrong Position
Should be CLOSED

SERVICE WATER COOLING TO DIESEL GENERATOR HEAT EXCHANGER

RBCCW HEAT EXCHANGERS (3)ONE SPARE

TBCCW HEAT EXCHANGERS (3)ONE SPARE

SERVICE WATER COOLING PUMPS (3)ONE SPARE

JACKET WATER COOLER

LUBE OIL COOLER

AIR COOLER

DIESEL MOTOR START CLOSES

DIESEL MOTOR START OPENS

DIESEL RUNNING

1. FOR NOTES, SYMBOLS AND UNIT #2 ABBREVIATIONS SEE 26001 SH. 1, 2 & 3. FOR ALL OTHER ABBREVIATIONS SEE ANSI STANDARD Y1.1.
2. JGD PIPING CAN CONSIST OF EITHER LINED CARBON STEEL PIPE OR STAINLESS STEEL PIPE, FOR ACTUAL MATERIAL REFER TO APPLICABLE SPOOL DRAWINGS.
3. FLANGED ENDS MATING WITH BUTTERFLY VALVES REQUIRE COUNTERBORING AFTER ASSEMBLY OF SPOOL, REFER TO MS-3 FOR REQUIREMENTS. SEE ANSI STANDARD Y1.1.
4. THIS BLIND FLANGE IS A BOB FLEX SERVICE WATER CONNECTION TIE-IN POINT. REFERENCE DC MPC-13-01131.

CHANGES MADE TO THIS P&ID MUST ALSO BE REFLECTED ON THE INSERVICE INSPECTION PROGRAM DRAWING 25203-26700 SH. 6

OPERATIONS CRITICAL

FSAR FIGURE

SAFETY EVALUATION MAY BE REQUIRED PRIOR TO CHANGES

0 MP2-15-01042

Dominion

Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Waterford, CT.

TITLE

PIPING & INSTRUMENT DIAGRAM
SERVICE WATER

REVISION DESCRIPTION (SIGNATURES ON FILE)	CAD NO: C:\fms32\rmpplot\P5-260082.DGN	
ISSUED FOR CONSTRUCTION OF DC MP2-15-01042	DRAWING NO: ~~25203-26008~~ 1501042-M-25203-26008 REV-0	REV ~~115~~
DSGN EAL	SCALE: NONE	UNLESS OTHERWISE NOTED SH 2

COMPT NO.	SCHEME NO. (FAC.)	EQUIP NO.	EQUIPMENT DESCRIPTION	MOTOR						LOAD			CABLE SIZE	MCC UNITS			CONTROL TRANSFORMER			REFERENCES
				RATED H.P.	FULL LOAD AMPS	SERV FACTOR	MTR. HTR.	CONTINUOUS	INTERMIT	KW	KVA	PF		STARTER TYPE SIZE	CKT BKR SIZE	HEATER NO. CR123- NOTE 1	VA	480V PRIMARY FUSE AMPS TYPE	120V SECONDARY FUSE AMPS TYPE NOTE 2	SCHEMATIC EXT. CONN. INT. CONN.
GF3	(Z1) B5155	2-RC-403	PRESSURIZER PORV "A" ISOLATION VALVE	0.67	2.3				X				1-3/C#12	FVR 1	THED 15	C196A	150	10A A4J10	4-1/2A FRN-4 1/2	32007/19 31023/26 39007/1028B
GF4	(Z1) B5122	2-CS-16.1A	CONTAINMENT SUMP RECIRC HEADER "A" ISOLATION VALVE	4	9				X				1-3/C#12	FVR 1	THED 30	C778A	150	10A A4J10	4-1/2A FRN-4 1/2	32008/25 31023/17 39007/1028B
HF1	(Z1) B5160	F51	WEST 480 VOLT SWITCHGEAR COOLING FAN	25			NOTE 3	X					1-3/C#4	FVNR 2	THED 70	C36.6B	200	10A A4J10	2-1/2A FRN-2 1/2	32023/42 31023/39 39007/1017
HF2	(Z1) B5124	2-CS-13.1A	RWST OUTLET HEADER "A" ISOLATION VALVE	2	3.1				X				1-3/C#12	FVR 1	THED 15	C3.01A	150	10A A4J10	4-1/2A FRN-4 1/2	32008/27 31023/18 39007/1028B
HF3	(Z1) B5172	NF-5172	ALTERNATE VENT. EAST 125VDC SWITCHGEAR RM.										1-3/C#10	FVR *1	THED 15					39007/1028P
HF4			BLANK																	
JF1	(1) B5125	UPS-VR11	ALTERNATE SUPPLY TO UPS-VR11					X			82.3		3-1/C#3/0		THED 125					30024 31023/44 39007/1029
JF2	(1) B5152	LP-L30	LIGHTING TRANSFORMER FEEDER UL12					X			30		1-3/C#4		THED 40					30025 35038/17 39007/1029
JF3	(Z1) B5153	L1A	SERVICE WATER PUMP "A" DISCHARGE STRAINER "A"	0.75	1.45	1	0	X					1-3/C#12		THED 15					32013/36 39007/1029
JF4A	(1) B5166	LP-L53	LIGHTING TRANSFORMER FEEDER UL53 1Ø					X			10		1-3/C#6		THED 15					30025 35038/51 39007/1029
JF4B	(Z1) B5171	AC-3	MCC B51 AIR COOLER						X	6.98	.85		1-3/C#8		THED 30					32021/36
JF5	(Z1) B5169	F40A	HYDROGEN ANALYZER "A" SAMPLE PUMP	3	4.4	1							1-4/C#10	FVNR 1	THED 15	C419A	60	10 A4J10	6/10A FRN-6/10	31023/42 32027/9 39007/1096
JF6		B51JF6 -SP	SPARE											FVNR 1	THED 15		60	10 A4J10	6/10A FRN-6/10	39007/1098

NOTES:

1. THE NEW G.E. THERMAL OVERLOAD HEATER PART NUMBER WILL NO LONGER USE THE DECIMAL POINT(.). HEATER NUMBER MAY BE SHOWN WITH OR WITHOUT THE DECIMAL.
2. THE TYPE FRN FUSE IS NO LONGER MADE AND HAS BEEN REPLACED BY FRN-R FUSES. MODEL NUMBER MAY BE SHOWN WITH OR WITHOUT THE (R).
3. FOR PUMP AND FAN MOTOR HEATER DISTRIBUTION PANEL SCHEDULE CROSS REFERENCE SUMMARY SEE DWG. 25203-30012 SH.A

*-STARTER DISCONNECTED

THIS DWG. SUPERSEDES IN PART THE FOLLOWING DWGS.:
25203-30011 SH. 34
25203-30011 SH. 35
25203-30011 SH. 36
25203-39007 SH. 1002

DC MP2-14-01015 (0)

OPERATIONS CRITICAL

Dominion

Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Waterford, CT.

TITLE
EMERGENCY MCC B51 (22-1E) FACILITY Z1
LOAD SUMMARY AUX BLDG 14'-6" (M4 17.2)

REVISION DESCRIPTION (SIGNATURES ON FILE) | CAD NO: P3001134E.DGN

ISSUED FOR CONSTRUCTION OF DC MP2-14-01015

DRAWING NO: ~~25203-30011~~ 1401015-E-25203-30011 REV-0 | REV ~~15~~

DSGN DLW | SCALE: NONE | UNLESS OTHERWISE NOTED | SH 34E

SFILES SCHATES

Component to be Worked:

L1A

"A" SERVICE WATER PUMP DISCHARAGE STRAINER ASSEMBLY

2_INTAKE _01406_

Notes:

REMOVE POWER FROM PUMP AND STRAINER MOTOR. ISOLATE FLOW FROM SYSTEM. DRAINING AND VENTING IS NOT REQUIRED

Reason Tagged

REPLACE AND CALIBRATE D/P INSTRUMENT, PDC-6475

INSTRUCTIONS/HAZARDS:

Additional Information:

25203-26008
25203-30005
25203-30011 sh.34E
SP 2326A-001

Tagout Attributes:

Work Order List:

Number / Equipment ID	Description
53M20709187	REPLACE AND CALIBRATE D/P INSTRUMENT, PDC-6475

Section Verification:

Status	Description	Name	Verification Date
Prepared	Prepared	"Qualified Operator"	"This Morning"
Walked Down	Walked Down	"Qualified Operator"	"This Morning"
Reviewed	Reviewed	"Qualified Operator"	"This Morning"
SRO Reviewed	SRO Reviewed		
Authorized for Hanging	Authorized for Hanging		
Tags Verified Hung	Tags Verified Hung		
Restoration Changed	Restoration Changed		
Approved to Remove	SRO Removal Review/Approval		
Tags Verified Removed	Tags Verified Removed		

Tagout Tag List
Tagout Group: 2C25
Tagout: 2326A11-002A

Dominion
Millstone Power Station

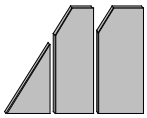
08/13/18 1935

Tag Serial No.	Tag Type	Equipment * Equipment Description * Equipment Location	Ver Req	Pla Seq	Placement Configuration * Notes	Place. 1st Verif Time/Date	Ver Req	Pla Seq	Restoration Configuration * Notes	As Left Configuration	Rest. 1st Verif Time/Date	Rest. 2nd Verif Time/Date
	Yellow	P5A-HS * SERVICE WATER PP A * 2_CB _03606_CNTRL RM _C06	IV	1	* BREAKER RACKED DOWN			5	P-T-L	P-T-L		
	Red	A407 * 4.16V BREAKER - P5C SERVICE WATER PUMP 24D6-2 * 2_TB _05606_UPR SWGR _BUS 24D	IV	2	RACKED DOWN			4	RACKED UP	RACKED UP		
	Yellow	L1A-HS * A SERVICE WATER PUMP DISCH STRAINER CONTROL PANEL L1A (HANDSWITCH) * 2_INTAKE 01406_SW/CW PPS _ AUTO-OFF-HAND HNDSWTCH ON PNL	IV	3	*BREAKER IS OFF			3	AUTO	AUTO		
	Red	B5153 * 480 BREAKER – L1A SERVICE WATER PUMP A DISCHARGE STRAINER A * 2_AB 01406_B61_ WEST / RIGHT CENTER, NEAR EXIT	IV	4	OFF			2	ON	ON		
	Red	2-SW-2A * "A" SERVICE WATER PUMP DISCHARGE STOP * 2_INTAKE _01406_SW/CW PPS _'A' SW STRAINER ASSEMBLY (L1A)		5	OPEN			1	OPEN	OPEN		

Form Approval

Approval Date	Effective Date
10/04/17	10/19/17

Form Cover Sheet



Generic Information

Form Title	Rev. No.
Service Water Alignment Verification, Facility 1	004

Reference Procedure	Applicable Tech. Spec.	Applicability (Tech. Spec.)	Frequency
OP 2326A	N/A	N/A	N/A

Specific Information

Schedule Start Date		WO Number	Mntc Restoration ☐ Yes ☐ No
Performance Modes N/A	Prerequisites Completed (Initials)	Precautions Noted (Initials)	
Test Authorized By		Date	Partial Surveillance ☐ Yes ☐ No
Performed By		Date	
Accepted By		Date	Acceptance Criteria Satisfied ☐ Yes ☐ No
Approved By (Department Head or Designee)		Date	

Comments

CR# _____

Service Water Valve Alignment Verification, Facility 1

T/S Acceptance Criteria All valves servicing safety−related equipment are in their required position unless locked, sealed, or otherwise secured in position.	
Notes:	
Note-1	If valve is electrically deenergized, valve position must be *independently* verified locally. [✤NU letter B09850 (LER 9−022−00), dated 1/14/91 (commitment record 422)] [Commitment Nos. A09428.15, A09391.03, 2−90−022−00.03 and A09328.01]
Note-2	"OP" when strainer is backwashing
Note-3	This valve is sealed. Its position must be checked following a refueling outage *or* system maintenance (if the valve is contained within the portion of the system tagged out), otherwise, "N/A" is placed in initials block.
Note-4	Valve is normally throttled to maintain flow in a band of 10−12 gpm, not to exceed 16 gpm. Flow may be throttled below 10 gpm, or isolated, when circ pump is running at greater than 65% speed. Valve is closed if circ pump is not running.
Note-5	Valve must be open when HX is in service, or throttled when providing SW pump minimum flow.
Note-6	The open position corresponds to the pre−determined "LOCA" position.
Note-7	Valve is normally closed and is only placed in service when service water inlet temperature permits low flow operation.
Note-8	"T" or "OP" when HX is in Service, "CL" when HX is in wet layup
Note-9	"T" or "OP" as necessary to maintain HX temperature setpoint
Note-10	Valve is set with a flow of 1 gpm to 5 gpm with the chiller in standby, using a controlotron. The valve is mechanically locked in position. Lineup ensures valve locknut is hand tight and stop is installed. Valve may be closed for short time periods.
Note-11	2−SW−7A and 2−SW−10A are Locked Close when "B" RBCCW HX is supplied by "A" Service Water Header.
Note-12	2−SW−7B and 2−SW−10B are Locked Close when "B" RBCCW HX is supplied by "B" Service Water Header.
Note-13	SW−97A open if "B" SW Pp in service on "A" SW Header SW−97A closed if "A" SW Pp in service on "A" SW Header
Note-14	SW−97B open if "B" SW Pp in service on "B" SW Header SW−97B closed if "C" SW Pp in service on "B" SW Header

Service Water Valve Alignment Verification, Facility 1

T/S Acceptance Criteria	Init.	Date	IV Init.	Date
If "B" service water pump is operating to replace "A" service water pump, 4,160 volt bus 24E is aligned to 4,160 volt bus 24C, HS 6484A (A502) "SIAS ACTUATION SIGNAL" in "NORMAL," and alarm "SW PUMP B SIAS/LNP START MANUALLY BLOCKED" (A−19A, C−06/07) NOT lit.				
If "B" service water pump is NOT operating, *but* 4,160 volt bus 24E is aligned to 4,160 volt bus 24C, HS 6484A (A502) "SIAS ACTUATION SIGNAL" in "BLOCKED."				
Facility 1 service water pump strainer control switch is in "AUTO"				

Service Water Valve Alignment Verification, Facility 1

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
Control Room (C−06)								
SW−3.1A	AO	"A" HDR RBCCW HX SERV WTR INLET VLV	OP	*Note-1*				
SW−3.2B	AO	(A HDR) TBCCW HX SERV WTR INLET VALVES	OP					
SW−97A	AO	PP DIS X−TIE	CL/ OP	*Note-1* *Note-13*				
SW−97B	AO	PP DIS X−TIE	CL/ OP	*Note-1* *Note-14*				
Unit 2 Intake Structure								
2−SW−2A	H	"A" SW PUMP DISCHARGE STOP	OP					
2−SW−61A	H	"A" SERVICE WATER PUMP STRAINER VENT STOP	CL					
2−SW−62A	H	"A" SERVICE WATER PUMP STRAINER DRAIN STOP	CL					
2−SW−276A	H	"A" SW PUMP STRAINER SAMPLE	CL					
2−SW−32A	H	"A" SERVICE WATER PUMP STRAINER INLET D/P STOP	OP					
2−SW−32B	H	"A" SERVICE WATER PUMP STRAINER OUTLET D/P STOP	OP					
2−SW−90A	AO	"A" SERVICE WATER PUMP STRAINER FLUSH	OP/ CL	*Note-2*				
2−SW−274	H	"A" SERVICE WATER HEADER VENT	CL					
2−SW−258	H	CROSS−TIE HEADER VENT	CL					

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
Unit 2 Intake Structure *(continued)*								
2−SW−2B	H	"B" SERVICE WATER PUMP DISCHARGE STOP	OP					
2−SW−62B	H	"B" SERVICE WATER PUMP STRAINER DRAIN STOP	CL					
2−SW−61B	H	"B" SERVICE WATER PUMP STRAINER VENT STOP	CL					
2−SW−276B	H	"B" SW PUMP STRAINER SAMPLE	CL					
2−SW−32C	H	"B" SERVICE WATER PUMP STRAINER INLET D/P STOP	OP					
2−SW−32D	H	"B" SERVICE WATER PUMP STRAINER OUTLET D/P STOP	OP					
2−SW−90B	AO	"B" SERVICE WATER PUMP STRAINER FLUSH	OP/ CL	*Note-2*				
2−SW−213	H	"A" LUBE WATER HEADER SUPPLY HEADER VENT	CL					
2−SW−3A	H	"A" SERVICE WATER HEADER STOP	OP					
2−SW−84A	H	"A" SW HEADER SUPPLY TO HYPOCHLORITE INJ SYSTEM	CL					
2−SW−299	H	"A" SERVICE WATER HEADER SUPPLY TO NORTH FILTER	OP					
2−SW−130B	H	"A" SW HEADER SUPPLY TO LUBE WATER SYSTEM	OP					
2−SW−131B	H	L−64B LUBE WATER FILTER INLET STOP	OP					
2−SW−24B	H	L−64B LUBE WATER FILTER D/P INLET STOP	OP					

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
Unit 2 Intake Structure *(continued)*								
2−SW−25B	H	L−64B LUBE WATER FILTER D/P OUTLET STOP	OP					
2−SW−132B	H	L−64B LUBE WATER FILTER BYPASS STOP	CL					
2−SW−133B	H	L−64B LUBE WATER FILTER OUTLET STOP	OP					
2−SW−134B	H	"A" SW HDR LUBE WTR FLTR OUTLET CROSS−TIE	OP					
2−SW−202	H	CIW PUMP LUBE WATER HEADER VENT	CL					
2−SW−26	H	SENSING LINE STOP FOR PCV 2−SW−98	OP					
2−SW−138B	H	OUTLET ISOLATION FOR PCV 2−SW−98	OP					
2−SW−203	H	DRAIN LINE STOP FOR PCV 2−SW−98	CL					
2−SW−98	AO	LUBE WATER TO CIRCULATING PUMPS PCV	T	*PIC−6522 at 40 psi*				
2−SW−138A	H	INLET ISOLATION FOR PCV 2−SW−98	OP					
2−SW−19	H	PCV 2−SW−98 BYPASS	CL					
2−SW−137	H	CIRC WATER LUBE WATER HEADER ISOLATION	OP					
2−SW−27	H	INSTRUMENT ROOT STOP FOR PS−6523	OP					
2−SW−67	H	BACKUP LUBE WATER PC−6514 ISOLATION	OP					

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
Unit 2 Intake Structure *(continued)*								
2–SW–198	H	CIRC WATER LUBE WATER X–TIE VENT	CL	*Note-3*				
2–SW–139A	H	“A” CW PUMP LUBE WATER FI INLET ISOLATION	OP					
2–SW–139B	H	“A” CW PUMP LUBE WATER FI BYPASS	CL					
2–SW–140A	H	“A” CW PUMP LUBE WATER FI OUTLET ISOLATION	T/CL	*Note-4*				
2–SW–139C	H	“B” CW PUMP LUBE WATER FI INLET ISOLATION	OP					
2–SW–139D	H	“B” CW PUMP LUBE WATER FI BYPASS	CL					
2–SW–140B	H	“B” CW PUMP LUBE WATER FI OUTLET ISOLATION	T/CL	*Note-4*				
2–SW–139E	H	“C” CW PUMP LUBE WATER FI INLET ISOLATION	OP					
2–SW–139F	H	“C” CW PUMP LUBE WATER FI BYPASS	CL					
2–SW–140C	H	“C” CW PUMP LUBE WATER FI OUTLET ISOLATION	T/CL	*Note-4*				
2–SW–139G	H	“D” CW PUMP LUBE WATER FI INLET ISOLATION	OP					
2–SW–139H	H	“D” CW PUMP LUBE WATER FI BYPASS	CL					
2–SW–140D	H	“D” CW PUMP LUBE WATER FI OUTLET ISOLATION	T/CL	*Note-4*				
2–SW–134A	H	“B” SW HDR LUBE WTR FLTR OUTLET CROSS–TIE	OP					

Service Water Valve Alignment Verification, Facility 1

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
14′6″ Turbine Bldg								
2−SW−194	H	“A” SW HEADER TO CHILLERS	OP					
2−SW−285	H	“A” SW SUPPLY HEADER TO CHILLERS VENT	CL					
2−SW−174	H	“A” SW HEADER SUPPLY TO AC SWITCHGEAR ROOM COOLER	OP					
2−SW−175	H	SW HEADERS SUPPLY TO AC SWITCHGEAR ROOMS X−TIE	CL					
2−SW−37E	H	“C” TBCCW HX FI HIGH SIDE STOP	OP					
2−SW−37F	H	“C” TBCCW HX FI LOW SIDE STOP	OP					
2−SW−5C	H	“C” TBCCW HEAT EXCHANGER SW INLET	T/CL	*Note-8*				
2−SW−33C	H	“C” TBCCW HEAT EXCHANGER INLET PI STOP	OP					
2−SW−49C	H	“C” TBCCW HEAT EXCHANGER INLET VENT	CL					
2−SW−50C	H	“C” TBCCW HEAT EXCHANGER INLET DRN	CL					
2−SW−65C	H	“C” TBCCW HEAT EXCHANGER INLET SMPL	CL					
2−SW−65B	H	“B” TBCCW HEAT EXCHANGER INLET SMPL	CL					
2−SW−50B	H	“B” TBCCW HEAT EXCHANGER INLET DRN	CL					
2−SW−5B	H	“B” TBCCW HEAT EXCHANGER SW INLET	T/CL	*Note-8*				
2−SW−37C	H	“B” TBCCW HX FI HIGH SIDE STOP	OP					
2−SW−37D	H	“B” TBCCW HX FI LOW SIDE STOP	OP					

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
14′6″ Turbine Bldg *(continued)*								
2−SW−33B	H	“B” TBCCW HEAT EXCHANGER INLET PI STOP	OP					
2−SW−49B	H	“B” TBCCW HEAT EXCHANGER INLET VENT	CL					
2−SW−271B	H	“B” TBCCW HEAT EXCHANGER OUTLET	OP/ CL	*Note-8*				
2−SW−66B	H	“B” TBCCW HEAT EXCHANGER OUTLET SAMPLE	CL					
2−SW−52B	H	“B” TBCCW HEAT EXCHANGER OUTLET DRAIN	CL					
2−SW−51B	H	“B” TBCCW HEAT EXCHANGER OUTLET VENT	CL					
2−SW−36B	H	“B” TBCCW HEAT EXCHANGER OUTLET PI STOP	OP					
2−SW−88B	AO	“B” TBCCW HEAT EXCHANGER TCV	T/OP	*Note-9*				
2−SW−88C	AO	“C” TBCCW HEAT EXCHANGER TCV	T/OP	*Note-9*				
2−SW−36C	H	“C”TBCCW HEAT EXCHANGER OUTLET PI STOP	OP					
2−SW−51C	H	“C” TBCCW HEAT EXCHANGER OUTLET VENT	CL					
2−SW−52C	H	“C” TBCCW HEAT EXCHANGER OUTLET DRN	CL					
2−SW−66C	H	“C” TBCCW HEAT EXCHANGER OUTLET SAMPLE	CL					

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
14′6″ Turbine Bldg *(continued)*								
2–SW–271C	H	"C" TBCCW HEAT EXCHANGER OUTLET	OP/ CL	*Note-8*				
2–SW–101	H	"A" SERVICE WATER HEADER TO CHILLER X–169A	OP					
2–SW–278A	H	CHILLER X–169A PDI–4668A HIGH STOP	OP					
2–SW–278B	H	CHILLER X–169A PDI–4668A LOW STOP	OP					
2–SW–119	H	CHILLER X–169A SW PCV INLET ISOLATION	OP					
2–SW–122	H	CHILLER X–169A SW CONTROL VALVE OUTLET	OP					
2–SW–125	H	CHILLER X–169A SW CONTROL VALVE BYP	T /CL	*Note-10*				
2–SW–232A	H	CHILLER X–169A FT HIGH STOP	OP					
2–SW–232B	H	CHILLER X–169A FT LOW STOP	OP					
2–SW–105	H	X–169A OUTLET STOP	OP					
2–SW–160	H	CHILLER X–170 OUTLET ISOLATION	CL					
2–SW–197	H	SW OUTLET FROM CHILLED WATER CHILLERS	OP					
2–SW–284	H	SW OUTLET FROM CHILLED WATER CHILLERS VENT	CL					
2–SW–192	H	SW OUTLET FROM AC SWITCHGEAR ROOM COOLERS	OP					
2–SW–283	H	SW OUTLET FROM AC SWITCHGEAR ROOM COOLERS VENT	CL					

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
14′6″ Turbine Bldg *(continued)*								
"A" SW Hdr Aligned To "B" TBCCW Hx (Otherwise Mark N/A)								
2−SW−4A	H	"A" SW HEADER TO "B" TBCCW HX	OP					
2−SW−4B	H	"B" SW Header to "B" TBCCW HX	CL					
"B" SW Hdr Aligned To "B" TBCCW Hxr (Otherwise Mark N/A)								
2−SW−4A	H	"A" SW HEADER TO "B" TBCCW HX	CL					
2−SW−4B	H	"B" SW Header to "B" TBCCW HX	OP					
31′6″ Turbine Bldg								
2−SW−179A	H	SW SUPPLY TO COOLERS X−181A, X−181B	OP					
2−SW−178A	AO	COOLERS X−181A, X−181B SW CONTROL VALVE	OP					
2−SW−177A	H	COOLER X−181A, X−181B CONTROL INLET	OP					
2−SW−180A	H	COOLER X−181A, X−181B INLET BYPASS	CL					
2−SW−183A	H	COOLER X−181A, X−181B INLET PI STOP	OP					
2−SW−184A	H	COOLER X−181A, X−181B OUTLET PI STOP	OP					
2−SW−186A	H	COOLER X−181A, X−181B FT HIGH SIDE STOP	OP					
2−SW−186B	H	COOLER X−181A, X−181B FT LOW SIDE STOP	OP					
2−SW−181A	H	COOLER X−181A, X−181B DISCHARGE	LT	*"LOCA" position*				
2−SW−280A	H	PI−6922 INSTRUMENT ROOT	OP					
2−SW−280B	H	2−SW−181A, PDI−6925A LOW SIDE STOP	OP					

Service Water Valve Alignment Verification, Facility 1

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
West 480 Volt Switchgear Room								
2−SW−128	H	COOLER X−181A, X−181B SW INLET DRAIN	CL					
2−SW−129	H	COOLER X−181A, X−181B SW OUTLET VENT	CL					
45′ Cable Vault								
2−SW−115	H	COOLER X−182 INLET DRAIN STOP	CL					
2−SW−114	H	COOLER X−182 OUTLET VENT STOP	CL					
54′6″ Turbine Bldg								
2−SW−179B	H	SERVICE WATER TO COOLER X−182	OP					
2−SW−178B	AO	COOLER X−182 CONTROL VALVE	OP					
2−SW−177B	H	INLET CONTROL VALVE ISOLATION	OP					
2−SW−180B	H	INLET CONTROL VALVE BYPASS	CL					
2−SW−183B	H	COOLER X−182 INLET PI STOP	OP					
2−SW−184B	H	COOLER X−182 OUTLET PI STOP	OP					
2−SW−187B	H	COOLER X−182 FI LOW SIDE STOP	OP					
2−SW−187A	H	COOLER X−182 FI HIGH SIDE STOP	OP					
2−SW−181B	H	COOLER X−182 DISCHARGE STOP	LT	*"LOCA" position*				
2−SW−281A	H	PI−6923 INSTRUMENT ROOT	OP					
2−SW−281B	H	2−SW−181B, PDI−6925B LOW SIDE STOP	OP					

Service Water Valve Alignment Verification, Facility 1

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
–25′6″ Aux Bldg								
2–SW–9B	H	“B” RBCCW HEAT EXCHANGER SW OUTLET	T/OP /CL	*Note-5*				
2–SW–9A	H	“A” RBCCW HEAT EXCHANGER SW OUTLET	T/OP /CL	*Note-5*				
2–SW–8A	H	“A” RBCCW HEAT EXCHANGER SW INLET	OP/ CL	*Note-8*				
2–SW–39A	H	“A” RBCCW HEAT EXCHANGER INLET PI STOP	OP					
2–SW–42A	H	“A” RBCCW HX FI HIGH SIDE STOP	OP	*Note-3*				
2–SW–42B	H	“A” RBCCW HX FI LOW SIDE STOP	OP	*Note-3*				
2–SW–42C	H	“B” RBCCW HX FI HIGH SIDE STOP	OP	*Note-3*				
2–SW–42D	H	“B” RBCCW HX FI LOW SIDE STOP	OP	*Note-3*				
2–SW–53A	H	“A” RBCCW HEAT EXCHANGER INLET VENT	CL					
2–SW–54A	H	“A” RBCCW HEAT EXCHANGER INLET DRN	CL					
2–SW–8B	H	“B” RBCCW HEAT EXCHANGER SW INLET	OP/ CL	*Note-8*				
2–SW–39B	H	“B” RBCCW HEAT EXCHANGER INLET PI STOP	OP					
2–SW–53B	H	“B” RBCCW HEAT EXCHANGER INLET VENT	CL					
2–SW–54B	H	“B” RBCCW HEAT EXCHANGER INLET DRN	CL					
2–SW–8.1B	AO	“B” RBCCW HEAT EXCHANGER TCV	T/CL /OP	*Note 6*				
2–SW–41B	H	“B” RBCCW HEAT EXCHANGER OUTLET PI STOP	OP					

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
–25′6″ Aux Bldg *(continued)*								
2–SW–55B	H	"B" RBCCW HEAT EXCHANGER OUTLET VENT	CL					
2–SW–56B	H	"B" RBCCW HEAT EXCHANGER OUTLET DRN	CL					
2–SW–246	AO	"B" RBCCW HEAT EXCHANGER WINTER TCV	T/CL	*Note-7*				
2–SW–247	AO	"A" RBCCW HEAT EXCHANGER WINTER TCV	T/CL	*Note-7*				
2–SW–41A	H	"A" RBCCW HEAT EXCHANGER OUTLET PI STOP	OP					
2–SW–55A	H	"A" RBCCW HEAT EXCHANGER OUTLET VENT	CL					
2–SW–56A	H	"A" RBCCW HEAT EXCHANGER OUTLET DRN	CL					
2–SW–8.1A	AO	"A" RBCCW HEAT EXCHANGER TCV	T/CL /OP	*Note 6*				
"B" RBCCW Hx Aligned To "A" SW Hdr (Otherwise Mark N/A)								
2–SW–7B	H	"A" SW HEADER TO "B" RBCCW HX	OP					
2–SW–7A	H	"B" SW HEADER TO "B" RBCCW HX	LC	*Note 11*				
2–SW–10B	H	"B" RBCCW HX TO "A" DISCHARGE HDR	OP					
2–SW–10A	H	"B" RBCCW HX TO "B" DISCHARGE HDR	LC	*Note 11*				
"B" RBCCW Hx Aligned To "B" SW Hdr (Otherwise Mark N/A)								
2–SW–7B	H	"A" SW HEADER TO "B" RBCCW HX	LC	*Note 12*				
2–SW–7A	H	"B" SW HEADER TO "B" RBCCW HX	OP					
2–SW–10B	H	"B" RBCCW HX TO "A" DISCHARGE HDR	LC	*Note 12*				
2–SW–10A	H	"B" RBCCW HX TO "B" DISCHARGE HDR	OP					

Service Water Valve Alignment Verification, Facility 1

VALVE NUMBER	TYPE OPER	FUNCTION	REQ POS	NOTES	PERFORMER		I.V.	
					INIT	DATE	INIT	DATE
EBFS Filter Area								
2–SW–12C	H	"B" SW HEADER TO "B" D/G HXS	LO					
2–SW–12A	H	"B" SW HEADER TO "A" D/G HXS	LC					
2–SW–12B	H	"A" SW HEADER TO "A" D/G HXS	LO					
2–SW–12D	H	"A" SW HEADER TO "B" D/G HXS	LC					
2–SW–100A	H	"A" D/G SW HEADER VENT	CL	*Note-3*				
2–SW–296	H	FIRE WATER CROSS–TIE TO "A" DG SW'	LC					

Nuclear Fleet

Administrative Procedure

Title: Equipment Clearance

Procedure Number	Revision Number	Effective Date and Approvals On File
OP-AA-200	29	

Revision Summary

Made the following changes in accordance with operations provided markup:

- Deleted “A qualified Operator shall:” before Step 3.2.2.a.
- Added Step 3.2.2.a and associated note.
- Added Step 3.2.2.g, 3.2.2.k, and 3.2.2.l.
- Added “including live electrical sources” to Step 3.2.2.s.
- Added reference to TRM in Step 3.2.2.c.
- Added 5th bullet to Step 3.3.7.b.
- Re-wrote the 9th bullet of Step 3.3.7.b.
- Added Reference 5.4.34.
- Deleted Steps, 2, 3, and 11 from Attachment 12.
- Added Attachment 16.

Functional Area Manager: Manager Nuclear Operations

INFORMATION USE

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1.0 PURPOSE

This procedure establishes the responsibilities, authorities, and methodologies to implement the Dominion clearance process.

2.0 SCOPE

This procedure applies to all Dominion and supplemental workers performing work at a Dominion nuclear site.

3.0 INSTRUCTIONS

User

3.1 General Practices

3.1.1 **REFER** to Equipment Clearance Process Flowchart (ATTACHMENT 1) for an overview of the clearance and lockout process.

3.1.2 **REFER** to OP-AA-201, Lockout, if lockout is being used.

3.1.3 **Danger Tags**

a. Danger Tags are used to establish energy isolation boundaries. **IF** computer generated tags are **NOT** available, **THEN** handwritten tags shall include the following information:

- Tagout Number
- Tag Number
- Mark number/Equipment ID
- Description
- Location
- Component position

b. **DO NOT OPERATE** components that have Danger Tags or Danger Tag ty-wraps. The red ty-wraps are considered to be equivalent to a Danger Tag and shall be treated as such.

Operations/ Tagging Office

3.1.4 **GENERATE** tagging records using eSOMS electronic tagging system. Non-Electric Tagging Process (ATTACHMENT 2) provides instructions for completing forms when the eSOMS system is unavailable. **REFER** to the appropriate User's Guide for detailed system software instructions.

3.1.5 **EVALUATE** Tagouts that affect systems common to multi-unit sites.

3.1.6 **ENSURE** required redundant equipment is operable prior to tagging out safety-related equipment.

3.1.7 **WHEN** tagging the control boards, **THEN USE** control panel tags/devices designated to be used on the control boards to prevent obscuring station status, indications, controls, switches, and labels.

Operations/ Tagging Office

3.1.8 **ENSURE** a work order does **NOT** rely on two distinct different Tagouts for the isolation boundaries.

3.1.9 **IF** work orders associated with a DCP / plant modifications require testing, **THEN** a Test Engineer must **SIGN ON** the Tagout prior to beginning any testing and will **SIGN OFF** the Tagout when the equipment is ready to be released to Operations.

3.1.10 **REPLACE** tags in the field that are worn or illegible. The new tag shall have the same information and be attached and verified in accordance with the Tagging Record. **REMOVE** the old tag and **DISPOSE** of the old tag after the new tag is installed.

Individual Placing or Removing Tags

3.1.11 **POSSESS** a copy of the governing document when in the field. This document may be the Tagging Hang Sheet, Tag Clear Sheet, or their electronic equivalent.

Operations Supervision

3.1.12 In general, all Tagouts will be verified **HUNG** and **REMOVED** except when verification is waived by an SRO for one of the follow reasons:

- Plant Emergencies
- High Radiation Areas
- Personnel Safety

DOCUMENT waiver in Notes section along with reason.

3.1.13 To attach Danger tags, a one-piece all environment-tolerant Red nylon ty-wrap is required. Employees engaged in hanging and removing tags shall use appropriate tools in the removal of tags. Do **NOT** use knives to cut ty-wrap ties when removing tags. **IF** components which have Danger Tags attached do **NOT** have a lockout capability, **THEN** it is acceptable but **NOT** the preferred method to use string instead of ty-wraps (i.e., 120V Breakers, lifted leads, patchcords). Blue Tefzel ty-wraps or locks and chains are required to be used in the containment only if the tags are to be hanging for extended periods of time (non-outage).

Some chemicals (e.g., zinc chloride) cause failure of the Red ty-wraps. **EVALUATE** using metal ty-wraps when possible chemical exposure could result in ty-wrap failure during tagging.

Operations

3.1.14 Control panel tags / devices are to convey information for equipment, **NOT** for personnel safety.

> **NOTE:** Industry events have shown that breakers may **NOT** be physically open even though the handle has been placed in the Open/Off position.

Independent Verifier

- As a good practice, the independent verifier of the control panel tags / devices should also observe any associated indicating lights are **NOT** lit, **IF** lit**, THEN** the independent verifier should inform the controller / SRO (a few components have indications that are powered separately).

Manager Nuclear Operations

3.1.15 **DETERMINE** the policy for the usage of Independent Verification (IV) / Concurrent Verification (CV) in the clearance process.

> **NOTE:** Past lessons learned in this area have shown a single point vulnerability that, if the wrong Danger tag was cleared and the incorrect breaker was closed, a person working on a de-energized piece of gear could be electrocuted because of a single person error.

All

3.1.16 When clearing an electrical Danger tag, **USE** the CV process instead of the IV process.

3.1.17 Do **NOT** operate components with Danger Tags attached, with the following exceptions:

- Qualified Operations personnel performing boundary verification only to the tagged position per SRO direction and prior to the release of any work.
- During torquing of boundary isolation valves due to leak-by; however, prior to additional torquing, permission must be obtained from the SM / SRO and all crafts with authorized work released under the Tagout.

3.1.18 **IF** it is the Shift Manager's decision to tag a component due to a potential safety concern, **THEN** tags should **NOT** be cleared without a resolution of the issue. These concerns could involve personnel or equipment safety such as but **NOT** limited to; tripped breakers, steam leaks, rubbing fans, electric shock hazard, etc.

Tagging Office

3.1.19 To **MAINTAIN** status control, specific components worked by Maintenance personnel should be designated on the Tagging Record.

a. **IF** applicable, **THEN INCLUDE** components worked by Maintenance Department personnel on the Tagging Record. This will allow status control of the component when clearing the Tagout.

b. **MINIMIZE** placing Danger tags on components that are to be worked to minimize temporary lifts or boundary modifications. **USE** a “No tag” ‘or “maintenance activity” type when possible to ensure position is verified when system is restored. **IF** the component will need to be manipulated by the Maintenance group, **THEN** evaluate using an Operating Permit.

Manager Nuclear Operations

c. **IF** applicable, **THEN DIRECT** personnel to align a system in accordance with valve lineups when clearing the Tagging Record. **IF** system alignment is performed in accordance with valve lineups, **THEN** the component is **NOT** required to be added to the Tagging Record.

Tagging Office

3.1.20 Tagging documentation practices:

a. **REFER** to the appropriate user's guide to access and use the system.

b. **IF** eSOMS is inoperable or unavailable, **THEN INITIATE** Contingency for Loss of eSOMS Computer (ATTACHMENT 13).

3.1.21 Due to containment sump blockage concerns, only metal tags may be used in containment above 200 degrees F.

3.1.22 For other Operating OE Practices that should be performed, **REFERENCE** Operating Experience (ATTACHMENT 12).

3.1.23 **ENSURE** plant conditions required for work safety, including unit mode or system/component liquid level or elevation differences, are in body of tagout. Examples of plant conditions are listed below: (Ref. 5.4.30)

- Reactor Vessel level
- Steam Generator level
- Reactor Coolant System <200°F
- Mode 5
- Intake Canal or Discharge Tunnel elevation

a. **IF** either of the following exist, **THEN OBTAIN** Operations Manager or Plant Manager approval: (Ref. 5.4.30)

- Plant conditions are **NOT** established by approved station procedures

OR

- Previously approved plant conditions **NOT** established by procedure are modified

3.1.24 **IF** a tagging boundary has non-standard Equipment Clearance isolation boundaries or energy release cannot be verified prior to signing on to the tagout (i.e. Manager Nuclear Operations/OMOC tagout boundary approval required, can't double isolate **NO** vent or drain path), **THEN INITIATE** an Operational Risk Assessment and the associated risk management/ contingency plan in accordance with WM-AA-301, Attachment 15, Operational Risk Assessment Template, provides a template for developing the Operational Risk Assessment. (Ref. 5.4.31)

3.1.25 The following sources of potential energy are **NOT** controlled by the Clearance process:

- Freon
- Sumps (e.g., the contents in a lube oil sump or water contained in the Turbine Building sump)

The Work Management Process will control the conditions required to perform work, i.e. "ensure Freon is removed", ensure sump has been pumped down, etc.

3.2 eSOMS Clearance Process

NOTE: Tagging requests should have sufficient detail to allow the tagging department to properly prepare the Tagout, including (as necessary) specific scope of work and reference drawings to provide safety to the workers and equipment.

3.2.1 Requesting a Tagout

Requestor

a. **REQUEST** Tagouts (Maximo electronic equivalent or Tag-Out Request (ATTACHMENT 5).

- **COMPLETE** the Maximo electronic equivalent or Tag-Out Request (ATTACHMENT 5).
- In an emergency or during backshift evolutions, **COMMUNICATE** directly with Operations Shift Supervision

User/Cognizant Dominion Foreman, Supervisor, Lead Craft, or NSS Foreman

b. **IF** a Tagout is required for work by supplemental personnel, **THEN** the cognizant Dominion foreman or supervisor shall approve the Tagout request. The Dominion foreman, supervisor, lead craft, or Nuclear Site Services (NSS) foreman shall be the Tagout holder.

c. The craft should use Tag-Out Request (ATTACHMENT 5 or Maximo) to request the conditions of the Tagout and electrical isolations necessary to allow maintenance to be performed safely. Tagging Office boundaries may be different but comparable to the Tagout request. The request is required to be reviewed by a knowledgeable reviewer (e.g., Planner, Engineer, Craft) and documented on the Tag-Out Request.

User/Cognizant Dominion Foreman, Supervisor, or NSS Foreman

d. The normal work flow process for tagging requests is as follows:

Planning during the work order preparation phase will initiate Tagout Request:

- For typical Mechanical maintenance work, **SPECIFY** in the tagging request the type of isolation required to perform the maintenance. This shall include interferences that must be de-energized/removed to support establishing safe boundaries. The specific boundary isolations do **NOT** need to be on the Tagout request. Some examples are: [Ref. 5.4.33]
  - For an Emergency Diesel Generator: Need No rotation, plus coolant tagged and drained.
  - For a pump with ancillary / auxiliary support systems: Need pump isolated and drained, cooling water to the seal cooler isolated and drained, oil system electrical isolated.
  - For a Heat exchanger: Need to isolate and drain both sides of the heat exchanger, or isolated and drain shell side and isolate the tube side.
  - For an AOV: System integrity will be maintained, no flow and air isolated.
- For work performed by Electricians, I&C, or NSS Electrical that rely on breakers as isolation points, **SPECIFY** the power source and reference the applicable drawing.
- For any work relying on lifted leads or pulled fuses **OR** ANY DCP, a detailed Tagout request is required. The request will reference the appropriate drawings used to develop the tagging boundaries. **ATTACH** marked up copies of the associated drawings (electrical/mechanical/ design change prints) to a hard copy of the Tagging Request.
- For intrusive breaker work, **ATTACH** the breaker internal prints to a hard-copy of the Tagout request.

User/Cognizant Dominion Foreman, Supervisor, or NSS Foreman/ Test Engineer

e. **IF** work orders associated with a DCP require testing, **THEN** a Test Engineer must **SIGN ON** the Tagout prior to beginning any testing and will **SIGN OFF** the Tagout when the equipment is ready to be released to Operations.

Craft Lead

f. **ENSURE** the tagging boundaries are adequate for personnel and equipment protection.

Operations/ Tagging Office

g. The following applies to ALL DCP/Plant modifications/Tagout Requests and also any other Tagout request that Operations/Tagging Office deems necessary:

- All DCP/MOD work orders must be accompanied by a Tagout Request.
- All DCP Tagout Requests must be signed by craft persons or engineers (depend on DCP) and shall be documented by the independent verification of the boundary isolation. All DCP Tagout Requests should be delivered to the Tagging Office at a minimum of four weeks prior to implementation.

Planning Department or Foreman

h. **IF** applicable, **THEN INITIATE** the tagging request based on the scope of the work being performed. This is normally performed during the work package development.

i. **Initial Review of Tagout Requests**

User

IF the Tagout Request is created, **THEN TRANSMIT** the Tagout Request to the Operations/Tagging Office. The Operations/Tagging Office shall:

Operations/ Tagging Office

1. **REVIEW** the Tagout Request:
   - **ENSURE** that the request is understandable.
   - **ENSURE** that the requested equipment can be removed from service.
2. **IF** the request is **NOT** valid, **THEN NOTIFY** the Craft Supervisor of the invalid request and **ATTEMPT** to resolve discrepancy.
3. **IF** the request is valid, **THEN INITIATE** Tagout preparation.

Qualified Operator

3.2.2 **Preparing a Tagout**

NOTE: Site-customized checklists can be used provided that they include the requirements of ATTACHMENT 16.

a. **USE** ATTACHMENT 16 when preparing tagouts.

b. **DETERMINE** if a procedure (e.g., MOP, OP, and TOP, TMOP) is in effect for the evolution.

c. **DETERMINE** tagging requirements by reviewing the work order job steps. These can be found in Maximo, eSOMS, or Primavera. **IF** required, **THEN CONTACT** Planning / Craft to provide clarification.

d. At multi-unit sites where common/shared equipment is affected, **NOTIFY** the opposite unit of the tagging activities.

e. **IF** tagging boundary isolates a BDB plant connection, **THEN REFER** to CM-AA-BDB-102, Beyond Design Basis FLEX Equipment Unavailability Tracking, to notify the SITE FLEX Program Owner or the Engineering Manager on Call (EMOC) to determine the effect on equipment availability.

f. **REVIEW** the request carefully using controlled documents. **IF NO** controlled documents exist for the item to be tagged, **THEN** one of the following methods should be used:

Craft/ Supervisor

1. **Method 1**
   - **USE** available references
   - Craft walkdown is required
   - **DOCUMENT** the walkdown on a Tagout request form
   - Two craft persons shall sign the Tagout request, to document verification of the boundaries
   - **DOCUMENT** reliance on the walkdown on the Tagging Record

Qualified Operator

2. **Method 2**

   This method verifies that the power supply identified on the Tagout will electrically isolate power from the component to be worked.

Craft/ Supervisor

   - A supervisor (usually from the tagging office) will accompany the craft involved to the field.
   - With power supply closed, **ENSURE** voltage to the component to be worked.
   - While the voltmeter is still indicating voltage to the component to be worked, **OPEN** the electrical disconnecting device.
   - **ENSURE** voltage goes to “zero”
   - **ENSURE** all phases to ground indicate “no” voltage

g. **CHECK** any drawings used for pending changes and **REVIEW** any pending changes identified.

Qualified Operator

h. **ENSURE** the boundaries for the work are comparable to those submitted by the requesting organization.

i. **ESTABLISH** the tagging sequence. **WHEN** procedural guidance exists, **THEN** the procedure takes precedence over the normal sequence of isolation. The normal sequence of isolation is as follows:

   - **POSITION** control switch
   - **REMOVE** power from component(s)
   - **ISOLATE** component/system from high pressure side to low pressure side
   - **OPEN** drain valve(s)
   - **OPEN** vent valve(s)

j. **ESTABLISH** restoration alignment and sequence.

k. **ENSURE** restoration alignment reflects normal valve lineup, controlling procedure, or equipment status positions.

l. **NOTE** any restoration positions that conflict with normal positions in the Tagout.

m. **COMPLETE** the electronic tagging process electronic equivalent or Non-Electronic Tagging Process (ATTACHMENT 2) in accordance with the instructions of the eSOMS user's guide.

n. **ENSURE** proper tag types are specified for each component on the tagout.

o. **ENSURE** effects of the Tagout on indications, instrumentation, or controls outside the boundaries have been evaluated and necessary actions taken to provide compensation for any loss.

p. **CONSIDER** the Tagout's effects on Reactivity Management and **NOTE** effects on the tagout cover page. **REFER** to OP-AP-300, Reactivity Management to aid in determination.

q. **MAKE** informational entries (e.g., **NO** drain / vent path, print number information, etc.) in the comment section of the cover page.

r. **IDENTIFY** reference document and drawing numbers on the cover page.

s. I**DENTIFY** hazards, including live electrical sources, associated with Tagout and **NOTE** on the tagout cover page.

t. **ASSEMBLE** support documents/drawings/procedures or electronic equivalent for inclusion in the tagging package. This is **NOT** required for emergent work.

u. **SIGN** for “Prepared By” and **RETURN** to Supervisor for review.

v. **WALKDOWN** Tagouts to **ENSURE** components on the Tagout are as follows:

- Properly labeled
- Proper configuration and system piping lay out
- Accessible and note various hazards in the area
- If practical, **SELECT** isolation points that are accessed more safely and are located in lower radiation fields (ALARA)

w. The walkdown is **NOT** required to be performed for the following:

- Outage Tagouts
- **IF** the component has been recently tagged
- At the discretion of the OMA or designee

3.2.3 **Approval of a Tagout**

Manager Nuclear Operations

a. **DETERMINE** the qualification level and number of approvals required to approve a Tagout. (**SEE** Qualification Levels and Reviews Process for Writing and Approving Danger Tagouts (ATTACHMENT 9))

Tagout Preparer and Approver

b. **ENSURE** the person approving the Tagout is different than the preparer.

NOTE: Reviewer shall be independent from preparer.

SRO or designee

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.
- **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.

d. **ENSURE** all required supporting documentation is included in the Tagout package.

e. **SIGN** for Reviewed By and **RETURN** to Supervisor for review.

f. **IF** applicable, **THEN HAVE** a controlled copy of the work package for review of the Tagout.

g. **UTILIZE** appropriate human performance tools (checklists) in conjunction with the approval process.

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.

i. **IF** the completed Tagging Record and tags are satisfactory, **THEN** the SRO shall electronically **SIGN** the Tagging Record indicating satisfactory review. **IF** required, **THEN FORWARD** to a second SRO for review.

3.2.4 **Authorization of Tagging Record to be Hung**

Shift Manager or Designee

a. After the SRO finishes the completeness and accuracy review, **DETERMINE** whether the Tagout can be authorized by the following:

1. **ENSURE** that any required testing is initiated prior to tagging.

2. **ENSURE** work is ready to begin.

3. **ENSURE** compliance with Technical Specifications requirements, including the following:

   - Operability of any required redundant equipment and satisfactory completion of testing.
   - Compliance with applicable LCOs

4. **ENSURE** effects of the Tagout on indications, instrumentation, or controls outside the boundaries have been evaluated and necessary actions taken to provide compensation for any loss.

5. **ENSURE** compliance with Technical Requirements Manual (TRM), Maintenance Rule, and other requirements.

6. **ENSURE** required Tagout attributes and notes are referred to and are completed.

7. **NOTIFY** Control Room personnel of Tagout to be hung, as applicable.

b. **IF** conditions for authorizing the Tagout are satisfactory, **THEN** the Shift Manager or designee shall **PERFORM** the following:

1. **APPROVE** the Tagging record for execution and **SIGN IN** the computer for Tagout to be hung.

2. **ENSURE** tags are hung as soon as possible after authorizing/printing to minimize potential tag sharing discrepancies in eSOMS.

c. **IF** the conditions for the Tagout are **NOT** satisfactory, **THEN** the Shift Manager or designee shall **PLACE** the Tagging Record on hold until conditions permit.

3.2.5 **Execution of a Tagout**

Shift Manager or Designee

a. **ASSIGN** a qualified tagging individual to perform the Tagout. **BRIEF** the individual on the purpose of the Tagout, the conditions that shall be established within the boundary, any Tagout cautions (e.g., high temperature and pressure) and **PROVIDE** the individual with the Tagout paperwork and tags.

Shift Manager or Designee/ Tagout Verifier

b. **IF** required, **THEN ASSIGN** a qualified tagging individual to perform independent verification or concurrent verification (IV/CV) of the Tagout. As required, **BRIEF** the individual on the purpose of the Tagout, the conditions that shall be established within the boundary, and any Tagout cautions (e.g., high temperature and pressure).

Qualified Individual Assigned the Tagging Record

c. **PERFORM** the following:

1. **USE** the procedure (**IF** applicable) and the Tagging Record Hang Sheet as instructions for component alignment and tag placement. **TRANSFER** information recorded on the copy to the original Tagging Record or electronic equivalent as soon as possible after tag placement.

2. **PLACE** control panel tags/devices in the control room so controls or control indications are **NOT** obscured. **IF** applicable, **THEN USE** control panel tags/devices to identify the status of various system components by placing them near the controls and indications on the control boards.

3. **PLACE** the tags conspicuously on the components so the components **CANNOT** be operated without the tag being seen.

4. **ENSURE** proper place keeping methods are used for each tag as the component is aligned.

5. **IF** during the execution of a Tagout, additional actions are required or the Tagout can **NOT** be completed as written, **THEN CONTACT** the controlling supervisor for resolution.

6. **ENSURE** that the physical result of each alignment action is observed to ensure the desired conditions are being satisfied for safe work. **IF** undesired conditions are encountered (e.g., the inability to depressurize a piping system due to leakage through a boundary valve), **THEN PERFORM** the following:

   - **STOP** the Tagging Record or electronic equivalent
   - **PLACE** the component in a safe condition, and
   - **CONSULT** with the controlling supervisor for resolution of the problem.

7. **NOTIFY** Shift Supervision of any component with labeling discrepancies.

8. **SIGN** the Tagging Record or electronic equivalent.

d. **IF** required, **THEN PERFORM** boundary modification to install grounding device and **PLACE** Danger tags per procedure or associated work order.

3.2.6 **Computer Update**

a. After the Tagout is completed in the field, **UPDATE** the electronic record and **SIGN** electronically (tags verified hung).

Shift Manager or Designee

b. **NOTIFY** the craft after tags are verified hung.

Tagout Holder/ Lead Craft

3.2.7 **Tagout Holder/Lead Craft Acceptance of Tagout**

a. **ENSURE** that the tagging boundary is adequate for the work being performed.

b. **ENSURE** Danger Tags are hung on the designated equipment.

- At least the first individual of each Craft who will hold the clearance walks down the Tagout.
- The walkdown should be sufficient to ensure an adequate safe boundary for work. It may not be necessary to walkdown the entire Tagout depending on scope of work.
- In all cases, the clearance holder should understand the basis for safety of the personnel under their leadership.

c. **BRIEF** work order holders on tagging boundaries and field activities.

d. **SIGN** on the Tagout as Tagout holder in eSOMS.

e. **ENSURE** a Live-Dead-Live check has been performed in accordance with SA-AA-125, Electrical Safety, before starting ANY work if necessary for safety. **COMPLETE** the check before beginning physical work activities.

f. **IF** performing work that requires tagging, **THEN SIGN** on as work order holder in eSOMS.

Work Order Holder

3.2.8 **Work Order Holders**

Work order holders shall:

Tagout Holder/ Lead Craft

a. **RECEIVE** a briefing from the Tagout holder or lead craft.

Work Order Holder

b. Be given the opportunity to walk down the Tagout.

c. **SIGN ON** to the applicable work order on the Tagout in eSOMS.

Work Order Holder

d. **SIGN OFF** of the applicable work order on the Tagout in eSOMS at the end of the shift or when work is complete.

Some large projects (e.g., turbine upgrade, turbine replacement) may be EXEMPT from SIGN OFF of the applicable work order on the Tagout in eSOMS at the end of the shift (each day) with Project Manager and Operations Manager permission.

- **IF** your work is complete and you do **NOT** plan to sign back onto this Tagout, **THEN SELECT** Yes in the Is this work complete box.
- **IF** you will need to sign back onto this Tagout or a revision of this Tagout, **THEN SELECT** No in the Is this work complete box.

Operations

- **MAKE NO** decision to clear the Tagout from the work complete box which is for information only.

Personnel Performing Equipment Clearance

3.2.9 **Work Order Holder Sign On/Off Log**

a. The Work Order Holder Sign On/Off Log (ATTACHMENT 14) is intended to be a back up method to the computer sign on/off features of the eSOMS tagging system. **USE** the Work Order Holder Sign On/Off Log as an exception rather than the rule. The preferred method for signing on/off a Tagout is to use the eSOMS tagging system.

*Tagout Holder **and** Operations*

b. Before ATTACHMENT 14 is used, the Tagout holder and the Operations Department shall both **AGREE** that a Work Order Holder Sign On/Off Log (ATTACHMENT 14) will be used.

Tagout and Work Order Holder

c. The intent of the Work Order Holder Sign On/Off Log is to allow qualified personnel to **SIGN ON/OFF** eSOMS Tagouts without using the eSOMS tagging system. When ATTACHMENT 14 is being used, the Tagout Holder becomes the main holder of worker safety. **INFORM** the Tagout Holder that the Tagout Holder is the main holder of worker safety for the Tagout until ATTACHMENT 14 is **NO** longer used.

d. The Tagout Holder is expected to **SIGN ON** to the Tagout and **HOLD** the tags until work is complete. Also, as a tracking mechanism, the Tagout Holder is expected to **SIGN IN** as the work order holder on each work order that uses a Work Order Holder Sign On/Off Log.

e. **IF** the Work Order Holder Sign On/Off Log is used, **THEN** the Tagout Holder is expected to follow the same requirements listed in OP-AA-200, Equipment Clearance.

f. The Tagout Holder is required to brief or ensure the Work Order Holders using the work order have equivalent knowledge of the clearance process as if they had taken the Computer Based Training (CBT).

g. Since electronic tracking is **NOT** available using the Work Order Holder Sign On/Off Log, it is the responsibility of the Tagout Holder to **ENSURE** all personnel on the Work Order Holder Sign On/Off Log are notified of any lifts that will occur.

h. **WHEN** complete, **RETURN** the Work Order Holder Sign On/Off Log to Operations to be transmitted to records management.

i. Each Work Order Holder Sign On/Off Log applies only to ONE Tagout.

j. **LIST** multiple work orders from the same Tagout on a single Work Order Holder Sign On/Off Log, if appropriate.

k. When a work order holder **SIGNS OFF** the Work Order Holder Sign On/Off Log (ATTACHMENT 14):

1. **IF** your work is complete and you do **NOT** plan to sign back onto this Tagout, **THEN WRITE** Yes in the Is this work complete box.

2. **IF** you will need to sign back onto this Tagout or a revision of this Tagout, **THEN WRITE** No in the Is this work complete box.

l. The intent of the Work Order Holder Sign On/Off Log is for use by station/supplemental personnel needing worker protection but having difficulties accessing eSOMS.

3.2.10 **Addition of Work Orders to an Existing Tagout**

Operations

a. **PERFORM** the same level of review for addition of a work order to an existing Tagout as for an initial work order.

Tagout Holder

b. **REPEAT** Step 3.2.7 as required.

3.2.11 **Boundary Modification or Revision**

Operations

a. **IF** work can **NOT** safely continue when boundary modification or revision occurs, **THEN NOTIFY** the affected craft to place the impacted work orders on hold.

Qualified Operator

b. Boundary modification is normally an expansion or reduction in the tagging boundary. Boundary modification is usually performed when any of the following occur. **REVIEW** the following:

- There is a change in work scope
- It is desired to recover a portion of the tagged system
- It is a part of a pre-approved work sequence
- A component fails to isolate

c. **REVIEW** and **APPROVE** boundary revisions or modifications using the same method as the initial creation of a Tagout.

Qualified Operator

d. **Boundary Modification Process**

Operations shall **PERFORM** the following:

- **PREPARE** modification
- **ESTABLISH** new boundary
- **NOTIFY** Craft of revision

Qualified Individual

- **ACCEPT** new boundary/revision and then **RELEASE** (sign off) previous Tagout (**IF** required, **THEN STOP** associated maintenance.)

Tagout Holder/ Qualified Operator

- After craft releases original boundary/Tagout, **CLEAR** the original Tagout per the Tagout removal process in Step 3.2.13.

3.2.12 **Temporary Lifts**

Operations/ Temporary Lift Requestor

USE Temporary lifts to modify Tagging Boundaries for testing. Temporary lifts are normally in place for no longer than 24 hours unless a longer period has been previously agreed upon. Do **NOT** use Temporary lifts to permanently modify tagging boundaries. The use of Temporary Lifts is discouraged; however, **IF** necessary, **THEN** the requestor is to provide as much detail as possible in "Reason for the Temporary Lift" section such that the purpose is clearly understood by all persons concerned (per ATTACHMENT 6).

NOTE: Tagging practices and documentation required to perform normal tagging evolutions are applicable for performing temporary lifts as well.

Craft Lead

a. **COMPLETE** a temporary lift request at least 12 hours before the lift is desired, whenever practical. The Temporary Lift Request (ATTACHMENT 6) will contain the following:

- Reason for lift
- Components to be lifted
- Time desired
- Reason for exceeding the 24-hour limit, if applicable

Operations

b. **PREPARE** the temporary lift and **PROVIDE** the temporary lift number to the craft lead who requested it, if plant conditions support the temporary lift.

Craft Lead/ Work Order Holders

c. **NOTIFY** work order holders of the lift and to place affected work orders on hold, **IF** required. Craft lead will also accept the temporary lift.

Each Supervisor Authorizing the Temporary Lift

d. **PERFORM** all of the following:

- **INSPECT** the work area to ensure non-essential items have been removed and to ensure that the machine or equipment component can support the testing.
- **ENSURE** that all employees have been safely positioned or removed.
- **ENSURE** that all required employees are notified that the Tagout will be lifted and the appropriate work/work orders are to be suspended.

e. **IF** a breaker is being temporary lifted to test, **THEN PLACE** the affected tags on the breaker racking mechanism using a temporary release sleeve **OR STOP** all associated work and lift tags.

Operations or Designated Qualified Individual

f. **WHEN** all affected work order holders have accepted the temporary lift, **THEN LIFT** the tags and **UPDATE** the computer. The tags remain with the temporary lift sheet until the lift is **NO** longer required, unless the temporary lift is used to rack a breaker to test.

Operations

g. **WHEN** the temporary lift is completed, **THEN NOTIFY** the craft lead that the requested temporary lift has been performed.

Craft Lead

h. **WHEN** the temporary lift is **NO** longer required (normally **NOT** to exceed 24 hours), **THEN NOTIFY** Operations to restore the tags.

Operations

i. **IF** applicable, **THEN RESTORE** the system to fully tagged state without craft approval **IF** the time limit for completion of the work for which the lift was requested has expired.

j. After the tags are restored, **UPDATE** the computer and **NOTIFY** the craft lead initially requesting the temporary lift.

3.2.13 Clearing a Tagout

Tagout Holder

a. **ENSURE** work order holders have signed off the Tagout in eSOMS.

b. **PERFORM** the following:

- **ENSURE** that personnel are clear of equipment.
- **ENSURE** that equipment is ready for admission of energy.
- **ENSURE** work area is operationally intact and clean of non-essential items to allow for safe admission of energy.

c. **IF** all work order holders have **NOT** signed off the Tagout and are **NOT** on-site, **THEN**:

Cognizant Supervisor or Designee

1. **MAKE** reasonable attempts to contact the worker, and **IF** attempts have failed, **THEN**:

Cognizant Supervisor or Designee/ Security

- **REQUEST** that Security **ENSURE** that the worker is off-site
- **REQUEST** and **ENSURE** that Security places the worker's badge access on hold until the worker is notified of the Tagout clearance

Cognizant Supervisor or Designee

2. **NOTIFY** the Shift Manager and have individual removed from the Tagout **IF** the worker is **NOT** on-site or the supervisor or designee was able to contact the worker and obtain their permission.

Cognizant Supervisor or Designee/Shift Manager

3. **DOCUMENT** the actions taken using Shift Manager Employee Sign-Off (ATTACHMENT 7) and **ATTACH** this form to associated work order.

Tagout Holder

d. **IF** all work is complete, **THEN SIGN OFF** the Tagout in eSOMS to release equipment back to Operations.

e. **NOTIFY** Operations shift supervision that Tagout is **NO** longer required.

SRO or Designee

f. **PERFORM** the following:

- **ENSURE** all personnel are signed off the Tagout.
- **ENSURE** all work orders are at least Status 50 or higher. **IF NOT** at least Status 50 or higher, **THEN SUSPEND** the clearance of the Tagout until the status of the work order can be determined.
- **DETERMINE** if any tags are to be removed and equipment restored per the tag removal list. **IF NO** tags are to be removed, **THEN PERFORM** verification within eSOMS to complete Tagout.

g. **REVIEW** the Tagout and any supporting documents for removal information, including restoration position and sequence. This includes leaving the Tagout in place for tag sharing.

h. **IF** changes are required, **THEN OBTAIN** a second SRO review.

i. **ENSURE** system configuration will support removal of the Tagout.

j. **ENSURE** valves inside the tagging boundary are restored to their correct position (i.e., a non-tag, a partial checklist, valve lineup, or in some cases, by another Tagout). For Tagouts with large boundaries, the SRO/WCS shall determine the extent of the applicable checklist to be performed. During outages, performance of checklist can be deferred to completion of work in the applicable outage window, when the complete checklist can be performed. It is permissible to sign the checklist and the Tagout restoration when the tag is cleared and the component positioned.

k. **SIGN** for SRO Restoration Review/Approval By.

- **IF** the component will **NOT** be restored to its normal position **AND** is **NOT** held by another Tagout, **THEN MAINTAIN** the status of the component position utilizing other approved status control systems.
- **SPECIFY** verification requirements.

SRO

l. **AUTHORIZE** Tagout removal.

SRO or Designee

m. **BRIEF** qualified tagging individuals assigned to perform the tagging manipulations and independent verification/concurrent verification.

n. **DETERMINE** what operability checks are needed before returning the components in the Tagout boundary to service. These checks may include the following:

- Post Maintenance Testing
- In-service Testing (IST)
- Preventative Maintenance Testing (for base line data)
- Other Technical Specifications Surveillance Testing

o. **ENSURE** the order in which the tags are to be removed.

Qualified Individual Assigned to Clear the Tagging Record

p. **PERFORM** the following:

- **REMOVE** tags in the sequence specified. **IDENTIFY** and **COMPARE** each tag to the Tag Removal List to ensure the correct tag is being removed.
- **REMOVE** Danger tags and control panel tags/devices in the designated order. **REMOVE** Danger tags from the station and then **REMOVE** control panel tags/devices from the Control Room with the Control Room Operator's concurrence.
- **ENSURE** proper place keeping is maintained as each Danger tag is removed and component is aligned.
- **ENSURE** that the physical result of each alignment action is observed to ensure the desired conditions are being satisfied for safe work. **IF** undesired condition are encountered (e.g., the inability to pressurize a piping system due to leakage through a valve), **THEN PERFORM** the following:
  - •• **STOP** the Tagging Record release
  - •• **PLACE** the component in a safe condition, and
  - •• **CONSULT** with the Shift Manager or designee for resolution of the problem.
- **ENSURE** that piping systems are properly filled and vented in accordance with the applicable system operating procedures.
- **UPDATE** eSOMS by signing on as restoration first verifier.
- **RETURN** the completed Tagout documents to the controlling supervisor.

Operations Shift Supervision/ Assigned Qualified Operator

q. **WHEN** assigned by Operations Shift Supervision, **THEN** a qualified operator shall **PERFORM** the following:

- **ENSURE** tags are removed and equipment is properly repositioned as specified on the Tagout removal list.
- **UPDATE** eSOMS by signing on as restoration second verifier.

Shift Supervision/ Shift Clerk

r. After completing the Tagging Record, **PERFORM** the following:

- **SIGN** tags verified removed on Tagging Record.
- **PRINT** and **TRANSMIT** completed tagging documents to records management.
- **ENSURE** destroyed or **DESTROY** the copies of the Tagging Record, the Danger tags, and copies of the temporary lifts.

3.3 Electrical Practices

All Personnel

Do **NOT** use component control switches as an isolation point for establishing a Tagout without Manager Nuclear Operations or designee permission unless specified per approved procedure. **USE** equipment and component breakers to **REMOVE** the energy source unless specified per approved procedure. **AFFIX** control panel tags/devices to control switches in the Main Control Room as an indication that the equipment is tagged out. Local and remote control switches may have control panel tags/devices affixed, **IF** required.

3.3.1 4160 Volt Breaker Cubicles

a. For all Danger tags placed on 4160 volt breakers for isolation, the tag should read one of the following:

- Removed
- Racked out
- Racked down
- Disconnect
- Racked out/removed

Qualified Individual

b. **WHEN** racked out/down, **THEN PLACE** the Danger tag on one of the following locations:

- Breaker Racking Mechanism
- Positioning handle lockout tab breaker for air magnetic breakers
- Interlock handle on vacuum breakers

c. **WHEN** a breaker or breaker blocking device is in the removed position, **THEN ATTACH** the Danger tags to front of cubicle.

d. **IF** required, **THEN TRANSFER** Danger tags between the racked out/down or removed positions and front of breaker cubicle per associated work order or procedure or use Breaker/Breaker Blocking Device Removal (ATTACHMENT 4).

Tagout Holder

e. **IF** equipped, **THEN TAG** control power knife switches in open position, **IF** applicable.

Operations

f. As an option to tagging 4160 VAC breakers to disconnect, a Breaker Blocking device (BBD) may be installed. This device will cover the shutters, preventing racking the breaker to connect.

- **REMOVE** the breaker from the cubicle in order to **INSTALL** or **REMOVE** the BBD.
- **USE** switchyard tag type for BBDs, facilitating the printing of a Tag Stub.
- **INSTALL** the tag on the device and **PLACE** the stub on the breaker cubicle door, providing a visual cue.
- **INSTALL** a placard on the front of the breaker as well as a control panel tag/device.
- **INSTALL** and **REMOVE** the BBD using plant specific procedures.

3.3.2 **Tagging 480 Volt Bus Type Breakers**

a. **IF** applicable, **THEN TAG** 480 volt breakers in the racked out/removed position or disconnect.

b. **WHEN** a breaker is racked out, **THEN ATTACH** the Danger tag to the racking window locking tab, **IF** applicable.

c. **WHEN** a 480-volt racking type breaker is removed, **THEN ATTACH** the tag to the front of the breaker cubicle.

Qualified Individual

d. **IF** required, **THEN TRANSFER** Danger tags between the racked out/down or removed positions and front of breaker cubicle per associated work order or procedure or use Breaker/Breaker Blocking Device Removal (ATTACHMENT 4).

3.3.3 **Tagging 480 Volt MCC Type Breakers**

a. **IF** applicable, **THEN TAG** 480 volt MCC breakers in the off/open or removed position to serve as an isolation.

b. **ATTACH** the Danger tag to the breaker operating handle.

3.3.4 **Tagging of 240/120 Volt Panels**

IF the electrical panel has an installed locking device, **THEN ATTACH** the Red ty-wrap and Danger tag to the locking bar. **IF NO** installed locking device, **THEN USE** an approved blocking device, if available.

3.3.5 Installation and Control of Grounds

Electrical Maintenance

a. **ENSURE** that all equipment or conductors are de-energized prior to installing grounding devices and placing ground tags.

User

b. **USE** grounding devices when working on electrical conductors that normally operate greater than 600 volts. Equipment grounding for less than 600 volts is optional.

Tagging Office/ Maintenance Craft Requiring the Grounds

c. Work orders requiring grounds should be specified by the tagging request. **WHEN** required by the Tagging Office, **THEN GENERATE** a separate work order to install grounds. The maintenance craft requiring the grounds shall **REQUEST** the ground tags.

d. **WHEN** requested, **THEN** grounds shall be installed per approved procedure and be controlled by the eSOMS Clearance system using ground tags.

Operations

e. To ensure a safe boundary, the sequence of installing a ground should be as follows:

- **HANG** initial Tagout to ensure safe boundary for the placement of the grounding device.

Electrical Maintenance/ Tagout Holder/ Work Order Holder

- **IF** required, **THEN** have Tagout holder and work order holders **SIGN ON** to Tagout for the placement of the grounding device.

Electrical Maintenance/ Tagging Office

- **GENERATE** new Tagout to include the required ground tags. (This can be a boundary modification to original Tagout.)

Qualified Electrical Worker/ Qualified Individual

- Have qualified individual **INSTALL** grounding devices per procedure or associated work order.
- Have qualified individual **PLACE** ground tags.

Operations

f. **WHEN** a grounding device is installed per a Tagout, **THEN ENSURE** the restoration sequence removes the grounding device prior to clearing tags on all breakers, disconnects and switches.

Electrical Maintenance/ Operations/Shift Supervision and Supervisor Electrical Maintenance, if applicable

g. **DO NOT OPERATE** electrical devices with a ground device installed on the conductor. An exception to this may be made for testing purposes with concurrence from Operations Shift Supervision and Supervisor Electrical Maintenance.

3.3.6 Fuses

Operations/ Maintenance Personnel/ Qualified Individual

REMOVE fuses for electrical isolation of a component for maintenance or testing. **IF** requested by Operations, **THEN** Maintenance Personnel may **REMOVE** fuses and have tags hung by qualified individual.

Responsible Department

a. **Motor Heater Fuses**

1. **REMOVE** the fuses from the distribution panel and, **IF** applicable, **INSTALL** a blank fuse holder.
2. **ATTACH** the Danger Tag to the blank holder, **IF** installed.
3. **PLACE** fuses in a Whirl Pak or clear plastic bag, with a copy of the Danger Tag. **STORE** the fuses by tying the Whirl Pak or clear plastic bag through the hole in the blank or in the bottom of the cabinet.
4. For all tags placed on fuse holders, the position shall read “removed”.

b. **4160 Volt Breaker Trip/Close Fuses and Similar Types**

1. **REMOVE** the fuses and holder.
2. **ATTACH** a plastic binder clip to the plastic housing of the female section of the fuse holder.
3. **ATTACH** the Danger Tag to the plastic binder clip (Do **NOT ATTACH** to the fuses or fuse holder).
4. **ATTACH** the fuses and fuse holder to a Whirl Pak or clear plastic bag. **IF** applicable, **THEN USE** a copy of the Danger Tag to identify the fuse(s) by placing the copy inside the Whirl Pak or clear plastic bag. **STORE** fuses inside the breaker cubicle or inside the cabinet, as appropriate.

c. **Fuses in Clip Holders**

1. **REMOVE** the fuses.
2. **INSTALL** the correct size (to prevent bending the clips, resulting in loose fuses) fuse tag holder into the fuse clip.
3. **ATTACH** a Danger Tag to fuse tag holder.
4. **PLACE** the fuses in a Whirl Pak or clear plastic bag with a copy of the Danger Tag or the Danger Tag stub itself if **NOT** part of a Switchyard Tagout. **STORE** the fuses inside the cabinet.

d. **Bus/Line Potential Fuses**

1. **REMOVE** the fuses. **STORE** inside the breaker or fuse panel.
2. **TAPE** the stub or a copy of the Danger Tag to the removed fuses.
3. **ATTACH** the Danger Tag to the outside of the fuse cabinet or drawer, as appropriate.

3.3.7 **Miscellaneous Electrical Practices**

Electrical Maintenance/ Plant Manager (Nuclear)

a. **ISOLATE** electrical circuits before starting work, **IF** applicable. **IF** a circuit must remain live to support maintenance, **THEN TAKE** precautions to prevent electrical shock and loss of safety related equipment. Excluding test equipment, **OBTAIN** permission to lift or jumper live circuits above 150 volts from Plant Manager (Nuclear) or station approved procedures/documents.

Qualified Maintenance Personnel/ Qualified Individual

b. **USE** lifted leads as an electrical isolation boundary **IF** the conductor ends are insulated to prevent shock, re-connection, or a fire hazard:

- Only qualified Maintenance personnel may **DISCONNECT** electrical equipment.
- **DOCUMENT** lifted leads on the Tagging Record and have Danger Tags installed by a qualified tagging individual.
- **PERFORM** the following, as required:
- **IF** lifted leads are determined to be a Tagout boundary, **THEN** the appropriate discipline (I&C, Electrical Maintenance or NSS Electrician) should **PROVIDE** input as to lead designations, location and potential related consequences.
- **IF** a lead will be lifted where multiple leads are landed on the same terminal point, **THEN EVALUATE** the potential effect of lifting all leads in case more than the intended lead is lifted, with craft assistance as necessary.
- The appropriate discipline (I&C, Electrical Maintenance, or NSS) craftsman will identify the proper lead for the qualified individual to **HANG** the tag.
- **ADD** the physical location of the lifted lead to the equipment database so it will appear in the Tagging Record (e.g., behind Unit 1 vertical board, in the Unit 2 Annunciator/Hathaway racks, in the Decon Bldg. in panel 1-EP-CB-XXX), **IF** applicable.
- **IF** a battery lead is lifted in order to Tagout a diesel engine or similar device, **THEN MAKE** clear where the lead is to be lifted (at the starter or battery terminal).
- **IF** the tagout requires a disconnect / reconnect of live leads, **THEN INITIATE** a risk review per WM-AA-301, Operational Risk Assessment.

c. Certain breakers are labeled ON/OFF while others are labeled CLOSED/OPEN and a few breakers are labeled with the international symbols of 0/1 (zero/one). For the purpose of execution of Tagouts, procedures, and operation; it is acceptable to interchange:

- OPEN & OFF & 0. OPEN = OFF = 0
- CLOSED & ON & I. CLOSED = ON = 1
- Fuses are designated as installed, removed, or replaced. Installed = replaced.

d. **IF** any tags are hanging inside of an electrical panel that the panel cover is to be removed, **THEN** a **LIFT** or **REVISION** shall be required. This ensures that the crafts are informed, to facilitate in cover removal and re-installation, and tagged breaker configuration to be correct when tag(s) are re-hung.

Qualified Electricians

e. Breaker/Breaker Blocking Device Removal

IF a breaker must be removed from its cubicle for maintenance **NOT** covered per work order or procedure, **THEN PERFORM** the following sequence:

Qualified Electricians/ Operations

1. **GENERATE** a Breaker/Breaker Blocking Device Removal (ATTACHMENT 4) form or use an approved Electrical Maintenance procedure. This can be performed by Operations or by qualified Electricians.

Qualified Electricians

2. **MOVE** Danger Tags on the breaker racking device or current location to the breaker cubicle face or to the breaker door.
3. **WHEN** the breaker/Breaker Blocking Device is ready for re-installation, **THEN**:
   - **RETURN** the Danger Tags to the racking device or appropriate electrical isolation location
   - **SIGN** the Breaker/Breaker Blocking Device Removal form(s) indicating breaker/Breaker Blocking Device return
   - **ATTACH** completed form to work order/minor work that directed breaker/Breaker Blocking Device removal.

f. **IF NO** locking device or alternate means is available, **THEN USE** string to attach Danger Tags for the following components:

- Hathaway Patch Cords
- Fuses
- Lifted leads
- Some 120/240 breakers when tie wraps and blocking devices do **NOT** work

3.4 Mechanical Practices

3.4.1 General

Qualified Operator/ Maintenance

a. **WHEN** isolating a system or component, **THEN ISOLATE** the high-pressure side of the system or component BEFORE the low-pressure side of the system is isolated.

b. When returning a system or component to service, **UN-ISOLATE** the low pressure of the system BEFORE the high-pressure side of the system is un-isolated.

c. **IF** maintenance activities are to be performed on a vent or a drain that would normally be tagged open, **THEN ENTER** the component on the Tagging Record to show the initial and final positions to maintain status control as a “No tag” item.

Qualified Individual

d. **IF** appropriate, **THEN ESTABLISH** and **TAG** atmospheric vents and drains in the **OPEN** position to ensure piping is depressurized and remains depressurized. Normally at least one vent or drain path will be tagged open.

- **IF** a normal depressurization path **CANNOT** be provided within a Tagout boundary, **THEN TAKE** other definite measures to ensure the system or component is adequately depressurized and drained.

  •• **IF** a tagging boundary has no vent or drain path, **THEN** INITIATE an Operational Risk Assessment and the associated risk management/ contingency plan in accordance with WM-AA-301, Attachment 15, Operational Risk Assessment Template, provides a template for developing the Operational Risk Assessment. (Ref. 5.4.31)

  •• **ESTABLISH** a vent/drain path for all intrusive mechanical work. For tagging boundaries which interface with active systems, if there is no way to verify that the component being worked is depressurized (installed vent or drain valve open between boundary valves and component being worked), **ESTABLISH** an alternate relief path. This alternate path may be established by such means as removing a valve bonnet, breaking a flange, loosening a union, removal of instrument tubing, or any safe method. It must be agreed upon between Operations and the affected craft prior to beginning work. If required, a walk down between the Craft and Operations should occur to determine the method of energy release.

  •• **DOCUMENT** actions taken on the Tagging Record, appropriate applicable Maintenance procedure, or work order to ensure the system status is maintained.

e. After a vent or drainpipe cap is removed, **PLACE** the cap in a Whirl Pak or clear plastic bag and **ATTACH** to the valve handwheel, **IF** appropriate.

f. **IF** a blank flange is removed, **THEN ENSURE** a work order is generated to reinstall the blank flange.

g. Careful consideration shall be given to venting and draining radioactive systems or potentially radioactive systems to prevent release and comply with good HP practices. **CONDUCT** draining operations so fluids are directed to proper collection points or drains in accordance with good housekeeping practices.

h. **CONSIDER** the potential for flooding when any piping system is open. A potential for flooding may be created by an open vent, drain, flange or valve body. While draining, **IMPLEMENT** adequate precautions and close monitoring to prevent flooding.

i. When instrument air supplies are to be isolated, **TAKE** extreme care to **ENSURE** other operable components are **NOT** affected.

j. **WHEN** equipment is returned to service, **THEN RE-INSTALL** caps or blind flanges on vents and drains used to vent and drain the equipment or systems that were tagged out. Do **NOT INSTALL** caps on equipment system leak-off lines or tell tale drains.

k. **EVALUATE** the Tagout when a check valve is within a tagged boundary. **IF** possible, **THEN ENSURE** the process fluid is drained from both sides of the check valve (especially if personnel entry is planned).

l. Due to consequences of an improperly positioned boundary isolations for systems containing high energy, radioactive material, hazardous chemicals or could affect RCS inventory (especially during reduced inventory conditions), the supervisor, at their discretion, may have boundary isolation IVs prior to venting and draining.

m. For Tagouts involving chemically treated water systems, **NOTIFY** the appropriate site organization(s) prior to draining to prevent damage to process systems or demineralizers. Some examples are:

   - At Surry, **NOTIFY** the Surry Radwaste Facility (SRF) of draining chromated water.
   - At Millstone, **NOTIFY** Waste Services of draining water containing freon.

n. Reverse flow through a relief/safety valve does **NOT** have to be considered for a tagging boundary. **CONSIDER** relief/safety valves as part of the pipe and relief/safety valves do **NOT** require approval as a boundary.

o. **WHEN** tagging valves with reachrods, **THEN PLACE** the tag on the reach rod handwheel (an additional tag may be hung on the valve, if desired. **IF** the reachrod is disconnected or broken, **THEN HANG** the tag on the valve and **HANG** a Caution tag on the reach rod handwheel indicating the reach rod is broken.

p. **WHEN** tagging overhead chain operated valves, **THEN RUN** ty-wrap through the chain (tying the chains together) so that if someone attempts to manipulate the valve (e.g., by the handwheel) the chain would bind up and prevent operation.

Qualified Maintenance Personnel/ Engineering

q. When valves are to be repacked with the applicable system in service, the Tagout boundary shall be consistent with Maintenance department procedures (shutseat or backseat). Engineering will **DETERMINE** which boundary (shutseat or backseat) isolates the stuffing box from system pressure.

Qualified Individual

1. Valves on the back seat or shut seat, **AFFIX** a Danger tag denoting the required position. For this activity, maintenance may be performed on the valve packing even though a Danger tag is affixed to the valve.

Operations Management

2. Valves on the back seat or shut seat, **OBTAIN** permission from Operations Management to perform work on the back seat or shut seat.

Engineering

3. **EVALUATE** the need to perform radiography to determine if stem/disk separation has occurred.

Operations

r. **IF** normal mechanical isolation methods **CANNOT** be used, **THEN USE** alternate methods (e.g., blank flanges and freeze seals), if appropriate. **LIST** boundary isolation methods on Tagging Records.

Qualified I&C Technicians

s. Instruments that are provided with instrument isolation valves (ICVs) may be isolated using the ICVs without a Tagout for the purpose of calibration or maintenance. In the event a component is removed from the system, an I&C technician must **REMAIN** at the work site until the component is replaced, system openings are plugged or capped, or the system is tagged out by Operations.

Qualified Individual

t. When tagging out carbon dioxide (CO_2) systems for maintenance on the system, **TAG** manual isolation valve or any manual actuating device along with the automatic initiation device. For low pressure CO_2 systems, **TAG CLOSED** the Electro Manual Pilot Valve by hanging the red tag on the glass cover plate for the valve.

u. **CONSIDER** using mechanical block devices when tagging ventilation. **IF** used, **THEN TAG** device used to block rotation.

v. **IF** the possibility exist of energy being trapped between a manual isolation boundary and another component (such as a control valve or trip valve) that may be repositioned inside the established boundaries in the course of maintenance, **THEN EVALUATE** the use of double isolation boundaries and **CONSIDER** delaying component manipulations until system integrity has been restored.

3.4.2 **Valve Practices**

Operations

a. **Pneumatic Operated Valves as Isolation Points**

1. **DO NOT CONSIDER** a valve that fails open to be closed for Tagout purposes unless it is verified that an installed jacking device or gag/block will keep it closed. In addition to the block, **ALIGN** an air supply with the air pressure set to ensure that the valve remains closed, if appropriate. This action may be desired to prevent a remote signal from operating the valve. If desired, **TAG** the valve's control switch and gas supply isolation points to control the alignment.

2. **DO NOT CONSIDER** a valve that fails closed to be closed for Tagout purposes unless its gas supply is isolated and vented and the valve is visually checked to be closed. **TAG** the valve's gas supply isolation points or electrical power.

Manager Nuclear Operations

3. Manager Nuclear Operations approval to use Pneumatic Operated Valves as a boundary may be performed by an OMOC qualified individual. When permission is given, **DOCUMENT** on Tagging Record or in the Narrative Log.

Qualified Individual

4. **IF** POV has a local operator, **THEN TAG** POV when used as a system isolation point.

b. **Pneumatic Operated Valves as Drain or Vent Points**

1. **DO NOT CONSIDER** a valve that fails open to be open for Tagout purposes unless its gas supply is isolated and vented and the valve is visually checked to be open. **TAG** the valve's gas supply isolations and/or electrical power.

Operations

2. **DO NOT CONSIDER** a valve that fails closed to be open for Tagout purposes unless it is verified that an installed jacking device or gag/block will keep the valve open. In addition to the block, **ALIGN** an air supply with the air pressure set to **ENSURE** that the valve remains open, if appropriate. **TAG** the valve’s gas supply isolation, or electrical power.

Operations

c. **Non-pneumatic Pressure Operated Valves (Safety/Relief Valves)**

1. Do **NOT USE** non-pneumatic pressure operated valves as isolation boundary valves unless:

Method 1

- The valve is physically restrained in the required position through the use of an approved gagging/blocking device that is tagged and listed on the Tagging Record.

Manager Nuclear Operations

- Manager Nuclear Operations approval to use Safety/Relief Valves as a boundary may be performed by an OMOC qualified individual. When permission is given, **DOCUMENT** on Tagging Record or in the Narrative Log.

Engineering

- **PERFORM** an engineering assessment to evaluate the gagging/block effects on the system/valve and code requirements

Operations

Method 2

- An operational assessment determines that no additional risk of personnel injury exists. This assessment should include but **NOT** be limited to:
  - Probability of the relief valve lifting
  - System(s) pressure (and control of pressure)
  - System fluid type
  - System temperature

Manager Nuclear Operations

- Manager Nuclear Operations approval to use Safety/Relief Valves as a boundary may be performed by an OMOC qualified individual. When permission is given, **DOCUMENT** on Tagging Record or in the Narrative Log.

Tagging Office

d. **Motor Operated Valves (MOVs)**

1. **IF** applicable, **THEN USE** MOVs as isolation boundary points **IF** the MOV power supply is isolated and tagged **AND** the handwheel tagged after the valve has been positioned.

2. **AVOID** the practice of manually engaging MOVs to check position. This will prevent inadvertent damage to the torque switch or valve seat, and will prevent the drifting problem associated with some Limitorque operated valves. **IF** a MOV must be manually operated due to leakage concerns, **THEN** additional notifications (e.g., Operations Management, Engineering) may be required based on station specific procedures. **PERFORM** this activity in accordance with station procedures.

3. **ISOLATE** and **TAG** the power supply before working on a motor actuator for a MOV. **IF** the MOV has to remain in a specified position during the work, **THEN INSTALL** and **TAG** a stem block, **IF** appropriate. **IF** the possibility of stem movement exist due to actuator/ MOV work and the MOV is required to be maintained in a specified position, **THEN INSTALL** and **TAG** a stem block.

e. **Check Valves**

AVOID USING check valves as isolation boundaries. If check valves must be used:

Manager Nuclear Operations

1. Manager Nuclear Operations approval to use check valves as a boundary may be performed by an OMOC qualified individual. When permission is given, **DOCUMENT** on Tagging Record or in the Narrative Log.

Operations

2. **USE** a positive means of assuring the valve is holding (e.g., tagged open vents and drains), **IF** available. Completely **DRAIN** and **DEPRESSURIZE** the system before releasing the Tagout.

3.5 Operating Permits

NOTE: Operating Permits should **NOT** be considered the first option for equipment tagging. Other avenues within OP-AA-200, OP-AA-201, and work management processes should be considered. There are situations where Operating Permits provide the most practical method of tagging (while providing an equal level of worker protection and configuration control) such as motorized/ solenoid valve testing and intake/service water screen maintenance.

Operations

3.5.1 **USE** Operating Permits when desired to allow Permit Holder (Tagout Holder) the authorization to operate a designated component.

3.5.2 **CONSIDER** the following prior to issuing Operating Permits:

- Configuration control of component is relinquished and **NOT** positively controlled.
- Equipment tagged with an Operating Permit can **NOT** be considered operable or functional.

3.5.3 **REVIEW** the following restrictions to use of operating permits:

- Component operation by craft shall **NOT** affect system or adjoining system operation.
- Operating Permits shall **NOT** be used to provide mechanical boundary isolation on high pressure or high temperature systems (>500 psi or 200°F).
- Scheduled duration for an Operating Permit tagout shall be two days or less, **NOT** including outages. Operations Management (OMOC) approval is required to extend the duration beyond two days.
- Operations Maintenance Advisor approval is required prior to issuing Operating Permits.

3.5.4 **SPECIFY** on Tagout Request if an Operating Permit is requested, including particular component(s) and initial position(s).

3.5.5 **TRACK** Operating Permits using the tagging process.

NOTE: Control switches are for information only and do **NOT** need locks.

3.5.6 **IF** a component tagged with an Operating Permit can be operated from a control switch, **THEN** the associated control switch should also be designated on the tagout.

Planning Department or Maintenance Craft

3.5.7 **ENSURE** each Operating Permit has a distinct Blue Lock associated with the tag.

Operations

3.5.8 **WHEN NOT** in use, **THEN CONTROL** Operating Permit Blue Locks as determined by site Operations Department.

3.5.9 **ATTACH** only one Operating Permit to a component at a time.

NOTE: For the purpose of changing tag types, it is permissible to apply dissimilar tag types to a component.

3.5.10 **WHEN** necessary to transfer between operating permits and danger tags, **THEN PERFORM** the following:

a. **DO NOT PLACE** an Operating Permit on a component with a Danger Tag device except during swapping.

b. **SUSPEND** Maintenance activities for affected tagouts during tag transfer.

Personnel Performing Equipment Clearance

c. **REMOVE** tag requiring removal prior to authorization of maintenance activities.

Operations/ Operating Permit Holder (Tagout Holder)

3.5.11 **ENSURE** only one Operating Permit Holder (Tagout Holder) for each Operating Permit tagout to ensure a single point of contact.

NOTE: Ownership and responsibility of Operating Permit Holder can be transferred to another individual.

Operating Permit Holder (Tagout Holder)

3.5.12 **NOTIFY** all work order holders prior to transferring ownership.

3.5.13 Prior to commencing work activities, **CONDUCT** a brief with Operations Shift Supervision.

3.5.14 **IF** ownership of Operating Permit is transferred, **THEN CONDUCT** a new brief.

3.5.15 **WHEN** personnel safety is required, **THEN INSTALL** a lock to isolate the energy source with Operating Permit tag.

CAUTION: Tagout Holders and Work Order Holders are required to sign on to Operating Permit tagouts in eSoms prior to starting work, even if the first two methods are utilized.

3.5.16 Prior to performing work, **ENSURE** workers establish individual protection utilizing **ONE** of the following methods: [Ref. 5.4.32]

- **PLACE** key for blue Operating Permit lock in a lock box and **AFFIX** a personal tag and/or lock to the lock box.
- **UTILIZE** ATTACHMENT 14 at work site and **SIGN IN**.
- **MAINTAIN** electronic worker accountability in eSoms and **SIGN IN**.

3.5.17 For each Operating Permit Tagout, **APPLY** method selected in step 3.5.16 to all workers protected by that Operating Permit. [Ref. 5.4.32]

3.5.18 **TRACK** lock boxes and personal locks in accordance with site-specific guidelines to ensure traceability to tagouts and individuals. [Ref. 5.4.32]

CAUTION: Operation of a component tagged with an Operating Permit Tag can ONLY be directed by Operating Permit Holder (Tagout Holder) with Operations Shift Supervision permission. This permission from Operations may be obtained during initial briefing.

3.5.19 Prior to operation of a component tagged with an Operating Permit Tag, **PEFORM** the following: [Ref. 5.4.32]

a. **ENSURE** equipment can accept an energy source.

b. **ENSURE** workers remove their individual protection of the operating permit lock by performing **ONE** of the following:

- **REMOVE** personal tag and/or lock for each worker to lock box.
- **SIGN OUT** of ATTACHMENT 14 at the work site.
- **SIGN OUT** of electronic tagging record in eSoms.

c. **NOTIFY** all affected work order holders on associated tagout of manipulation.

3.5.20 **IF** a component must be re-isolated to allow additional maintenance, **THEN ESTABLISH** individual protection in accordance with step 3.5.16. [Ref. 5.4.32]

3.5.21 **WHEN** all work order holders have signed off Operating Permit Tagout and removed any individual protection devices, **THEN ENSURE** lock is removed and **NOTIFY** Operations to clear Tagout.

3.5.22 **IF** ATTACHMENT 14 was utilized for worker accountability, **THEN MAINTAIN** completed form with the work order. [Ref. 5.4.32]

3.6 Caution/Information Tags

USE a Caution/Information tag for circumstances that must be satisfied prior to operating the tagged component, to denote Temporary Modifications, or to convey information to station personnel.

All Personnel

3.6.1 General

a. Operations department shall control the Caution/Information tag process.

b. Caution/Information tags may provide information to supplement approved procedures but shall **NOT** be used in lieu of or contrary to approved procedures.

c. Caution/Information tags shall **NOT** be posted in a manner that will obscure controls, indications or indicating lights.

d. Caution/Information tags should **NOT** be used to label station components or systems.

e. **DO NOT USE** Caution/Information tags for the protection of personnel and equipment in place of Danger tags.

f. **USE** Caution/Information tags to provide information or caution about an abnormal condition associated with a component or control.

3.6.2 Development, Approval, and Placement of Caution/Information Tags

Requestor of a Caution/ Information Tag

a. **NOTIFY** Operations Shift Supervision of the request and **PROVIDE** information (e.g., location, reason for posting, conditions for removal, expiration date) about the proposed Caution/Information tag.

Shift Manager or Designee

b. **EVALUATE** the request. If the request is valid, the Shift Manager or designee shall have a qualified operator perform the following:

Qualified Operator

1. **CREATE** a Caution/Information Tagging Record to include:
   - •• Name of Requestor
   - •• If required, desired position of component (e.g., from work order, from tagging)
   - •• **IF** actions required, **THEN LIMIT** actions to one per Caution/Information tag. (Ref. 5.4.29)
   - •• The reason for the Caution/Information tag, conditions allowing restoration and any other pertinent information. Some examples could be work order number or TM number. **ENTER** this information in the tag placement notes.
   - •• The associated watch station: This is the watch station that the caution order tag pertains to, if required
2. **SIGN** prepared by and **NOTIFY** the Shift Manager that the section is ready for approval.

Shift Supervision

3. **REVIEW** the Caution/Information Tagging Record and **APPROVE**, **IF** satisfactory.
4. **ASSIGN** a qualified tagging individual to place the tag in the field.

Qualified Tagging Individual Placing the Caution/ Information Tag

c. **PERFORM** the following:

1. **POSITION** Caution/Information tag conspicuously on component so that component can **NOT** be operated without tag being seen. **DO NOT USE** red ty-wraps for attaching the tag.
2. **COMPLETE** electronic Tagging Record in eSOMS.
3. **NOTIFY** Shift Manager Caution/Information tag has been placed.

3.6.3 Caution/Information Tag Removal

Requestor of a Caution/ Information tag/ Shift Manager

a. When the requestor determines the Caution/Information tag can be removed, the requestor shall **NOTIFY** the Shift Manager. The Shift Manager may also determine that a Caution/Information tag can be removed based on station status without requestor concurrence.

Shift Supervision

b. **EVALUATE** the request to **REMOVE** the tag and **ENSURE** that the conditions for removal have been met.

c. **IF** the request is valid, **THEN AUTHORIZE** removal of the Caution/ Information tag:

1. Electronically **SIGN** to **REMOVE** Caution/Information tag.

2. **ASSIGN** a qualified tagging individual to remove Caution/Information tag in the field.

Qualified Tagging Individual Assigned to Remove the Caution/ Information Tag

d. **PERFORM** the following:

1. **REMOVE** and **DISPOSE** of the Caution/Information tag in accordance with the clearance sheet.

2. **SIGN** the electronic Tagging Record in eSOMS.

3. **NOTIFY** Shift Manager Caution/Information tag has been removed.

3.6.4 **Caution/Information Tag Review**

Operations

a. On a quarterly basis, **CONDUCT** a review of active Caution/Information tags per site guidelines:

1. **CONDUCT** an administrative review to determine the applicability of each active Caution/Information tag.

2. **PERFORM** a physical review consisting of visual verification that the proper Caution/Information tags are legible and remain attached to the components identified by the eSOMS Tagging Record and/or audit report.

b. **DO <u>NOT</u> REVIEW** Caution/Information tags in normally inaccessible or high radiation areas.

Operations/ Other Tagging Authorities

3.7 Switchyard Tagouts

3.7.1 Due to the interface with other tagging authorities, switchyard tagging should be controlled by Switchyard Tagouts (ATTACHMENT 11).

3.7.2 **<u>IF</u>** switchyard Tagouts are requested to be performed in eSOMS, **<u>THEN</u>** standard Tagout practices developed in this procedure should be followed.

4.0 RECORDS

4.1 The following record(s) completed as a result of this procedure are required to be transmitted to Nuclear Document Management (NDM). The records have been identified and retention requirements established for the Nuclear Records Retention Schedule (NRRS) per RM-AA-101, Record Creation, Transmittal, and Retrieval.

Quality Assurance Records

None

Non-Quality Assurance Records

None

4.2 The following record(s) completed as a result of this procedure are **NOT** required to be transmitted to Nuclear Document Management (NDM), but are required to be retained as indicated below. The NRRS has been updated and Alternate Storage approved per RM-AA-101 for Quality Assurance Records.

Quality Assurance Records

None

Non-Quality Assurance Records

None

4.3 The following item(s) completed as a result of this procedure are **NOT** records and are **NOT** required to be transmitted to Nuclear Document Management (NDM).

- eSOMS Electronic Tagging Records
- Non-Electronic Tagging Process - Tagging Report (ATTACHMENT 2)
- Breaker/Breaker Blocking Device Removal (ATTACHMENT 4)
- Tagout Request (ATTACHMENT 5)
- Temporary Lift Request (ATTACHMENT 6)
- Shift Manager Employee Sign-Off (ATTACHMENT 7)
- Work Order Holder Sign On/Off Log (ATTACHMENT 14)
- Tag-Out Preparation and Review Check List (ATTACHMENT 16)

5.0 ADMINISTRATIVE INFORMATION

5.1 Commitments

None

5.2 Responsibilities

5.2.1 Operations Department Personnel

Operations department personnel are responsible for:

a. Controlling station equipment.

b. Reviewing and approving Tagout requests.

c. Generating Tagging Records and Danger tags.

d. Overall Danger tag process.

e. Administratively controlling valves, locks and switches.

5.2.2 Operations Maintenance Advisor (OMA)

The OMA is responsible for:

a. Providing Operations Department input to daily and outage planning in accordance with Manager Nuclear Operation's directives.

b. Prioritizing Work Requests to optimize the use of Tagouts on systems, trains, and components.

c. Briefing Shift Supervision on the Plan of the Day.

5.2.3 Shift Manager

NOTE: The following responsibilities may be delegated to former SROs with approval from the Manager Nuclear Operations.

The Shift Manager/Surry Supervisor Water Treatment (for equipment in the condensate polishing building only) is responsible for:

a. Reviewing and approving Tagout requests submitted to the operations department during backshift or emergency conditions.

b. Reviewing and approving Tagging Records.

c. Approving the hanging of Danger tags based on completion of proper review, system availability and personnel readiness.

d. Notifying the craft supervisor of Tagout request completion.

e. Reviewing and approving modifications to existing Tagouts.

5.2.4 **Unit Supervisor**

The Unit Supervisor is responsible for performing the Shift Manager's Tagout responsibilities as directed by the Shift Manager.

NOTE: The ASSIGNED tagging individuals main task is to prepare and develop a safe boundary for personnel and equipment protection. Request for assistance outside normal business needs should be balanced with the needs of the plant.

5.2.5 **Qualified Tagging Individual**

Qualified tagging individuals are responsible for:

a. Researching Tagout requests.

b. Generating Tagging Records and Danger tags based on research and Tagout requests.

NOTE: Only NRC-licensed operators may MANIPULATE equipment for tag placement on the main control boards in the control room.

c. Executing Tagouts, Tagout modifications and clearing Tagouts.

d. Independently verifying completion of Tagouts, Tagout modifications and Tagout clearances.

5.2.6 **Shift Clerk**

The Shift Clerk, when assigned, is responsible for:

a. Transmitting completed Tagging Records and Temporary Lifts to records management.

b. Maintaining files for active Tagout records.

5.2.7 **Tagging Controller**

The Tagging Controller is responsible for:

a. Briefing the participants in an evolution as to specific job assignments.

b. Ensuring that each participant understands the requirements of Independent Verification and stress the importance of the Independent Verifier remaining unbiased throughout the evolution. The aspects of separations by time and distance are very important to maintaining this unbias.

5.2.8 **Electrical Maintenance Personnel**

Electrical Maintenance personnel are responsible for:

a. Installing, removing and independently verifying electrical grounding devices.

b. Lifting and installing lead(s) in accordance with approved Tagouts:

1. An electrician will identify the lead(s) specified on the Tagout and place the lead(s) in the position required by the Tagout. A qualified tagging individual will hang the Danger tag for that lead.

2. **IF** concurrent verification is determined to be required, **THEN**:

- A second electrician will accompany the first electrician and verify the correct lead(s) are being lifted.
- A second qualified tagging individual will independently verify that the tag is hung correctly.

3. **IF** concurrent verification is **NOT** required, **THEN** a second qualified tagging individual will verify the lifted lead when independent verification is performed.

4. This same method will be used when removing Danger tags.

c. Removing and installing fuse(s) in accordance with approved Tagouts, when requested by Operations:

1. A qualified individual will identify the fuses specified on the Tagout and place the fuses in the position required by the Tagout. A qualified tagging individual will hang the Danger tag for the fuse(s).

2. **IF** concurrent verification is determined to be required, **THEN**:

- A second qualified individual will accompany the first electrician and verify the correct fuse(s) are being removed.
- A second qualified tagging individual will independently verify the tag is hung correctly.

3. **IF** concurrent verification is **NOT** required, **THEN** the second qualified tagging individual will verify the removed fuse(s) when independent verification is performed.

4. This same method will be used for reinstalling fuses when removing Danger tags.

d. **IF** qualified, Lifting Danger Tags and operating breakers for motor operated valve diagnostic testing partial clearance forms or breaker testing in accordance with station procedures.

e. Operation and locking/unlocking breakers in accordance with Maintenance lockout.

5.2.9 **Instrumentation and Control (I&C) Maintenance Personnel**

I&C Personnel are responsible for:

a. Isolating instruments in accordance with approved procedures when Instrument Control Valves (ICVs) or valve manifolds are provided:

1. ICVs will only be manipulated by trained I&C technicians for the purpose of performing calibration or maintenance procedures. Operators may operate ICVs for tagging purposes.

2. When an instrument is removed, an I&C technician will remain at the work site until the instrument is installed or the system is capped, plugged or tagged out by Operations.

3. Equipment will **NOT** always be tagged out for routine calibrations, trouble shooting, stroking or as found data collection.

b. Requesting a Tagout of Instruments where ICVs are **NOT** provided:

1. Operations and the I&C planner with input from I&C as required, will coordinate tagging of these instruments.

2. Instrument Air will **NOT** normally be tagged out to allow I&C testing unless:

- Requested to be tagged
- Required to provide a safe isolation boundary

c. Identifying and reporting station component failures by completion of a Nuclear Work Request.

5.3 Definitions

5.3.1 Affected Employee

An employee whose job requires him or her to operate or use equipment on which servicing or maintenance is being performed under lockout or Tagout, or whose job requires him or her to work in an area in which such servicing or maintenance is being performed.

5.3.2 Authorized Employee

An employee who locks out or tags out equipment to perform maintenance on that equipment. When employee's duties include performing servicing or maintenance on that equipment they are also an affected employee.

5.3.3 Blocking Device

A device used in conjunction with a Danger Tag to maintain a component in a required position.

5.3.4 Caution/Information (Yellow) Tags

Tags placed on components and controls to provide information to personnel. The tags are approved, controlled, and placed by Operations Department personnel. They are also commonly referred to as Yellow Tags.

5.3.5 Configuration Control

The process by which status control of plant systems is maintained. Examples of programs that maintain status control are:

- Procedures
- Clearance Systems
- Equipment status programs

5.3.6 Control Panel Tags/Devices

Any approved device (e.g., stickers, magnets, or tags) used to affix the Tagout information to a control panel component or switch. **USE**:

- At Surry: Generic colored magnets
- At North Anna: Attach stickers that are controlled in eSOMS process
- At Millstone: Control Panel tags

5.3.7 Coordinator (eSOMS)

Coordinators are given rights in eSOMS to sign other personnel on or off Tagouts and work orders.

5.3.8 **Danger Tag**

A tag used to establish energy isolation boundaries. Danger tags are placed on equipment such as valves, electrical breakers, fuse holders, or switches in specified positions to delineate a safe work boundary.

5.3.9 **Energy Isolation Device**

CAUTION: Push buttons, selector switches, and other control-circuit-type devices are **NOT** energy isolating devices.

A mechanical device that physically prevents the transmission or release of energy, including, but **NOT** limited to, the following:

- Manually operated circuit breaker
- Disconnect switch
- Manually operated switches by which the conductors of a circuit can be disconnected from all ungrounded supply conductors
- Valve
- Mechanical block or any similar device used to block or isolate energy

5.3.10 **Global Tagout**

The method that is used to optimize the tag sharing function of eSOMS. This normally is done by having a large Tagout, then using these tags to create smaller tagging boundaries. Work orders will not be assigned. This is not to be confused with a Master Tagout where work is assigned.

5.3.11 **Ground Tag**

A tag used to delineate a ground placed on a conductor being used as an energy dispensation device.

5.3.12 **Energy Source**

Any electrical, mechanical, hydraulic, pneumatic, chemical, nuclear, thermal, or other energy source that could cause injury to personnel.

5.3.13 **Lift**

The act of removing a Danger Tag off a component that is part of a tagging boundary to allow testing or verification of proper maintenance.

5.3.14 **Lockout**

Placement of a Lockout device on an energy isolating device, ensuring the energy isolating device and equipment being controlled **CANNOT** be operated until the Lockout device has been removed.

5.3.15 **Lockout Device**

Device using a positive means such as a lock and key to hold an energy isolating device in a safe position and prevent the energizing of equipment.

5.3.16 **Low Impact Plant Equipment**

Power Block equipment that Operations designates available to work under the lockout process based on site specific direction.

5.3.17 **Non-Plant Equipment**

Equipment that is **NOT** necessary for, or does **NOT** directly support Generation, Transmission, or Distribution of electrical power. Equipment that does **NOT** effect continued plant operations.

5.3.18 **Operating Permit Tag**

a. A single owner tag that provides personnel safety when used with a lock.

b. The single owner has been authorized by Operations to manipulate the tagged component.

5.3.19 **Qualified Individual**

A person who has satisfactorily completed necessary training and is certified to perform a specific activity.

5.3.20 **Signature**

Entry of name and password into a computer OR written name on a piece of paper.

5.3.21 **Tagout Tag Hang List**

Sequential list of the following needed to remove equipment/components from service:

- Danger tags
- Other tags authorized by eSOMS
- Non-Tag components
- Equipment configurations
- Tag placement notes

5.3.22 **Tagout Tag Removal List**

- Danger tags
- Operating permits to be removed
- Non-tag equipment checks
- Equipment configurations
- Tag restoration notes

5.3.23 **Ty-wrap**

- Red ty-wraps use red Danger tags that are used in the protection of personnel safety.
- BLUE “Tefzel” or other approved ty-wraps may be used for at power tagging in containment.
- BLACK ty-wraps are used for other tag types. This includes:
  - Ground tags
  - Caution tags
  - Operating Permits

5.3.24 **Work Order Holder**

Individual identified to perform work that requires protective tagging.

5.3.25 **Work Planner**

Individual responsible for defining the work scope of a work order.

5.4 References

5.4.1 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout)

5.4.2 29 CFR 1910.269, Electric Power Generation, Transmission, and Distribution

5.4.3 29 CFR 1910.333, Selection and Use of Work Practices

5.4.4 DOE Standard, DOE-STD-1030-96, Guide to Good Practices for Lockouts and Tagouts

5.4.5 INPO Working Group Paper, Excellence in Work Management

5.4.6 INPO Process Description, AP-0928, Work Management

5.4.7 INPO Good Practice OP-203, Tagging Procedures for the Protection of Personnel, Components, and Systems

5.4.8 INPO 87-003, Good Practice OP-214 - June 1991

5.4.9 Energy Facility Contract Owner's Group (EFCOG), Work Management Excellence (contains key attributes of an excellent Clearance Program)

5.4.10 10 CFR 50, XIV, Inspection, Test and Operating Status

5.4.11 Regulatory Guide 1.33, Quality Assurance Program Requirements (Operation)

5.4.12 ANSI N18.7-1976, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants

5.4.13 TMI Action Plan NUREG 0737, Item I.C.6

5.4.14 IE Information Notice No. 84-51: Independent Verification

5.4.15 SOMS Clearance Module Users Guide

5.4.16 PI-AA-500, Verification Practices

5.4.17 OP-AA-1500, Operational Configuration Control

5.4.18 PI-AA-5000, Human Performance (HU)

5.4.19 SA-AA-125, Electrical Safety

5.4.20 WM-AA-301, Operational Risk Assessment

5.4.21 CM-AA-BDB-102, Beyond Design Basis FLEX Equipment Unavailability Tracking

5.4.22 CONVEX Operating Instruction #6401

5.4.23 PCR019523, COMTRAK 87-136 & 137 - LER 87-010

5.4.24 CA021270, COMTRAK 83-061

5.4.25 SOER 94-2, OEA 94-075

5.4.26 Regulatory Commitment 11505, NU Letter B15468 dated 12/4/95

5.4.27 CA168183, Respond to Audit Finding 10-04-01KM annual reviews of tagging process

5.4.28 CAPR000795, WM-AA-301 Operational Risk Assessment in response to RCE001074

5.4.29 CA241014, Change step 3.6.2.b.1 bullets to clarify only one instruction per caution/info

5.4.30 RCE001137, Service Water Intrusion in Unit 1 Safeguards and Auxiliary Building (CR580345), Surry Unit 1

5.4.31 CA3053339, Incorporate a developed template for Operational Risk Assessment in OP-AA-200

5.4.32 CAPR CR1065600/CA3057970, Revise procedure OP-AA-200, Equipment Clearance

5.4.33 CR1066949/CA3059713, 2-EE-EG-2H lube oil tags released early

5.4.34 OP-AP-300, Reactivity Management

ATTACHMENT 1

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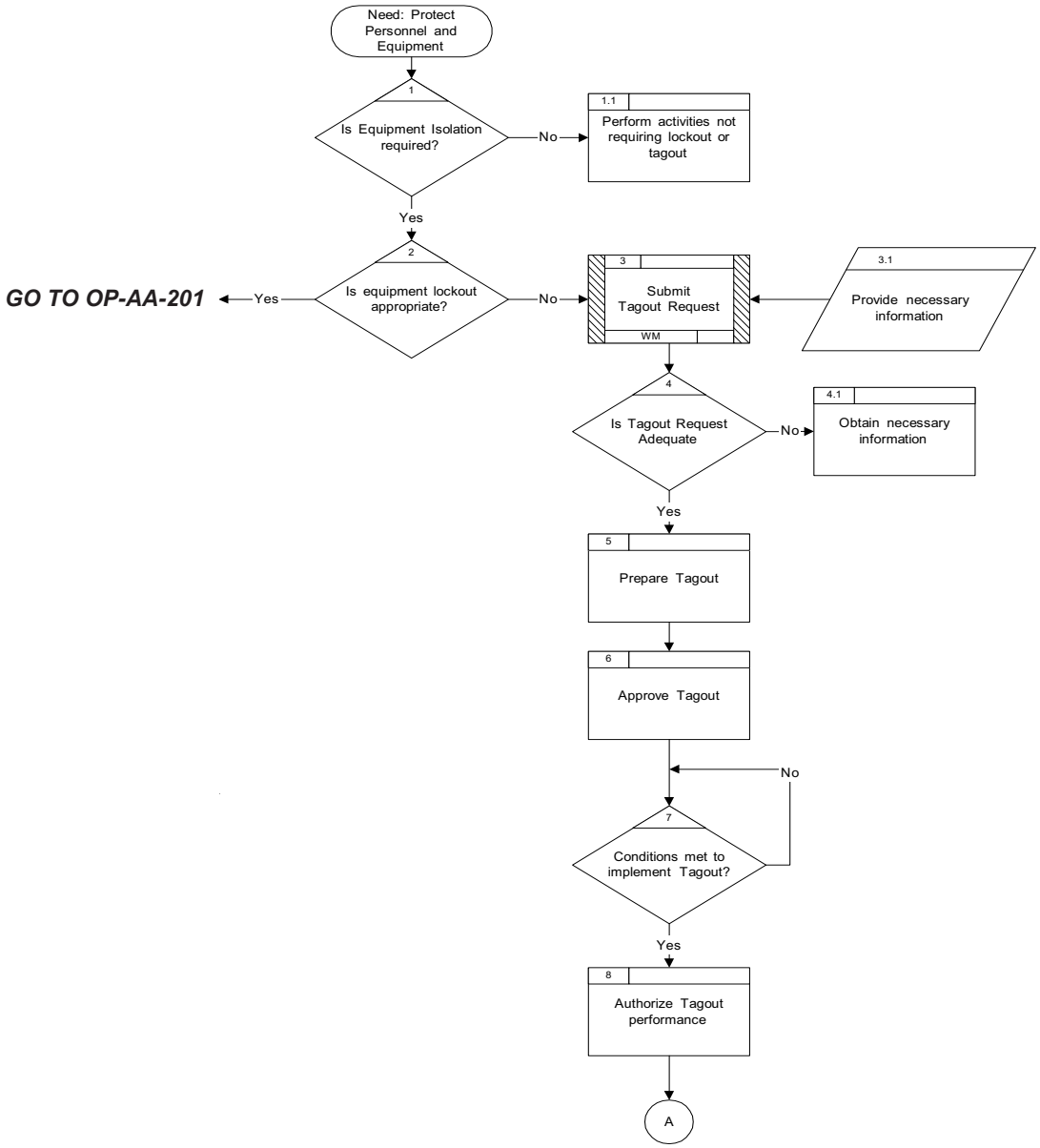
Equipment Clearance Process Flowchart



ATTACHMENT 1

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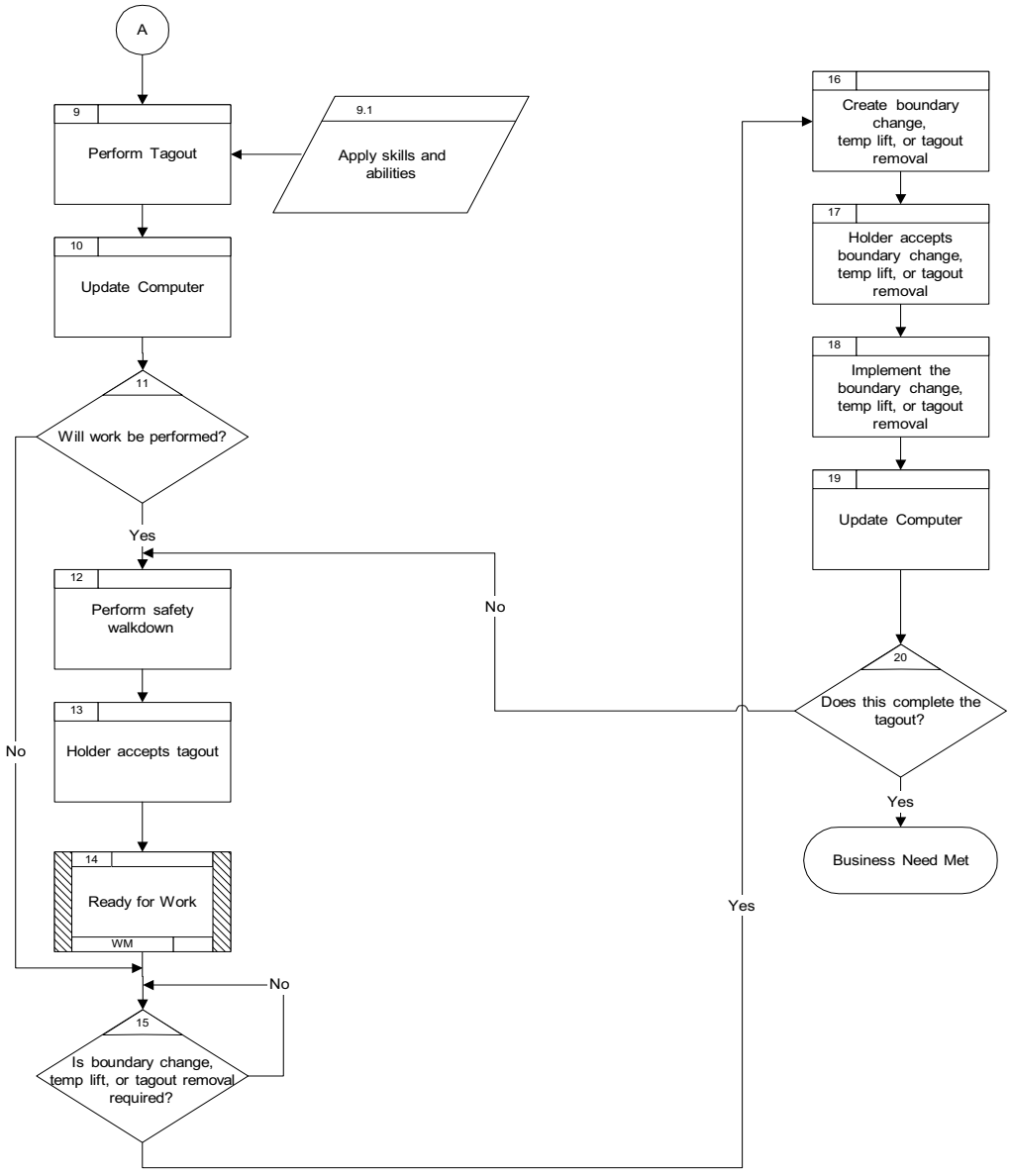
Equipment Clearance Process Flowchart



ATTACHMENT 1

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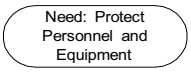
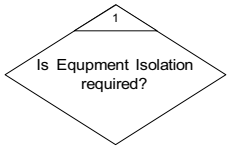
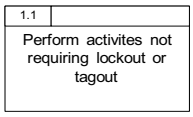
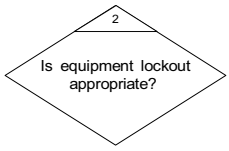
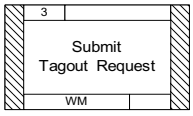
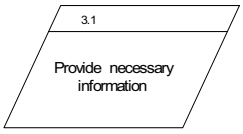
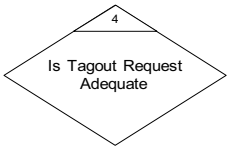
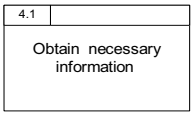
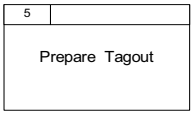
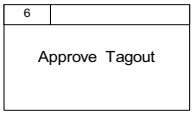
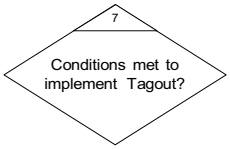
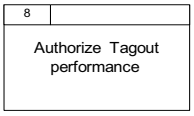
Equipment Clearance Process Flowchart

	The tagout process is designed to protect personnel from hazards such as electricity, fluids, gases, vapors, chemicals, physical hazards, and radioactivity while performing activities on systems or components. The process may be also be used to: • **PROTECT** equipment while maintenance is being performed • **PREVENT** inadvertent equipment operation • **ESTABLISH** positive control of a system, structure, or component
	**NOTE:** Not all work activities on equipment require tagout (lockout or tagout) in order to ensure adequate protection. **EVALUATE** the activity to be performed to determine if a lockout or tagout is necessary to protect personnel, protect equipment, or establish positive configuration status control.
	**PERFORM** activities not requiring a tagout in accordance with approved procedures and work schedule. Examples that do **not** require a tagout include: • Activities that are controlled by approved plant procedures that include direction to manipulate and restore components • Activities that are controlled by other status control methods
	**If** equipment needs to be isolated, **and** equipment lockout is appropriate, **then GO TO** Step 22. Otherwise, **GO TO** Step 3.
	**PREPARE and SUBMIT** a Tagout Request, including sufficient details to facilitate the development of a safe tagout. A request may be submitted electronically, manually, or verbally.
	**PROVIDE** details of the requested activity. Examples: • Equipment identification • Work Request (WR) • Type of isolation (mechanical, electrical, etc.) • Work scope

ATTACHMENT 1

(Page 4 of 6)

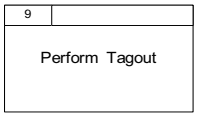
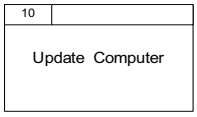
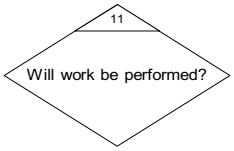
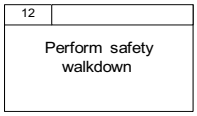
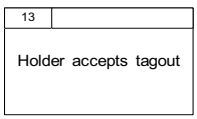
Equipment Clearance Process Flowchart

	**REVIEW** the Tagout Request to ensure it contains sufficient information to create a safe boundary for the activity to be performed.
	**If** the Tagout Request does not contain sufficient information to create a safe boundary for the activity to be performed, **either CONTACT** the requesting individual **or REJECT** the Tagout Request **and RETURN** it to the requesting individual for additional details.
	**PREPARE** the tagout: • **DEVELOP** isolation points using approved methods • **SEQUENCE** the tagout steps • **ENSURE** drain or fill precautions are specified • **EVALUATE** risks **and PROVIDE** appropriate comments
	The tagout approver shall **ENSURE** that: • Protection is provided for the planned activities • Steps are properly sequenced • Risks are identified • Upon completion of the above, **APPROVE** the tagout **and OBTAIN** a second approval when required.
	**NOTE:** It may be necessary to reschedule the activity. **REVIEW** the tagout for plant impact prior to authorizing execution. **If** conditions are not conducive to executing the tagout, **then CONTINUE to EVALUATE** plant conditions until the tagout can be implemented.
	**ASSIGN** tagout to be performed **and DOCUMENT** accordingly (administrative requirements, Technical Specification or Technical Requirements Manual actions, etc.)

ATTACHMENT 1

(Page 5 of 6)

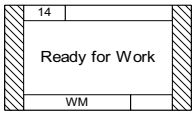
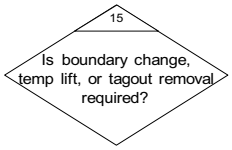
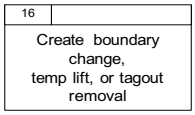
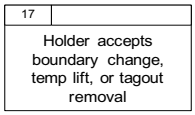
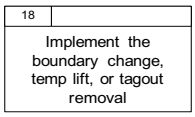
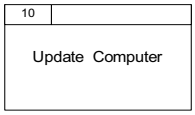
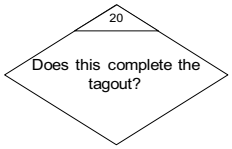
Equipment Clearance Process Flowchart

	**IIMPLEMENT** the tagout by manipulating components and/or placing tags.
	**APPLY** those skills and abilities that are fundamental to plant operations, including: • Valve operations • Communications • Error reduction techniques • Proper placekeeping techniques
	**UPDATE** the computer tool used for tagouts in order to maintain up-to-date status.
	**NOTE:** Some tagouts are used for non-work related situations, e.g.: • Prevent inadvertent equipment operation • Administrative controls **DETERMINE** whether or not there will be activities in the field that will rely upon the tagout for protection. **If** Yes, **then GO TO** Step 12, **otherwise, PROCEED** to Step 15
	**PERFORM** a safety verification by conducting those activities necessary to assure oneself that the existing tagout is adequate (Lead craft).
	**After** the tagout is placed and verified, the holder **ACCEPTS** the tagout in order for work to be performed. This step includes sign-on by each individual doing work under the tagout.

ATTACHMENT 1

(Page 6 of 6)

Equipment Clearance Process Flowchart

	**STATUS** the work as ready.
	**When** a boundary change, temp lift, or removal of the tagout is required, **then GO TO** Step 16.
	**NOTE:** The process of modifying a tagout follows the same sequence as the original tagout creation. **CREATE and APPROVE** the boundary change, temp lift, or tagout removal.
	The holder **REVIEWS** the status of the work or activity **and ACCEPTS** the boundary change, temp lift, or tagout removal. This step includes sign-off of the tagout by all personnel relying on the tagout, in preparation for component manipulation.
	**NOTE:** Boundary changes can shrink **or** expand boundaries. **IMPLEMENT** the boundary change, temporary lift, or tagout removal.
	**UPDATE** the computer tool used for tagouts in order to maintain up-to-date status.
	**If** all tags have been removed, **then EXIT** this process. The business need has been met. Otherwise, **GO TO** Step 12.

ATTACHMENT 2

(Page 1 of 3)

Non-Electric Tagging Process - Tagging Report

Non-Electric Tagging Process – Tagging Report

OP-AA-200 – Attachment 2 **Page 1 of 3**

Tagging Record Number:	Page of
Component To Be Worked On:	
Work Description:	

Tag Number	Tag Type	Equipment ID / Mark Number	Component Description	Position Tagged	Order	Tag Placed		Position Returned	Order	Tag Removed	
						Date	Initial/Verify			Date	Initial/Verify

Tag-out Prepared by (Signature)	Date	Time (24 Hours)
Tag-out Reviewer (Signature)	Date	Time (24 Hours)
Tag-out Authorized to Hang (Signature)	Date	Time (24 Hours)
Tags Verified Hung / Release Work (Signature)	Date	Time (24 Hours)
Review Tag-out for Restoration (Signature) (If Required)	Date	Time (24 Hours)
Authorize Tag-out Restoration (Signature)	Date	Time (24 Hours)
Tag Removal Verified By (Signature)	Date	Time (24 Hours)

Form No 722470 (Feb 2018)

ATTACHMENT 2

(Page 2 of 3)

Non-Electric Tagging Process - Craft Supervisor / Tag-Out Holder Tracking Sheet

Dominion Energy®

Non-Electric Tagging Process – Craft Supervisor/Tag-Out Holder Tracking Sheet

OP-AA-200 – Attachment 2 **Page 2 of 3**

System or Component		
Tag-Out Number		
Craft Supervisor Name	**Department**	**Shift Manager Verification that Craft Supervisor Authorized Removal (Initials)**

Form No 722470 (Feb 2018)

ATTACHMENT 2

(Page 3 of 3)

Non-Electric Tagging Process - Work Order Holder Tracking Sheet (Safe Access Log)

Non-Electric Tagging Process – Work Order Holder Tracking Sheet (Safe Access Log)

OP-AA-200 – Attachment 2 **Page 3 of 3**

Craft Supervisor Name			Department		
Tag-Out Number					
Component or System					
Work Status					
Work Order Holder (Print Name)	Work Order Number	Description	Date Started	Date Completed	Work Completed Craft Supervisor (Initials)
All work orders above are completed and tags can be removed.					
Craft Supervisor (Signature)				Date	

Form No 722470 (Feb 2018)

ATTACHMENT 3

(Page 1 of 2)

Non-Electronic Tagging Process Instructions

1.0 General Guidelines

1. When electronic system is unavailable, use **caution** when clearing tags due to the difficulty of determining tags being shared by the electronic system.
2. **DO NOT use** tag sharing for non-electronic tagging.
3. The processes outlined in this procedure (OP-AA-200) should be followed to extent possible for the non-electronic process to **ensure personnel safety**.
4. Use ATTACHMENT 2 to document all performed tagging activities.
5. When eSOMS system is restored, update the system electronically.
6. Consideration should be given to using the Maintenance Lockout process during eSOMS unavailability.
7. Use of non-electronic tagging process **should be minimized** and **NOT** used for routine maintenance.

2.0 Completion of Non-Electronic Tagging Process (ATTACHMENT 2)

1. Use Manual Tagout Log (ATTACHMENT 8) to determine Tagout record number.
2. Enter component to be worked and a brief work description.
3. Enter equipment id/mark numbers required for the Tagout.
4. For each equipment id/mark number assign the following:
   - Sequential tag number
   - Tag type
   - Tagged position
   - Order to hang the tag
   - Create a tag for each component that will need a Danger tag.
5. Sign for Tagout Prepared By.
6. Have Tagout reviewed. **IF** review is satisfactory, sign for Tagout reviewed. **IF** unsatisfactory, consult Preparer to resolve discrepancies.
7. When ready to hang tags, authorize the Tagout and brief the qualified tagging individual placing the tags.
8. After all tags have been verified in the field, as required, sign tags verified hung, and release maintenance.
9. Use ATTACHMENT 2 page 2 to allow Tagout holders to sign onto the Tagout.
10. Use ATTACHMENT 2 page 3 to track work order holder working under the associated Tagout.
11. Do **NOT** clear the Tagout until all work order holders and Tagout holders have signed off work complete.

ATTACHMENT 3

(Page 2 of 2)

Non-Electronic Tagging Process Instructions

12. When all work order holders and Tagout holders have released the Tagout review the Tagout for restoration by:
    - Ensuring the correct return to position for each component.
    - Placing a sequence to remove the tags.
13. Sign for review of Tagout for restoration.
14. When ready to clear the Tagout, authorize Tagout for restoration and brief the qualified tagging individual removing the tags.
15. When all associated tags are verified, sign tag removal verified.
16. Complete Manual Tagout Log (ATTACHMENT 8) for associated tagging record.

ATTACHMENT 4

(Page 1 of 1)

Breaker/Breaker Blocking Device Removal

Dominion Energy®

Breaker/Breaker Blocking Device Removal

OP-AA-200 – Attachment 4 **Page 1 of 1**

Breaker to be Removed		
Issued To		
Prepared By		
Tag Number	Equipment ID/Mark Number	Component Description/Location

When Removal Sheet is hung, give a copy of this form to Operations.
When Removal Sheet is completed, notify Operations that breakers is installed and attach this form to document that requires breaker removal.
Tagging Records Affected:

Approval to Remove Tags (Operations) (Signature)	Date / Time
Local Verification of Correct Breaker and Cubical By)Signature) / CV	Date / Time
Tags Placed on Cubical Door By (Signature) / CV	Date / Time
Approval to Return Tag(s) to Breaker By (Signature)	Date / Time
Local Verification of Correct Breaker and Cubical By (Signature) / CV	Date / Time
Tag(s) Returned to Breaker By (Signature) / CV	Date / Time

Form No 730968 (Feb 2018)

ATTACHMENT 5

(Page 1 of 1)

Tag-Out Request

Dominion Energy®

Tag-Out Request

OP-AA-200 –Attachment 5 **Page 1 of 1**

Issued To (Name)	Extension	Department

Tag-Out Requested On Unit: ☐ 1 ☐ 2 ☐ 3 ☐ Common

Reason For Tag-Out	Initiating Document
☐ Corrective Maintenance ☐ Preventive Maintenance ☐ Trouble Shooting ☐ Testing ☐ Engineering Work Package ☐ Other _____	Work Order Number _____ Design Change Package Number _____ Other _____

Equipment Affected

Work To Be Done

Assist in Defining Work Scope and establishing safe work boundaries, review the following and check all that apply:

- ☐ "NO ROTATION" Tags (Equipment de-energized and prevented from turning; Non-intrusive maintenance.)
- ☐ "NO FLOW" Tags (System isolated to allow equipment to be manipulated without affecting the plant. Non-intrusive maintenance.)
- ☐ "FULL TAGOUT" Tags (Equipment isolated from all energy sources and depressurized. Intrusive maintenance.)
- ☐ "ELECTRICAL ONLY" (Equipment electrically isolated, the craft will use LOCKOUT, if required, for all other energy sources.)
- ☐ Controlling Procedure, which defines energy sources (OP, MOP, PT, ICP, MCM, etc. List in remarks.)
- ☐ Personnel entering a piping system or plant equipment (List in remarks.) (Operations will assist in determining applicable OPS procedures.)
- ☐ Auxiliary Components associated with equipment:
  - ☐ Seal Water
  - ☐ Oil sub-system
  - ☐ Cooling Water (i.e., BC, SW, CD, CC)
- ☐ Heat Trace (consider if removing insulation)
- ☐ Purge Path Required (Describe Below)
- ☐ System in-service for Freon removal
- ☐ Steam removed from air handler
- ☐ Hazardous Chemicals involved
- ☐ Control Power fuses removal required
- ☐ Grounds required
- ☐ Motor Heater fuses
- ☐ MOV motor/grease heater fuse
- ☐ MOV internal power supplies on LS/Rotor Contacts
- ☐ PMT requires Danger Tags (MOV testing, Flow Scan)

Tag-Out Request Submitted By (Name)	Date	Time
Tag-Out Request Verified By (Name)	**Date**	**Time**

Recommended Isolations or Remarks (If possible, include tag type and position.)

Form No. 721716 (Feb 2018)

ATTACHMENT 6

(Page 1 of 2)

Temporary Lift Request

NOTE: Temporary Lifts will be valid for 24 hours **only**. **If** a longer period is required, record reason in Section 3 of this form. Unless agreed upon in advance, Operations may re-tag components on Temporary Lifts in-place greater than 24 hours.

Section 1

Record reason for Temporary Lift:

Section 2

Record components requiring tag removal:

_____/_____ _____/_____

Date/Time Required Requested By/Date

Deliver signed Temporary Lift Request to Operations. Request shall be submitted at least 12 hours prior to when tags need to be lifted. Operations will prepare Temporary Lift and notify requester when it has been prepared -**OR**- that plant conditions do **NOT** support the lift at this time. When created, a copy of the Temporary Lift will be attached to this form. The requester will obtain acceptance from affected Craft leads (signed electronically) and notify Operations.

Section 3

Record reason for Temporary Lift extension (greater than 24 hours)

Approved/Rejected _____

Operations SRO

ATTACHMENT 6

(Page 2 of 2)

Temporary Lift Request

Temporary Lifts

1. Temporary Lifts should be requested using the attached “Temporary Lift Request Form”. They should be delivered to Operations with sufficient advance notice to allow Operations to process the request.
2. When creating a Temporary Lift, include as much detail in the “Reason for the Temporary Lift” section as is possible. The purpose must be clear and easily determined by anyone reviewing it.
3. It is the responsibility of the Temporary Lift requestor to obtain the necessary signatures for approval of the partial clearance. When creating a Temporary Lift, provide a copy to the requestor. This will assist the crafts in determining the work covered by the specific Tagout being modified.
4. Removal of any 125V panel cover requires a Temporary Lift **if** there are any tags hanging inside the panel. This ensures all breakers remain open, ensures all foreman are informed that the panel cover is being removed, and facilitates cover removal and reinstallation.
5. Use of Temporary Lifts is to be discouraged. When one is requested question the requestor to ensure that it is necessary and an efficient use of manpower.
6. Temporary Lifts should **NOT** normally be active for more than 24 hours. It is recognized that in order to perform testing, and other reasons, that there may be Temporary Lifts older than 24 hours. This practice should be minimized. When this is anticipated, it should be stated on the Temporary Lift request, prior to delivery to Operations. Operations may choose to revise the section, rather than perform the Temporary Lift for an extended time.
7. Temporary Lifts should be reviewed daily by the Tagging group to determine **if** the need still exists. **If** the need is no longer valid, the Temporary Lift shall be cleared and the section updated.

ATTACHMENT 7

(Page 1 of 1)

Shift Manager Employee Sign-Off

Dominion Energy®

Shift Manager Employee Sign-Off

OP-AA-200 – Attachment 7 **Page 1 of 1**

Tag-Out Number				Date
Affected Groups			Date/Time Notified	
Work Order Number	Affected Work Order Holder	Verified Off-Site	Worker Contacted	Badge Flagged Date / Time
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
		☐ Yes ☐ No	☐ Yes ☐ No	
Visual Inspection of Job Site complete (Signature)(Comments, if any) (N/A when documenting missing Work Order Holder Sign-Off)				
Group Supervisor (Signature)				Date / Time
Shift Manager (Signature)				Date / Time

Form No 730993 (Feb 2018)

ATTACHMENT 8

(Page 1 of 1)

Manual Tag-Out Log

Dominion Energy®

Manual Tag-Out Log

OP-AA-200 – Attachment 8 **Page 1 of 1**

Tag-Out Number	Component Tagged	Issued		Completion*		
		Date	Initial	Transfer	Date	Initial

* If tag-out transferred to computer for further processing, mark form and initial for completion.

Form No 728641 (Feb 2018)

ATTACHMENT 9

(Page 1 of 1)

Qualification Levels and Reviews Process for Writing and Approving Danger Tagouts

1. Only qualified operators may write Tagouts. The supervisor assigning the Tagout preparation needs to take into account the complexity of the Tagout and the individual's qualifications prior to assigning the individual who will prepare the Tagout.
2. Normally Tagout preparation is performed by the Tagging Office. The Tagging Office has it's own qualification card that applies to individuals assigned to the Tagging Office. The qual-card was written to capture lessons learned to train individuals assigned to the Tagging Office. Tagging can be performed by the shift when the Tagging Office is **NOT** available.
3. The Tagout approval process is as follows for Danger Tagouts:
   a. A qualified operator **WRITES** the Tagout.
   b. The Tagout is then **REVIEWED** and **APPROVED** for technical accuracy by **two** independent qualified Tagout personnel.
   c. The Tagout is then **AUTHORIZED** to hang when plant conditions can support the Tagout. This approval can be made by one SRO that approved the Tagout for accuracy.
   d. As the minimum, the Tagout approval process is looked at by three different people.
4. Approvals (ATTACHMENT 10) shows how the eSOMS software is set up to support approvals at each site.

ATTACHMENT 10

(Page 1 of 1)

Approvals

Prepared By: NLO, RO, SRO, former SRO, or equivalent with Ops Mgr Approval	**GENERATE** TAGOUT providing a safe working boundary for all work included on the TAGOUT. **IF** procedure guidance exists, **THEN** procedure takes precedence over the normal sequence of isolation. **ESTABLISH** restoration alignment. **ASSEMBLE** TAGOUT package for review.
Reviewed By: NLO, RO, SRO, former SRO, or equivalent with Ops Mgr Approval	**REVIEW** TAGOUT to ensure a safe working boundary is provided for all work contained on the tagout. **ENSURE** placement alignment/ sequence and restoration alignment/sequence are correct. **ENSURE** all required supporting documentation is included in the TAGOUT package.
SRO Reviewed By: SRO, former SRO, or equivalent with Ops Mgr Approval	**REVIEW** TAGOUT to ensure a safe working boundary is provided for all work contained on the TAGOUT. **ENSURE** placement alignment/ sequence and restoration alignment/sequence are correct. **ENSURE** all required supporting documentation is included in the TAGOUT package.
Authorized for Hanging By: SRO	The plant is in a position to support the maintenance on this TAGOUT and all required reviews and contingencies are in place. (can be same SRO as Reviewer, if Reviewer was SRO)
Tags Verified Hung By: SRO, former SRO, or equivalent with Ops Mgr Approval	All tags required to provide a safe working boundary are in-place. If authorized in Maximo, work may begin.
Restoration Changed By: NLO, RO, SRO, former SRO, or equivalent with Ops Mgr Approval	(Optional) IF SRO Restoration Review/Approval requires changes to Position or Sequence, than this line shall be signed. This shall be independent of SRO Restoration Review/Approval.
SRO Removal Reviewed/Approved By: SRO	All Work Order Holders and TAGOUT Holders have signed off the TAGOUT and no additional work is planned under this section. Review tagout removal sequence and position. **ENSURE** no changes required and approve.
Tags Verified Removed By: SRO, former SRO, or equivalent with Ops Mgr Approval	Record is closed.

ATTACHMENT 11

(Page 1 of 1)

Switchyard Tagouts

Surry and North Anna:

1. Control Ops is the system interface organization for the Station.
2. When requested, Operations will **CREATE** a Tagout to a system employee and provide stubs to comply with system safety manual requirements.
3. System Tagouts can **NOT** be **CLEARED** or **LIFTED** until the owner of the Tagout has surrendered the stubs to Operations. (The stubs are the tracking device for system operations.)
4. Switching orders are **REQUIRED** for all tagging activities in the switchyard for 50 KV and higher.
5. Local switching orders or MOP attachments are **REQUIRED** for below 50 KV tagging evolutions.
6. **USE** SAP work order numbers as the unique work order identifier in eSOMS tagging system for work order tracking purposes.
7. System Operations will **PERFORM** grounding and tagging operations in the switchyard, when necessary. This includes hanging of ground tags with Operations support, if **NOT** qualified.

Millstone:

1. **ENSURE** CONVEX tagging is in accordance with TD800, Switching and Tagging.
2. **WHEN** a tagging request requires tags to be placed on equipment **NOT** within Dominion's jurisdiction, **THEN OBTAIN** a specific tagging agreement from CONVEX to place Millstone tags on any components which CONVEX will not tag **OR INCORPORATE** discrete text steps into the tag section to ensure that an adequate tagging boundary is established per the tagging request.
3. **WHEN** using CONVEX tagging for worker protection, **THEN ESTABLISH** a link as follows:
   - In tag section, additional information section, **LIST** CONVEX tagging and any pertinent information.
   - **ASSIGN** a "CONVEX" tag to tag section.
   - **ATTACH** "CONVEX" tag to CONVEX tagging when it is hung.
   - Prior to releasing CONVEX tagging, **CLEAR** and **REMOVE** "CONVEX" tag.

ATTACHMENT 12

(Page 1 of 1)

Operating Experience

1. When performing maintenance on electric motors, it is desired to keep the motor heaters energized unless required by the scope of work. This reduces return to service delays due to moisture in the motor windings.
2. The Tagging Record can be locked to prevent Tagout Holders or Work Order Holders from signing on. This is a useful tool to ensure they do not begin work on a boundary that is in the process of being revised or modified. It can also be used when questions arise about the status of the boundary. Whenever this is used, ensure the reason for the lock is placed in the appropriate field of the Tagout.
3. If practical High Temperature/High Pressure sources (> 200 degrees / > 500 PSI) should be isolated by two boundary valves.
4. When filling a system, ensure the restoration sequence vents the system to the greatest extent possible.
5. When performing status changes in eSOMS, it is important to save the file, refresh the data, or close the program to ensure these changes are written to the database. Examples include:
   - Tagout Holder sign on / sign off
   - Work Order Holder sign on / sign off
   - Work Order addition or deletion
6. If available, controlled references should be consulted to ensure proper ratings of fuses installed or removed during Tagging activities. This information should be captured in the Equipment Database.
7. As a good practice, drawings shall be marked with unique colors to aid in understanding the boundary. As a minimum they will contain the following items:
   - Vents/drains
   - Boundary valves
   - Components to be worked
   - Area within the boundary
   - Other items, as determined by the site
8. Pre-job briefs will be performed. The extent of the briefing is commensurate with the level of complexity, amount of required coordination, and potential consequences. Additional guidance may be provided at the station level.

ATTACHMENT 13

(Page 1 of 1)

Contingency for Loss of eSOMS Computer

1. Notify IT Help Line of eSOMS failure.
2. Determine length of time that eSOMS will be unavailable.
3. Based on current plant conditions evaluate waiting for eSOMS to be restored. The preferred option is to wait for the restoration of eSOMS.
4. If plant conditions do not support delaying, contact IT to have them initiate the Technical Recovery Plan for eSOMS.
5. While waiting for the recovery continue on with this procedure to initiate manual tagging process.
6. Depending on what is in progress when the network goes down, it may or may not be possible to clear the tags. However, having the knowledge of all the work order holder names etc can maximize the chances of success. Examples of how to obtain this information are as follows:
7. A hard copy of the Tagout with all the work order holder names
8. A report originated outside of the eSOMS modules that can retrieve the names
9. In order to safely remove tags and restore equipment it is vital to know which tags are shared with other work and who is working under the tags to be removed.
10. If available to assist in determining affected workers and shared tags print out a copy of the Tagout after all the initial work order holders have signed on. The Tagout Holder should also be aware of the work in progress and who is working on the equipment. Any shared tags will be “grayed” out on the tag sheet. Operations management shall be consulted prior to any Tagout removal under these conditions, as it is possible for additional people to sign on as work order holders.
11. Depending on when eSOMS failed, the Tagout will vary so it is impossible to develop a single procedure for clearing Tagouts in this condition. Each Tagout must be evaluated individually. If at all possible, do not clear the Tagout until eSOMS has returned to service.
12. OP-AA-200, ATTACHMENT 2 provides the manual method for generating new Tagouts when eSOMS is down.

ATTACHMENT 14

(Page 1 of 1)

Work Order Holder Sign On/Off Log

Dominion Energy

Work Order Holder Sign On/Off Log

OP-AA-200 - Attachment 14 Page 1 of 1

Tag-out No.:

Before use of this form, the Tag-out Holder and Operations must approve the use of this form.

Tag-out Holder Print Name	Signature authorizing using this paper form	Department	Date

Operations Management Print Name	Signature authorizing using this paper form	Date

Folder/Tag-out: _____ Work Order (Task) Number(s): _____.

Accepted By Print Name	Accepted By Sign	Accepted Date/Time	Ext.	Badge Number	Released By Sign	Released Date/Time	Work Complete on this Tag-out

Form No. 731062 (Feb 2018)

ATTACHMENT 15

(Page 1 of 1)

Operational Risk Assessment Template

Use one or more of the following risk mitigation actions when developing Operational Risk Assessments (ORA) due to non-standard Equipment Clearance isolation boundaries or inability to verify energy release prior to signing on to the tagout.

- A pre-job brief involving the Job Foreman/First Line Supervisor, participants performing the tasks, and support personnel directly supporting performance of the activity, as required.
- If available, alternate isolation boundaries will be identified in the Operational Risk Assessment and reviewed by the implementing Operations Supervisor.
- Field operator will physically locate alternate isolation boundary valves by performing a field walkdown as required.
- The craft will brief Work Control Center (WCC) on plan to check system isolation and venting. Low pressure/low temperature systems Do **NOT** require brief, for example, Domestic Water System.
- If applicable ensure makeup source is available or aligned, i.e., makeup aligned to the Component Cooling Surge Tank.
- Field operator will be present during initial breech of system when there are alternate isolation boundaries identified on the Operational Risk Assessment.
- The craft will loosen previously identified component in a method that will permit re-tightening as necessary (i.e., due to boundary valve leakage), and utilizing an alternate path for depressurization as necessary.
- ORA will remain in effect until boundary isolation(s) is /are checked adequate.

ATTACHMENT 16

(Page 1 of 1)

Tag-Out Preparation and Review Checklist

Dominion Energy

Tag-Out Preparation and Review Check List

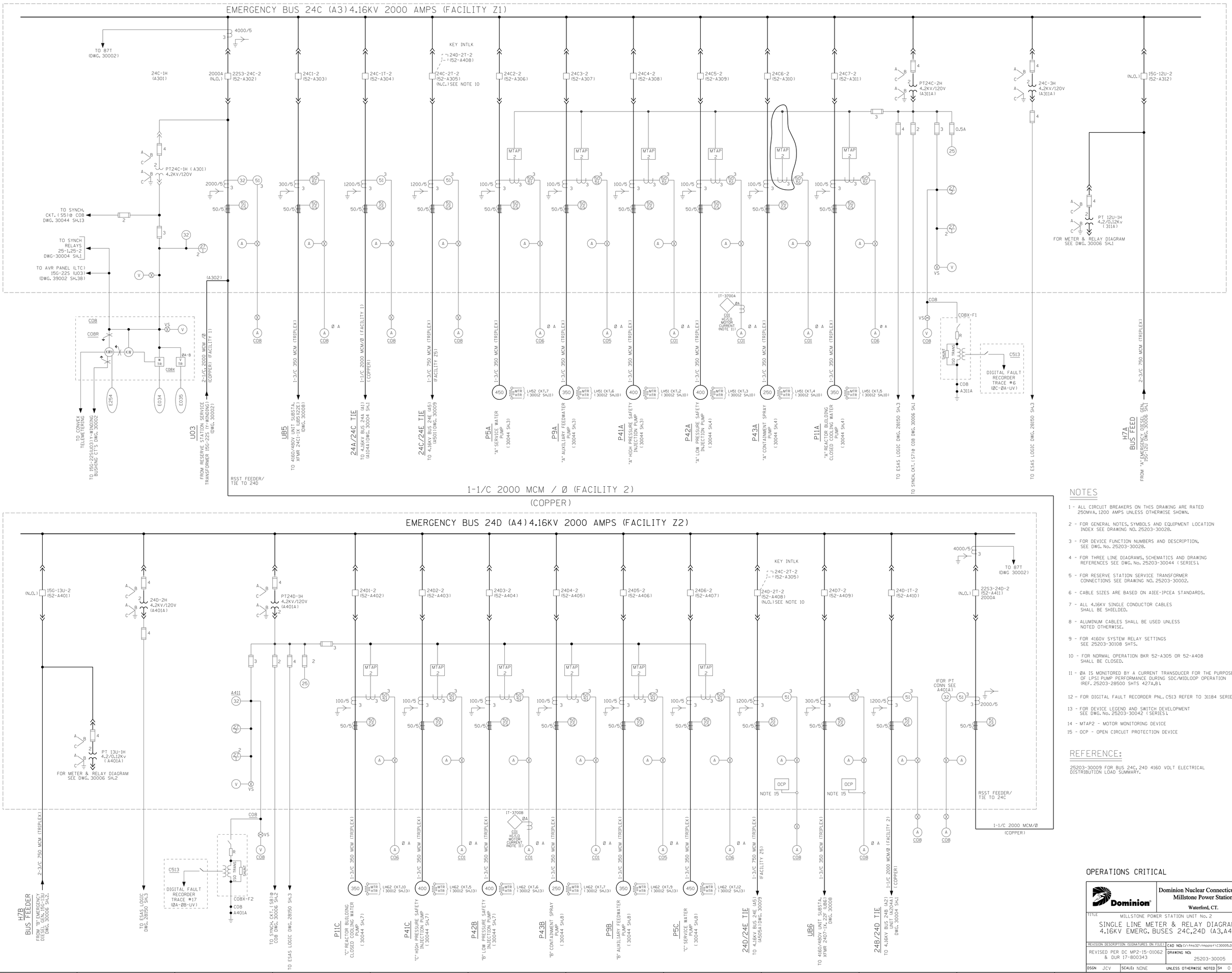
OP-AA-200 – Attachment 16 ***Page 1 of 1***

Tagging is a Safety Process. Tagging is NOT a production process.

Item to be worked: _____ **Tag-out number:_____** **Date to be worked:_____**

Items	Preparer	1st Reviewer	SRO Review
Work scope defined and understood using the following as applicable: Tagging Request, work order, job steps, maintenance procedure, Craft, Planner, Work Week Coordinator, and Engineering.			
Applicable procedures are identified.			
Components being worked are positively identified on **controlled** drawings. Check any drawings used for pending changes, and review any pending changes identified. If not using controlled drawings, refer to OP-AA-200 step 3.2.2.f.			
All drawings used to prepare tagout are marked up and attached.			
Safe boundaries established for task and hazards with all energy sources removed or noted on the tagout.			
Review for hidden energy sources (heat trace, air, seal water, seal cooling, fuses, patch cords, motor/MOV heaters, "hidden" power supplies).			
Ensure all tag types are correct (Op Permit, Ground, Switchyard).			
Components to be worked are No Tag or Restoration Only.			
Tagout is sequenced as directed by controlling procedure or per OP-AA-200 standards.			
Restoration positions reflect normal valve lineup, controlling procedure, or equipment status positions. Note restoration position conflicts on the tagout.			
Vent/drain provided between boundaries and closed valves that can be repositioned.			
Live electrical sources identified & craft will be notified to evaluate risk.			
Review for BDB connection isolation. Reference CM-AA-BDB-102 if impacted.			
WM-AA-301, Operational Risk Assessment, initiated for tagouts with non-standard isolation boundaries, when energy release cannot be verified prior to worker sign on, or if tagout requires lifting energized leads.			
OMOC permission received and documented if: using a pneumatic, check or relief valve as isolation; using an Operating Permit for > 2 day duration.			
Consider effects on batteries, alarms, indications, instrumentation, and controls.			
Consider the effects on Reactivity Management. Reference OP-AP-300 Attachment 7 to aid in determination. IF affected, THEN note on the tagout.			
Are there additional compensatory measures that should be considered (fire hoses staged, notifications made, etc)?			
Ensure tagout is in compliance with Tech Specs/TRM and other regulatory requirements. Ensure redundant equipment (including power sources) is operable.			
Pre-maintenance and post-maintenance testing requirements are understood and are acceptable for expected plant conditions.			
Required signatures are in eSOMS.			
Comments:			

Form No. 733545 (Feb 2018)



NOTES

1 - ALL CIRCUIT BREAKERS ON THIS DRAWING ARE RATED 250MVA, 1200 AMPS UNLESS OTHERWISE SHOWN.

2 - FOR GENERAL NOTES, SYMBOLS AND EQUIPMENT LOCATION INDEX SEE DRAWING NO. 25203-30028.

3 - FOR DEVICE FUNCTION NUMBERS AND DESCRIPTION, SEE DWG. No. 25203-30028.

4 - FOR THREE LINE DIAGRAMS, SCHEMATICS AND DRAWING REFERENCES SEE DWG. No. 25203-30044 (SERIES).

5 - FOR RESERVE STATION SERVICE TRANSFORMER CONNECTIONS SEE DRAWING NO. 25203-30002.

6 - CABLE SIZES ARE BASED ON AIEE-IPCEA STANDARDS.

7 - ALL 4.16KV SINGLE CONDUCTOR CABLES SHALL BE SHIELDED.

8 - ALUMINUM CABLES SHALL BE USED UNLESS NOTED OTHERWISE.

9 - FOR 4160V SYSTEM RELAY SETTINGS SEE 25203-30108 SHTS.

10 - FOR NORMAL OPERATION BKR 52-A305 OR 52-A408 SHALL BE CLOSED.

11 - ØA IS MONITORED BY A CURRENT TRANSDUCER FOR THE PURPOSE OF LPSI PUMP PERFORMANCE DURING SDC/MIDLOOP OPERATION (REF. 25203-28500 SHTS 427A,B).

12 - FOR DIGITAL FAULT RECORDER PNL. C513 REFER TO 31184 SERIES.

13 - FOR DEVICE LEGEND AND SWITCH DEVELOPMENT SEE DWG. No. 25203-30042 (SERIES).

14 - MTAP2 - MOTOR MONITORING DEVICE

15 - OCP - OPEN CIRCUIT PROTECTION DEVICE

REFERENCE:

25203-30009 FOR BUS 24C, 24D 4160 VOLT ELECTRICAL DISTRIBUTION LOAD SUMMARY.

OPERATIONS CRITICAL

Dominion

Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Waterford, CT.

TITLE: MILLSTONE POWER STATION UNIT No. 2
SINGLE LINE METER & RELAY DIAGRAM
4.16KV EMERG. BUSES 24C,24D (A3,A4)

REVISION DESCRIPTION (SIGNATURES ON FILE)	CAD NO: C:\fms32\tmpplot\C30005.DGN	
REVISED PER DC MP2-15-01062 & DUR 17-800343	DRAWING NO: 25203-30005	REV 25
DSGN JCV	SCALE: NONE UNLESS OTHERWISE NOTED	SH 0

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Radiological Assessment and Task Supervision

JPM Number: A4S Revision: 1/1

Initiated:

John W. Riley – Signature on File	8/14/2018
Developer	Date

Reviewed:

Leone Angelo – Signature on File	8/15/2018
Technical Reviewer	Date

Approved:

Michael John Cote– Signature on File	8/20/2018
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
08/13/2018 jwr	Incorporated NRC comments from NRC prep week.	1/1

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: A4S Revision: 1/1

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 : 1/1

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 in the posted area to clear the tags and perform the initial valve lineup. It will take PEO #2 approximately 45 minutes to perform the same task.
  - It will take PEO #1 approximately 15 minutes in the posted area to perform the valve lineup Independent Verification. It will take PEO #2 approximately 25 minutes 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: 1/1

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: Provide a calculator. If requested, provide examinee with a copy of RPM 5.2.2; Basic Radiation Worker Responsibilities.			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A4S Revision: 1/1

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: The examinee either:

1. Calculates the <u>stay times</u> and compares them against the task time, or

• 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
$850\ mrem \div 1000 \frac{mrem}{hr} = 0.85\ hours$
$0.85\ hours\ \times 60 \frac{mins}{hour} = 51\ minutes$

2. Calculates the <u>expected dose</u> against the remaining dose

• PEO #1 Clear tags & LU = 500 mr
$30\ mins\ x\ 1000 \frac{mrem}{hr} = 500\ mr$

• PEO #1 Line up IV = 250 mr
$15\ mins\ x\ 1000 \frac{mrem}{hr} = 250\ mr$

• PEO #2 Clear tags & LU = 750 mr
$45\ mins\ x\ 1000 \frac{mrem}{hr} = 750\ mr$

• PEO #2 Line up IV = 417 mr
$25\ mins\ x\ 1000 \frac{mrem}{hr} = 417\ mr$</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: 1/1

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 (or 850 mRem available for a job that will take will take him/her 750 mRem).	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 (or 400 mRem available for a job that will take will take him/her 500 mRem).. 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 (or 400 mRem available for a job that will take will take him/her 250 mRem) . He/she must be directed to perform the valve lineup Independent Verification.	Y ☒ N ☐	S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: A4S Revision: 1/1

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: 1/1

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: 1/1

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 in the posted area to clear the tags and perform the initial valve lineup. It will take PEO #2 approximately 45 minutes to perform the same task.
  - It will take PEO #1 approximately 15 minutes in the posted area to perform the valve lineup Independent Verification. It will take PEO #2 approximately 25 minutes 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?

Table 1. – Definitions and Entry Requirements for Areas Within the RCA							
	Definition	SRD and DLR	Dose Rate Meter	Continuous Coverage	Pre–job briefing	PCs	Other requirements
Rad Area	> 5 mrem/hr	✓					
HRA	> 100 mrem/hr	✓[1]	✓[1]	✓[1]	✓		
LHRA	≥ 1000 mrem/hr	✓[1]	✓[1]	✓[1]	✓		Sign on LHRA RWP Job Task. Tech Specs require entrances to LHRA remain locked or continuously guarded.
HRA where no enclosure exists for the purpose of locking	≥ 1000 mrem/hr	✓[1]	✓[1]	✓[1]	✓		Sign on LHRA RWP Job Task. Tech Specs require the area to be continuously guarded or barricaded, conspicuously posted and a flashing light activated.
VHRA	≥ 500,000 mrad/hr	✓[1]	✓[1]	✓	✓		Sign on Special RWP. A written procedure & a key for the unique lock.
Hot Spot	≥ 100 mrem/hr & 5X general area dose rate	✓					
Contaminated Area	≥ 1000 dpm/100cm^2	✓				✓	
Hot Particle Area		✓				✓	
Airborne Activity Area	30% of DAC sustained or 1 DAC	✓					

[1] – Have one or more of the following:

- Dose rate meter
- Alarming or Telemetry Electronic Dosimetry and knowledge of area dose rates
- Continuous HP Coverage

Other Radiation Protection Signs – The HP Department at times uses other signs to assist workers in RCAs. These other signs may assist a worker to comply with procedures, provide information, or help to keep exposure ALARA.

- Compliance signs remind workers of important rules which must be followed. One example of a compliance sign reminds workers that a Locked High Radiation Area door must be locked.
- Information signs help workers complete tasks properly. Examples of information signs include the signs posted at Step Off Pads instructing workers how to remove PCs and signs at friskers reminding the worker of the proper method of frisking.
- ALARA signs inform the worker of general area dose rates that are higher or lower than the rest of the area. A worker can use these signs to find the best places to stand.

MILLSTONE POWER STATION

HEALTH PHYSICS OPERATIONS PROCEDURE

Basic Radiation Worker Responsibilities

RPM 5.2.2

Rev. 017

STOP THINK ACT REVIEW

Approval Date: 05/15/17

Effective Date: 05/23/17

Level of Use
Information

Millstone All Units
Health Physics Operations Procedure

Basic Radiation Worker Responsibilities

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1. INSTRUCTIONS

1.1 **Basic Guidelines for Work in the RCA**

Personnel are required to comply with instructions issued by Health Physics concerning radiation protection matters, such as orders to stop work involving radiation exposure and radioactive material. These instructions may be verbal or written.

The following sections discuss good radiological work practices to be used by Radiation Workers when working in the Radiological Control Areas at Millstone Station. This procedure contains sound radiation protection principles and work practices that, when followed by the worker, achieve occupational doses that are as low as reasonably achievable (ALARA). Information contained in this procedure can be printed or distributed in any medium, such as a handbook.

1.2 **Your Rights**

You have the right to request a written report of your current Millstone radiation exposure. The Health Physics (HP) Department, or your supervisor, will provide you with this information in an NRC Form 5. This report is issued annually to each worker who receives greater than 100 mrem or when requested by the worker. Requests for exposure history from PADS (Personnel Access Data Systems) can also be provided to the individual.

You have the right to know the radiological conditions of the area in which you are working. Radiological postings alert plant personnel to the presence, magnitude, and boundaries that are associated with the radiological conditions encountered at Millstone Station. Postings should provide personnel sufficient information to minimize their exposure to radiation. This information will be provided to you by the applicable HP department.

You have the right to bring any concern, safety or otherwise, to the attention of your supervisor without fear of retaliation or discrimination. If at any time you do not feel comfortable talking about the matter with your immediate supervisor, you may talk to an Employee Concerns representative, or directly with the NRC.

1.3 Your Responsibilities

You should be able to provide Health Physics with a reverse brief regarding the details of your exposure and work activity. It is your responsibility to know your available exposure and maintain your exposure ALARA. Know your RWP number and Job Step. Review your RWP. Know your RWP dose limits and SRD alarm set points.

- Comply with all radiological postings and signs. If you need a boundary repositioned, contact HP. It is a violation for you to move it yourself.
- If the work scope or radiological conditions change, stop work, leave the area, and contact HP.
- Comply with all HP verbal or written Stop Work orders.
- Minimize the amount of materials taken into the RCA.
- Report all unusual occurrences within the RCA and radiological deficiencies to HP.

In the case of a station emergency, follow the instructions of Station Emergency Response Organization (SERO).

1.4 Medical Concerns

If you have an open sore or injury, see HP prior to entering the RCA. Health Physics and Medical personnel may restrict your entry to the RCA when it is in the best interest of your health and well being. Depending on wound severity, you may not be permitted into a radiological control area, or you may be required to take additional precautions for entry such as extra bandages, gloves or other coverings. If an injury occurs while working in the RCA which results in cuts or abrasions, exit the area and notify Health Physics.

Your response to a medical emergency will depend upon the severity of the injury or illness, the area of the plant that the injury took place, and your own medical training. Minor problems are routinely handled at the health facility. If an injury occurs while inside a radiological control area, HP will assist you exiting the area. If a true medical emergency occurs, such as heat stroke, serious injury or severe illness, the immediate welfare of the individual takes precedence over routine radiological controls. Contamination and radiation controls will be considered, but will not interfere with the individual receiving care as rapidly as possible. EMTs at Millstone can be almost anywhere on site within about 8 minutes.

1.5 Radiopharmaceuticals

If you are scheduled for a medical treatment or diagnostic using radiopharmaceuticals (nuclear medicine), turn in your DLR to Dosimetry prior to treatment, if possible. When you return to work report to the Dosimetry Office. You will be restricted from RCA access until you can clear the monitoring equipment, although Health Physics Supervision can grant access to the RCA for critical work. This access will require pre and post job whole body counts. If not already turned in, your DLR will be collected and Dosimetry will then issue you a Portal Monitor Exemption which will allow you to pass through the radiation monitoring equipment at the Security Access Points, even though you are likely to cause an alarm. Carry this Portal Monitor Exemption with you until the end of the exemption period, at which time you will report to HP for an evaluation in a PCM. A radiopharmaceutical Portal Monitor Exemption is required for all workers who must enter the Protected Area, even if they do not need a DLR for RCA Access.

1.6 Exposure

Dose – The amount of radiation exposure one receives is referred to as dose. The unit of measure for dose received is called the rem. It is a measure of the biological effect that the radiation has on living tissue. Generally, a fractional unit of the rem is used: the millirem (mrem). One mrem is 1/1000th of a rem. This idea is similar to the use of meters and millimeters to describe length, or grams and milligrams for mass.

Dose Rate – Just as miles–per–hour is an expression of travel rate, mrem–per–hour is an expression of dose rate. You must understand dose rate in order to be able to read survey maps, and work within Radiation areas. Dose is an amount of radiation. Dose rate is an amount of radiation per hour.

Radon – Radon is a naturally occurring radioactive gas that comes out of the earth's crust or ground water and tends to concentrate in basements and tightly constructed buildings, especially when ventilation flow is poor. It has the electrostatic ability to attach itself to plastics and polyester fabrics. Radon is found in homes, schools, office buildings, churches, and train stations. We routinely monitor for radon and are able to detect it in the buildings on site, even though the hazards associated with exposure to radon are extremely low. The sensitivity of our equipment is so high we often experience nuisance alarms while exiting the RCA. This gives false indications of radioactive contamination on individuals. If you have any questions concerning radon, contact HP for additional information.

Stay Times – Stay times are established by HP when a worker may be approaching an exposure limit, or when the dose rate is such that an administrative limit would be met or exceeded in a relatively short period of time. A stay time is an amount of time that a worker can remain in a Radiation, High Radiation, Locked High Radiation Area, or Very High Radiation Area without exceeding any exposure limit.

Contamination – Contamination can take various forms: fixed, loose, airborne and discrete (hot) particles. The terms 'personnel contamination' and 'internal contamination' are used to describe contaminated people. Both types of contamination, if in large enough amounts, may result in dose to the individuals.

Radiation Exposure Limits – Federal limits have been established by the NRC for radiation exposure. These limits are given in the Code of Federal Regulations, 10CFR20. Administrative guidelines have been established to keep from exceeding the federal limits. These two limits are:

Federal Limits And Administrative Guidelines For Adults		
	Federal Dose Limits	Administrative Guidelines
Whole Body (TEDE)	5 rem/year	from MP site – 2 rem/year
Whole Body (TEDE)	5 rem/year	from all licenses – 3 rem/year
Skin (SDE)	50 rem/year	40 rem/year
Extremities	50 rem/year	40 rem/year
Eyes	15 rem/year	12 rem/year
Organs (TODE)	50 rem/year	40 rem/year
Embryo/Fetus (Declared Pregnant Worker)	0.5 rem/term	0.450 rem/term or 50 mrem/ month
Expected Pregnant Worker	N/A	500 mrem/quarter
Planned Special Exposures (PSE)	5 rem/yr or 25 rem/Lifetime TEDE	N/A
System Radiation Worker (applies when monitored at more than one Dominion Site at the same time)	N/A	750 mrem/year per site; 3000 mrem/year
Plant Access Radiation Worker	N/A	125 mrem /year per site; 500 mrem/year

Prenatal Exposure Policy – Millstone Power Station has established policies to limit exposure during pregnancy or for a planned pregnancy. Additional information concerning prenatal exposure, and the proper forms for declaring pregnancy or expected pregnancy, are provided by the HP department.

- *Declared Pregnant Policy*: A worker who is pregnant may choose to declare her pregnancy by notifying her supervisor in writing about her condition. To do this, the worker must submit a statement estimating the conception date. The supervisor in turn would notify the Dosimetry Department to place the worker in the "Declared Pregnant Category."

- *Expected Pregnant Policy:* A worker who expects to become pregnant in the near future and would like to be placed in the Expected Pregnancy Category, must submit a request to her supervisor. The supervisor in turn would notify the Dosimetry Department to place the worker in the "Expected Pregnant Category." The worker must submit a new request every 60 days to remain in this category.

Declared or Expected pregnant workers will not be required to engage in work that requires entry into any posted airborne radioactivity area or any area requiring the use of protective clothing or respiratory protection. Millstone employees in either category will usually be reassigned within their department to allow continued employment with reduced exposure. If reassignment is not possible, the pregnancy may be treated as a disability. For contracted employees, it is a matter to be resolved between the employee and their employer.

1.7 ALARA: As Low As Reasonably Achievable

Closely monitoring the dose you receive will help you maintain your exposure As Low As Reasonably Achievable – ALARA. It is Millstone's policy, as well as the law, that all exposures be kept not only within regulatory limits, but ALARA. The primary means of reducing exposure to workers are Time, Distance, and Shielding.

ALARA Goals:

- maintain personnel exposures below federal limits

- eliminate exposure that is not necessary, and

- maintain *necessary* exposures As Low As Reasonably Achievable.

Minimize Time: The most important thing a worker can do is plan the job. Planning your job will minimize time spent in radiation areas. Reducing time spent in radiation areas reduces exposure. Proper planning should include:

- Make sure you have all the proper tools and equipment prior to entering the work area.
- Be familiar with the job and equipment, review repair manuals, diagrams, photographs, procedures, work orders and RWPs before entering the area.
- Know the radiation levels and component locations prior to entering the area, plan your route, your low dose area and where standby personnel, if needed, should wait.
- Perform mockups of new processes, tools, or methods identifying any problems before actually using them in radiation areas.
- Complete as much work as possible outside of RCAs. This can include preassembly and prefabrication.

Maximize Distance: When planning the job, consider increasing the distance between you and the job. Often the tools used for minimizing time are also used for maximizing distance, such as utilizing low dose waiting areas, or preassembly and prefabrication. Another way to increase distance is to employ robotics or long handled tools or wires.

Maximize Shielding*:* Shielding is a third method of reducing exposure. Increasing shielding decreases dose rate. Thick concrete walls, metal piping, pools of water, and thick steel vessels all form permanent shielding. Plan your job to allow you to use plant structural components as shielding. Concrete blocks, lead sheets, lead blocks, lead blankets, and water–filled containers are examples of temporary shielding.

The use of temporary shielding is determined by ALARA and Engineering Departments. They determine when, where, and how much shielding to use for any given situation. Anyone may submit a temporary shielding request to the ALARA Coordinator, but you must never add or remove temporary shielding without the approval of the ALARA Coordinator.

Respiratory Protection and ALARA*:* Respirators reduce internal exposure by filtering out radionuclides entrained in the air, but using them may slow workers down. This sometimes results in higher external dose due to the increased time spent in the radiation area. This is *not* ALARA. The ALARA Program considers the TEDE (total dose, both internal and external), for the whole job. Because of this, respiratory protection use for radiological purposes has been greatly reduced.

All individuals have an important role in exposure control and reduction efforts.

- Managers participate by ensuring proper job and project planning and by supporting exposure reduction efforts.
- First Line Supervisors and job leaders participate by carefully planning radiation work and providing the tools, equipment, training, access control, convenience items, and leadership necessary to perform this work in a manner that would reduce exposure. They also participate by performing ALARA job reviews with the assistance of ALARA personnel and ensuring that all exposure controls specified for the job are implemented. Following jobs, supervisors should solicit and document feedback from the workers and provide the feedback to the ALARA Coordinator.
- Individual Radiation Workers participate in exposure control by taking responsibility for their own exposure at the job site and employing the exposure controls specified for the job.
    - Avoid rework
    - Control work crew size and use low dose area for waiting while in the RCA.
    - Ensure all preparations have been made prior to entering the RCA.

If you think of ways to reduce your exposure, tell your supervisor, HP, or the ALARA Coordinator.

1.8 Dosimetry

Health Physics may impose restricted access to the RCA due to dosimetry device status, abnormalities and exposure accumulation.

Dosimeter of Legal Record (DLRs): – Millstone uses a Thermoluminescent Dosimeter as DLR to record and differentiate between beta, gamma, and neutron radiation. It is used to record your permanent dose. The beta window is covered by a thin mylar film. If you notice that the mylar is damaged or missing, bring the DLR to HP. The thin window on the DLR points away from the body and is worn on the outside of clothing except when wearing full protective clothing, or directed otherwise by Health Physics. When applicable for specific work activities, Health Physics will provide special dosimetry instructions. Health Physics will instruct personnel if dosimetry is to be moved to any other position.

Radiation from X–ray machines at airports or the plant can be differentiated from occupationally received exposure. Do not leave you DLR in your personal items when placing them on the X–ray belt when entering plant. Always wear you DLR through Security entry point. Do not travel with your DLR.

DLR Issue and Return: – Dosimetry is issued to the station population on a semi–annual basis, normally the closest day to the first workday of January and July. At this time the last wear period's DLR is exchanged for a new DLR. Special dosimetry (i.e., multiple badging and extremity DLRs) is returned to the Dosimetry Office after use. Prior to trips to other nuclear facilities, notification to the Dosimetry Office is required to ensure that proper requests are prepared for the other nuclear facility. When employment is terminated, all dosimetry is returned to the Dosimetry Office.

Self Reading Dosimeter (SRD): – The most commonly used SRD is a self–reading electronic device that works in conjunction with the Windows Access Control System (WACS) to measure, record, and display a workers gamma dose and dose rate. After placing SRD into WACS, display end down, follow the prompts on the screen. The SRD alarms at the end of the log–in process, verifying the alarm function is operable. If the alarm does not sound, the SRD is not operating correctly. Notify HP personnel and obtain a new SRD.

If it has been determined that you have a hearing deficiency such that you can not hear the alarm, the message "Alternate Alarming Device Needed" will appear on the WACS screen. HP personnel will determine what additional equipment (vibrating alarm unit or telemetry) to be issued to you to ensure you are aware of changing radiological conditions.

A correctly operating SRD will have a number displayed in the LED, which is the dose the Radiation Worker has received. Pressing the SRD button will temporarily display the dose rate in the area in which the Radiation Worker is working. Pressing the button again will display the last four digits of the individual's EID number. As the worker spends time in the area, the dose recorded by the SRD will increase, while the display dose rate will vary as the worker moves about in the radiation area.

Do not rely on electronic dosimetry alarms to warn you that it is time to leave the area. When wearing protective clothing, place the SRD in the pocket on the outside of the protective clothing in order to perform self–checking. Check your dose periodically; approximately two to three times per hour. HP personnel may brief you differently based upon the area you are entering. Be sure to look at your SRD more frequently in High Radiation Areas, high noise areas, or when the audible alarm may be muffled by protective clothing. Leave work area in a safe condition and exit RCA when you have received 80% of your allowable dose.

An alarming SRD will display a red flashing light in addition to the audible alarms.

- Do not cover the speaker of a SRD: you will not be able to hear the alarms.
- Do not remove your SRD to use as a survey meter. The SRD must remain attached to your body to ensure accurate measurement of your dose.

HP may brief you to expect a dose rate alarm while in transit to your work area. If the SRD alarms in the location specified by HP, continue to your work area. If you you receive any other alarm, put work in a safe condition, exit RCA, and report to HP prior to attempting to log out. You may be given additional instructions on expected dose rate alarms when the dose rate alarm is set below 100 mR/hr. Read your RWP carefully regarding dose rate alarms.

To log out of a WACS, follow the prompts on the screen. Remove SRD when prompted. Removing the SRD before the system prompts removal may result in an incomplete transaction.

Wearing Dosimetry – Since dosimetry devices measure your exposure to radiation, remember to wear your dosimetry each and every time you enter the Protected Area as well as the RCA. You must wear your dosimetry on the upper front portion of your body unless told otherwise by the HP Department. Dosimetry is not to be worn on the belt or at the belt line**.**

NOTE

A method of wearing your dosimetry is to attach it to a break away lanyard. Remember, always keep all dosimetry devices within about a hands width of each other and on your upper torso.

In some cases HP may require that multiple placement dosimetry or extremity dosimetry be used. Instructions for their use will be provided by HP at that time.

Do not move dosimetry to other parts of your body unless instructed to do so by HP.

Dosimetry Care And Storage – Your dosimetry is accurate, compact, and sturdy, but was not built to withstand abuse. For it to measure, track, and display your radiation exposure accurately, you must exercise care when using it. Remember these tips:

- Electronic dosimetry has been known to be sensitive to extreme cold, mechanical shock, covering the speaker, electronic key card readers, and erratic behavior near arc welding machines.
- If you have dropped or jarred your electronic dosimeter, check it closely. If it appears to give faulty or unexpected information, leave the area immediately and contact HP before signing out electronically.
- Dropping a DLR has no effect on its recorded dose, but could crack the plastic case. If a DLR case is damaged or opens, bring the DLR to the Dosimetry Office.
- Return your SRD each time you exit to the RCA exit storage areas, unless authorized by the Radiation Protection Manager.
- Wear your DLR and SRD properly at all times while at work in the Protected Area, that is on your upper torso within a hands width of each other.
- Store your DLR safely at home when off work. This is done to allow for the correct background radiation values to be applied.
- When going to another site where you will be monitored, notify the Dosimetry Office.

1.9 Working in RCAs

Specific requirements for entry into an RCA are determined by Health Physics. Unless specifically exempted by HP Supervision, all work within the RCA requires an RWP. With the exception of RCA visitors, DLRs are required for all entries to an RCA. Specific requirements for the SRD type are determined by Health Physics.

Work Practices for the RCA

- Do not eat, drink or smoke in RCAs. Chewing tobacco or gum is considered eating. This can lead to facial contamination and possible ingestion of contaminants.
- Do not climb in overhead areas unless specifically authorized by HP.
- Do not contact your face with contaminated items, such as contaminated gloves or phones.
- Do not unzip PCs; items that need to be retrieved should be placed in outer packets.
- Ensure that all hoses, cords, etc. that cross a contaminated area boundary are secured so that they do not move out of the area. Contact HP prior to placing hoses or cords over a contaminated area boundary or an RCA boundary as they must be secured and tagged by Health Physics.
- If you must wait for something or someone while in the RCA, insure that you are in an ALARA low dose area.
- Tools with fixed contamination less than or equal to 50,000 dpm are available in the Hot Tool Cribs which are managed by the Tool Management Group. It is the tool user's responsibility to notify HP when non−RCA tools or clean vendor tools are required. This will allow HP to identify controls to reduce the risk of the items becoming contaminated.
- If you think an area might be contaminated, but you are not sure, contact HP before entering the area. If you have already entered the area, and have possibly become contaminated, limit your movement as much as possible and contact HP.
- The best place to control contamination is at its source. Contamination control methods should be discussed before the job starts. Job planning and pre−job briefings are essential to controlling the spread of contamination.

- Observe Contaminated Area postings. Think of the Contaminated Area boundary as a wall which you cannot reach through. Never reach into, or out of, a Contaminated Area to remove or receive items, unless authorized by HP.

- Beverages may be administered within the RCA under HP Supervision direction.

- Leave coats outside the RCA, whenever possible.

- Do not place vinyl adhesive save stickers, e.g., "Save" tags, "Hot Spot" stickers, directly onto stainless steel piping surfaces, as the vinyl in the sticker has detrimental affects on stainless steel.

Vacuum Cleaners And Ventilation Units In the RCA – If you need to use a vacuum cleaner or a ventilation unit within the RCA, it must have a HEPA filter installed in it. Units with these filters installed and set up especially for RCA work are available from HP. Vacuum cleaners are logged in and out and locked when not in use. If you are issued one of these vacuums or ventilation units, check the following items prior to use:

- Performance Challenge Label

- Vacuum Cleaner Inspection Tag

- Leak Test Verification Label

- Leak Test Integrity Seal (intact)

- Unit or hose integrity (look for damage)

- Trouble tag on unit

- Radioactive Material stickers

If you have any questions about the use of these special units, see HP. They will provide information and instruction. The improper use of vacuum cleaners and ventilation units or using the wrong units within the RCA could cause increased radiation exposure by generating airborne contamination.

Personnel Exiting A Contaminated Area – Step–off pads identify the approved exit routes in order to help prevent the spread of contamination by limiting the number of exit paths. Step–off (sticky) pads are treated as un–contaminated and are outside contamination boundaries. All protective clothing must be removed before stepping onto step–off pads. Under normal working conditions, leave the contaminated area using the step–off pad. When removing booties, take care not to back into the contaminated area.

Occasionally routine work activities or job functions that require multiple entries into contaminated areas are exempted from removing all protective clothing each time or requiring a whole body frisk each time. This will be determined by Health Physics on a case basis.

All individuals exiting a contaminated area will perform a whole body frisk, using a Personnel Contamination Monitor (PCM), if available, or a hand held frisker and then proceed to the nearest PCM. Instructions for specific frisking will be given to the worker or posted in the area by Health Physics.

Pumps, Valves, Drain Catches in the RCA – Components such as valve packing and mechanical joints may have minor leakage. This leakage could be in the form of boron deposits or liquids. In these instances Health Physics will visibly identify these components. Avoid these contaminated portions unless your RWP covers this task and you have been briefed by HP.

Material Exiting a Contaminated Area – Unless directed differently by HP, all items must be yellow bagged and sealed as they are removed from contaminated areas. Packages must then be surveyed by HP and labeled as radioactive material, with the radiation levels clearly marked. Items that are too large for bags may be wrapped or placed in a container or four sided cart for removal. All packages must be attended at all times by a trained Radiation Worker and remain within the RCA until HP can survey and label the package. Always contact HP prior to removing items from contaminated areas. Tools and equipment should be bagged separately from waste materials.

Protective Clothing – Protective clothing prevents contamination, not radiation! The type of protective clothing worn will vary depending on contamination levels and the type of work to be performed. Follow the instructions provided by HP and the RWP.

Select protective clothing that is large enough to slip on and off easily, but not so large that it hangs from the body creating a hazard. Gloves and shoe covers are color coded to indicate size. Inspect the protective clothing you will wear, checking for tears, holes, rips, split seams, or broken zippers. Damaged protective clothing that is found should not be used and be disposed of appropriately.

All outer clothing and personal effects should be removed prior to putting on protective clothing. You will not be reimbursed for loss of personal effects, outer clothing, or personal modesty garments due to contamination if worn under protective clothing. Religious and medical jewelry are exempted. Modesty garments, such as scrubs, are provided for wear under protective clothing, and in some cases may be used as the outer protective clothing such as in heat stress environment. These modesty garments are controlled in the RCA. Make arrangements to store personal items such as wallets and jewelry. Lockers are not always available.

Donning Protective Clothing – The order in which protective clothing is put on is not as important as the order in which it is removed. The following is the normal sequence of dressing out.

- Booties
- Glove liners and, if required, finger rings under the liners.
- Coveralls (PCs)
- DLR inside your Coveralls
- SRD in the Coveralls pocket, unless otherwise directed
- Rubber shoe covers are put on over the inner shoe covers
- Hook inner coverall sleeve over thumbs
- Rubber gloves (over inner coverall sleeves)
- Pull coverall outer sleeve down over rubber gloves (tape sleeve, if required by HP)
- Hood, attached together under chin, or skull cap, as directed by RWP or HP
- Hard hat and hard hat cover
- Any other protective clothing required, will be indicated on the RWP or by HP.

Removing Protective Clothing – The following is the normal sequence of undressing.

- Outer rubber shoe covers
- Any tape, if used
- Fold back outer coverall sleeve
- Rubber gloves, taking care not to pull off the glove liners, or touch the contaminated outsides of the gloves
- Hood or skull cap
- Hard hat cover
- Coveralls, if used
- Booties, placing each foot on the step off pad as the shoe cover is removed. Do not step back into the contaminated area!
- Glove liners
- Wear your hard hat to the frisking area. Carry dosimetry to the frisking area with you.
- If the modesty garment was worn as the outer protective clothing, change into a clean modesty garment in an area designated by HP prior to exiting the RCA.

Personnel Exiting The RCA – Exit from the primary (power block) RCAs require a whole body frisk, usually accomplished with a gamma sensitive automated whole body monitor, like an Argos Zeus–4G. If an Argos is not available, a Personnel Contamination Monitor (e.g., PCM 1B) and a Gamma Sensitive Monitor (e.g., PM 7) will be used instead. When an automated whole body monitor is *not* available at an RCA exit, a manual whole body frisk is required. All clothing worn into the RCA and all items taken into the RCA must be frisked upon removal from the RCA. Individuals who remove coats while in the RCA must perform two frisks: first without the coat and second with the coat. A Canberra Sirius–5AB is located at some building exits to exit into the RCA yards. These are used the same as satellite RCAs mentioned in in the next paragraph.

Satellite RCAs, counting rooms, radioactive material storage areas, exits to selected yard areas or temporary RCA egresses may have reduced frisking requirements based upon the risk of contamination. Instructions for specific frisking will be given to the worker or posted in the area by Health Physics. Normally, the Radiation Worker then proceeds to the nearest PCM or manual whole body frisker, preferably an Argos Zeus−4G.

If a positive alarm is received at the RCA exit due to licensed material, HP personnel will respond and decontaminate as needed. When an alarm at the RCA exit is due to noble gas, an individual can be unconditionally released by RP Supervision. Additional instructions for noble gas contamination will be given by HP personnel.

Personnel Exiting The Protected Area − All individuals who exit from the Protected Area require a whole body frisk using a Gamma Sensitive Monitor (GSM), e.g., a PM−7 Portal Monitor, with the exception of the those who have a Portal Monitor Exemption.

Material Exiting The RCA − Whenever materials are removed from the RCA they must be monitored for licensed material. The type of material and the circumstances in which they were used will determine the type of evaluation that will be required. If it is desired to store radioactive material in an outside RCA or transfer radioactive material between RCAs, contact Health Physics to obtain authorization and instruction.

If HP is not available at the RCA exit to monitor material, tag the material for identification and ownership. Store material in RCA and request HP to monitor.

- If the material is a liquid or granular solid, a sample of the material must be taken for analysis. Attachment 2 contains specific guidance for sampling liquid or granular solids. Contact HP prior to sampling for specific sampling requirements.
- If a vehicle being released is from or was connected to a system within the RCA, HP must evaluate survey requirements for release. Always contact HP prior to moving vehicles. Examples of these vehicles are Hydrolazers, Vacuum trucks, Sludge lancing equipment, Chemical decontamination equipment, and other equipment that may directly interface with plant components.
- Excavation materials must be surveyed by HP for removal from RCAs. These include soil, asphalt, and roofing materials.
- If large amounts of material (soil, gravel, system components, RCA clean trash) require unconditional release, contact Health Physics for pre−planning assistance.

Tool and Equipment Monitor (TEM) – These monitors are located at the RCA exits and are used by HP to unconditionally release items from the RCA. The TEM is the best method for Radiation workers to monitor personal items that have not been in a Contaminated Area. Only HP is allowed to unconditionally release items that have been in a contaminated area. No tools leave the RCA, with the exception of M&TE and specialty tools as determined by HP Supervision; HP surveys these tools. Trained Radiation Workers may unconditionally release personal items such as notebooks, clipboards, gloves, contents of pockets and non–tool items on belt.

Instructions for the use of the tool monitors are provided at the RCA exits, however, the use of these instruments is relatively easy. Individuals who have been in a Contaminated Area will perform a personal frisk or an Argos count and exit the RCA, allowing the HP to monitor their items in the TEM. All others can place the item in the TEM and the press the start button. All individuals stand back approximately three feet while the monitor performs its count cycle. This allows the background of the monitor to be maintained. If counting cycle ends with no alarm, the item can be released. If the counting cycle ends with an alarm, request further instructions from HP. If a one–door TEM is used, the items are placed on a table near the TEM before leaving the RCA. If using a two–door TEM, the items are normally removed from the non–RCA clean side.

Transferring Radioactive Materials – Radioactive materials are transferred between RCAs on site by personnel in the Radiation Protection/Chemistry department. Radiation Workers in other departments who have been authorized by HP management may escort radioactive materials between RCAs. Once authorized, the Radiation Worker will be briefed by HP for each transfer and log on to a RWP for transfer of radioactive materials between RCAs. Radiation Workers not authorized to transfer radioactive materials between RCAs will require escort by an authorized individual, or an escort from the Radiation Protection/Chemistry department, to transfer the material. *Never* leave radioactive material unattended outside of an RCA.

The outside of the package must be free of loose contamination, be surveyed and properly labeled with Radioactive Material stickers and in certain cases, escorted by HP.

- If the package is less than 100 mrem/hr at 30 cm, all of the following conditions must be met:
  - HP must be notified that the package is being transferred by an authorized Radiation Worker.
  - Radiation Worker is signed on an approved RWP.
  - Radiation Worker has been provided with adequate information to safely transport item or container (e.g., dose rates).
  - Radiation Worker has been instructed to maintain control of item or container and transport directly to another RCA or designated storage location.
- If the package is greater than or equal to 100 mrem/hr at 30 cm, HP must escort the package to its destination.

1.10 **RCA Escort Responsibilities**

When escorting an RCA Visitor in the RCA, the escort is responsible for remaining with the RCA Visitor at all times while in the RCA. If it becomes necessary to transfer the escorted RCA Visitor to another person, the escort must ensure that the new RCA escort is Radiation Worker Trained and understands the requirements for an RCA escort. RPM 1.3.2, "Dosimetry Issue and Return," contains additional information on RCA Visitors and Escorts and the restrictions that apply to them.

1.11 Personnel Monitoring

Personnel monitoring is done to check for the presence of radioactive contamination and/or radioactive materials on you or your clothing, hard hats, and, if applicable, your security equipment. It is required when exiting contaminated areas, when leaving the RCA, and finally, when leaving the site. As a Radiation Worker, you will have the opportunity to use a PCM (PCM−1 or Argos). When using the PCM−1, you will also use a Gamma Sensitive Monitor (GSM), e.g., a PM−7 Portal Monitor or Argos. In cases where a PCM is not available, the hand−held frisker will be used or, if available, a Sirius−5AB Hand and Foot Monitor. Monitoring for the presence of internal contamination is done with a whole body counter. Individuals exiting the RCA are expected to be monitored in the same manner of dress as they entered an RCA, with the exception that the individual empties the contents of their pants and shirt pockets of everything, (except for money and wallets). For instance, the individual always wears their SRD, DLR, and their security badge on their lanyard and should wear them through the PCM. Also, you wear your jacket into an RCA, you should wear your jacket when being monitored by the PCM. If contamination is detected on your body or your clothing during a frisk, stay where you are and contact HP. HP will assist you in detecting and removing the contamination.

PCM−1 − To use a PCM−1, remove all sharp objects before stepping into the machine, then step into the machine inserting your right or left arm into the slot. A red light will blink in front of you indicating the machine is counting. When the count is complete, the light will stop blinking and the machine will chime. Remove your arm and step out of the machine. Reverse your position and repeat the process, inserting your other arm. You may leave the area if you pass the first count, stepping out of the PCM−1 to outside the RCA boundary. If the PCM−1 detects contamination, it will alarm and identify the location of the contamination. Even if the machine alarms during the first half of the check, you must complete the PCM−1 count (both sides). If the machine alarmed during the count, perform a second count. You may leave the area if you pass the second count, stepping out of the PCM−1 to outside the RCA boundary. If the PCM−1 alarms on the second count, contact HP for assistance. After completing the count in the PCM−1, you will also have to monitor in a PM−7 Portal Monitor (GSM) or, if unavailable, an Argos.

Canberra Argos – To use the Argos, remove all sharp objects before stepping into the machine, then step into the machine facing the detectors. Place your right hand, palm down and forearm on the angled array of detectors. The Argos uses voice prompts if you are in the proper position, at which point the machine will start counting. Reverse your position and repeat the process, placing your other hand and forearm on the angled array of detectors. You may leave the area if you pass the first count, stepping out of the Argos to outside the RCA boundary. If the Argos detects contamination, perform a second count. You may leave the area if you pass the second count, stepping out of the Argos to outside the RCA boundary. If the Argos alarms on the second count, contact HP for assistance.

Manual Frisking – Ensure that the hand–held frisker is turned on and, if it is not plugged in, battery check is satisfactory. Check that the frisker is on the "x1" scale, and the background is less than 200 cpm. Pass your hand over the probe one–half inch away to ensure your hand is not contaminated before picking up the probe. If your hand is clean, pick up the probe and pass it slowly over your body, holding the probe one–half inch away from the surface being checked. The probe must be moved very slowly: one inch per second. While frisking, watch the needle on the meter face and listen for the clicks. If you observe an increase of 100 counts per minute above background, you are considered contaminated and must contact HP.

Sirius–5AB Hand and Foot Monitor – These monitors are similar to Canberra Argos series monitors. To use the Sirius, remove all sharp objects from hands and cuffs before stepping onto the machine. Step onto the machine facing the detectors and place your hands in the designated hand slots. A voice activated prompt will assist if you are not in the correct position. The Sirius will begin to count down. If the Sirius detects contamination, perform a second count. You may leave the area if you pass the second count. If the Sirius alarms on the second count, contact HP for assistance.

Portal Monitor – The device used when exiting some RCAs and the site is the Gamma Sensitive Monitor (GSM), e.g., a PM–7 Portal Monitor. Its primary purpose is to detect radioactive materials on personnel and material. The Portal Monitors are located at the NAP and SAP security exit points and Unit 1 RCAs. To use the Portal Monitor, wait approximately three feet behind the portal until anyone in front of you steps out of the monitor. When it is your turn and the green light is lit, step into portal archway and pause while the light changes to yellow. When the yellow light turns off, exit monitor. If the Portal Monitor alarms, step back, wait for the machine to reset or press the reset button, and try again. If you alarm it a second time, contact HP. If you are carrying material out of the Protected Area that can not be easily passed through the Portal Monitor, contact HP for further guidance. If you have a current medical exemption and have alarmed the portal monitor, you may exit protected area. For assistance, call HP at one of the following numbers:

- At NAP, call Unit 3 HP x5355
- At SAP, call Unit 2 HP x4355

Whole Body Counter (WBC) – These devices are used to detect the presence of radionuclides inside the body which can result in internal dose. A passive monitoring WBC is done when hiring in, terminating, or leaving the station to visit another licensee. An analytical WBC is conducted whenever internal contamination is suspected, and at the direction of Health Physics for confirmatory monitoring. Health Physics personnel operate these instruments and will instruct you in their use.

Emergency Response – Special consideration is required for emergency response workers (e.g., security, medical, fire) responding to an actual event, when rapid response is essential to ensure control of the situation is obtained expeditiously.

- Responding individuals are not required to perform a whole body frisk when exiting the RCA, while directly involved in the task. As soon as practical, all individuals who exited the RCA without performing a whole body frisk during the event should perform a whole body frisk at the nearest PCM station.

- During training exercises, every effort needs to be made to make each exercise as realistic as possible. To do this, the individuals may need to enter and exit the RCA and they will not be required to perform a whole body frisk when they exit. To prevent loss of control of radioactive material the following precautions will be implemented:

  - The exercise will be preplanned and the areas viewed and approved by Health Physics Supervision.

  - All personnel that enter the RCA during the exercise will perform a whole body frisk at the nearest PCM station as soon after completion of the exercise as practical.

  - When emergency response personnel are responding to alarms, they will perform whole body frisks when they exit the RCA in the same manner as all other station personnel, unless responding to a subsequent alarm outside the RCA.

1.12 Radiation Work Permit (RWP)

An RWP is required for entry into RCAs, with very few exceptions. The RWP has three major functions:

- Authorizes entry into, and activities within, RCAs.

- Details the radiological requirements necessary for the work being performed including dosimetry, protective clothing, and precautions.

- Provides information concerning the radiological conditions in the work area.

A Radiation Worker RWP Data Card, which is a job aid for the worker, is completed by the Radiation Worker before entry into the RCA. It summarizes the key points of the RWP and includes good radiation practices on the back. There are three types of color coded cards:

- Green for RCA and Radiation Area entries
- Yellow for High Radiation Area entries
- Red for Locked High Radiation Area entries

There are two types of RWPs, general and specific. A general RWP, also called a blanket or routine, may be issued for control of routine or repetitive work under stable or predictable radiological conditions. Specific RWPs are used for work that requires more stringent controls or involvement. If you are responsible for requesting an RWP, provide the following information to HP as accurately as possible.

- work location and the job description.
- estimated number of man−hours to complete the job.
- contact phone number.
- any specialized equipment or tools needed.
- support needed, e.g., scaffolding, breathing air, firewatch, operations.

An RWP consists of a cover sheet and job step sheets.

- *Cover sheet:* The cover sheet describes the job or jobs to be performed on the RWP in general terms.
- *Job Step sheets:* The Job Step sheets, also known as "tasks," specify exactly which type(s) of dosimetry, pieces of protective clothing are required, SRD set points, and any special instructions for each individual task or area.

RWP Compliance – Compliance with all RWP requirements is expected. Failure to comply may result in disciplinary action. Regulatory actions, including fines to the individual and Millstone Power Station, may also result.

The RWP is your permission to work in an RCA. Perform only the work that is specified on the RWP and only in specified areas. Read your RWP prior to each entry so that you are always aware of any changes that may have been made to the RWP requirements.

Protective Requirements – Protective requirements are based on observed or expected radiological conditions. Performing activities that are not specified in the job descriptions, such as moving components, opening contaminated systems, or removing shielding, will change radiological conditions. If you believe, or discover, that radiological conditions are different than expected, or if the conditions change unexpectedly, inform others in the area, exit the area, and contact HP.

The RWP provides information on radiological protection. Review the RWP and note the requirements such as the following:

- Job scope and allowable work activities
- Protective clothing requirements
- Dosimetry requirements
- Restricted activities or areas
- Hold points and stay times
- Radiological conditions in area
- Frequency of reading dosimeter
- ALARA instructions
- Electronic dosimeter setpoints
- Respiratory protection
- Ventilation requirements
- Level of HP coverage

Signing In On An RWP – All workers entering the RCA are required to sign in on the appropriate RWP. By signing in, you are stating that you have read and understand your RWP, will comply with the requirements and are cognizant of the radiological conditions of your work area. The sign in process is done electronically with an electronic dosimeter.

When using electronic dosimetry, workers sign in and out of the RWP by typing information on a computer keyboard or by scanning a bar code. To sign on to an RWP, follow the screen prompts. There will be a screen prompt for "Have you read and understand your RWP/Task?" Selecting "Yes" means you have read you RWP and will comply with your RWP. If you are signing on a HRA or LHRA RWP Task, you will also be prompted to answer whether or not you understand the requirements for the HRA/LHRA entry.

Ensure that the information on the reader display is correct, then remove your SRD after the "Entry Granted" message. Ensure the SRD beeps; this ensures the alarm function works.

You are now signed in on the RWP and the SRD is turned on.

Signing Out On An RWP – Signing out ensures that exposure received by the worker is recorded. Please note that you should not attempt to sign out with an actively alarming dosimeter, or one that you think is not functioning correctly; exit the area, and contact HP prior to logging out. To sign off an RWP (RCA exit), insert the dosimeter into the reader. Ensure that the information on the reader display is correct. If the information on the reader display is not correct, contact HP. Remove your SRD after the "Exit Granted" message. If the SRD display does not become blank, contact HP.

You are signed out. Signing out automatically updates exposure information and turns off the SRD.

1.13 **Survey Maps**

Survey maps are diagrams of an area or an item which indicate radiation and contamination levels as measured by HP. Review the survey map prior to entering the area in which you will be working. Survey maps can be found at the HP Control Points or outside of HP Offices. If you are not sure the survey information is current, or you need more survey information, ask an HP.

Numbers on the survey map are radiation dose rates: there is no emphasis on the numbers.

*Asterisked numbers on the survey map are contact radiation dose rates.

○ Circled numbers on the survey map are smear locations. Check in the "Smear Results" table on the survey map for contamination levels.

1.14 Radiological Area Postings and Entry Requirements

Radiological postings are required by 10CFR20. Radiological postings are placed at the entrance to an area to inform workers of the conditions present. Usually the postings are yellow and magenta. You are required to comply with all postings. With the exception of entrance barriers designed for personnel access, only HP personnel are allowed to move postings or stanchions. When entering or leaving a posted area, ensure barriers are returned to the correct position. Unauthorized relocation or defacing of radiological postings and boundaries may result in regulatory action including fines and disciplinary action to the individual.

A **Restricted Area** is an area where access is limited for the purpose of protecting individuals from exposure to radiation and radioactive material.

A **Radiological Control Area (RCA)** is an area where personnel may be exposed to radiation or radioactive material. Eating, drinking, smoking and chewing are not allowed inside the RCA. The following conditions are required for all entries to the RCA.

- With the exception of RCA visitors who only wear SRDs, DLRs and SRDs must be worn by all personnel entering an RCA.
- Workers must be signed in on an RWP (with few exceptions) and must follow instructions as specified on the RWP or by HP.
- Be aware of the radiological conditions in the area prior to entry.
- Workers exiting RCAs must perform a whole body frisk.

Table 1. – Definitions and Entry Requirements for Areas Within the RCA							
	Definition	SRD and DLR	Dose Rate Meter	Continuous Coverage	Pre–job briefing	PCs	Other requirements
Rad Area	> 5 mrem/hr	✓					
HRA	> 100 mrem/hr	✓[1]	✓[1]	✓[1]	✓		
LHRA	≥ 1000 mrem/hr	✓[1]	✓[1]	✓[1]	✓		Sign on LHRA RWP Job Task. Tech Specs require entrances to LHRA remain locked or continuously guarded.
HRA where no enclosure exists for the purpose of locking	≥ 1000 mrem/hr	✓[1]	✓[1]	✓[1]	✓		Sign on LHRA RWP Job Task. Tech Specs require the area to be continuously guarded or barricaded, conspicuously posted and a flashing light activated.
VHRA	≥ 500,000 mrad/hr	✓[1]	✓[1]	✓	✓		Sign on Special RWP. A written procedure & a key for the unique lock.
Hot Spot	≥ 100 mrem/hr & 5X general area dose rate	✓					
Contaminated Area	≥ 1000 dpm/100cm^2	✓				✓	
Hot Particle Area		✓				✓	
Airborne Activity Area	30% of DAC sustained or 1 DAC	✓					

[1] – Have one or more of the following:

- Dose rate meter
- Alarming or Telemetry Electronic Dosimetry and knowledge of area dose rates
- Continuous HP Coverage

Other Radiation Protection Signs – The HP Department at times uses other signs to assist workers in RCAs. These other signs may assist a worker to comply with procedures, provide information, or help to keep exposure ALARA.

- Compliance signs remind workers of important rules which must be followed. One example of a compliance sign reminds workers that a Locked High Radiation Area door must be locked.
- Information signs help workers complete tasks properly. Examples of information signs include the signs posted at Step Off Pads instructing workers how to remove PCs and signs at friskers reminding the worker of the proper method of frisking.
- ALARA signs inform the worker of general area dose rates that are higher or lower than the rest of the area. A worker can use these signs to find the best places to stand.

1.15 Work Conditions

Changing Conditions – In some areas of the plant, radiological conditions can change quickly. This is expected near the reactors, but it also happens in auxiliary buildings, near piping penetrations, and in pipe trenches during power level changes. The operation of components may also change dose rates. Any component that moves water may move radioactive material. Changes in dose rates can be expected near pipes, tanks or vessels which carry or receive radioactive material. Work activities can also cause changes in radiological conditions. Opening a component could cause dose rates to increase as shielding is removed, or could cause contamination to leak out of the system.

If you discover that radiological conditions in your work area are different than expected, or if the conditions change unexpectedly, inform others in the area, place your equipment in a safe condition, exit the area, and contact HP.

Radiography – Radiography presents a unique situation. Radiography is a process which uses radiation to check the condition of structures and components, much as a doctor uses x–rays to check the condition of a patient. When radiography is being conducted, the area will be posted. Unless specifically authorized to enter radiography areas, do not enter, even if your RWP permits entry into Radiation and High Radiation areas.

1.16 Radiological Alarms

Radiological alarms are used to inform workers of changing conditions. If a radiological alarm sounds in the area in which you are working:

- Put your work in a safe condition.
- Warn others to ensure they are aware of the alarm.
- Exit the area using the normal undressing process if dressed in PCs.
- Once outside, secure access to the area (warn anyone trying to enter)
- Call the Control Room and HP.
- Check your electronic dosimeter.

Radiological alarms include:

- Area Radiation Monitor (ARM) – ARMs warn workers that dose rates are increasing. Generally, ARMs have electronic horn or buzzer type alarms along with flashing lights.

- Continuous Air Monitor (CAM) – CAMs alert workers of increasing airborne contamination levels. CAMs tend to have bell type alarms along with flashing lights. Radiological alarms can be an indication of a serious problem. Ignoring radiological alarms can result in increased radiation exposure, or even an overexposure. Do not disregard or disable radiological alarms! CAMs and ARMs alert workers to changes in local conditions.

Site Evacuation Alarms – Site Evacuation Alarms alert workers to more widespread emergencies. Instruction on where to go during a station evacuation is provided in Plant Access Training. If you are dressed in protective clothing when an actual evacuation occurs, remove your outer shoe covers and outer gloves at the step off pad, and proceed to your assembly area.

1.17 Spill and Leaks

A spill is the release of contamination in an uncontrolled manner. A spill can be liquid or dry, for example water from a leaking valve, drip bag, or dirt, dust, or waste material from a bag containing radioactive material. Always call the unit Control Room and Health Physics in the event of any spill. Do *not* operate valves or plant equipment to stop a spill unless specifically authorized to do so.

If you encounter a spill of potentially radioactive material, think of the word **SWIM**;

- ***S**top* your work.

- ***W**arn* others, call the control room and HP.

- ***I**solate,* – Prevent others from entering area.

- ***M**inimize* your exposure

Minimizing the amount of area contaminated by a spill will make clean up easier, reduce the need for personnel to enter the area, and reduce the amount of radwaste generated.

1.18 Radioactive Waste

Radioactive Waste is radioactive material in liquid, gaseous, or solid form that requires processing and disposal. Ways to minimize radwaste are as follows:

- Reuse items whenever possible.
- Take only the materials needed for the job into the RCA.
- Use RCA tools from the RCA Tool Crib.
- Do not take packaging materials into the RCA.
- Use bags with "Save" tags to remove tools and equipment from contaminated areas.
- Do not use yellow bags to wrap clean items.
- Do not dump oils, solvents or any chemicals down floor drains. They destroy the filters and resins.
- Notify the Control Room if you notice excessive leakage from any system.
- When decontaminating, use only the minimum material required to clean the area or item.
- Use Radwaste receptacles properly. These receptacles are for dry, radioactive waste only. Do not throw away respirators, protective clothing, tools, or equipment. Small pieces of non–compactible waste may be thrown into Radwaste receptacles, otherwise, compactible and non–compactible items are treated separately.
- Contact Radioactive Material Control to pick up and disposition large non–compactible items, e.g. metal, wood, etc.

NOTE

Wet or liquid waste must be separated from dry waste. Do not place these items in dry waste receptacles. Radioactive Material Control or HP can provide appropriate plastic bags for wet materials.

Mixed Waste is a combination of hazardous waste and radioactive waste. Examples of hazardous waste include: solvents, degreasers, paints and paint related products, lead, chromium, sealant, and spent hydrazine. Typical mixed waste processing fees start around $10,000 per 55 gallons. Some ways to minimize mixed waste are:

- Use hazardous materials in the RCA only when absolutely necessary. Work with Station Chemistry and Radioactive Material Control personnel to find acceptable substitutes that will perform the intended function without the hazard.
- If you must bring hazardous material into the RCA, bring only the amount necessary to do the job.
- If you must use hazardous material in a contaminated area, try not to contaminate the hazardous material. Follow the controls specified in the work control or chemical control procedures to prevent or control mixed waste.
- Anytime you mix hazardous waste with non−hazardous waste, you make the whole amount hazardous waste. Never mix waste types, or mix hazardous with non−hazardous waste.
- If you do generate a mixed waste, do not put it in with normal radioactive waste. Keep it segregated from other wastes and contact the Radioactive Material Control Department for further direction.
- DO NOT pour chemical products down floor drains.

If you have any questions or suggestions concerning radwaste, contact the Radioactive Material Control Department or the Unit HP Department.

1.19 Construction Activities Outside RCAs Within the Protected Areas

Construction activities outside of RCAs within the Protected Area have the potential to disturb very low levels of legacy licensed radioactive material. Activities include renovation, repair, excavating, digging, or cutting of material or soil. Notify Health Physics department prior to performing any of these activities.

2. REFERENCES

2.1 ANI Radiation Protection Criteria, “Radiation Work Permits” 8.9

2.2 ANI/MAELU “Engineering Inspection Criteria for Nuclear Liability Insurance.” Section 8.4 Rev. 4, Radiation Protection External Dosimetry.

2.3 ANI/MAELU Nuclear Insurance Inspection Report, October 28, 1994

2.4 CY–AA–CTL–510, “Chemical Control”

2.5 Efficiency Bulletin: 16–26c, “Implement Common NANTeL Radiation Worker Training,” Sept. 30, 2016

2.6 INPO 05–008, “Guidelines for Radiological Protection at Nuclear Power Stations”

2.7 MP–HPO–94105, “Expectations Concerning Use of Electronic Dosimeters and Electronic Access Control (Fastrak)” Chris Wend, dated January 13, 1994

2.8 MP–HP–95093, “TLD Storage Proposals,” Ken Hajnal to J. E. Laine, dated March 3, 1995

2.9 MP–HP–98106, “Technical Basis for Enhancements to Procedure 2.4.2 (Rev.5),” G. Pillsbury to H. Siegrist, dated June 24, 1998

2.10 NRC Letter A09440, “MNPS, Units Nos. 1, 2, and 3. Reply to NOV and Notice of Deviation Inspection Report Nos. 50–423/91–01,” dated April 19, 1991. This was formerly tracked as RCR–18384.

2.11 USNRC, Docket Nos. 50–245/50–423/B15223, “Millstone Nuclear Power Station, Unit Nos. 1, and 3: Pilot Program Summary Report – NEI Guidelines for Managing NRC Commitments,” dated Nov. 13, 1995. This was formerly tracked as RCR–13976.

2.12 NU Letter A01496, “Reference: Nuclear Regulatory Commission Immediate Action Letter No. 81–02,” dated March 19, 1981. This was formerly tracked as RCR–15901.

2.13 NU Letter B13345, “MNPS, Unit No. 3 Systematic Assessment of Licensee Performance (SALP),” dated September 14, 1989. This was formerly tracked as RCR–26067.

2.14 NU B15223 Letter, "Millstone Nuclear Power Station, Unit Nos. 1 and 3, Pilot Program Summary Report, NEI Guideline for Managing NRC Commitments," dated November 11, 1995

2.15 "MP2 & MP3 Commitment Reduction Plan" dated December 29, 2000

2.16 Outage Focus, October 28, 2003

2.17 RB−94−474, "Formulation of the Northeast Utilities Position Paper Concerning the Monitoring of Beta Radiation at the Nuclear Sites," November 10, 1994 From T.E. Quattrochi

2.18 RP−AA−106, "Radiological Work Control Program"

2.19 RP−AA−203, "Radiological Labeling and Marking"

2.20 RP−AA−225 (Att) "Material Release Sample Plan"

2.21 RP−AA−243, "Portable HEPA Ventilation Units"

2.22 RPM 2.4.3, "Performance Challenge of Portable HEPA Filtered Ventilation and Vacuum Units"

2.23 PIR 1−94−312, "Spill of Radioactive Liquid Outside of RCA Fence," prepared by J. W. Doroski, dated October 24, 1994.

2.24 MP−HPO−99196, "Closure of AR 98021117−04," from A. S. Klotz to R. J. Decensi , dated October 7, 1999.

2.25 e−mail, "Re: PADS Procedure" from Robert Kelm (RobertKelm@aol.com) to Ira L. Haas (ira_l_haas@dom.com dated 03/10/05, allows the release of the Form 4 equivalent to the individual.

2.26 SOER 2001−04, April 2003 − Perry Unit 1 (BWR − USA)

3. COMMITMENTS

3.1 None

4. SUMMARY OF CHANGES

4.1 Regulatory Commitments with a status of Closed were moved from the Commitment Section to the Reference Section. The closing of these commitments were documented in NU B15223 Letter, "Millstone Nuclear Power Station, Unit Nos. 1 and 3, Pilot Program Summary Report, NEI Guideline for Managing NRC Commitments," dated November 11, 1995 and "MP2 & MP3 Commitment Reduction Plan" dated December 29, 2000.

4.2 Changed as required by Efficiency Bulletin: 16–26c, "Implement Common NANTeL Radiation Worker Training," Sept. 30, 2016.

- SAM (Small Articles Monitor) to TEM (Tools and Equipment Monitor)
- TLD (Thermoluminescent Dosimeter) to DLR (Dosimeter of Legal Record)
- ED (Electronic Dosimeter) and PIC (Pocket Ion Chamber) to SRD (Self Reading Dosimeter)

4.3 Deleted a phrase in Section 1.3, first bullet that allowed HP to authorize a boundary to moved by a radworker, consistent with RP–AA–202, "Radiological Posting."

4.4 Section 1.6 was revised for the following:

- Updated the definition of Stay Time to include Locked High Radiation Area and Very High Radiation Area.
- Added a definition for System Radiation worker under Radiation Exposure Limits. Updated the rest of the table to meet changes in RP–AA–105.

4.5 Section 1.8 was revised for the following:

- DLR Issue and Return was revised to add the reason for notifying Dosimetry prior to visiting another nuclear facility.
- Electronic Dosimeter (ED) was revised to change Access Control Workstation (ACW) to Windows Access Control System (WACS).

4.6 Section 1.9 was revised for the following:

- Deleted part of the 7th paragraph under Work Practices regarding tool boxes being controlled with red or green tag devices. This is no longer HP policy.
- Deleted paragraph on separating trash by “Green is Clean.” this no longer part of the HP Program.
- Section for Vacuum Cleaners And Ventilation Units In the RCA was updated to the correct labels according to RPM 2.4.3, “Performance Challenge of Portable HEPA Filtered Ventilation and Vacuum Units,” and RP−AA−243, “Portable HEPA Ventilation Units.”
- Personnel Exiting A Contaminated Area was changed to remove the color of the Step off pad and to add that it is a sticky step−off pad.
- Tools and Equipment Monitor (TEM) was rewritten to ensure those who have been in a Contaminated Area have their items monitored in the SAM by HP.
- 12 inches was changed to 30 cm.

4.7 Section 1.11 was revised for the following:

- Added the Sirius−5AB to the Personnel Monitoring Section for monitoring hands and feet. This is corrective action for INDEX assignment RPM 5.2.2.08.27.2014.10.02.45.
- RCA boundary tape at the RCA exits has been deleted.
- Manually frisking rates were revised from one to two seconds consistent with RP−AA−225. The prompt to check that frisker is turned on and the battery is satisfactory were added.
- A new Section Emergency Response was added. This material was originally found in RPM 1.1.2, “Radiation Protection Program and ALARA Program,” which was superseded by RP−AA−101 through RP−AA−112.

4.8 Section 1.12 was revised for the following:

- Added the three new color coded Radiation Worker RWP Data Cards.
- Added SRD set points to bullet on Job Step Sheets.
- Added a statement to ensure the SRD beeps to verify the alarm function works when signing in on an RWP.

4.9 Updated acronyms and procedure titles.

Attachment 1
Definintions

(Sheet 1 of 1)

PCM (Personnel Contamination Monitor) – A whole body contamination monitor, e.g. Eberline PCM–1, Eberline PM–7, Canberra Argos

HRA – High Radiation Area

LHRA – Locked High Radiation Area

VHRA – Very High Radiation Area

Attachment 2
Example Label for Isotopic Analysis
(Sheet 1 of 1)

A

Date/Time:
Contact/Ext:
Description:
MSDS#:
ID No. 0000001

Tear along perforation and attach to sample

Tear along perforation and attach to item

Date/Time:
Contact/Ext:
Description:
MSDS#:
ID No. 0000001

PROTECTIVE SEAL

DO NOT TAMPER WITH THIS LABEL.
DO NOT ADD ANY MATERIAL TO THIS CONTAINER.

THIS MATERIAL HAS BEEN SAMPLED AND A RADIOLOGICAL EVALUATION IS BEING PERFORMED TO RELEASE THIS MATERIAL. DAMAGING THIS LABEL WILL NECESSITATE RE-SAMPLING, RE-LABELING, AND RE-ANALYZING THE CONTENTS OF THIS CONTAINER.

PROTECTIVE SEAL

Sample Container

Original Container

B

PROTECTIVE SEAL

DO NOT TAMPER WITH THIS LABEL.
DO NOT ADD ANY MATERIAL TO THIS CONTAINER.

THIS MATERIAL HAS BEEN SAMPLED AND A RADIOLOGICAL EVALUATION IS BEING PERFORMED TO RELEASE THIS MATERIAL. DAMAGING THIS LABEL WILL NECESSITATE RE-SAMPLING, RE-LABELING, AND RE-ANALYZING THE CONTENTS OF THIS CONTAINER.

PROTECTIVE SEAL

Original Container

Seal A is used for all samples. The smaller portion is placed on the sample container and the larger portion is placed on the original sample container. Seal B is used if the original container is large or there are additional sample openings.

Attachment 3
Release Of Liquids or Granular Solids From RCAs

(Sheet 1 of 4)

With the exception of personal items, all material exiting the RCA is monitored or surveyed by Health Physics. Control of radioactively contaminated items is maintained at the RCA boundary.

Safety Data Sheets provide the user or handler of materials with the chemical properties and the safe use of that material. Ensure all liquids and materials sampled are correctly labeled with the SDS number and in the correct container.

Attachment 2, "Example Label for Isotopic Analysis," is an example of a serialized label to be used with liquid and solid volumetric samples.

NOTE

1. RP−AA−203, "Radiological Labeling and Marking," instructs the HP on the limits and conditions of labeling and controlling radioactive material. Always contact Health Physics prior to moving radioactive material.
2. Radioactive material must never be left unattended outside of the RCA.
3. Any item(s) unable to be released, must be controlled or stored within an RCA.

1. To release liquids and granular solids, CONSULT with Health Physics to determine release method and required sample needed.

2. ENSURE identity of sample and hazardous properties are known.

HP or Chemistry

2.1 IF sample is a chemical consumable product, Refer To CY−AA−CTL−510, "Chemical Control," and ENSURE permits and chemical controls for sample are completed.

2.1.1 OBTAIN an appropriate sample container and serialized label.

2.1.2 COLLECT sample(s) in accordance with the RP−AA−225 (Att) "Material Release Sample Plan" documentation.

2.1.3 FILL sample container to within 1/2 inch of top of container.

2.2 Using serialized label, LABEL original material and sample container as follows:

2.2.1 On both sections of label, PRINT the following information:

- Date and time
- Responsible individual's name and phone extension
- Chemical description of sample
- SDS number

2.2.2 IF sample constitutes entire volume, PLACE small label on sample and DISCARD protective seal.

2.2.3 IF sample does *not* constitute entire volume, PERFORM the following:

a. PLACE small label on sample container.

NOTE

For large containers, use two seals across from each other to make it easier to identify that the container has been sampled regardless of which side of the container is turned. In some cases, the original sample is not found in a container but is found in piles or open excavations. Alternate controls and labels may be used to control the area. For example, the area may be posted or roped off with part of the silver label affixed to the posting.

b. To establish chain of custody and to prevent addition of material following sampling, PLACE protective seal on original container over opening or over cover.

c. IF necessary, PLACE additional protective seals, without serial numbers, over other potential openings or lid.

2.3 IF original container must be opened and protective seal broken, ENSURE Health Physics is present.

2.4 TAKE sample container to RCA exit point for exterior surface survey by Health Physics.

NOTE

RP−AA−203, "Radiological Labeling and Marking," instructs the HP on the limits and conditions of labeling and controlling radioactive material. Always contact Health Physics prior to moving radioactive material.

2.5 IF original containers can *not* be stored in the RCA, CONTACT Health Physics

2.6 MAINTAIN custody of sample and TRANSFER directly to designated count room.

Worker

3. IF Health Physics determines sample is non−radioactive, PERFORM the following:

3.1 TAKE original material container to RCA exit point for external surface survey.

3.2 REQUEST sample and OBTAIN copy of sample analysis results.

3.3 IF requested, PROVIDE copy of sample analysis results to Health Physics at RCA exit.

3.4 ENSURE any radioactive labels have been removed or defaced.

3.5 IF necessary, NOTIFY Chemistry and Radioactive Material Control for disposition of material.

4. IF Health Physics determines sample is radioactive, PERFORM the following:

4.1 CONSULT Radioactive Material Control for guidance in disposing of material and sample.

4.2 ENSURE that a copy RP−AA−225 (Att) "Material Release Sample Plan" and the attached sample analysis results remains with container.

4.3 TAKE original container to RCA exit point for external surface contamination survey.

4.4 IF requested, PROVIDE copy of sample analysis results to Health Physics at RCA exit.

4.5 ENSURE sample is transported with original container, if applicable.

NOTE

RP−AA−203, "Radiological Labeling and Marking," instructs the HP on the limits and conditions of labeling and controlling radioactive material. Always contact Health Physics prior to moving radioactive material.

4.6 ENSURE copy of sample analysis results remains with container.

Attachment 4
Release of Material from Warehouses

NOTE

1. Material records, such as purchase orders, shipping papers, and computer records, may indicate if material is radioactive.
2. Evaluation of material can include, but is not limited to, determination of survey, shipment, or license requirements.

1. IF warehouse material records indicate radioactive material OR material is labeled "Radioactive Material," NOTIFY Health Physics for evaluation of material.

2. IF material or tools to be shipped or taken offsite meet any of the following conditions, NOTIFY Health Physics for evaluation:

   - Material or tools have been used at some time in the RCA.
   - Material or tools were used outside Protected Area in an area posted as RCA.
   - Usage history of materials or tools is unknown

MILLSTONE UNIT 2 EMERGENCY ACTION LEVELS

11/17/16
APPROVAL DATE

11/18/16
EFFECTIVE DATE

GENERAL EMERGENCY ALPHA | GENERAL EMERGENCY BRAVO | SITE AREA EMERGENCY CHARLIE-TWO | ALERT CHARLIE-ONE | UNUSUAL EVENT DELTA-TWO | UNUSUAL EVENT DELTA-ONE

BARRIER FAILURE

BG1 ALL THREE BARRIERS — Mode 1, 2, 3, 4

See Barrier Failure Reference Table

BS1 ANY TWO BARRIERS — Mode 1, 2, 3, 4

See Barrier Failure Reference Table

BA1 FUEL CLAD OR RCS BARRIER — Mode 1, 2, 3, 4

See Barrier Failure Reference Table

BA2 STEAM LINE BREAK — Mode 1, 2, 3, 4

Unisolable Steam Line Break Outside CTMT

BU1 CTMT BARRIER — Mode 1, 2, 3, 4

See Barrier Failure Reference Table

BU2 RCS LEAKAGE — Mode 1, 2, 3, 4

1. Pressure Boundary Leakage > 10 GPM
2. Unidentified Leakage > 10 GPM
3. Identified Leakage > 25 GPM
4. Primary to Secondary Leakage >25 GPM

BU3 FUEL CLAD DEGRADATION — Mode ALL

1. RCS Activity > 60 µCi/gm I-131 DEQ
2. Dose Rate at One Foot from Unpressurized RCS Sample ≥ 2 mR/hr/ml

NOTE: When two or more EALs apply, always choose the EAL of the highest incident classification; also always read from top to bottom in each category.

LOSS OF POWER

PG1 STATION BLACKOUT — Mode 1, 2, 3, 4

Loss of Voltage on Buses 24C AND 24D AND ANY of the Following:

- **Restoration of Power to AT LEAST One Vital Bus is NOT Likely Within Four Hours**
- **Core Exit Thermocouple Readings Indicate Superheat**
- **Inadequate SG Heat Removal Capability as Indicated by SG Water Level ≤ 10% in BOTH SGs AND Inadequate Terry Turbine Feedwater Flow**

PS1 STATION BLACKOUT — Mode 1, 2, 3, 4

Loss of Voltage on Buses 24C AND 24D > 15 Minutes

PS2 LOSS OF DC — Mode 1, 2, 3, 4

Loss of Voltage on DC Buses 201A AND 201B > 15 Minutes

PA1 STATION BLACKOUT — Mode 5, 6, 0

Loss of Voltage on Buses 24C AND 24D > 15 Minutes

PA2 SINGLE AC POWER SOURCE — Mode 1, 2, 3, 4

Only One AC Power Source Available to Supply Buses 24C AND/OR 24D > 15 Minutes Such That Loss of That Power Source Would Result in a Station Blackout (Unit 3 Buses 34A/B CANNOT be Credited unless already aligned to Unit 2 Bus 24C or 24D)

PU1 LOSS OF OFFSITE POWER — Mode ALL

Loss of all **OFFSITE** power to buses 24C AND 24D for > 15 Minutes.

PU2 LOSS OF DC — Mode 5, 6

Loss of Voltage on DC Buses 201A AND 201B > 15 Minutes

EQUIPMENT FAILURE

EG1 ATWS/INADEQUATE COOLING — Mode 1

Functional Recovery of Reactivity Control Ineffective AND EITHER of the Following:

- **RCS Heat Removal by Steam Generator Heat Removal SFSC Criteria Can NOT Be Satisfied**
- **Core Exit TC Temperature Readings > 800°F**

ES1 ATWS — Mode 1

Manual Reactor Trip Attempted At Panel C04 AND Reactor Is NOT Shutdown

ES2 INABILITY TO MAINTAIN HOT S/D — Mode 1, 2, 3, 4

1. No RCS Heat Removal Via Steam Generators AND Once Through Cooling NOT Effective AND Shutdown Cooling is NOT In Service
2. RCS Boration Capability Unable to Eliminate Inadvertent Criticality

ES3 IN-VESSEL FUEL UNCOVERY — Mode 5, 6

Shutdown Cooling Has Been Lost AND ANY of the Following Conditions Exist:

- Alternate Methods for Restoring RCS Inventory are NOT Effective
- RVLMS Reading = 0% with OPERABLE #8 string (NA if no OPERABLE #8 string)
- Core Exit TC Temperature Readings Indicate Superheat

ES4 LOSS OF ANNUNCIATORS/TRANSIENT — Mode 1, 2, 3, 4

Loss of Most (75%) MCB Annunciators AND BOTH of the Following

- Significant Transient in Progress
- Loss of SPDS AND ICC Instrumentation

EA1 AUTOMATIC RX TRIP FAILURE — Mode 1, 2

Failure of Automatic Reactor Trip AND Manual Trip Was Successful

EA2 INABILITY TO MAINTAIN COLD S/D — Mode 5, 6

1. Uncontrolled RCS Temperature Increase > 10°F That Results in RCS Temperature > 200°F
2. Inadvertent Criticality

EA3 LOSS OF ANNUNCIATORS/TRANSIENT — Mode 1, 2, 3, 4

Loss of Most (75%) MCB Annunciators > 15 Minutes AND EITHER of the Following:

- Significant Transient in Progress
- Loss of SPDS AND ICC Instrumentation

EU1 LOSS OF COLD S/D FUNCTION — Mode 5, 6

1. Loss of Shutdown Cooling > 15 Minutes AND Refuel Pool Water Level < 35 Ft., 6 In.
2. Uncontrolled RCS Temperature Increase > 10°F
3. RCS Boron Concentration < Minimum Required

EU2 REFUEL/SPENT FUEL POOL LEVEL — Mode 6, 0

1. Uncontrolled Spent Fuel Pool Water Level Decrease Causing Loss of Cooling Suction Flow
2. Uncontrolled Refuel Pool Water Level Decrease Requiring Containment Evacuation AND All Spent Fuel Assemblies in Safe Storage Locations

EU3 LOSS OF ANNUNCIATORS — Mode 1, 2, 3, 4

Loss of Most (75%) MCB Annunciators > 15 Minutes AND SPDS OR ICC Instrumentation Available

EU4 LOSS OF COMMUNICATIONS — Mode ALL

1. Loss of ALL Onsite Electronic Communications Methods
2. Loss of ALL Electronic Communications Methods With Government Agencies

EU5 SHUTDOWN LCO EXCEEDED — Mode 1, 2, 3, 4

Unit NOT Brought To Required Mode Within Applicable LCO Action Statement Time Limits

OFFSITE RELEASES

OG1 OFFSITE DOSE — Mode ALL

1. **MP2 Kaman Vent Monitor (RM-8168) Reading ≥ 2 µCi/cc for > 15 Minutes**
2. **MP2 WRGM Site Stack Effluent Activity (RM-8169) Reading ≥ 30 µCi/cc for > 15 Minutes**
3. **MSL Monitor (RM-4299/A/B/C) Reading ≥ 2 R/hr for > 15 Minutes**
4. **Measured Plume Dose Rate OnSite ≥ 1,000 mR/hr for > 15 Minutes**
5. **Rad Assessment Determines Integrated Dose Offsite ≥ 1 Rem TEDE OR ≥ 5 Rem CDE Thyroid**

OS1 OFFSITE DOSE — Mode ALL

1. MP2 Kaman Vent Monitor (RM-8168) Reading ≥ 0.2 µCi/cc for > 15 Minutes
2. MP2 WRGM Site Stack Effluent Activity (RM-8169) Reading ≥ 10 µCi/cc for > 15 Minutes
3. MSL Monitor (RM-4299A/B/C) Reading ≥ 0.3 R/hr for > 15 Minutes
4. Measured Plume Dose Rate Onsite ≥ 50 mR/hr for > 15 Minutes
5. Rad Assessment Determines Integrated Dose Offsite ≥ 0.05 Rem TEDE OR ≥ 0.25 Rem CDE Thyroid

OA1 OFFSITE DOSE — Mode ALL

1. MP2 Kaman Vent Monitor (RM-8168) Reading ≥ 0.02 µCi/cc for > 15 Minutes
2. MP2 WRGM Site Stack Effluent Activity (RM-8169) Reading ≥ 1 µCi/cc for > 15 Minutes
3. MSL Monitor (RM-4299A/B/C) Reading ≥ 0.03 R/hr for > 15 Minutes
4. Measured Plume Dose Rate Onsite ≥ 5 mR/hr for > 15 Minutes
5. Rad Assessment Determines Integrated Dose Offsite ≥ 0.005 Rem TEDE OR ≥ 0.025 Rem CDE Thyroid

OU1 UNPLANNED RELEASE — Mode ALL

Effluent Monitors in Alarm OR Unplanned, Unmonitored or Uncontrolled Offsite Release AND DELTA-TWO Posture Code Limits as Determined from EPI-FAP06, "Classification and PARs," Exceeded.

Note: Effluent Monitors Indicate Release Above Alarm Setpoint Continuing > 60 minutes and Reportability Evaluations NOT Complete

CLASSIFICATION

GENERAL EMERGENCY

ALPHA

OR

BRAVO

Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or security events that result in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

SITE AREA EMERGENCY

CHARLIE-TWO

Events are in process or have occurred which involve an actual or likely major failure of plant functions needed for protection of the public or security events that result in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) prevents effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exeed EPA Protective Action Guideline exposure levels beyond the site boundary.

ALERT

CHARLIE-ONE

Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of intentional malicious dedicated efforts of a hostile act. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

UNUSUAL EVENT

DELTA-TWO

OR

DELTA-ONE

Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

2
Millstone

MILLSTONE UNIT 2 EMERGENCY ACTION LEVELS

GENERAL EMERGENCY ALPHA | GENERAL EMERGENCY BRAVO | SITE AREA EMERGENCY CHARLIE-TWO | ALERT CHARLIE-ONE | UNUSUAL EVENT DELTA-TWO | UNUSUAL EVENT DELTA-ONE

IN–PLANT RADIATION

RG1 — MAJOR FUEL DAMAGE — Mode ALL

1. **RM-8240/8241 Reading > 1,200 R/hr**
2. **At Least 20% Fuel Clad Damage As Determined By Core Damage Estimate**
3. **Spent Fuel is Exposed from Water Loss from Open Vessel, Cavity, Or SF Pool AND BOTH of the Following:**
   - **Spent Fuel Has Decayed < 30 Days**
   - **CTMT Integrity is NOT Established OR Exposed Spent Fuel is Outside CTMT**

RS1 — SPENT FUEL DAMAGE — Mode ALL

Spent Fuel is Exposed from Open Vessel or Cavity AND BOTH of the Following:

- Spent Fuel Has Decayed < 30 Days
- CTMT Integrity Established

RA1 — SPENT FUEL ASSEMBLY DAMAGE — Mode ALL

1. Spent Fuel is Exposed from Open Vessel, Cavity, or SF Pool AND Spent Fuel Has Decayed > 30 Days
2. Fuel Handling Accident Causing Damage to Spent Fuel, Indicated by Fuel Building OR Containment Radiation Monitors Increasing

RA2 — PLANT RADIATION — Mode ALL

1. Radiation Readings > 15 mR/hr in Control Room OR Central Alarm Station OR Secondary Alarm Station
2. Radiation Reading > 5 R/hr in Areas Requiring Access for Safe Shutdown

RU1 — RAD MONITORS — Mode ALL

1. Uncontrolled Refuel Pool Water Level Decrease AND Rad Levels Require Evacuation of CTMT or Spent Fuel Pool Area
2. Unexpected Area Rad Monitor Reading Offscale High OR > 1000 Times Normal Reading

SECURITY THREAT/ DESTRUCTIVE PHENOMENA

TG1 — SECURITY EVENT — Mode ALL

A HOSTILE FORCE has taken control of plant equipment such that plant personnel are unable to operate equipment required to maintain safety functions. Any of the following meet this EAL:

1. **Loss of Control Room**
2. **Loss of Hot Shutdown Panel (C–21) (West 480v SWGR Room)**
3. **Loss of Cold Shutdown Panel (C–10) (Upper 4160v SWGR Room)**
4. **Security reports the loss or imminent loss of a Target Set**

OR

A HOSTILE ACTION has caused failure of Spent Fuel Cooling Systems and IMMINENT (for EALs) fuel damage is likely for a freshly off–loaded reactor core in pool.

TS1 — SECURITY EVENT — Mode ALL

A notification from the site security force that an armed attack, explosive attack, airliner impact, or other HOSTILE ACTION is occurring or has occurred within the protected area.

TA1 — SECURITY EVENT — Mode ALL

1. Security Events as determined for Station Safeguards Contingency Plan and reported by Security Shift Supervision. (Addresses events that involve Actual or Potential Substantial degradation to the level of safety of the plant.)
2. A notification from the site security force that an armed attack, explosive attack, airliner impact, or other HOSTILE ACTION is occurring or has occurred within the OCA.
3. A validated notification from the NRC of an airliner attack threat less than 30 minutes away.

TA2 — DESTRUCTIVE PHENOMENA — Mode ALL

1. Seismic Event > 0.09g ZPA
2. Onsite Sustained Windspeed > 90 MPH
3. Visible Damage to Structures or Equipment AND Affecting Safe Shutdown
4. Vessel or Vehicle Collision AND Affecting Safe Shutdown
5. Missiles Affecting Safe Shutdown
6. Flooding Affecting Safe Shutdown

TU1 — SECURITY EVENT — Mode ALL

1. Security Condition as determined for Station Safeguards Contingency Plan and reported by Security Shift Supervision. (Addresses events that involve Potential degradation in the level of safety of the plant.)
2. A credible site specific security threat notification.
3. A validated notification from the NRC providing information of an aircraft threat.

TU2 — DESTRUCTIVE PHENOMENA — Mode ALL

1. Seismic Activity Detected Per AOP-2562, Earthquake
2. Report by Plant Personnel of Tornado Striking Within Protected Area
3. Visible Damage to Structures or Equipment Within the Protected Area
4. Onsite Sustained Windspeed > 75 MPH
5. Explosion Within the Protected Area
6. Turbine Failure Causing Observable Casing Damage
7. Vessel or Vehicle Collision With Structures OR Equipment Required for Safe Shutdown or a loaded ISFSI Confinement Boundary
8. Flood Level > 19 Feet Mean Sea Level
9. Flooding in Areas Containing Safe Shutdown Equipment

FIRE/GASES

GS1 — CONTROL ROOM EVACUATION — Mode ALL

Unit Control from Hot Shutdown Panel C-10 Or C-21 NOT Established Within 15 Minutes After Control Room Evacuation

GA1 — CONTROL ROOM EVACUATION — Mode ALL

Control Room Evacuation Initiated

GA2 — FIRE/EXPLOSION — Mode ALL

Fire or Explosion Affecting Safe Shutdown Area AND Damage to Structures OR Safe Shutdown Equipment Indicated

GA3 — TOXIC/FLAMMABLE GASES — Mode ALL

Life Threatening Toxic Gases OR Flammable Gas Concentrations as Identified in C–OP 200.5, "Oil, Hazardous Material, Hazardous Waste and Mixed Waste Contingency Plan" Affecting Areas for Safe Shutdown

GU1 — FIRE — Mode ALL

1. Fire in Building OR Areas Adjacent to Areas Needed for Safe Shutdown NOT Extinguished Within 15 Minutes of Notification OR Verification of Control Room Alarms
2. Fire Affecting a Loaded ISFSI Confinement Boundary NOT Extinguished Within 15 Minutes of Notification.

GU2 — TOXIC/FLAMMABLE GASES — Mode ALL

1. Life Threatening Toxic Gases OR Flammable Gas Concentrations as Identified in C–OP 200.5, "Oil, Hazardous Material, Hazardous Waste and Mixed Waste Contingency Plan" Affecting Normal Operation
2. Notification of a Near-Site Release That May Require Evacuation

AREAS OF CONCERN FOR SAFE SHUTDOWN

Control Room
Cable Vaults
Turbine Building
Penetration Areas
RBCCW Rooms
Diesel Generator Room
Charging Pump Cubicles
Switchyard
Switchgear Rooms
Intake Structure
Switchgear Area
Coolant Tanks Area
Containment
DC Equipment and Battery Rooms
Safety Injection Pump Rooms

JUDGEMENT

JG1 — JUDGEMENT — Mode ALL

Other Conditions Exist For Which Judgement Indicates:

1. **Actual Or Imminent Substantial Core Degradation With Potential For Loss Of Containment,**

   OR

2. **Potential For Uncontrolled Radiological Releases. These Releases Can Be Reasonably Expected To Exceed EPA PAG Plume Exposure Levels Outside The Site Boundary**

JS1 — JUDGEMENT — Mode ALL

Other Conditions Exist For Which Judgement Indicates Actual Or Likely Major Failures of Plant Functions Needed For Protecton Of The Public

JA1 — JUDGEMENT — Mode ALL

Any Condition For Which Judgement Indicates That Safety Systems May Be Degraded AND Which Requires Emergency Response Organization Staffing

JU1 — JUDGEMENT — Mode ALL

Any Condition For Which Judgement Indicates Potential Degradation in the Level of Safety of the Plant

CLASSIFICATION

GENERAL EMERGENCY

ALPHA

OR

BRAVO

Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or security events that result in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

SITE AREA EMERGENCY

CHARLIE–TWO

Events are in process or have occurred which involve an actual or likely major failure of plant functions needed for protection of the public or security events that result in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) prevents effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exeed EPA Protective Action Guideline exposure levels beyond the site boundary.

ALERT

CHARLIE–ONE

Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of intentional malicious dedicated efforts of a hostile act. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

UNUSUAL EVENT

DELTA–TWO

OR

DELTA–ONE

Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

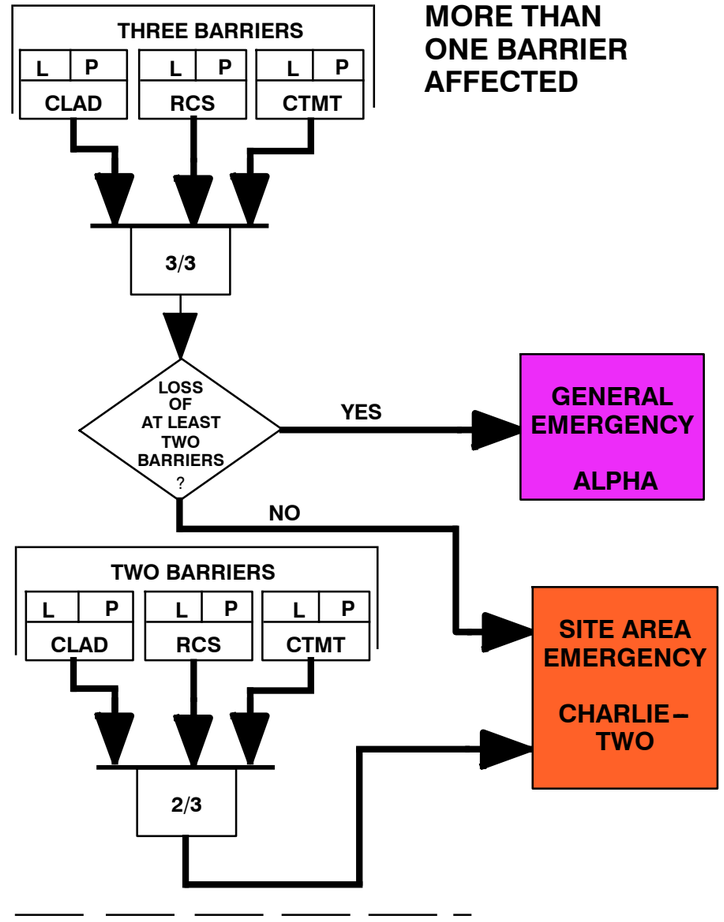
NOTE: When two or more EALs apply, always choose the EAL of the highest incident classification; also always read from top to bottom in each category.

2
Millstone

MILLSTONE 2 EMERGENCY ACTION LEVELS BARRIER FAILURE REFERENCE TABLE

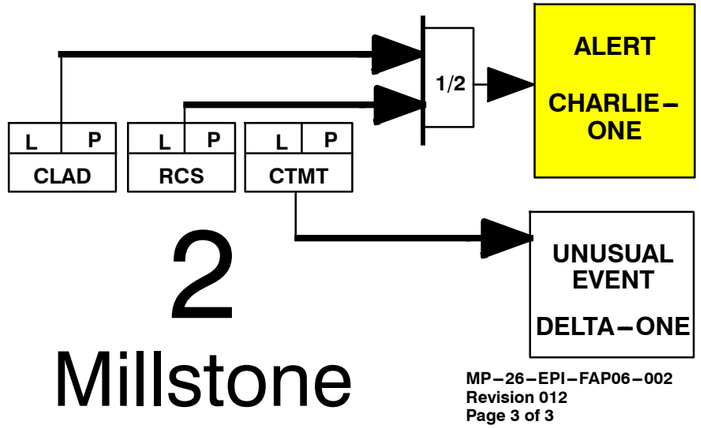
IMMINENT - No Turnaround in Safety System Performance is Expected AND Escalation to General Emergency Conditions Will Occur Within 2 Hours

INDICATORS	FUEL CLAD BARRIER	RCS BARRIER	CTMT BARRIER
SAFETY FUNCTION STATUS/ FUNCTIONAL RECOVERY	FCB1 LOSS Not Applicable POTENTIAL LOSS P No RCS Heat Removal Via Steam Generators AND Once Through Cooling NOT Effective AND Shutdown Cooling System Is NOT In Service	RCB1 LOSS Not Applicable POTENTIAL LOSS P Uncontrolled RCS Cooldown AND RCS Pressure-Temperature To the Left Of the PTS Limit 200°F Subcooling Maximum Curve P No RCS Heat Removal Via Steam Generators AND Once Through Cooling NOT Effective AND Shutdown Cooling System Is NOT In Service	
CORE EXIT TC TEMPERATURES	FCB2 LOSS L Core Exit Thermocouple Readings > 1200 °F POTENTIAL LOSS P Core Exit Thermocouple Readings > 700 °F	RCB2 LOSS L RCS Subcooling < 30°F POTENTIAL LOSS Not Applicable	CNB1 LOSS Not Applicable POTENTIAL LOSS P Core Exit TC Temperature Readings >1200°F AND Do NOT Decrease Within 15 Minutes
PRESSURE		RCB3 LOSS Not Applicable POTENTIAL LOSS P Uncontrolled RCS Pressure Decrease and Increasing Containment Radiation Monitors	CNB2 LOSS L Rapid Unexplained CTMT Pressure Decrease Following Initial Increase L No CTMT Pressure Increase When Expectation Exists POTENTIAL LOSS P CTMT Pressure > 10 PSIG AND Increasing AND No Containment Spray Pump P CTMT H_2 Concentration $\geq$ 4%
COOLANT LEAKAGE		RCB4 LOSS L Reactor Coolant Leak > CVCS Capacity AND Entry Into EOP-2534, Steam Generator Tube Rupture or EOP 2540, Functional Recovery, to Address Steam Generator Tube Rupture POTENTIAL LOSS P Reactor Coolant Leak > CVCS Capacity AND Entry Into EOP-2525, Standard Post Trip Actions P Reactor Coolant Leak Rate $\leq$ CVCS Capacity AND EITHER of the following: • Entry Into EOP 2534, Steam Generator Tube Rupture • Entry Into EOP 2540, Functional Recovery, to Address Steam Generator Tube Rupture	CNB3 LOSS L Primary to Secondary > Tech Spec Limits and EITHER exists: • Nonisolable Steam Release from Affected S/G to environment • Prolonged Release From Affected S/G to Environment When Used for Cooldown (see basis for description of prolonged release) L Leakage Through BOTH Isolation Valves AND a Pathway to the Environment Exists Requiring Actions Outside the Control Room to Isolate POTENTIAL LOSS P Leakage Exists Outside CTMT Requiring Isolation From inside the Control Room AND EITHER of the following: • Entry Into EOP 2532, Loss of Coolant Accident • Entry Into EOP 2540, Functional Recovery, to Address Loss of Coolant Accident
RADIATION	FCB3 LOSS L RM-8240/8241 Reading > 300 R/hr L RM–8240/8241 Reading > 5 R/hr Without RCS Release Inside CTMT L At Least 5% Fuel Clad Damage As Determined By Core Damage Estimate OR Sample System Dose Rates Obtained Using CP 2802N, "Primary System Sampling Analysis" L Dose Rate at One Foot from Unpressurized RCS Sample $\geq$ 28 mR/hr/ml POTENTIAL LOSS Not Applicable	RCB5 LOSS L RM-8240/8241 Reading > 5 R/hr Without Fuel Clad Barrier Loss POTENTIAL LOSS Not Applicable	CNB4 LOSS L Offsite Dose Plume Rate $\geq 10^{-6}$ Times RM-8240/8241 Reading if Release is to CTMT POTENTIAL LOSS P RM-8240/8241 Reading > 1,200 R/hr P At Least 20% Fuel Clad Damage As Determined By Core Damage Estimate
WATER LEVEL	FCB4 LOSS Not Applicable POTENTIAL LOSS P RVLMS Reading = 0% with OPERABLE #8 string (NA if no OPERABLE #8 string)		CNB5 LOSS L No CTMT Sump Level Increase When Expectation Exists POTENTIAL LOSS Not Applicable
JUDGEMENT	FCB5 Any Condition For Which Judgement Indicates Loss or Potential Loss of Fuel Clad Barrier Due to: • Imminent Barrier Degradation Based On Current Safety System Performance • Degraded Fission Barrier Monitoring Capability Making Barrier Status Indeterminate	RCB6 Any Condition For Which Judgement Indicates Loss or Potential Loss of RCS Barrier Due to: • Imminent Barrier Degradation Based On Current Safety System Performance • Degraded Fission Barrier Monitoring Capability Making Barrier Status Indeterminate	CNB6 Any Condition For Which Judgement Indicates Loss or Potential Loss of CTMT Barrier Due to: • Imminent Barrier Degradation Based On Current Safety System Performance • Degraded Fission Barrier Monitoring Capability Making Barrier Status Indeterminate



MORE THAN ONE BARRIER AFFECTED

ONLY ONE BARRIER AFFECTED



2

Millstone

8/18/15	8/26/15
Approval Date	Effective Date

Control Room Protective Action Recommendations

NOTE

The State must be notified within 15 minutes after a decision is made to issue or update PARs.

- State officials automatically implement a PAR for a GE BRAVO out to 2 miles and GE ALPHA out to 5 miles. The Incident Report Form serves as PAR notification in these instances.
- If a GE ALPHA is declared requiring a PAR beyond 5 miles, the PAR is verbally transmitted to the 24-hour DEEP Dispatcher in Hartford.

Section A: Evaluating Protective Action Recommendations (PARs)

NOTE

Do not delay initial PAR decision process if dose assessment results from the Chemistry Technician are not available. Until dose assessment is available, it is assumed that Table 2 values are not exceeded.

❑ 1. Refer To Section B, "CR PAR Process Flowchart" and determine the appropriate PAR.

2. IF conditions warrant a PAR beyond 5 miles, perform the following:

❑ a) Contact DEEP dispatcher at 860-424-3333.

❑ b) Identify yourself and read the applicable evacuation or shelter recommendations from Section B.

❑ c) IF dose projections or actual dose for thyroid (Committed Dose Equivalent) is greater than or equal to 5 Rem at or beyond site boundary, recommend the State implement KI strategy for the general public.

❑ d) Request dispatcher to inform the DEEP Duty Officer that a PAR has been issued. (DEEP Duty Officer will call back to verify the PAR and obtain additional information.)

❑ e) Log the date and time of notification.

3. IF a release is in progress, perform the following:

❑ a) Direct Chemistry Technician to perform offsite dose assessment (MIDAS) to determine if Table 2 values are exceeded.

❑ b) IF Table 2 values are exceeded, issue PAR per the Control Room PAR process flowchart.

Section A: Evaluating Protective Action Recommendations (PARs)

4. IF *no* release is in progress, perform the following:

- ❑ a) Direct Chemistry Technician to perform offsite dose assessment (MIDAS) on possible conditions as time permits to determine if Table 2 values could be exceeded.
- ❑ b) IF Table 2 values could be exceeded, consider revising PAR per the Control Room PAR process flowchart.

5. IF there is a wind shift (change in direction potentially affecting new zones), perform the following:

- ❑ a) Determine if one of the following conditions is met:
  - Potential for significant release as indicated by:
    - Any Fuel Barrier Clad Loss

      AND
    - Any Containment Barrier Loss or Potential Loss

    OR
  - Dose Assessment or Field Readings indicates a Projected Dose of 1 Rem TEDE OR 5 Rem Thyroid CDE in new area.
- ❑ b) IF one of the above conditions is met, issue a new PAR including new affected areas.

NOTE

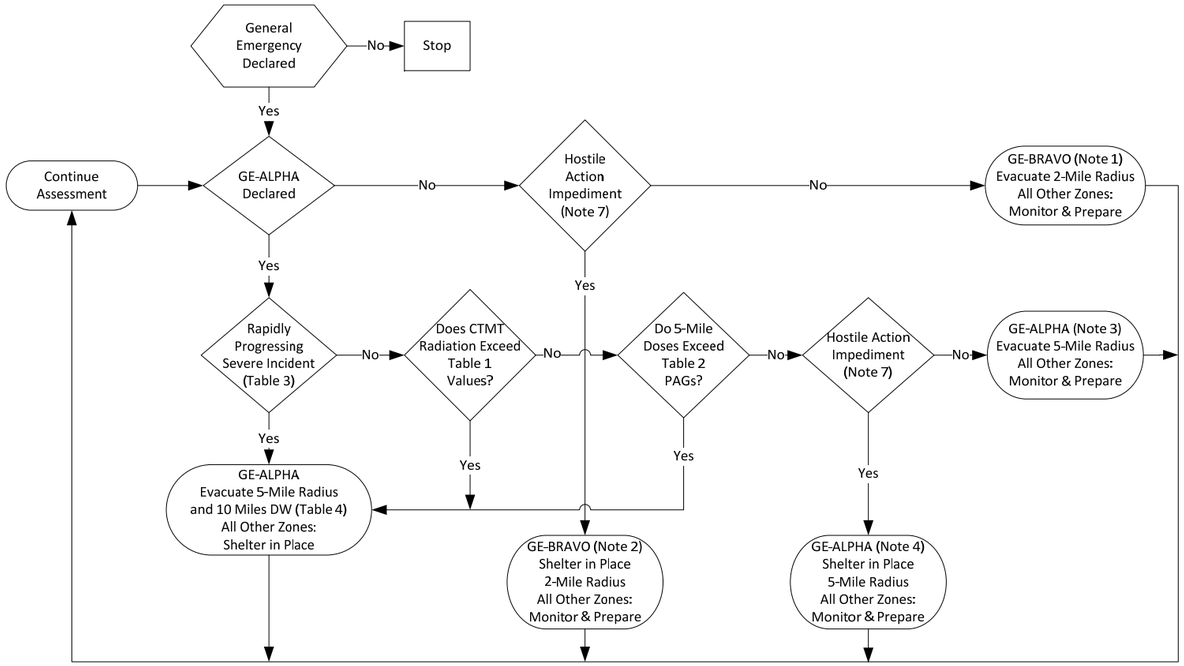
If none of the conditions in step 5.a. are met, the PAR is not changed.

- ❑ c) IF none of the above conditions are met, continue to monitor events for potential change.

Section B: Control Room PAR Process Flowchart

Table 1
Containment Radiation Monitors
MP2>19,000 R/hr
MP3>30 000 R/hr

Table 2 EPA PAGs
EPA PAGs (> 1Rem TEDE or >5 Rem CDE thyroid) are, or are suspected to be, Exceeded at or Beyond 5 miles (See Note 6).



NOTE:

1. If a General Emergency – Bravo is declared with no Hostile Action Impediment, State officials automatically recognize a PAR to Evacuate a 2-mile radius and all other zones Monitor and Prepare. The Incident Report Form serves as PAR notification.
2. If a General Emergency – Bravo is declared during a Hostile Action event, State officials automatically recognize a PAR to Shelter a 2-mile radius and all other zones Monitor and Prepare. The Incident Report Form serves as PAR notification.
3. If a General Emergency – Alpha is declared with actions only necessary out to 5 miles and no Hostile Action event, State officials automatically recognize a PAR to Evacuate a 5-mile radius and all other zones Monitor and Prepare. The Incident Report Form serves as PAR notification.
4. If a General Emergency – Alpha is declared with actions only necessary out to 5 miles during a Hostile Action Event, State officials automatically recognize a PAR to Shelter a 5-mile radius and all other zones Monitor and Prepare. The Incident Report Form serves as PAR notification.
5. The State must be notified within 15 minutes after a decision is made to issue or update a PAR.
6. Do not delay initial PAR decision process if dose assessment results from the Chemistry Technician are not available. Until dose assessment is available, it is assumed that Table 2 values are not exceeded.
7. The site Hostile Action is considered an impediment to evacuation, and, as a result, sheltering is the preferred PAR.

Table 3, Rapidly Progressing Severe Incident
Core Exit Thermocouple Readings > 1200°F
AND
For Unit 3 RCS Subcooling < 32°F Due to RCS Leak (115 ° Adverse CTMT)
For Unit 2 RCS Subcooling < 30°F
AND
Any one Containment Barrier Loss.

Table 4, GE-ALPHA - Evacuate 5-mile Radius and 10 Miles DW

1. **WIND DIRECTION (142 FT LEVEL) = FROM:_____ TIME: _____**
2. **EVACUATE THE FOLLOWING ZONES:**

✓	Wind From	Zones to Evacuate
	030°-051°	**A** and **B**
	052°-088°	**A** and **B** and **Old Lyme** in **D**
	089°-093°	**A** and **B** and **D**
	094°-138°	**A** and **B** and **D** and **East Lyme** in **C**
	139°-154°	**A** and **B** and **C** and **Lyme** in **D**
	155°-177°	**A** and **B** and **C**
	178°-186°	**A** and **B** and **Montville** and **Waterford** in **C**
	187°-193°	**A** and **B** and **Montville** and **Waterford** in **C** and **Ledyard** in **E**
	194°-218°	**A** and **B** and **E** and **Montville** and **Waterford** in **C**
	219°-229°	**A** and **B** and **E** and **Waterford** in **C**
	230°-244°	**A** and **B** and **E**
	245°-257°	**A** and **B** and **Groton City & Town** in **E**
	258°-286°	**A** and **B** and **F** and **Groton City & town** in **E**
	287°-316°	**A** and **B** and **F**
	317°-339°	**A** and **B**
	340°-029°	**A** and **B** and **Plum Island**

3. **SHELTER IN PLACE ALL OTHER ZONES.**
4. **IF DOSE PROJECTIONS OR ACTUAL DOSE IS EQUAL TO OR GREATER THAN 5 REM THYROID (CDE) AT OR BEYOND SITE BOUNDARY, RECOMMEND STATE OFFICIALS IMPLEMENT POTASSIUM IODIDE (KI) STRATEGY FOR GENERAL PUBLIC.**
5. **GO TO SECTION A, STEP 2, FOR NOTIFICATION.**

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: EAL Classification and PAR

JPM Number: A5S Revision: 1/0

Initiated:

John W. Riley – Signature on File	8/15/2018
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/2018
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/2018
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
11/20/08	Create for use on LOIT-2008 NRC Exam	0
12/13/08	Incorporated NRC comments	0
12/29/08	NRC comments Post-Validation	0
JWR 09/19/2012	Updated to new format and minor editorial changes.	0/1
jwr 07/26/2018	Incorporated NRC comments for the 2018 ILT NRC Exam. This JPM replaced the selected EAL JPM as requested by the NRC. Number as A5S. Previously in bank as A4S. Note that there are more than one A4S in bank.	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

Validated Time (minutes): 25

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

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

***** 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:

- The plant is operating at 100% power.
- Bus 24E is aligned to Bus 24C.
- "B" LPSI Pump is out of service.

0 minutes — Reactor trips, Turbine trips, EOP 2525 actions commenced

17 minutes — EOP 2525 complete with following status and indications:

- Buses 25A/B, 24A/B, and 24C are de-energized
- Bus 24D is energized by the 'B' D/G
- S/G press: #1 is 745 psia, #2 is 740 psia, both slowly lowering
- S/G levels: #1 is 18%, #2 is 16%, both rising slowly
- 'B' AFP supplying both S/Gs
- Th is 289°F and Tc is 262°F: both slowly lowering
- CETS are 847°F and slowly rising
- Pressurizer level is 0%
- RVLMS is 0%. (Both #8 string HJTCs are inoperable)
- Pressurizer pressure is 53 psia and slowly lowering
- Subcooling (CET) indicates -478°F and becoming more negative
- Letdown Isolation Valves, CH-515, 516, and 089, indicate open and will NOT close from C-02
- CTMT pressure is 42 psig, rising slowly
- Main Steam Line RM-4299A and B indicate 1.6 R/hr and RM-4299C indicates 1.8 R/hr, all rising
- CTMT Hi Range, RM-8240 / 8241 indicate 20,000 R/hr / 21,000 R/hr, respectively, both rising
- CTMT Personnel Access Area, RM-7890, off scale high
- Facility 2 CTMT atmosphere, RM-8262A/B show pre CIAS spikes and alarm
- The Kaman Rad Monitor, RM-8168 is reading 5E+02µCi/cc and is in alarm and rising
- All other RMs outside CTMT are elevated, but NOT in alarm

20 Minutes — Crew transitioned to EOP 2532

Initiating Cues:

- You are the on-duty SM.
- Your task is to determine the NRC and state posture code classification for the following event.
- Report EAL Classification when determined.
- This is a time critical JPM.

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: A5S Revision: 1/0

Task Title: EAL Classification and PARs

JPM / EAL START TIME: _____

S T E P # 1	Performance: Obtain Millstone 2 Emergency Action Levels, MP -26-EPI-FAP06-002.	Standard: The examinee reads the student Handout and obtains Millstone 2 Emergency Action Levels, MP -26-EPI-FAP06-002.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: 1) Millstone 2 Emergency Action Levels, MP-26-EPI-FAP06-002. 2) MP-26-EPI-FAP06, Classification and PARs. Note: The best way to provide this material is by using the CRDSEO book, EAL book, and EAL Basis Document from the simulator. These should be placed on the desk the License Candidate will be administered the JPM.			
	Comments: The 15 minute time will start when the EAL tables are referenced, i.e. when the License Candidate starts using the Millstone 2 Emergency Action Levels, MP -26-EPI-FAP06-002, and ends when the classification is made.			

PERFORMANCE INFORMATION

JPM Number: A5S Revision: 1/0

Task Title: EAL Classification and PARs

S T E P # 2	Performance: Classify the event as a GENERAL EMERGENCY State Posture Code, ALPHA, within 15 minutes, based on Barrier Failure, BG1, any three barriers failed.	Standard: Using the barrier reference table, examinee determines the event as a; **GENERAL EMERGENCY, State Posture Code, ALPHA within 15 minutes** (this is critical information that must be reported) The classification is based on the following; • Fuel Clad Barrier failed FCB3 (L) • RCS Barrier failed RCB2 (L), • CTMT Barrier, CNB3(L) What the classification is based on is important but not critical. Note that the same classification could also be determined from In-Plant Radiation RG1 or Offsite Dose OG1. • RG1 RM-8240/8241 reading > 1,200 R/hr. Currently reading 20,000 R/hr and 21,000 R/hr. • OG1 Kaman Vent Monitor (RM-8168) ≥ 2 µCi /cc. Currently reading 5E+02 µCi /cc for > 15 minutes.	Critical: Y ☒ N ☐ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐
	Cue: Once the classification is made and provided to the examiner give STUDENT HANDOUT #2 to the examinee. Record the time the examinee completed reading the handout and commences determination of the Protective Action Recommendation (PARS).			
	Comments:			

EAL STOP TIME: _____

PERFORMANCE INFORMATION

JPM Number: A5S Revision: 1/0

Task Title: EAL Classification and PARs

S T E P # 3	Performance: For Control Room PARs, Refer to EPI-FAP06-005, "Control Room Protective Action recommendations" and determines the PAR recommendation as; • Evacuate Zones A and B and Plum Island. • Shelter all other zones. The information below is not critical but is the correct path using the Control Room PAR Process Flowchart • General Emergency – Yes • GE – Alpha declared – Yes • Rapidly Progressing Event - No • Does CTMT Radiation Exceed Table 1 Values – Yes (20,000 and 21,000 R/hr) • GE - ALPHA Evacuate 5 – Mile Radius, and 10 Miles DW (Table 4) All Other Zones Shelter in Place • Sector 340-029 Zones to evacuate; A and B and Plum Island • Shelter all other zones	Standard: Using the Control Room PAR Process Flowchart, determine that the present wind direction (between 340° - 029°) requires the examinee to recommend an evacuation of Zones A, B, and Plum Island, and to shelter all other zones. The critical information that must be reported is **Evacuate 5 – Mile Radius and 10 Miles DW (Table 4).** **Table 4: Evacuate the following zones 10 Miles DW: Zones A and B and Plum Island** **All other zones Shelter in place.**	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Thyroid CDE is NOT known; therefore, issuance of KI tablets should not be recommended.			

TERMINATION CUE: The evaluation for this JPM is concluded.

JPM 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 EAL Portion Only	
Validated Time (minutes):	15	Actual Time to Complete (minutes): Classification 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 #2

Hand to Candidate After the Classification is provided

JPM Number: A5S Revision: 1/0

Initial Conditions: Wind at the site is from 15 deg at 3 mph

Initiating Cues:

- You remain the on-duty SM.
- Provide any additional recommendations based on your classifications, as required.

Control Room Protective Action Recommendation (PAR):

STUDENT HANDOUT #1

JPM Number: A5S Revision: 1/0

Initial Conditions:

- The plant is operating at 100% power.
- Bus 24E is aligned to Bus 24C.
- "B" LPSI Pump is out of service.

0 Minutes — Reactor trips, Turbine trips, EOP 2525 actions commenced.

17 Minutes — EOP 2525 complete with following status and indications:

- Buses 25A/B, 24A/B, and 24C are de-energized
- Bus 24D is energized by the 'B' D/G
- S/G press: #1 is 745 psia, #2 is 740 psia, both slowly lowering
- S/G levels: #1 is 18%, #2 is 16%, both rising slowly
- 'B' AFP supplying both S/Gs
- Th is 289°F and Tc is 262°F: both slowly lowering
- CETS are 847°F and slowly rising
- Pressurizer level is 0%
- RVLMS is 0%. (Both #8 string HJTCs are inoperable)
- Pressurizer pressure is 53 psia and slowly lowering
- Subcooling (CET) indicates -478°F and becoming more negative
- Letdown Isolation Valves, CH-515, 516, and 089, indicate open and will NOT close from C-02.
- CTMT pressure is 42 psig, rising slowly
- Main Steam Line RM-4299A and B indicate 1.6 R/hr and RM-4299C indicates 1.8 R/hr, all rising
- CTMT Hi Range, RM-8240 / 8241 indicate 20,000 R/hr / 21,000 R/hr, respectively, both rising
- CTMT Personnel Access Area, RM-7890, off scale high
- Facility 2 CTMT atmosphere, RM-8262A/B show pre CIAS spikes and alarm
- The Kaman Rad Monitor, RM-8168 is reading 5E+02µCi/cc and is in alarm and rising
- All other RMs outside CTMT are elevated, but NOT in alarm.

20 minutes — Crew transitioned to EOP 2532.

Initiating Cues:

- You are the on-duty SM.
- Your task is to determine the NRC and state posture code classification for the following event.
- Report EAL Classification when determined.
- This is a time critical JPM.

Immediately notify the examiner when your classification has been made

Classification Level NRC:_____ State:_____

EAL Major Heading:_____ Minor:_____

THIS JPM IS TIME CRITICAL

JOB PERFORMANCE MEASURE APPROVAL SHEET

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

JPM Number: S1 Revision: 9/1

Initiated:

John W. Riley – Signature on File	8/3/18
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/18
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/15/18
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
8/3/2018 jwr	Incorporated NRC editorial enhancements.	9/1

JPM WORKSHEET

Facility: MP 2 Examinee: _____

JPM Number: S1 Revision: 9/1

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 : 9/1

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 18-24 psig. Ensure VCT level 72 – 78%. 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.

*** * * * <u>NOTES TO TASK PERFORMANCE EVALUATOR</u> * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the student to achieve a satisfactory grade, **<u>ALL</u>** 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 **<u>NO</u>** 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: 9/1

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: 9/1

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: 9/1

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: 9/1

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: 9/1

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: 9/1

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: 9/1

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: 9/1

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: 9/1

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: 9/1

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: 9/1

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: 9/1

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

STEP #22	Performance:	Standard:	Critical:	Grade:
	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).	• 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.	Y ☒ N ☐ Y ☐ N ☒	S ☐ U ☐ S ☐ U ☐
	Cue: Acknowledge recommendations or requests.			
	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".			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S1 Revision: 9/1

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: 9/1

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.

MILLSTONE POWER STATION
SYSTEM OPERATING PROCEDURE

Make Up (Boration and Dilution) Portion of CVCS

OP 2304C

Rev. 027

STOP THINK ACT REVIEW

Approval Date: 9/21/16

/Effective Date: 9/27/16

Level of Use
Continuous

Millstone Unit 2
System Operating Procedure

Make Up (Boration and Dilution) Portion of CVCS

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Attachment 3 "Resetting PMW and BA Flow Controllers" 92
OP 2304C–001, "Placing the Boric Acid System in Operation"
OP 2304C–002, "Boric Acid Valve Lineup"

1. PURPOSE

1.1 **Objective**

This procedure provides instructions for the various modes of operation of the RCS Make Up (Boric Acid and PMW) System.

1.2 **Discussion**

The Boric Acid System is used during normal plant operations to provide a means of maintaining the required boron concentration in the RCS for reactivity control.

To maximize hydrogen absorption and oxygen scavenging in make up water prior to reaching the RCS, the preferred make up path is to the VCT.

The Boric Acid System is capable of bringing the reactor to COLD SHUTDOWN conditions any time in core life, *without* movement of CEAs.

When required, the Boric Acid System provides a means of emergency borating the RCS or raising SHUTDOWN MARGIN.

The Boric Acid System provides a means of supplying borated water to the RWST.

The Boric Acid System provides a source of borated water to the charging pumps during post accident conditions. This enables the charging pumps to supplement the HPSI pumps during a small break LOCA by injecting at least 40 gpm to the RCS.

During normal plant operations, batch mixing will be initiated to verify that TRM LCO 3.1.2.7 and 3.1.2.8 are met, as specified on TRM Figure 3.1–1.

The volume of the piping from the blending tee to the charging pump suction is 39 gallons and from the blending tee to the VCT is 26 gallons. This piping may contain PMW or boric acid.

2. PREREQUISITES

2.1 General

2.1.1 The Volume Control System is operable and available to provide a make up flow path to the RCS as specified in OP 2304A, "Volume Control Portion of CVCS."

2.1.2 120 VAC vital instrument power is available.

2.1.3 120 VAC instrument power is available.

2.1.4 125 VDC control power is available.

2.1.5 MCCs B51 and B61 are energized and available for the following:

- "A" and "B" boric acid pumps
- Motor operated boric acid valves
- Boric acid pipe heat tracing (limited)
- Boric acid tank heaters (available, *not* used)

2.1.6 PMW is available for blended make up or dilution.

2.1.7 Instrument Air is available for air operated valves.

2.1.8 Boric Acid System valves are lined up as specified in the following:

- OP 2304C–001, "Placing the Boric Acid System in Operation"
- OP 2304C–002, "Boric Acid Valve Lineup"

2.1.9 Clean Liquid Radwaste System is available to accept letdown flow when VCT level is high (88%).

2.1.10 Sample System is available to verify boron concentration of the VCT and RCS.

2.2 Documents

2.2.1 OP 2208, "Reactivity Calculations"

2.2.2 OP 2304A, "Volume Control Portion of CVCS"

2.2.3 OP 2304E, "Charging Pumps"

2.2.4 SP 2601A, “Borated Water Sources Verification”

2.2.5 SP 2602A–001, “Manual RCS Leak Rate Determination”

2.2.6 SP 2654B, “Forcing Pressurizer Sprays”

2.2.7 AOP 2558, “Emergency Boration”

2.2.8 TRM, Figure 3.1–1

2.3 **Personnel**

2.3.1 Chemistry department personnel perform boric acid concentration sampling.

3. PRECAUTIONS

3.1 *All* boration and dilution evolutions shall be conducted in a deliberate and carefully controlled manner, while closely monitoring the response of the reactor [Ref. 6.2].

3.2 Calculations that involve reactivity control are independently verified prior to use [Ref. 6.2].

3.3 *Anytime* boron dilution operations are being performed with the reactor subcritical, criticality should be anticipated.

3.4 When an RCS boron concentration change of 50 ppm or greater is initiated, the pressurizer spray valves, RC–100E or RC–100F, should be operated to equalize the pressurizer and RCS boron concentrations to within 10 ppm (C–03).

3.5 To verify adequate mixing during boron dilution, a minimum of *one* RCP or 1 LPSI pump operating in shutdown cooling mode with core flow greater than or equal to 1,000 gpm, must be running.

3.6 When RCS boron concentration is being changed, exceeding the PDIL alarm point must be avoided.

3.7 If the PDIL alarm point is reached when the reactor is critical, emergency boration must be *immediately* started as specified in AOP 2558, “Emergency Boration.”

3.8 Effects of boration or dilution on reactor power and T_{AVG} should be closely monitored. If response is *not* in the proper direction, boration or dilution must be *immediately* stopped.

3.9 VCT pressure must be monitored during make up operations. VCT pressure should rise when making up to the VCT. VCT pressure lowering with a constant VCT level may indicate a level instrument problem. VCT must be vented to the waste gas header prior to reaching 35 psig.

3.10 If it is desired to perform a planned (i.e. *not* an emergency), boration to the RCS with *no* RCPs operating in MODE 5, to prevent a potential dilution event, the RCS must *first* be drained to at least 17 inches above the centerline of the hot leg (drains SG u−tubes) [Ref. 6.1].

3.11 If charging pumps are to be aligned to take a suction from the RWST, a suction path from the RWST exists and the following valves are open:

- 2−CS−13.1B, "RWST HDR B ISOL"
- 2−CS−028, "RWST to CVCS Stop"
- 2−CS−13B, "RWST OUTLET HEADER "B" ISOLATION"

3.12 If a manual RCS leak rate determination is in progress and totalizers for PMW and BA controllers, FC-210X and FC-210Y are being used to track RCS makeup, values must be recorded on SP 2602A−001, "Manual RCS Leak Rate Determination," prior to resetting totalizers to zero.

3.13 The potential exists for lifting 2−CH−345, "LETDOWN HEAT EXCHANGER HEADER TO CWRT RELIEF VALVE," upon restoration of the normal letdown path when valves have been repositioned. When shifting CH−500, "LTDN DIVERT," or CH−520, "ION EXCH BYPASS," following any manual valve manipulations in the downstream flow paths, letdown parameters (i.e. flow, pressure, filter D/P) should be monitored to ensure the relief valve has not lifted.

3.14 Due to PMW valve response time, PMW flow will continue after reaching the integrator endpoint. Depending on the total flowrate, from 0 to 5 gallons of additional PMW flow can be anticipated. At 40 gpm, approximately one gallon of additional PMW flow can be expected.

3.15 While diluting at high PMW flow rates, flow anomalies have been noted due to pressure surges realized when a second PMW pump starts, or 2−CH−210X closes rapidly. These anomalies may impact calculated RCS leak rate. Flow anomalies are noted *not* to occur at dilution rates of 80 GPM and less.

3.16 Make up to the VCT improves RCS chemistry by increased contact with hydrogen over−pressure, and its use is preferred over the charging pump suction path.

3.17 Following any evolution where boric acid is NOT flushed from the make−up system piping, a lamicoid should be placed on the Main Control Board identifying the piping is loaded with boric acid.

4.9 **Manual Blended Make Up to VCT**

4.9.1 As required, Refer To Section 4.20, "Maintaining VCT Level and Pressure During Normal Operation," and PERFORM applicable actions.

CAUTION

1. Manual make up must be monitored closely as there is *no* automatic shutoff 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.

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.

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.

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)

4.9.5 DETERMINE desired VCT level change in % level.

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*

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"

4.9.8 START PPC trend of VCT level (L226).

NOTE

Boric acid flow rates of less than 3 gpm and greater than 30 gpm are achievable, but are *not* to be exceeded.

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):

a. ENSURE "AM" is lit.

b. PRESS "SEL" button until cursor appears above setpoint (left hand bar graph).

c. Using "▲" and "▼" buttons, ADJUST setpoint to desired flow rate.

4.9.10 PLACE "MAKEUP MODE SEL" in "MANUAL" (C−04).

4.9.11 START *one* boric acid pump (C−02).

- P−19A, "BA PP A"
- P−19B, "BA PP B"

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)

NOTE

When CH−512, ”MAKEUP VLV STOP,” is opened, the “M” part of the “AM” light will extinguish, indicating the controller is activated.

4.9.13 OPEN CH−512 (C−04).

4.9.14 ENSURE flows have stabilized at setpoint of flow controllers (C−04).

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”

4.9.16 IF level change is *not* as expected, CLOSE CH−512 and INVESTIGATE cause of discrepancy (C−04).

4.9.17 WHEN discrepancy is resolved, OPEN CH−512 and CONTINUE make up to VCT (C−04).

4.9.18 WHEN desired VCT level is reached, CLOSE CH−512 (C−04).

4.9.19 STOP boric acid pump (C−02).

- P−19A, “BA PP A”
- P−19B, “BA PP B”

4.9.20 PLACE “MAKEUP MODE SEL” in “DILUTE” (C−04).

4.9.21 OBSERVE and RECORD *total* gallons added from the following controllers (C−04):

a. “PRI MAKEUP WTR FLOW CONTROLLER FC−210X” total gallons of PMW added: _____

b. “BORIC ACID FLOW CONTROLLER FC−210Y” total gallons of BA added: _____

4.9.22 Using totals recorded from each controller, PERFORM the following:

a. CHECK proper flow ratio was maintained for makeup.

b. CHECK *total volume* added is consistent with volume calculated in step 4.9.6

4.9.23 IF necessary, BORATE or DILUTE to maintain proper RCS boron concentration.

4.9.24 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"

4.9.25 RECORD new BAST reference levels on local control board markers (C-02).

4.9.26 ENSURE computer alarms are established at 0.9% above BAST reference levels.

– End of Section 4.9 –

4.20 **Maintaining VCT Level and Pressure During Normal Operation**

CAUTION

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.

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.

4.20.1 IF desired to raise VCT level and pressure, Go To Section 4.4, 4.6, *or* 4.9.

4.20.2 IF desired to reduce VCT level and pressure, PERFORM the following:

a. PLACE CH−500, "LTDN DIVERT," IN "RWS" (C−02).

b. ENSURE CH−500 shifts to "RWS" (C−02).

c. WHEN desired VCT level is reached PLACE CH−500 in "VCT" or "AUTO" (C−02).

d. ENSURE CH−500 shifts to "VCT" or "AUTO" (C−02).

NOTE

Hydrogen is normally added in 5 and 10 cubic foot increments which will raise pressure 3 psig and 6 psig, respectively. One revolution of the integrator is 5 cubic feet.

4.20.3 IF desired to raise VCT hydrogen pressure, PERFORM the following:

a. NOTIFY an operator of the quantity of hydrogen to be added.

b. THROTTLE open 2−GAH−31, "HYDROGEN OUTLET FROM FLOW TOTALIZER," (TB 14′6″).

c. WHEN the required amount of hydrogen has been added, CLOSE 2−GAH−31.

d. NOTIFY Control Room of completion of hydrogen addition.

4.20.4 IF desired to reduce VCT pressure, PERFORM the following:

a. NOTIFY Health Physics of intent to vent VCT to the Waste Gas System.

b. SEND plant page alerting personnel that radiation levels will be changing in the Waste Gas Area.

c. CLOSE 2−LRR−39, "EQUIPMENT DRAIN SUMP TANK TO WASTE GAS SYSTEM," (AB, −45'6").

d. OPEN CH−513, "VCT VENT," (C−02).

e. WHEN desired VCT pressure is reached, CLOSE CH−513 (C−02).

f. OPEN 2−LRR−39 (AB, −45'6").

– End of Section 4.20 –

Attachment 3
Resetting PMW and BA Flow Controllers

(Sheet 1 of 1)

1. IF desired to reset "PRI MAKEUP WTR FLOW CONTROLLER FC−210X" to 0 total gallons, PERFORM the following (C−04):

    1.1 As required, PRESS "SEL" button until "PMW TOTAL" is displayed.

    1.2 CHECK "R/L" light indicates "L."

    1.3 IF a manual leak rate determination is in progress AND flow controller totalizers are being used to track RCS makeup, Refer To SP 2602A−001, "Manual RCS Leak Rate Determination," and RECORD total gallons added to the RCS.

    1.4 PRESS "SEL" button and HOLD until display indicates "TOTAL RST."

    1.5 PRESS "R/L" button to transfer to "R" mode to reset totalizer.

    1.6 PRESS "R/L" button to transfer to "L" mode.

    1.7 PRESS "SEL" button and HOLD until "PMW TOTAL" is displayed.

    1.8 ENSURE "AM" is lit.

2. IF desired to reset "BORIC ACID FLOW CONTROLLER FC−210Y" to 0 total gallons, PERFORM the following (C−04):

    2.1 As required, PRESS "SEL" button until "BA TOTAL" is displayed.

    2.2 CHECK "R/L" light indicates "L."

    2.3 IF a manual leak rate determination is in progress AND flow controller totalizers are being used to track RCS makeup, Refer To SP 2602A−001, "Manual RCS Leak Rate Determination," and RECORD total gallons added to the RCS.

    2.4 PRESS "SEL" button and HOLD until display indicates "TOTAL RST."

    2.5 PRESS "R/L" button to transfer to "R" mode to reset totalizer.

    2.6 PRESS "R/L" button to transfer to "L" mode.

    2.7 PRESS "SEL" button and HOLD until "BA TOTAL" is displayed.

    2.8 ENSURE "AM" is lit.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Inadvertent AEAS Actuation

JPM Number: S2 Revision: 0/1

Initiated:

John W. Riley – Signature on File	8/3/18
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/18
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/18
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
04/04/2018	New JPM for the 2018 ILT NRC examination.	0/0
8/3/2018 jwr	Incorporated comments from NRC review.	0/1

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: S2 Revision: 0/1

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 : 0/1

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.

Initiating Cues:

- The Unit Supervisor has directed you to reset the inadvertent AEAS actuation signal by completing steps 11.1 through 11.4 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 and input conditions identified below. IC-52 (password "2018ilt>nrc") contains the conditions below.
- 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: 0/1

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 verifies 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: 0/1

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: 0/1

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. Pressing the (2) bistable module "TRIP" lights that are lit is the critical task. Pressing the (2) not tripped is not required to successfully complete the task. 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: 0/1

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: 0/1

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: 0/1

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: 0/1

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.

Initiating Cues:

- The Unit Supervisor has directed you to reset the inadvertent AEAS actuation signal by completing steps 11.1 through 11.4 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.

MILLSTONE POWER STATION
ABNORMAL OPERATING PROCEDURE

Inadvertent ESFAS Actuation

AOP 2571
Rev. 007

STOP THINK ACT REVIEW

Approval Date: **07/13/2017**

Effective Date: **08/03/2017**

Level of Use
Continuous

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1.0 PURPOSE

1.1 Objective

To minimize the impact on plant operations of an inadvertent actuation of Engineered Safety Features equipment.

1.2 Discussion

The Engineered Safety Features System equipment is designed for standby service and responds automatically to various Engineered Safeguards Actuation System (ESFAS) signals. Personnel errors, equipment failures, or malfunctions may result in spurious ESAS signals. All pertinent plant parameters must be carefully considered to determine if the ESFAS actuation is spurious. When it has been determined that the actuation is spurious, then various operator actions are required to minimize the impact of the equipment actuation while reducing the time the equipment may be disabled.

An ESFAS signal to an individual piece of equipment can be overriden by placing the associated handswitch to the accident condition (OPEN, CLOSED, ON, OFF, START, or STOP) and releasing the handswitch. When equipment is placed in its non-emergency status by overriding an ESFAS signal, then the equipment will not respond to future ESAS signals until the ESFAS modules are reset.

1.3 Applicability

This procedure is applicable in **ALL** Modes.

2.0 ENTRY CONDITIONS

Inadvertent ESFAS Actuation may be entered when **ANY** of the following conditions exist:

- An inadvertent SIAS actuation has occurred as indicated by **ALL** of the following conditions:
  - **ANY** of the following conditions exist:
    - "SIAS OR UV ACTUATION SIG CH 1 TRIP" (C-01, A-34) alarm
    - "SIAS OR UV ACTUATION SIG CH 2 TRIP" (C-01, B-34) alarm
    - Equipment actuation indicates that a SIAS actuation has occurred
  - **ALL** of the following conditions exist:
    - Pressurizer pressure is greater than 1,714 psia. or trip function bypassed
    - Containment pressure is less than 4.42 psig
    - Bus 24C and 24D voltage is greater than 2,912 VAC
- An inadvertent CIAS or EBFAS actuation has occurred as indicated by **ALL** of the following conditions:
  - **ANY** of the following conditions exist:
    - "CIAS ACTUATION SIG CH 1 TRIP" (C-01, A-35) alarm
    - "CIAS ACTUATION SIG CH 2 TRIP" (C-01, B-35) alarm
    - "EBFAS ACTUATION SIG CH 1 TRIP" (C-01, A-36) alarm
    - "EBFAS ACTUATION SIG CH 2 TRIP" (C-01, B-36) alarm
    - Equipment actuation indicates that a CIAS or EBFAS actuation has occurred
  - **ALL** of the following conditions exist:
    - Pressurizer pressure is greater than 1,714 psia
    - Containment pressure is less than 4.42 psig

(continue)

2.0 (continued)

- An inadvertent CSAS actuation has occurred as indicated by **ALL** of the following conditions:
  - **ANY** of the following conditions exist:
    - "CSAS ACTUATION SIG CH 1 TRIP" (C-01, C-34) alarm
    - "CSAS ACTUATION SIG CH 2 TRIP" (C-01, D-34) alarm
    - Equipment actuation indicates that a CSAS actuation has occurred
  - Containment pressure is less than 9.48 psig
- An inadvertent AFW actuation has occurred as indicated by **ALL** of the following conditions:
  - **ANY** of the following conditions exist:
    - "AFW A AUTO START" (C-04, BB-23) alarm
    - "AFW B AUTO START" (C-04, BB-24) alarm
    - Equipment actuation indicates that an AFW actuation has occurred.
  - **ALL** of the following conditions exist:
    - Steam generator levels are greater than 26.8%
    - Pressurizer pressure is less than 2,400 psia
- An inadvertent SRAS actuation has occurred as indicated by **ALL** of the following conditions:
  - **ANY** of the following conditions exist:
    - "SRAS ACTUATION SIG CH 1 TRIP" (C-01, C-35) alarm.
    - "SRAS ACTUATION SIG CH 2 TRIP" (C-01, D-35) alarm.
    - Equipment actuation indicates that a SRAS actuation has occurred.
  - RWST level is greater than 9%.

(continue)

2.0 (continued)

- An inadvertent CPVIS actuation has occurred as indicated by **ALL** of the following conditions:
  - **ANY** of the following conditions exist:
    - "CTMT RAD ACTUATION SIG CH 1 TRIP" (C-01, C-36) alarm
    - "CTMT RAD ACTUATION SIG CH 2 TRIP" (C-01, D-36) alarm
  - **ALL** of the following conditions exist:
    - Containment gaseous radiation is less than 7×10^4 cpm
    - Containment particulate radiation is less than 7×10^4 cpm
- An inadvertent AEAS actuation has occurred as indicated by **ALL** of the following conditions:
  - **ANY** of the following conditions exist:
    - "AEAS ACTUATION SIG CH 1 TRIP" (C-01, C-37) alarm
    - "AEAS ACTUATION SIG CH 2 TRIP" (C-01, D-37) alarm
    - Equipment actuation indicates that an AEAS actuation has occurred
  - Spent fuel pool area radiation is less than 50 mr/hr

3.0 Initial Actions

INSTRUCTIONS	CONTINGENCY ACTIONS
___3.1 IF an inadvertent bus 24C UV actuation has occurred, Go To AOP 2502C, "Loss of Vital 4.16 KV Bus 24C."	
___3.2 IF an inadvertent bus 24D UV actuation has occurred, Go To AOP 2502D, "Loss of Vital 4.16 KV Bus 24D."	

CAUTION

When an ESAS signal has been overridden by use of the equipment handswitch, then future ESAS signals will not be processed for that equipment until the ESAS modules have been reset.

___3.3 IF an inadvertent containment spray actuation has occurred, PERFORM the following as required:	
a. CHECK Containment pressure less than 9.48 psig.	a.1 Go To appropriate EOP or AOP
b. OVERRIDE CSAS start signals and STOP containment spray pumps. (C- 01)	
c. OVERRIDE CSAS open signals and CLOSE the following valves: (C- 01) • CS-4.1A, containment spray header "A" isolation • CS-4.1B, containment spray header "B" isolation	
d. Go To Section 7.0, "Inadvertent CSAS Actuation."	

INSTRUCTIONS	CONTINGENCY ACTIONS
___3.4 IF an inadvertent SIAS actuation has occurred, PERFORM the following as required:	
a. IF DG has started, ENSURE associated service water pump is operating.	a.1 Emergency STOP **ANY** DG operating with *no* service water.
b. Go To Section 4.0, "Inadvertent SIAS Actuation."	
___3.5 IF inadvertent AFW actuation occurred, Go To Section 8.0, "Inadvertent AFW Actuation."	
___3.6 IF inadvertent SRAS actuation occurred, Go To Section 9.0, "Inadvertent SRAS Actuation."	
___3.7 IF inadvertent EBFAS actuation occurred, Go To Section 6.0, "Inadvertent EBFAS Actuation."	
___3.8 IF inadvertent AEAS actuation occurred, Go To Section 11.0, "Inadvertent AEAS Actuation."	
___3.9 IF inadvertent CPVIS actuation occurred, Go To Section 10.0, "Inadvertent CPVIS Actuation."	
___3.10 IF inadvertent CIAS actuation occurred, Go To Section 5.0, "Inadvertent CIAS Actuation."	

11.0 Inadvertent AEAS Actuation

INSTRUCTIONS	CONTINGENCY ACTIONS
___11.1 CHECK spent fuel pool area radiation is less than 50 mr/hr.	11.1.1 Go To appropriate EOP or AOP.
___11.2 IF an inadvertent AEAS actuation has occurred, ENSURE condenser air removal aligned to Unit 2 stack as follows: (C- 06) 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.	
___11.3 NOTIFY HP and Chemistry that an inadvertent AEAS actuation has occurred.	
___11.4 Refer To Attachment 2, "Resetting ESAS," Section 5.0, Resetting AEAS," and ATTEMPT to reset AEAS.	11.4.1 IF AEAS signals can *not* be reset, NOTIFY I&C department.
+ 11.5 WHEN AEAS signals reset, CONTINUE with this procedure.	

INSTRUCTIONS

CONTINGENCY ACTIONS

___11.6 RESTORE ventilation systems as follows:

a. IF desired,
Refer To OP 2314G, "Enclosure Building Filtration System" and STOP EBFS.

b. Refer To OP 2315A, "Control Room Air Conditioning System" and RETURN control room ventilation to normal.

c. Refer To OP 2314F, "Fuel Handling Area Ventilation System," and RETURN fuel handling area ventilation to normal.

___11.7 ALIGN condenser air removal to Unit 1 stack as follows: (C- 06)

a. OPEN **BOTH** of the following:

- EB-55, condenser air removal #1 stack (Z2)
- EB-56, condenser air removal #1 stack (Z1)

b. CLOSE EB-57, condenser air removal #2 stack.

___11.8 Refer To SP 2609D, "Enclosure Building Filtration System Filter Testing - Refuel" and PERFORM charcoal sample test.

___11.9 Refer To SP 2609F, "Control Room Ventilation System Filter Testing - Refuel" and PERFORM charcoal sample test.

___11.10 Go To Section 12.0, "Follow-up Actions."

Attachment 2
Resetting ESFAS
(Sheet 11 of 11)

5.0 Resetting AEAS

INSTRUCTIONS	CONTINGENCY ACTIONS

___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)

___5.2 PRESS "AEAS ACTUATION RESET" (Actuation Cabinet 5).

___5.3 OBSERVE "AEAS GROUP 1 AM513" actuation module "TRIP" light extinguished (Actuation Cabinet 5):

___5.4 PRESS "AEAS ACTUATION RESET" (Actuation Cabinet 6).

___5.5 OBSERVE "AEAS GROUP 1 AM613" actuation module "TRIP" light extinguished (Actuation Cabinet 6):

___5.6 IF AES cannot be reset, Go To Step 11.4.1 contingency step.

___5.7 OBSERVE "AEAS ACTUATION SIG CH 1 TRIP" annunciator reset (C-01, C-37).

INSTRUCTIONS	CONTINGENCY ACTIONS
___5.8 OBSERVE "AEAS ACTUATION SIG CH 2 TRIP" annunciator reset (C-01, D-37).	

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Respond to a Failed Open PORV

JPM Number: S3 Revision: 1/1

Initiated:

John W. Riley – Signature on File	8/3/18
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/18
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/18
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
08/3/2018 jwr	Incorporated NRC comments. Included IC number for initial conditions.	1/1

JPM WORKSHEET

Facility: MP 2 Examinee: _____

JPM Number: S3 Revision: 1/1

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 : 1/1

Initial Conditions:

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

Initiating Cues:

- You are the RO.

Simulator Requirements:

- Reset to any 100% power IC in a normal configuration. IC-064 (password "2018ilt>nrc") contains the conditions below.
- 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% (Event 1).**
- When the examinee places the hand switch for PORV Block Valve, RC-403, in the CLOSE position, insert the following on **Event 2** (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: 1/1

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 **Event #1** malfunction **RC06A at 10%.**			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S3 Revision: 1/1

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 2 (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: 1/1

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. Examinee goes to EOP 2525 "Standard Post Trip Actions."	Critical: Y ☒ N ☐ Y ☒ N ☐ Y ☐ N ☒	Grade: S ☐ U ☐ S ☐ U ☐ S ☐ U ☐
	Cue: This JPM is complete when the examinee trips the reactor and goes to EOP 2525 "Standard Post Trip Actions."			
	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: 1/1

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: 1/1

Initial Conditions:

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

Initiating Cues:

- You are the RO.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Respond to Containment Sump Clogging

JPM Number: S4 Revision: 3/1

Initiated:

John W. Riley – Signature on File	8/9/18
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/18
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/18
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
8/3/2018 jwr	Incorporated comments from the NRC review for the 2018 ILT NRC exam. Changed JPM based on the procedure changing from revision 034-00 to revision 035-00.	3/1

JPM WORKSHEET

Facility: MP-2 Examinee: _____

JPM Number: S4 Revision: 3/1

Task Title: Respond to Containment Sump Clogging

System: Emergency Core Cooling

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 15

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 assessed HPSI pump post SRAS performance and determined that HPSI pump performance is degraded as a result of sump clogging. They will then take action to secure all running containment spray pumps. And when HPSI pump parameters are not improved after securing the containment spray pumps the examinee will take Response Not Obtained actions to throttle HPSI flow to stabilize HPSI pump parameters while maintaining the minimum ECCS flow required for decay heat removal.

Required Materials: (procedures, equipment, etc.)
EOP 2532, "Loss of Coolant Accident", R 035 -00, Effective 7/10/2018
EOP 2541, Appendix 2, Figures – R002, Effective 6/30/2006

General References:
EOP 2532, "Loss of Coolant Accident", R 035 -00, Effective 7/10/2018
EOP 2541, Appendix 2, Figures – R002, Effective 6/30/2006

***** 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 : 3/1

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 45 of EOP 2532).

Initiating Cues: The Unit Supervisor has directed you to perform step 48 of EOP 2532 to monitor containment sump for blockage.

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 @ 95% with a 10 second ramp** on Event Trigger 1 (BT-1). BT-1 95% w/ 10 second ramp.
- Verify keys 30 & 31 in RO key locker.
- Verify keys 30 & 31 returned to RO key locker after running JPM.
- Verify EOP 2541, Appendix 2, "Figures," Figure 5 is clear of any marking in RO and US copy.

*** * * * 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: 3/1

Task Title: Respond to Containment Sump Clogging

START TIME: _____

S T E P # 1	Performance: NOTE: Degradation in HPSI or containment spray pump performance, following SRAS, may be indicative of debris fouling the CTMT sump screen.	Standard: Examinee reads and understands the note.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: The initiating cue directed the examinee to perform step 48 of EOP 2532.			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S4 Revision: 3/1

Task Title: Respond to Containment Sump Clogging

STEP # 2	Performance:	Standard:	Critical:	Grade:
	Monitor Containment Sump Blockage			
	*48. MONITOR for loss of HPSI OR containment spray pump suction. a. CHECK SRAS actuated. b. CHECK for loss of ECCS pump suction as indicated by **ANY** of the following conditions met: • HPSI OR containment spray pumps flow low OR erratic, **NOT** due to high RCS pressure • HPSI OR containment spray pumps discharge pressure low OR erratic • HPSI OR containment spray pumps motor current low OR erratic • Abnormal noise from operating pumps c. NOTIFY TSC indications of containment sump blockage. (continue)	Examinee checks SRAS actuated by CO1 alarms and/or references cue that SRAS verification (step 45 of EOP 2532) has been completed. Examinee checks HPSI and containment spray pumps and observes one or more of the following: • Flow low OR erratic • Discharge pressure low OR erratic • Motor current low OR erratic Examinee notifies TSC of indications of containment sump blockage.	Y ☐ N ☒ Y ☐ N ☒ Y ☐ N ☒	S ☐ U ☐ S ☐ U ☐ S ☐ U ☐
	Cue: When examinee takes action to NOTIFY TSC of indications of containment sump blockage, state that “TSC has been notified”.			
	Comments: HPSI and containment spray pumps flow, discharge pressure and motor current should be erratic (oscillating high to low).			

PERFORMANCE INFORMATION

JPM Number: S4 Revision: 3/1

Task Title: Respond to Containment Sump Clogging

STEP # 3	Performance:	Standard:	Critical:	Grade:
	*48 (continued) **Monitor Containment Sump Blockage** d. CHECK **BOTH** of the following conditions exist: • CTMT pressure can be maintained less than 51 psig without containment spray • At least **TWO** CAR fans are operating, with adequate RBCCW flow e. STOP **ALL** containment spray pumps. f. CHECK HPSI pump parameters improve.	Examinee observes containment pressure is less than 51 psig.	Y ☐ N ☒	S ☐ U ☐
		Examinee checks that at least two CAR fans are operating with adequate RBCCW flow by: • observing CAR fan current meters indicating amps • CAR fan hand switch "run slow" red light lit • CAR fan RBCCW emergency valve open with approximately 2000 gpm flow through each CAR fan.	Y ☐ N ☒	S ☐ U ☐
		Examinee stops all running containment spray pumps by taking the hand switch to the start position (clears start signal which will allow the pump to turn off when taken to stop) and then taking the hand switch to the stop position.	Y ☒ N ☐	S ☐ U ☐
		Examinee checks HPSI pump parameters improve and observes parameters have not improves and goes to RESPONSE NOT OBTAINED f.1	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments:			

PERFORMANCE INFORMATION

JPM Number: S4 Revision: 3/1

Task Title: Respond to Containment Sump Clogging

S T E P # 4	Performance: f.1 IF necessary for pump performance, OR as desired , THEN THROTTLE HPSI flow to maintain **BOTH** of the following: • Minimum ECCS flow requirement for decay heat removal, as specified in EOP 2541, Appendix 2, "Figures," Figure 5 • CET temperature less than OR equal to saturation	Standard: Examinee throttles HPSI injection valves by taking the switch to the "open" position and then to "close" to throttle the HPSI injection valves. Must throttle valves on both headers. **Throttle valves to stop oscillation of HPSI pump discharge pressure, flow and motor amps AND maintains HPSI flow ≥ 250 gpm** HPSI flow ≥ 250 gpm is the minimum ECCS flow requirement for decay heat removal, as specified in EOP 2541, Appendix 2, "Figures," Figure 5.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: Once HPSI pump discharge pressure, flow and motor amps have stabilized AND HPSI flow is ≥ 250 gpm this JPM is complete.			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S4 Revision: 3/1

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: S4 Revision: 3/1

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 45 of EOP 2532).

Initiating Cues: The Unit Supervisor has directed you to perform step 48 of EOP 2532 to monitor containment sump for blockage.

MILLSTONE POWER STATION
EMERGENCY OPERATING PROCEDURE

TIME CRITICAL ACTIONS

Loss of Coolant Accident

EOP 2532

Rev. 035- 00

STOP THINK ACT REVIEW

Approval Date: **06/28/2018**

Effective Date: **07/10/2018**

Level of Use
Continuous

ACTIONS/EXPECTED RESPONSE | RESPONSE NOT OBTAINED

NOTE

Degradation in HPSI or containment spray pump performance, following SRAS, may be indicative of debris fouling the CTMT sump screen.

Monitor Containment Sump Blockage

* 48. MONITOR for loss of HPSI OR containment spray pump suction.

a. CHECK SRAS actuated.

a.1 **PROCEED TO** step 49.

b. CHECK for loss of ECCS pump suction as indicated by **ANY** of the following conditions met:

- HPSI OR containment spray pumps flow low OR erratic, **NOT** due to high RCS pressure
- HPSI OR containment spray pumps discharge pressure low OR erratic
- HPSI OR containment spray pumps motor current low OR erratic
- Abnormal noise from operating pumps

b.1 **PROCEED TO** step 49.

c. NOTIFY TSC indications of containment sump blockage exist.

(continue)

(continue)

ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*__48 (continued) **Monitor Containment Sump Blockage**	
d. CHECK **BOTH** of the following conditions exist: • CTMT pressure can be maintained less than 51 psig without containment spray • At least **TWO** CAR fans are operating, with adequate RBCCW flow	d.1 **PROCEED TO** RNO step 48.f.1.
e. STOP **ALL** containment spray pumps.	
f. CHECK HPSI pump parameters improve.	f.1 IF necessary for pump performance, OR as desired, THEN THROTTLE HPSI flow to maintain **BOTH** of the following: • Minimum ECCS flow requirements for decay heat removal, as specified in EOP 2541, Appendix 2, "Figures," Figure 5 • CET temperature less than OR equal to saturation f.2 IF unable to maintain sump recirc, AND RWST inventory is available, THEN ALIGN HPSI suction to RWST.
g. **GO TO** EOP 2540, "Functional Recovery."	

MILLSTONE POWER STATION
EMERGENCY OPERATING PROCEDURE

STOP THINK ACT REVIEW

Figures

EOP 2541, Appendix 2

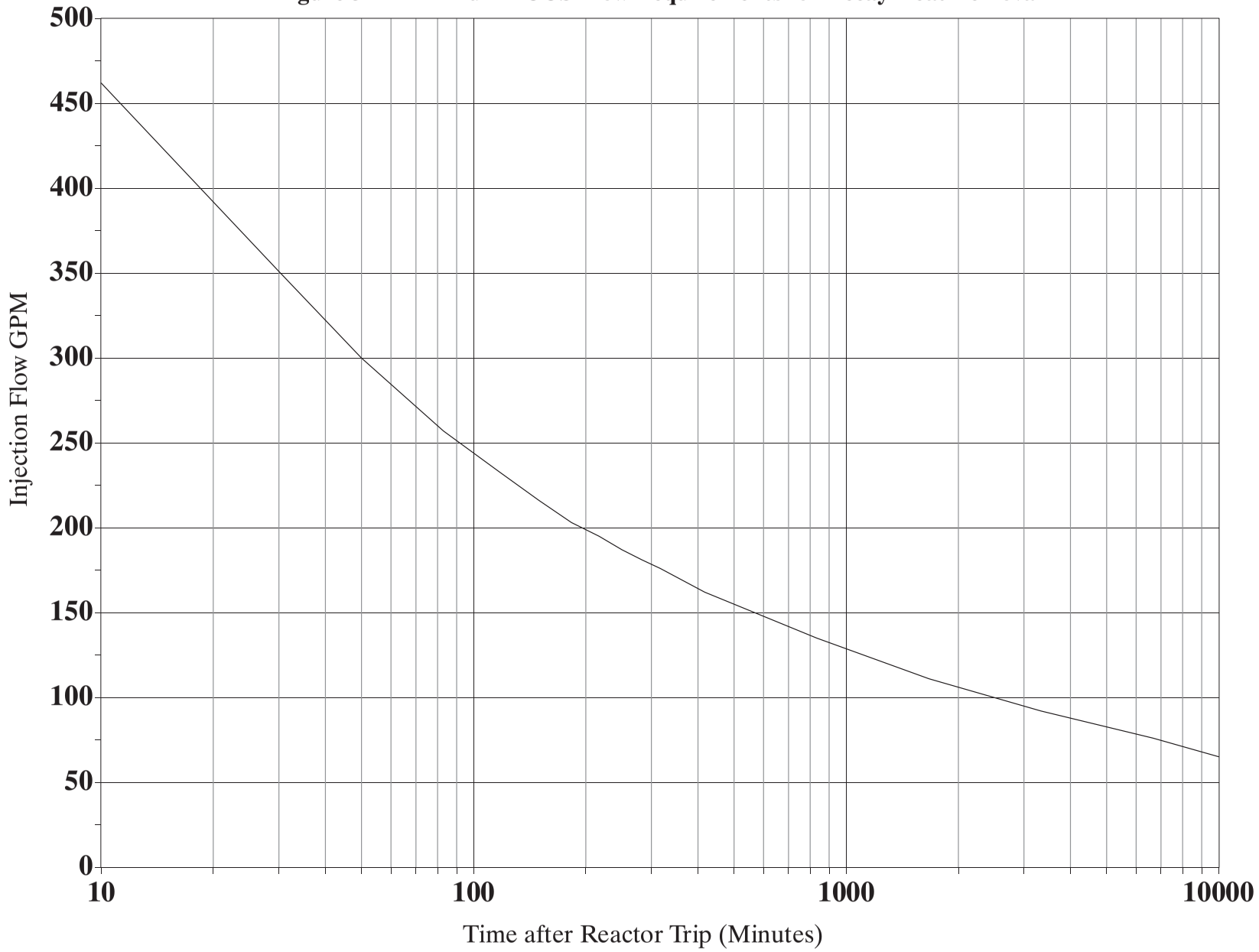
Rev. 002

Approval Date: 06/29/06

Effective Date: 06/30/06

Level of Use
Continuous

Figure 5 – Minimum ECCS Flow Requirements for Decay Heat Removal



JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Containment Isolation due to Fuel Handling Accident

JPM Number: S5 Revision: 2/1

Initiated:

John W. Riley – Signature on File	8/9/18
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/18
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/18
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
08/09/2018 jwr	Incorporated NRC comments from NRC prep week. Made minor editorial changes	2/1

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: S5 Revision: 2/1

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 the Facility 1 CRAC system.

Required Materials: (procedures, equipment, etc.) AOP 2577, "Fuel Handling Accident", R 010, effective TBD

General References: AOP 2577, "Fuel Handling Accident", R 010, effective TBD

***** 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 : 2/1

Initial Conditions:

- Unit 2 is in a Refueling outage with fuel movement occurring in Containment.
- Containment ventilation is aligned purging using main exhaust with both personnel access doors open and the containment purge valves (AC-4, 5, 6 & 7) open.
- 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-193 (password "2018ilt>nrc"), 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. 12A2S3 (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
  - "FUSE REMOVED" magnets removed from AC-4, 5, 6 & 7.
  - Z1 CRAC is in service and Z2 CRAC is not in service.

*** * * * 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: 2/1

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 observes the subject valves are open and 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: If the examinee states the containment purge valves (AC-4, 5, 6 & 7) are open and the procedure states to VERIFY closed and requests guidance from Unit Supervisor, ask the examinee for his recommendation and agree with the examinee's recommendation.			
	Comments: VERIFY means to close if the valves are not closed.			

PERFORMANCE INFORMATION

JPM Number: S5 Revision: 2/1

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 ☐ Y ☒ N ☐	Grade: S ☐ U ☐ 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: 2/1

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. The examinee will determine Facility 1 CRAC can't be placed in "Recirc" and go to Facility 2 to ensure it is in "Recirc".	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: 2/1

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.	Y ☐ N ☒	S ☐ U ☐
	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.**	Y ☒ N ☐	S ☐ U ☐
	Cue:			
	Comments: The examinee should go to Facility 2 and ensure all components are in their proper position. This includes putting them in their proper position.			

PERFORMANCE INFORMATION

JPM Number: S5 Revision: 2/1

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**	Once the Facility 2 filter fan is started the examinee ensures Facility 2 CRAC in recirculation by;		
	• HV-203B, Fan F-21B exhaust damper open	• Verifies HV-203B, Fan F-21B exhaust damper is open by red "OPEN" light lit. The fan must be started to open this damper.	Y ☐ N ☒	S ☐ U ☐
	• Fan F-21B, supply fan running	• **Starts Fan F-21B, supply fan and verifies running by observing red "ON" light lit only.**	Y ☒ N ☐	S ☐ U ☐
	• HV- 206B, Fan F-31B exhaust damper open	• Verifies HV-206B, Fan F-31B exhaust damper is open by red "OPEN" light lit. The fan must be started to open this damper.	Y ☐ N ☒	S ☐ U ☐
	• Fan F-31B, exhaust fan running.	• **Starts Fan F-31B, exhaust fan and verifies running by observing red "ON" light lit only.**	Y ☒ N ☐	S ☐ U ☐
	Cue:			
	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. The examinee may stop the running fans on Facility 1. This is acceptable.			

PERFORMANCE INFORMATION

JPM Number: S5 Revision: 2/1

Task Title: Containment Isolation due to Fuel Handling Accident

STEP #8	Performance:	Standard:	Critical:	Grade:
	3.6 **TCOA:** ENSURE ONE complete facility of CRAC operating, in RECIRC mode (C25A/B) **Facility 2**. • 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 supply and exhaust fans are started and their discharge dampers are verified open then the remaining dampers positions are checked. • 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:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S5 Revision: 2/1

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: 2/1

Initial Conditions:

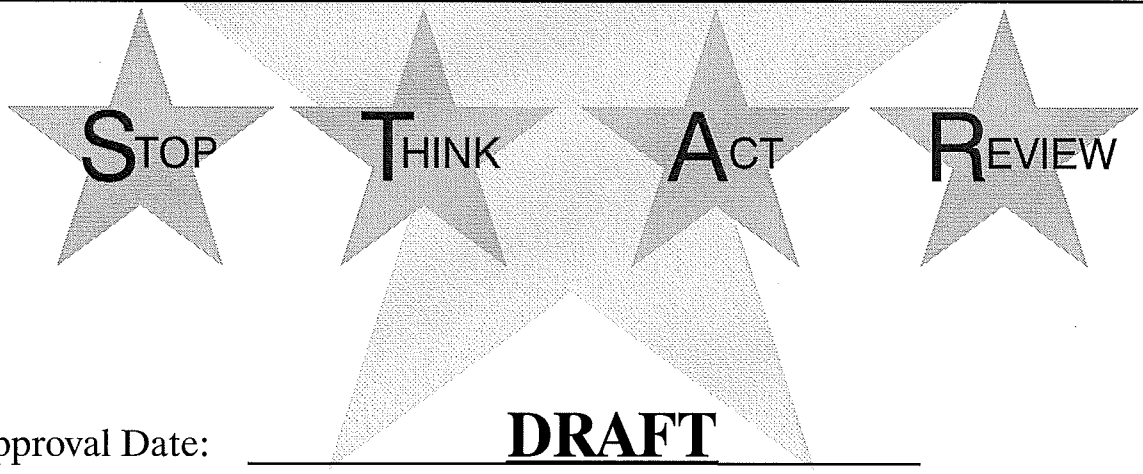
- Unit 2 is in a Refueling outage with fuel movement occurring in Containment.
- Containment ventilation is aligned purging using main exhaust with both personnel access doors open and the containment purge valves (AC-4, 5, 6 & 7) open.
- The Refuel SRO on the bridge just called the Control Room to report 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.

MILLSTONE POWER STATION
ABNORMAL OPERATING PROCEDURE

Fuel Handling Accident

AOP 2577
Rev. 010



Approval Date: **DRAFT**

Effective Date: **TBD**

Level of Use
Continuous

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1.0 PURPOSE

1.1 Objective

This procedure provides instructions for a fuel handling accident in containment or the spent fuel pool. The isolation of containment or spent fuel pool, will occur within 30 minutes following a fuel handling accident.

1.2 Discussion

The design basis fuel handling accident occurs 72 hours following shutdown and results in the failure of all fuel rods.

Control Room radiological exposure following a fuel handling accident in containment is calculated on having at least one train of CRACS operating in the recirculation mode within one hour of the accident.

Containment Closure is established when all of the following conditions exist:

- The equipment door is closed and held in place by a minimum of four bolts or the outage equipment door is installed.
- A minimum of one door in each airlock is closed.
- Each penetration providing direct access from the containment atmosphere to the outside atmosphere is either:
  - Closed by an isolation valve, blind flange, manual valve, or special device, or
  - Capable of being closed by an operable automatic containment purge valve.

1.3 Applicability

This procedure is applicable any time fuel is being moved within the spent fuel pool or containment.

2.0 ENTRY CONDITIONS

Fuel Handling Accident may be entered when **ANY** of the following conditions exist:

- Communications with personnel inside containment indicate a fuel handling accident has occurred
- Communications with personnel inside the spent fuel pool area indicate a fuel handling accident has occurred
- RM-7891, containment refuel floor area radiation monitor, alarms
- RM-8123A or RM-8262A, containment particulate radiation monitor, alarms
- RM-8123B or RM-8262B, containment gaseous radiation monitor, alarms
- RM-7890, personnel access area radiation monitor, alarms and can *not* be attributed to transported radioactive materials in the vicinity
- RM-8240 (east) or RM-8241 (west), containment high range radiation monitor, alarms
- RM-8145A, spent fuel pool particulate radiation monitor, alarms
- RM-8145B, spent fuel pool gaseous radiation monitor, alarms
- RM-8139, spent fuel pool area radiation monitor, alarms
- RM-8142, spent fuel pool area radiation monitor, alarms
- RM-8156, spent fuel pool area radiation monitor, alarms
- RM-8157, spent fuel pool area radiation monitor, alarms

3.0 Fuel Handling Accident in the Containment

INSTRUCTIONS	CONTINGENCY ACTIONS
___3.1 REQUEST Health Physics Department perform the following: • Evacuate personnel from SG primary sides and loop areas • Coordinate an evacuation of personnel in containment	
___3.2 SOUND the Containment Evacuation Alarm for approximately 30 seconds.	
___3.3 ANNOUNCE the following over plant page system: "Attention all personnel, a fuel handling accident has occurred inside Unit 2 containment. All personnel evacuate Unit 2 containment." "SET CTMT closure, closure team respond"	
___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	
___3.5 VERIFY Containment Closure is established.	

INSTRUCTIONS	CONTINGENCY ACTIONS
___3.6 **TCOA:** 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	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."
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	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 3.6.4 START "CRACS FLTR FAN, F–32B, HS–8007."

(continue)

INSTRUCTIONS

CONTINGENCY ACTIONS

___3.6. (continued)

Facility 2

- HV–495, fresh air damper, closed
- HV–496, exhaust air damper, closed
- HV–497, cable vault exhaust damper, closed

___3.7 Refer To MP-26-EPI-FAP06, "Classification and PARs," and DETERMINE reportability requirements.

___3.8 DEVELOP a plan for recovery of the fuel assembly, addressing as a minimum the following items:

- Personnel safety and exposure
- Assembly location
- Assembly physical condition and orientation
- Radiation levels
- Airborne activity levels
- Any other items needed for recovery of the assembly, depending upon the situation.

___3.9 WHEN conditions allow, PERFORM applicable actions to enter containment and recover the fuel assembly.

4.0 Fuel Handling Accident in the Spent Fuel Pool

INSTRUCTIONS	CONTINGENCY ACTIONS
___4.1 REQUEST Health Physics coordinate an evacuation of personnel from the spent fuel pool area.	
___4.2 ANNOUNCE the following over plant page system: "Attention all personnel, a fuel handling accident has occurred inside Unit 2 spent fuel pool. All personnel evacuate Unit 2 spent fuel pool area."	
___4.3 Refer To Attachment 1 and VERIFY EBFS is operating in the AEAS mode.	

INSTRUCTIONS	CONTINGENCY ACTIONS
___4.4 **TCOA:** 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	4.4.1 IF **ANY** CRAC damper is *not* properly positioned, THEN PLACE **BOTH** facilities "NORM/RECIRC MODE" handswitches in "RECIR:" (C25A/B) • HS–8359 • HS–8346 4.4.2 START "CRACS FLTR FAN, F–32A, HS–8006." 4.4.3 IF **ANY** CRAC damper is *not* properly positioned, THEN PLACE **BOTH** facilities "NORM/RECIRC MODE" handswitches in "RECIR:" (C25A/B) • HS–8359 • HS–8346 4.4.4 START "CRACS FLTR FAN, F–32B, HS–8007."

(continue)

INSTRUCTIONS

CONTINGENCY ACTIONS

___4.4. (continued)

Facility 2

- HV–495, fresh air damper, closed
- HV–496, exhaust air damper, closed
- HV–497, cable vault exhaust damper, closed

___4.5 Refer To MP-26-EPI-FAP06, "Classification and PARs," and DETERMINE reportability requirements.

___4.6 Refer To Attachment 2 and VERIFY fuel handling area integrity.

___4.7 DEVELOP a plan for recovery of the fuel assembly, addressing as a minimum the following items:

- Personnel safety and exposure
- Assembly location
- Assembly physical condition and orientation
- Radiation levels
- Airborne activity levels
- Any other items needed for recovery of the assembly, depending upon the situation.

___4.8 WHEN conditions allow, PERFORM applicable actions to enter the spent fuel pool area and recover the fuel assembly.

– FINAL –

Attachment 1
EBFS Operating in AEAS Mode

(Sheet 1 of 1)

Item	Required Condition
At least one OPERABLE EBFS Train operating in the Auxiliary Exhaust Mode	As indicated below for Faciity 1 and / or Facility 2

Item	Location	Required Condition
Facility 1		
EBFS "FAN A, F–25A"	C–01	On
HDR A ISOL, EB–51		Open
EBFS SUCT DMPR, EB–50		Closed
FAN A DIS DMPR, EB–52		Open
FUEL AREA SUCT DMPR, EB–60		Open
CTMT CLEANUP TO EBFS, EB–73		Closed
COND AIR RMVL MILLSTONE STACK, EB–56	C–06	Closed
FUEL HANDLE AREA SUPPLY FAN, F–20		Off
MAKE–UP DMPR, EB–171		Closed
38′6″ Aux Bldg floor plugs (2)		Installed
Facility 2		
EBFS "FAN B, F–25B"	C–01	On
HDR A ISOL, EB–41		Open
EBFS SUCT DMPR, EB–40		Closed
FAN A DIS DMPR, EB–42		Open
FUEL AREA SUCT DMPR, EB–61		Open
CTMT CLEANUP TO EBFS, EB–72		Closed
COND AIR RMVL MILLSTONE STACK, EB–55	C–06	Closed
FUEL HANDLE AREA SPLY FAN, F–20		Off
MAKE–UP DMPR, EB–171		Closed
38′6″ Aux Bldg floor plugs (2)		Installed

Attachment 2
Fuel Handling Area Integrity
(Sheet 1 of 1)

Required Condition: The following doors are closed:			
Door #	**Elev.**	**Type**	**Area Serviced**
(291) 205–14–007	14′6″	Double Door	SFP Skimmer System
(294) 205–14–008	14′6″	Single Door	"A" DG Room
(292) 205–14–016 or (207) 205–14–017	14′6″	Double Door or 8′ Rollup Door	Solidification System or Outside Access
205–14–015	14′6″	8′ Rollup Door	To Drumming Room
(208) 205–14–019	14′6″	16′ Rollup Door	Railway Access
(293) 205–14–021	14′6″	Double Door	Health Physics Area
N/A	38′6″	Double Sliding Door	Elevator
(297) 205–38–001	38′6″	Double Door	North Stairwell
205–56–002	55′6″	Hatch	Top of North Stairwell
205–54–001	55′6″	Single Door	Elevator Machinery Room
(296) 205–38–009	38′6″	Single Door	Aux. & Radwaste HVAC
(295) 205–38–008	38′6″	Double Door/Rollup	
(298) 205–38–003	38′6″	Single Door	Penetration Room
(299) 205–38–005	38′6″	Double Door	Main Exhaust Fan Room
(247) 205–38–007	38′6″	Single Door	South Stairwell
(253) 205–71–001	55′6″	Single Door	Roof above DG Day Tanks
(254) 205–71–002	55′6″	Single Door	Roof above Storage Floor
(274) 205–38–006	38′6″	Single Door	Area below Mezzanine
Refer To OPS–FH 216 for ongoing SFP ventilation boundary work.			

JOB PERFORMANCE MEASURE APPROVAL SHEET

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

JPM Number: S6 Revision: 0/1

Initiated:

John W. Riley – Signature on File	8/8/18
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/18
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/18
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
8/8/18 jwr	Incorporated NRC's comments from NRC prep week. Reordered initiating cues. Other minor editorial changes.	0/1

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: S6 Revision: 0/1

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
- ARP 2590F-025 6.9KV BUS 25A NSST SUPPLY BKR H101 TRIP, R000-01, 2/17/09
- ARP 2590F-016 SYNC SELECTOR SWITCH ON, R000, 5/2/08

***** 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 : 0/1

Initial Conditions:

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

Initiating Cues:

- 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.
- 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.
- Bus transfer can be performed in any order.
- Retest of "RSS SPLY BKR, 22S3-24C-2 (A302)" is required. Cycling the breaker is the retest.
- Retest of "RSS SPLY BKR, 22S2-25A-2 (H103)" is required. Cycling the breaker is the retest.

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: 0/1

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:	Standard:	Critical:	Grade:
	4.9.1 ENSURE RSST, 15G-22S, is available.	Examinee checks voltage on 4.16 KV windings of the RSST.	Y ☐ N ☒	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: Synchronizing scope will alarm on the C08 main board after 55 seconds. This is expected. Examinee will acknowledge.			

PERFORMANCE INFORMATION

JPM Number: S6 Revision: 0/1

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: 0/1

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: Examinee may make a plant announcement similar to the page made when transferring Busses 25A and 25B. This is not procedurally required for transferring Busses 24A and 24C.			

PERFORMANCE INFORMATION

JPM Number: S6 Revision: 0/1

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: 0/1

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 22S2-25A-2 (H103)" slot and turns to the "ON" position. Then observes incoming and running voltages.	Y ☒ N ☐	S ☐ U ☐
	Cue:			
	Comments: Synchronizing scope will alarm on the C08 main board after 55 seconds. This is expected. Examinee will acknowledge.			
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: 0/1

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 • Bus 25A volt meter indicates normal voltage	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 ☒ Y ☐ N ☒	S ☐ U ☐ 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 -	Examinee observes C08-A7 alarm, 6.9KV BUS 25A NSST SUPPLY BKR H101 TRIP. Examinee then acknowledges alarm and refers to the alarm response or states they will refer to the alarm response.	Y ☐ N ☒	S ☐ U ☐
	Cue: This JPM is complete.			
	Comments: C08-A7 alarm, 6.9KV BUS 25A NSST SUPPLY BKR H101 TRIP, is an expected alarm.			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S6 Revision: 0/1

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: 0/1

Initial Conditions:

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

Initiating Cues:

- 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.
- 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.
- Bus transfer can be performed in any order.
- Retest of "RSS SPLY BKR, 22S3-24C-2 (A302)" is required. Cycling the breaker is the retest.
- Retest of "RSS SPLY BKR, 22S2-25A-2 (H103)" is required. Cycling the breaker is the retest.

Setpoint: "SYNC" switch on for greater than 55 sec.

D−4

SYNC SELECTOR SWITCH ON

AUTOMATIC FUNCTIONS

1. None

CORRECTIVE ACTIONS

1. To clear alarm, PLACE "SYNC" switch in "OFF."

SUPPORTING INFORMATION

1. Initiating Device
   - "SYNC" switch
2. Procedures
   - OP 2324, "Turbine Generator and Exciter"
3. Control Room Drawings
   - 25203−32002 Sheet 17
   - 25203−32002 Sheet 18
4. Annunciator Card Location: TB24−J8

Level of Use Reference

Setpoint: Trip of breaker H101

A–7

**6.9KV BUS 25A
NSST SUPPLY
BKR H101 TRIP**

AUTOMATIC FUNCTIONS

1. Possible turbine and reactor trip.
2. If trip is not caused by overcurrent or ground fault on 6,900 volt bus, possible automatic transfer to RSST.
3. If bus 25A is deenergized, the following loads are lost:
   - Condensate pump P2A
   - Condensate pump P2B
   - Reactor coolant pump P40A
   - Reactor coolant pump P40C
   - NSST feeder to bus 25A (2S2–25A–2)
   - Potential transformer, 25A–1H/NSST
   - RSST feeder to bus 25A (22S2–25A–2)

CORRECTIVE ACTIONS

1. IF reactor tripped, Go To EOP 2525, “Standard Post Trip Actions.”
2. IF alarm is due to a normal transfer from NSST, 15G–2S, to RSST, 15G–22S, CLEAR trip alarm on breaker.
3. OBSERVE and RECORD relay targets and DETERMINE cause of trip.
4. Refer To OP 2342, “6,900 Volt Electrical System” and PERFORM the following:
   - 4.1 TRY to restore power to 6.9 KV bus 25A.
   - 4.2 RESET targets and RESTORE system to normal operation.
5. IF power can not be restored to 6.9 KV bus 25A, Go To EOP 2528, “Loss of Offsite Power/Loss of Forced Circulation.” ①

Level of Use
Reference

SUPPORTING INFORMATION

1. Initiating Devices
   - Breaker “open” contacts
   - Overcurrent − 51 phase A, phase B, phase C
   - Ground Fault − 51GS
   - Generator Lockout − 86G1A−86G2A
   - Generator Tone Trip − 94F−1
   - NSST Lockout from Differential Overcurrent −86T1−86T3
2. Procedures
   - OP 2342, “6,900 Volt Electrical System”
   - EOP 2528, “Loss Of Offsite Power Loss Of Forced Circulation”
   - EOP 2525, “Standard Post Trip Action”
3. Control Room Drawings
   - 25203−30001
   - 25203−30003
   - 25203−30042, sheets 1 − 4
   - 25203−32001, sheet 3
4. Annunciator Card Location: TB24−J13

MILLSTONE POWER STATION
SYSTEM OPERATING PROCEDURE

6900 Volt Electrical System

OP 2342
Rev. 015

STOP THINK ACT REVIEW

Approval Date: 05/11/17

Effective Date: 05/18/17

Level of Use
Continuous

Millstone Unit 2
System Operating Procedure

6900 Volt Electrical System

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1. PURPOSE

1.1 **Objective**

Provide instructions for the start−up, shutdown, and normal operation of the 6,900 Volt Electrical System.

1.2 **Discussion**

During power operation the 6,900 Volt System is normally aligned as follows:

- NSST, 15G−2S, is in service
- "NSS SPLY BKR, 2S2−25A−2 (H101)" and "NSS SPLY BKR, 2S2−25B−2 (H206)" are closed
- RSST, 15G−22S, is energized
- "RSS SPLY BKR, 22S2−25A−2 (H103)" and "RSS SPLY BKR, 22S2−25B−2 (H204)" are open
- 6,900 volt bus 25A and 25B are in service
- 125 VDC control power is in service (D1216 for 25A and D2216 for 25B)

During plant shutdown the 6,900 Volt System is normally aligned as follows:

- RSST, 15G−22S, is in service
- "RSS SPLY BKR, 22S2−25A−2 (H103)" and "RSS SPLY BKR, 22S2−25B−2 (H204)" are closed
- "NSS SPLY BKR, 2S2−25A−2 (H101)" and "NSS SPLY BKR, 2S2−25B−2 (H206)" are open
- 6,900 volt bus 25A and 25B are in service
- 125 VDC control power is in service

Operation of main generator, 15G−2U, lockout relay results in the following:

- 6,900 volt bus feeder breakers “NSS SPLY BKR, 2S2−25A−2 (H101)” *and* “NSS SPLY BKR, 2S2−25B−2 (H206)” will open
- 6,900 volt bus feeder breakers “RSS SPLY BKR, 22S2−25A−2 (H103)” *and* “RSS SPLY BKR, 22S2−25B−2 (H204)” will close
- 6,900 volt buses being supplied from RSST, 15G−22S

In order to prevent excessive phase displacement from developing between load and source, a timer is included in the transfer scheme. If transfer does *not* occur within a 6 hertz dead time, it is inhibited.

6.9 kV busses 25A and 25B have been identified as single point vulnerabilities. Basis for this declaration can be found under the “SPV basis” field on the Master Equipment List (MEL).

2. PREREQUISITES

2.1 General

2.1.1 125 VDC control power and RSST are available to support 6,900 Volt Electrical System operation.

- D1216, 125 VDC Bus 25A Control Power
- D2216, 125 VDC Bus 25B Control Power

2.1.2 Prior to energizing a dead 6,900 volt bus, *all* breakers on the bus are open.

2.1.3 All switching must be cleared with CONVEX prior to energizing or deenergizing RSST, 15G–22S.

2.2 Documents

2.2.1 OP 2347D, "Backfeeding Unit 2"

2.2.2 OP 2348A, "6,900 and 4,160 Volt Breaker Operation"

2.2.3 Operations Critical Drawings

2.3 Definitions

2.3.1 Single Point Vulnerability (SPV) – A single component whose failure can cause a plant trip or entry into a LCO with a less than eight hour shutdown requirement.

3. PRECAUTIONS

3.1 Prior to energizing equipment, Switching and Safety Tag Logs must be reviewed to verify clearance of all tags on equipment to be energized.

3.2 OP–AP–300, "Reactivity Management," considerations specific to this procedure include the following:

- Plant personnel demonstrate a reactivity conscious attitude in day to day work
- Planned activities that affect reactivity are discussed in advance. Post–job briefings are used, when appropriate, to capture lessons learned
- Human performance tools are used to enhance reactivity management

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.

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.

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"

4.5.5 TURN "SYN SW 22S2−25A−2 (H103)" to "ON" and OBSERVE indication of incoming and running voltages.

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.

4.5.6 CLOSE "RSS SPLY BKR, 22S2−25A−2 (H103)" and CHECK the following:

- "NSS SPLY BKR, 2S2−25A−2 (H101)" open
- Bus 25A volt meter indicates normal voltage

4.5.7 TURN “SYN SW 22S2−25A−2 (H103)” to “OFF.”

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).”

– End of Section 4.5 –

MILLSTONE POWER STATION
SYSTEM OPERATING PROCEDURE

4160 Volt Electrical System

OP 2343

Rev. 025

STOP THINK ACT REVIEW

Approval Date: 05/31/17

Effective Date: 06/07/17

Level of Use
Continuous

Millstone Unit 2
System Operating Procedure

4160 Volt Electrical System

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OP 2343–001, "Component Alignment for Shifting 24E to 24C"

OP 2343–002, "Component Alignment for Shifting 24E to 24D"

1. PURPOSE

1.1 **Objective**

This procedure provides instructions for the startup, shutdown, normal and casualty operation of the 4,160 Volt Electrical System.

1.2 **Discussion**

During periods such as startup and shutdown, when NSST is *not* available, power is supplied from RSST to buses 24C and 24D. Bus ties to 24A and 24B supply power to those buses. Bus 24E may be fed from either 24C or 24D. A separate feed is provided to bus 24E from the Unit 3 RSST or NSST through bus 34A or 34B.

The crosstie from Unit 3 bus 34A or 34C is the second offsite source of power for Unit 2. The crosstie and Bus 24E must be capable of being manually aligned to energize bus 24E within 3 hours of a loss of power to energize 24E or relieve a DG. the Unit 2 NSST is *not* an acceptable second offsite power source during normal operation. However once the main generator disconnect links have been removed and the backfeed lineup established, the Unit 2 NSST is an acceptable offsite power source.

The SBO EDG connects to the crosstie from Unit 3, bus 24E is required to remain capable of being manually aligned to the SBO EDG within one hour for SBO concerns. There are no actions for the SBO EDG aspect of the crosstie. SBO is *not* a FSAR Chapter 14 event.

The MP2 Appendix R analyses assume that charging is lost at the time of the event (fire and plant trip) and is then restored within 3 hours of the plant trip. This is necessary to prevent a complete loss of pressurizer water volume.

Only one source of power from Unit 3 can be aligned to Unit 2 at a time. A505 is interlocked such that the line coming in must be energized and only one source of power is supplying power to the crosstie.

The “B” service water pump and the “B” RBCCW pump are credited in PRA modeling for RCP seal cooling (LOCA preventer) as an immediate replacement for the running aligned pump. When 24E is to be deenergized, run an EOOS risk assesment to verify no adverse impacts on the overall risk profile.

During normal at power operation, expected plant conditions are as follows:

- NSST, 15G−2S, is in service.
- The following breakers are closed:
  - "NSS SPLY BKR, 2S3−24A−2 (A102)"
  - "NSS SPLY BKR, 2S3−24B−2 (A206)"
  - "24A/24C TIE BKR, 24C−1T−2 (A304)"
  - "24B/24D TIE BKR, 24D−1T−2 (A410)"
  - "24C/24E TIE BKR, 24C−2T−2 (A305)"
- RSST, 15G−22S, is energized.
- "RSS SPLY BKR, 22S3−24C−2 (A302)" and "RSS SPLY BKR, 22S3−24D−2 (A411)" are open.
- 4,160 volt buses 24A, 24B, 24C, 24D, 24E and 34A or 34B, are in service.
- Bus 24E is normally energized and connected to bus 24C through "24C/24E TIE BKR, 24C−2T−2 (A305)" or bus 24D through "24D/24E TIE BKR, 24D−2T−2 (A408)." Electrical and mechanical key interlocks prevent connecting bus 24E to both buses 24C and 24D, simultaneously.
- "24E/34B TIE BKR, 34B−24E−2 (A505)" from bus 34 A or 34B to bus 24E is open.
- "DG A FDR BKR, 15G−12U−2 (A312)" is open.
- "DG B FDR BKR, 15G−13U−2 (A401)" is open.
- 125 VDC control power is in service.

During shutdowns, expected plant conditions are as follows:

- RSST, 15G–22S, is in service.
- The following breakers are closed:
  - "RSS SPLY BKR, 22S3–24C–2 (A302)"
  - "RSS SPLY BKR, 22S3–24D–2 (A411)"
  - "24A/24C TIE BKR, 24C–1T–2 (A304)"
  - "24B/24D TIE BKR, 24D–1T–2 A410)"
- *One* of the following breakers is closed:
  - "24C/24E TIE BKR, 24C–2T–2 (A305)"
  - "24D/24E TIE BKR, 24D–2T–2 (A408)"
- "NSS SPLY BKR, 2S3–24A–2 (A102)" and "NSS SPLY BKR, 2S3–24B–2 (A206)" are open.
- 4,160 volt buses 24A, 24B, 24C, 24D, 24E and 34A or 34B, are in service.
- "24E/34B TIE BKR, 34B–24E–2 (A505)" from bus 34 A or 34B to bus 24E is open.
- "DG A FDR BKR, 15G–12U–2 (A312)" is open.
- "DG B FDR BKR, 15G–13U–2 (A401)" is open.
- 125 VDC control power is in service.

4.16 kV busses 24C and 24D have been identified as single point vulnerabilities. Basis for this declaration can be found under the "SPV basis" field on the Master Equipment List (MEL).

2. PREREQUISITES

2.1 **General**

2.1.1 125 VDC control power is available to support 4,160 Volt Electrical System Operation on applicable bus:

- Bus 24A Control Power – Panel D11, Breaker D1116
- Bus 24B Control Power – Panel D21, Breaker D2115
- Bus 24C Control Power – Panel DV10, Breaker DV1021
- Bus 24D Control Power – Panel DV20, Breaker DV2021

2.1.2 Emergency Diesel Generators are available as required.

2.1.3 Fire Detection System is available and in service.

2.2 **Documents**

2.2.1 AOP 2583, “Loss of All AC Power During Shutdown Conditions”

2.2.2 OP 2315D, “Vital Electrical Switchgear room Cooling Systems”

2.2.3 OP 2325A, “Circulating Water System”

2.2.4 OP 2344A, “480 Volt Load Centers”

2.2.5 OP 2346A, ““A” Emergency Diesel Generator”

2.2.6 OP 2346C, ““B” Emergency Diesel Generator”

2.2.7 OP 2347D, “Backfeeding Unit 2”

2.2.8 OP 2348A, “6,900 and 4,160 Volt Breaker Operation”

2.2.9 OP 2384, “ESAS Operation”

2.2.10 EOP 2525, “Standard Post Trip Actions”

2.2.11 EOP 2528, “Loss of Offsite Power/Loss of Forced Circulation”

2.2.12 EOP 2541, Appendix 1, “Diagnostic Flowchart”

2.2.13 SP 2619G, “AC Electrical Sources Inoperability”

2.3 **Definitions**

2.3.1 Single Point Vulnerability (SPV) – A single component whose failure can cause a plant trip or entry into a LCO with a less than eight hour shutdown requirement.

3. PRECAUTIONS

3.1 When restoring RSST to service on the emergency buses 24C or 24D following a LNP, undervoltage relays on the ESAS actuation cabinets for the respective emergency bus must *not* be reset until immediately prior to energizing bus from the RSST. This prevents simultaneous starting of all facility related safeguard equipment in the event of a SIAS actuation, while operating on diesel generator only.

3.2 Prior to energizing equipment, Switching and Safety Tag Logs must be reviewed to verify clearance of all tags on equipment to be energized.

3.3 Synchronizing switch should be in "OFF" when *not* in use.

3.4 Circuit breakers required to be isolated must have control power disconnected and breaker racked out *and* tagged.

3.5 When taking the plant off–line, the 4,160 volt buses must be manually transferred from the NSST to the RSST at equal to or greater than 10% turbine load (90 MWe).

3.6 Before energizing any bus, a visual inspection must be made to ensure the following:

- All portable grounds have been removed.
- Bus compartment panels have been replaced.
- All breakers on the bus are OPEN, RACKED DOWN or in TEST.
- All foreign objects are removed from in and around breaker compartments.
- All protective relay targets and lockout relays are reset.
- Potential transformer compartments are in the operating position (inserted) and secondary fuses are installed and "ON."

3.7 OP–AP–300, “Reactivity Management,” considerations specific to this procedure include the following:

- Plant personnel demonstrate a reactivity conscious attitude in day to day work.
- Planned activities that affect reactivity are discussed in advance. Post–job briefings are used, when appropriate, to capture lessons learned.
- Human performance tools are used to enhance Reactivity Management.

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).

4.9.1 ENSURE RSST, 15G−22S, is available.

4.9.2 ENSURE "RSS SPLY BKR, 22S3−24C−2 (A302)" is open AND control power is available.

4.9.3 ENSURE "24A/24C TIE BKR, 24C−1T−2 (A304)" is closed.

4.9.4 PLACE "SYN SW 22S3−24C−2 (A302)" to "ON" and OBSERVE indication of incoming and running voltages.

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 SPLY BKR, 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.

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.

4.9.6 CLOSE "RSS SPLY BKR, 22S3−24C−2 (A302)" and OBSERVE indication for normal response.

4.9.7 OBSERVE bus meter for voltage.

4.9.8 PLACE “SYN SW 22S3−24C−2 (A302)” to “OFF.”

4.9.9 PLACE “NSS SPLY BKR, 2S3−24A−2 (A102)” to “OPEN” and CHECK amber light, *not* lit.

– End of Section 4.9 –

MILLSTONE POWER STATION

ABNORMAL OPERATING PROCEDURE

Loss of 120 VAC Vital Instrument Panel VA-10 [♣]

AOP 2504C

Rev. 005 – 00

STOP THINK ACT REVIEW

Approval Date: 5/31/17

Effective Date: 6/1/17

Level of Use
Continuous

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1.0 PURPOSE

1.1 Objective

This procedure provides instructions to be performed upon the loss of 120 Volt AC Vital Instrument Panel VA-10.

1.2 Discussion

The loss of VA-10 causes the loss of many annunciators, indications, PPC inputs, interlocks and controls. Equipment that affects Unit operation includes the following:

- FW-51A, "#1 SG FRV," fails as is on loss of power and closes when power is restored
- FW-41A, "#1 SG FRV" bypass, closes and control from C-05 is lost
- "A" Charging Pump loses the plunger flush pump
- Charging Pump suction swaps from VCT to RWST
- If Channel "X" is controlling pressurizer level, charging will go to maximum and letdown will go to minimum
- RCS Loop 1 control temperature inputs to reactor regulating Tavg fail low. These temperature inputs are automatically deselected from reactor regulating to enable an accurate Tavg calculation and quick open signal capability
- Auto control of pressurizer sprays is lost. PIC-100Y can *not* communicate with the RC-100F controller. Pressurizer spray control is "MANUAL" only from HIC−100F
- All pressurizer heaters are deenergized due to channel "X" pressurizer level low−low heater cutout. To restore pressurizer heaters, the heater selector switch must be placed in the channel "Y" position
- #1 SG "ATMOS DUMP MS 190A" control from C-05 and C−21 is lost
- #1 Aux feed reg valve fails open and manual control from C-05 is lost
- All functions of Facility 1 ESAS and AFW are lost. If an accident occurs, Facility 1 safety systems will *not* perform **ANY** automatic actions

1.3 Applicability

This procedure applies during MODEs 1, 2 and 3. This procedure also applies in MODE 4 when core cooling is accomplished using the steam generators (*not* SDC).

2.0 ENTRY CONDITIONS

Entry Conditions to this procedure may include one or more of the following:

- AOP 2501, "Diagnostic for Loss of Electrical Power," has directed use of this procedure
- Loss of power to all channel "A" indications
- Any of the following C-08 annunciators, lit:
  - "INVERTER INV-1 TROUBLE" (A-25)
  - "VA-10 ON ALTERNATE SUPPLY INV-5" (A-26)
  - "INVERTER INV-5 TROUBLE" (A-27)

3.0 Loss of 120 VAC Vital Instrument Panel VA-10

INSTRUCTIONS CONTINGENCY ACTIONS

CAUTION

Charging and letdown must be isolated due to loss of LC-227 which will swap charging pump suction to the RWST.

___3.1 PERFORM the following to secure charging and letdown:

a. CLOSE CH-515, "LTDN ISOL."

b. PLACE all charging pumps in "PULL TO LOCK."

CAUTION

Due to the loss of SPEC 200 power, pressurizer spray control is in "MANUAL" only.

___3.2 IF forcing sprays,
STOP forcing sprays.

___3.3 PERFORM the following:

a. ENSURE the following:

- Pressurizer pressure controller on channel "Y"
- Pressurizer level control on channel "Y"
- Pressurizer heater selector switch on channel "Y"

b. Manually CONTROL pressure by **ANY** of the following:

- CYCLE pressurizer heaters
- PLACE HIC-100F in manual and ADJUST pressurizer spray

INSTRUCTIONS CONTINGENCY ACTIONS

CAUTION

The #1 SG AFW reg valve is failed open. If AFW is in service a SG level transient will occur.

___3.4 IF AFW is in service, PERFORM the following:

a. DISPATCH an operator to take manual control of FW-43A, "AFW-FCV."

b. ESTABLISH communication between local operator and Control Room and direct operator to manually position valve as required to control #1 SG level

c. CONTROL #2 SG level from C-05.

d. Go To step 3.8.

CAUTION

FW-51A, "#1 SG FRV," has failed "as is" which may cause a SG level transient. The valve will *not* close on a Reactor trip.

FW-51A, "#1 SG FRV," position may drift until the valve is placed in LOCAL/MANUAL.

___3.5 To control #1 SG level, PERFORM the following:

a. PRESS "A" **AND** "B" SGFP manual pushbutton.

b. PRESS "RAISE" or "LOWER" as necessary to change feed flow.

INSTRUCTIONS

CONTINGENCY ACTIONS

___3.6 DISPATCH an operator to FW-51A, "#1 SG FRV," and PERFORM the following:

a. ESTABLISH continuous communications between FW-51A, "#1 SG FRV," and Control Room.

b. Refer To OP 2385, "Feedwater Control System Operation," and PLACE FW-51A, "#1 SG FRV," in local manual control.

CAUTION

Facility 1 ESAS and AFAS functionality is *not* available.

___3.7 IF #1 SG level *not* controllable, PERFORM the following:

a. TRIP the reactor.

b. Go To EOP 2525, "Standard Post Trip Actions."

INSTRUCTIONS

CONTINGENCY ACTIONS

___3.8 DISPATCH an operator to VA-10 to perform the following (east DC switchgear room and 38′6″ west 480V load center room):

a. DETERMINE if there is obvious physical damage to **ANY** of the following:

- Inverter 1 (INV–1)
- Inverter 5 (INV–5)
- Static Switch (VS–1)
- VA–10 Breaker Panel

NOTIFY the US.

b. At the direction of the SM/US, OPEN breakers.

c. ENSURE supply breaker is open.

___3.9 REQUEST Electrical Maintenance to troubleshoot the bus.

NOTE

Step 3.10 is being performed to ensure proper power restoration to ESF actuation cabinet 5.

___3.10 Refer To OP 2384, "ESAS Operation," and DEENERGIZE ESF actuation cabinet 5.

INSTRUCTIONS CONTINGENCY ACTIONS

CAUTION

If signals to the ESAS sensor cabinet are *not* cleared,
ESAS may actuate when power to actuation cabinet 5 is restored.

NOTE

The breakers in the following step energize instrumentation only.
No equipment will energize or actuate.

___3.11 WHEN power available to restore VA-10,
PERFORM the following
(east DC switchgear room):

a. ENSURE all breakers open.

b. At the direction of the US,
CLOSE supply breaker.

c. CLOSE the following breakers:

- 1003
- 1013
- 1014
- 1015

___3.12 Refer To OP 2384, "ESAS Operation," and RESTORE power to ESF actuation cabinet 5.

CAUTION

Closing breaker 1008 on VA-10 may initiate auto AFW.

___3.13 PLACE Facility 1 AFW "OVERRIDE/MAN/START" switch in pull-to-lock.

INSTRUCTIONS CONTINGENCY ACTIONS

CAUTION

1. FW-51A will ramp closed if in "AUTO" when power from VA-10 is restored. Pressing "DOWNCOMER RESET" stops closure.
2. FW-51A will *not* ramp closed if it is in local manual control when power from VA-10 is restored.
3. FW-51A may reposition upon reset, even when in LOCAL/MANUAL, due to slack in manual operator.

___3.14 RETURN control of FW-51A, "#1 SG FRV" to control room as follows:

a. PRESS and HOLD #1 SG "DOWNCOMER RESET" pushbutton.

b. CLOSE breaker 1008 on VA-10 (east DC switchgear room).

c. RELEASE #1 SG "DOWNCOMER RESET" pushbutton.

d. RESTORE Facility 1 AFW "OVERRIDE/MAN/START" switch to "MAN" after reset.

e. Refer To OP 2385, "Feedwater Control System Operation," and TRANSFER control of FW-51A, "#1 SG FRV" to control room.

___3.15 Refer To OP2321, "Main Feedwater," and ENSURE "A" and "B" SGFPs are in "AUTO".

___3.16 Refer To Attachment 2, "120 VAC Vital Instrument Panel VA-10 Load List," and CLOSE breakers as directed by SM/US.

INSTRUCTIONS CONTINGENCY ACTIONS

CAUTION

Closing breaker 1001 on VA-10 will cause "A" Hydrogen Analyzer to auto–start. I&C support will be required to secure the Hydrogen Analyzer.

___3.17 REQUEST I&C to perform necessary actions to secure the "A" Hydrogen Analyzer.

___3.18 NOTIFY I&C and Electrical Maintenance of loads from VA-10 that can *not* be restored.

___3.19 PERFORM the following:

a. RESET radiation monitors RM-8240 and RM-9799A.

b. RESTORE CRACS as directed by SM.

c. RESTORE Containment purge as directed by SM.

___3.20 Refer To OP 2302A, "Control Element Drive System," and CLOSE the affected TCBs.

CAUTION

Charging piping may contain a significant quantity of borated water from the RWST.

___3.21 Refer To OP 2304A, "Volume Control Portion of the Chemical and Volume Control System" and ESTABLISH charging and letdown.

___3.22 RESTORE pressurizer heaters and sprays to normal system alignment.

INSTRUCTIONS CONTINGENCY ACTIONS

NOTE

1. Technical Specification applicability may be affected by current plant status. Consideration should be given to equipment out of service prior to the event, equipment lost during the event, redundant equipment operability and redundant power supplies.
2. SIT annunciators for pressure high/low and level high/low may be used as a backup method for verifying SIT pressure (PI-311/PI-321 lost) or level (LI-311/LI-321 lost)

___3.23 As a minimum, REVIEW the Technical Specifications in Attachment 1 for applicability.

___3.24 Refer To EP−AA−303, "Equipment Important to Emergency Response," and PERFORM applicable actions with RM−8168 non−functional.

___3.25 Refer To RAC 14, "Non−Emergency Station Events," and PERFORM applicable actions for EP−AA−303 Category "A" equipment (RM−8168) out of service.

− FINAL −

Attachment 1
Electrical Related Technical Specifications/Technical Requirements

(Sheet 1 of 1)

Number	Technical Specification Title
3.3.1.1	Reactor Protective Instrumentation
3.3.2.1	Engineered Safety Feature Actuation System Instrumentation
3.3.2.2	Engineered Safety Feature Actuation System Sensor Cabinet Power Supply Drawers
3.3.3.1	Radiation Monitoring Instrumentation
3.3.3.5	Remote Shutdown Instrumentation
3.3.3.8	Accident Monitoring
3.5.1	Safety Injection Tanks (SITs)
3.5.2	ECCS Subsystems - $T_{avg} \geq 300°F$
3.6.2.1	Containment Spray and Cooling Systems
3.6.3.1	Containment Isolation Valves (spec 200 cabinet deenergized, High Rad and CIAS signal can *not* actuate EB-99)
3.6.4.1	Combustible Gas Control - Hydrogen Monitors
3.6.5.1	Enclosure Building Filtration System (EB-50 fails locked)
3.7.1.2	Auxiliary Feedwater Pumps
3.7.1.6	Main Feedwater Isolation Components (MFICs) (spec 200 cabinet deenergized, MSI signal can *not* actuate FW-51A)
3.7.6.1	Control Room Emergency Ventilation System
3.8.1.1	AC Sources
3.8.2.1	AC Distribution - Operating
3.8.2.1A	AC Distribution - Operating
3.9.2	Refueling Operations - Instrumentation

Attachment 2
120 VAC Vital Instrument Panel VA-10 Load List

(Sheet 1 of 9)

CIRCUIT	LOCATION	CIRCUIT DESCRIPTION	POWER LOSS RESULTS, INDICATIONS	PRINT#
1001	RC05E	AVMS	Loss of signal to annunciators.	28500, Sh. 193, 194, 298, 299
	C-101	RM-9799A	RM-9799A fails low CRAC shifts to recirculation.	28500 Sh. 660
		AE-8152, hydrogen analyzer A	Loss of recorder (RC-101A) indication.	28500 Sh. 854
		PT-8238, containment pressure		28500 Sh. 860
		LT-8242, containment level		28500 Sh. 864
		LIC-8242, cont. sump level	Loss of indication.	
		RC-101C, containment and stack radiation recorder	Loss of recorder indication.	28500, Sh. 862
		X-8240, containment high rad. signal to Hydrogen purge isolation valve EB-99	Loss of signal for isolation, annunciator, & PPC.	
		RIC-8168, Unit 2 stack high range radiation monitor	Loss of signal to purge valves, annunciator, & PPC.	28500 Sh. 858
		RY-8240, containment high range radiation monitor	Loss of signal to PPC.	28500 Sh. 862
		AY-8152, hydrogen analyzer A		28500 Sh. 854
1002	C1110	ICC Cabinet A	Loss of indication, cabinet cooling, HJTC Heaters, and inputs to PPC alarm.	39318 Sh. 55A, 55B, and 56A
1003	C-04R	RPS Ch. A (SE-134)	Loss of speed sensing Ch A, RPS Ch A RCP P40A speed trip & low speed indication.	28500 Sh. 120
	RC 30A	LT-1113A and LT-1123A SG level	Loss of indicators LI-1113A, LI-1123A (C-05), LI-1113A-2 (C-21), and signal to Ch A RPS & PPC and Auto AFW in 2/3 Logic.	28500 Sh. 370, 380
		PT-1013A and PT-1023A SG pressure	Loss of indicators PI-1013A & PI-1023A, and signal to Ch A RPS, ESAS & PPC.	28500 Sh. 340, 355
		LT-311 & LT-321 #1 & #2 SIT level	Loss of indicators LI-311 & LI-321, and signal to PPC.	28500 Sh. 267, 273
		PT-311 & PT-321, #1 & #2 SIT pressure	Loss of indicators PI-311 & PI-321, and signal to PPC.	28500 Sh. 266, 272
		JI-009, JI-010, JR-009, power range control channels X and Y	Loss of signal to auto AFW initiation for Z1 low alarm contact.	28500 Sh. 16

Attachment 2
120 VAC Vital Instrument Panel VA-10 Load List

(Sheet 2 of 9)

CIRCUIT	LOCATION	CIRCUIT DESCRIPTION	POWER LOSS RESULTS, INDICATIONS	PRINT#
1003	RC 30A	PT-100X, pressurizer pressure	Loss of signal to RC-100E, RRS, PIC-100X, PR-100, annunciator, & PPC.	28500 Sh. 50A through 50F
		PT-102A, pressurizer pressure	Loss of signal to RPS Ch A: TMLP Ch. A trip input, pressurizer pressure Ch. A SIAS input. Loss of ATWS/DSS Ch. A, PI-102A and PI-102AB (C-21), annunciator, PPC & ICC.	28500 Sh. 53A, 53B
		P-8113,containment pressure Loop	Loss of indication (C-01) and signal to ESAS, PPC, & UR9862.	28500 Sh. 840
		PT-8238, containment pressure (Fac Z1)	Loss of signal to PPC and RC101A (C101).	28500 Sh. 860
		FT-5277A & FT-5278A, AFW to #1 & #2 SG	Loss of indicators FI-5277A-1, FI-5278A-1 (C-05), FI-5277A-2 (C-21) and signal to PPC.	28500 Sh. 595, 597
		HV-5276, #1 AFW FRV	Loss of positioner HIC-5276A (C-05) & HIC-5276B (C-21) and control for HV-5276 (FW-43A)	28500 Sh. 603A, 603B
		FE-8412	Loss of F-8412 indication on RR-8132, F-16 and F-20 trip and 2-HV-710 closes.	28500 Sh. 1155
	RC 30A-1	SG Level Auto AFW Initiation (Z1)	Loss of Z1 Auto AFW Initiation, channel trip and microprocessor fail indications at C-517.	28500 Sh. 370B
		TE-112CA T_C loop 1A TE-122CA T_C loop 2A	Loss of signal to TI-112CA, TI-122CA (C-03), Ch A RPS, & PPC.	28500 Sh. 79
		TE-112HA T_H loop SG #1 TE-122HA T_H loop SG #2	Loss of signal to indication (C-03), Ch A RPS, & PPC.	28500 Sh. 85
		TE-115, loop 1A cold leg temperature	Loss of signal to ICC, C12A, TR-115 (C-03), TTI-115 (C-21), & annunciator.	28500 Sh. 75B
		PT-103-1, pressurizer pressure	Loss of signal to ICC, PI-103-1 (C-03), PI-10301B (C-21), RC-402, SI-614, SI-624,annunciator, & PPC.	28500 Sh. 75C, 75D
		T-111Y, loop 1A cold leg temperature	Loss of signal to RRS TI-1117 (C-03), annunciator, & PPC.	28500 Sh. 75A

Attachment 2
120 VAC Vital Instrument Panel VA-10 Load List

(Sheet 3 of 9)

CIRCUIT	LOCATION	CIRCUIT DESCRIPTION	POWER LOSS RESULTS, INDICATIONS	PRINT#
1003	RC 30A-1	PDT-111A & PDT-121A reactor coolant flow (pressure differential)	Loss of signal to PDI-101A, RPS, & PPC.	28500 Sh. 72
		RE-8240, high range radiation monitor	Loss of high radiation and CIAS signal to hydrogen purge isolation, 2-EB-99 (HV-8377).	28500 Sh. 862
1004		Test switch for inverter full load 152 amps (only used when panel loads are disconnected).		
1005	C-25A C-01R C-01X	Control Room Air Conditioning System (Z1)	Loss of indications, interlocks, damper controls, and signals to PPC & C-01X. Dampers move to failed positions.	32023 Sh. 37, 37A, 38 31057 Sh. 7
	C-25A	Moisture detectors, MS-6925 (X-181A/B) and MS-6927 (X-182)	Relay deenergizes, 2-SW-178A and 2–SW–178B fail as is, and upon re–energization fail closed C-06/7ann window, C-5, actuates.	30022 Sh. 10ED

Attachment 2
120 VAC Vital Instrument Panel VA-10 Load List

(Sheet 4 of 9)

CIRCUIT	LOCATION	CIRCUIT DESCRIPTION	POWER LOSS RESULTS, INDICATIONS	PRINT#
1006	C-05R	PT-4223, PY-4223 SG #1 atmospheric dump	Transmitter fails low Loss of Indication on C-05, C-21.	28500 Sh. 489
		PT-5259, HP heaters X-1A and X-1B pressure	Loss of HP feed heaters X1A & X1B pressure indication.	28500 Sh. 585
		LI-1114A, LI-1124A, #1 and #2 SG wide range lvl	Loss of indication on C-05 and PPC.	28500 Sh. 374, 384
	RC-31C	LIC-110X Pzr Level (Ch"X")	- If HS-110 selected to "X" all Charging Pumps Start, Pzr Htrs deenergize - Letdown Flow Control valves close to min - Pzr level & pressure increases - Ind. & computer point fail low	28500 Sh. 69 C,D,E
		L110X, pressurizer pressure (LIC-110X, HIC-110)	Loss of PZR level indications in all locations. Loss of PZR level control due to level input failed low. (Note: The selected control loop will "think" the PZR has emptied and respond accordingly.)	28500 Sh. 69 C,D,E
		LT-110X Pressurizer Level	Indicator and computer indication fail low	28500 Sh. 69A
	C-21	LI-110X	LO-LO Pzr Level Alarm on C-03	28500 Sh. 69B
	RC-31C	LI-1114A, LI-1124A, #1 and #2 SG wide range lvl	Loss of indication on C-05 and PPC.	28500 Sh. 374, 384
	C-06F	Cond air rmvl, Millstone stack, EB-56 (HV-8695)	Deenergize damper (fails locked), Loss of indication C-06, C-01X.	32022 Sh. 66
1007	C-02R	TIC-206 and TIC-207 Tanks T-8A and T-8B Temperature Indicating Controllers	Disable Temperature Controllers for T-8A and T-8B	29205 Sh. 1
		LC-227 VCT level loop	Loss of interlock to VCT outlet, CH-501, RWST to charging pp suct, CH-504, RWST suction, CH-192, VCT makeup bypass, CH-196.	28500 Sh. 227
		LC-226 VCT level loop	Loss of interlock to VCT makeup, CH-512, SOV, CH-210X & 210Y. Loss of automatic boric acid pump start signal.	28500 Sh. 226

Attachment 2
120 VAC Vital Instrument Panel VA-10 Load List

(Sheet 5 of 9)

CIRCUIT	LOCATION	CIRCUIT DESCRIPTION	POWER LOSS RESULTS, INDICATIONS	PRINT#
1008	C-05F	PIC-4223, #1 SG atmospheric dump	Loss of controller operation.	28500 Sh. 489
	C-05F	PR-4223	Recorder indication fails as is.	28500 Sh. 489
	C-21	HIC-4223	Controller fails, loss of output to MS-190A (PV4223).	
	C-05F/R	Auto AFW Z1	Disables Z1 AAFWIS, loss of interlock and indication C-05, C-21.	32012 Sh. 44, 46
	C-05F	FV-5268 (#1 SG FRV)	FW-51A, #1 SG FRV, fails as is on loss of power, and it closes when power is restored. When the circuit is deenergized, there is a loss of manual control from C-05. Loss of auto closure functions Loss of C-05 white lights Loss of 85% Hi Level Alarm Loss of 90% signal to Hi Level Alarm and Turbine Trip	32012 Sh. 31A
		FV-5215 (#1 SG FRV bypass)	#1 SG FRV bypass, 2-FW-41A, closes, and there is a loss of manual control from C-05.	

Attachment 2
120 VAC Vital Instrument Panel VA-10 Load List

(Sheet 6 of 9)

CIRCUIT	LOCATION	CIRCUIT DESCRIPTION	POWER LOSS RESULTS, INDICATIONS	PRINT#
1009	C-03F/R	TT-111X SG #1 hot leg temperature	Loss of signal to TI-111X (C-03), TY-111X-1, RRS, annunciator, & PPC.	28500 Sh. 73
		TY-111X	Loss of signal to TR-115.	
		UY-111X	Loss of T–111X Loop 1 Hot leg temp signal to:T–111x, Rx Reg, computer indication fails low.	
	C-03R	63X/P103-1, 63X-1/P103-1 pressurizer pressure low range	Loss of interlock to SI-614, 624, 651, and "SI-651 OPEN" alarm (C-01).	28500 Sh. 75D
		74-1 SI-651 open alarm (C-01)	Annunciator alarms on loss of power.	32008 Sh. 11
		FIC-306	Disables controller output/operation to SI306. Loss of indication to FI306, SI306, and PPC.	28500 Sh. 261
		FT-306, SDC bypass throttle valve, SI-306	Transmitter Fails.	
	C-01F	HIC-3657, SI-657 controller	Disables SDC flow control valve SI-657, loss of indication to PPC.	28500 Sh. 425
1010	NP97A	MP97A, A charging pump plunger flush pump	Deenergizes A charging pump plunger flush pump, Loss of local indication.	32009 Sh. 44
	NP97A3	NP97A3	Deenergizes A charging pump suction stabilizer heaters.	
	NP97A1	42X	Loss of signal to annunciator.	32009 Sh. 44
	NP97A4	MP18A, A charging pump	Loss of packing cooling auto level control. Valve fails closed.	32009 Sh. 55

Attachment 2
120 VAC Vital Instrument Panel VA-10 Load List

(Sheet 7 of 9)

CIRCUIT	LOCATION	CIRCUIT DESCRIPTION	POWER LOSS RESULTS, INDICATIONS	PRINT#
1011	RC05A	RPS Channel A	RPS Channel A trips	
		Neutron Out of Core Wide Range Detector	Loss of Neutron Flux Monitor	28500 Sh. 1111
		RPS Calibration Indication	Loss of RPS Calibration Indication	29193 Sh. 6
		Core Protection Calculator No. 1	Loss of Core Protection Calculator No. 1	39069 Sh. 40
		Core Protection Calculator No. 2	Loss of Core Protection Calculator No. 2	39069 Sh. 41
		RPS Aux Logic	Loss of RPS Aux Logic	39069 Sh. 24A
		RPS Bin Assemblies	Loss of RPS Bin Assemblies	39069 Sh. 7
		RPS Isolation System	Loss of RPS Isolation System	39069 Sh. 52
		Excore Linear Amplifier	Loss of Excore Linear Amplifier	29262 Sh. 3
		RPS Power Supply	• Loss of Ch A/D A Matrix • Loss of Ch A/C A Matrix • Loss of Ch A/B A Matrix • Loss of RPS Ch A Trip Unit No. 1 Variable High Power Trip • Loss of RPS Ch A Trip Unit No. 2 Low Reactor Coolant Pump Speed • Loss of RPS Ch A Trip Unit No. 3 Low Flow Reactor Coolant • Loss of RPS Ch A Trip Unit No. 4 Low Level Steam Generators • Loss of RPS Ch A Trip Unit No. 5 Low Pressure Steam Generators • Loss of RPS Ch A Trip Unit No. 6 High Pressure Pressurizer • Loss of RPS Ch A Trip Unit No. 7 Thermal Margin/Low Pressure • Loss of RPS Ch A Trip Unit No. 8 Turbine Trip • Loss of RPS Ch A Trip Unit No. 9 High Containment Pressure • Loss of RPS Ch A Trip Unit No. 11 Local Power Density	29193 Sh. 21A and 21B

Attachment 2
120 VAC Vital Instrument Panel VA-10 Load List

(Sheet 8 of 9)

CIRCUIT	LOCATION	CIRCUIT DESCRIPTION	POWER LOSS RESULTS, INDICATIONS	PRINT#
1011	RC05A	Disables RPS Ch "A," RPS puts in 1/3 trip		
		Audio Count Rate	Loss of Audio Count Rate	39069 Sh. 27
		Excore Linear Amplifier	Loss of Excore Linear Amplifier	29262 Sh. 3
		Power Ratio Signal Calculator	Loss of Power Ratio Signal Calculator	39069 Sh. 54
		Reactor Protection	Loss of RPS Trip Path No. 1	39069 Sh. 15
		RPS Ch. A	Loss of RPS Ch. A	
		Trip Inhibit Module	Loss of Trip Inhibit Module	39069 Sh. 16
		Dual Linear Ch NP-6	Loss of Power Range Safety Ch. A	29198 Sh. 1
		Wide Range Ch NLW3	Loss of Wide Range Logarithmic	29198 Sh. 3
1012	C-06F/R	HV-8275, fuel handling exhaust damper, HV-171	Loss of indication (C-06, C-01X), AEAS override, disables damper (fails locked), loss of alarm (C-01X).	32021 Sh. 9
1013	C-01F/R	HV-8143, fuel handling area exhaust to plenum EB-60	Loss of indication (C-01, C-01X), EBFAS/AEAS override, disables dampers (fails locked) (fails closed for EB–60 and EB–73), loss of alarm (C-01X).	32022 Sh. 52
		HV-8153, E.B. filtration system damper, EB-50		32022 Sh. 37
		HV-8651, containment cleanup damper, EB-73		32022 Sh. 68
		HV-8078, E.B. filtration fan intake cross connect damper, EB-76		32022 Sh. 51
		HV-8123, containment sample fan MF39A isolation valves	Loss of interlock to isol valves HV-8123AB1 & 2 (AC-529 & 530) & ctmt sample fan MF39A	32022 Sh. 14A
		PI-8113, containment pressure	Loss of indication (C-01).	28500 Sh. 840
1014	RC02A1	LT-3001, Ch. A RWST level	RWST level transmitter receives backup power from VA-40 via ESAS sensor channel D. Level indication remains unaffected.	28500 Sh. 400 39047 Sh. 1 page 1
		ESAS sensor cabinets Ch A (normal) and Ch D (alternate)	Loss of ESAS Ch A sensor cabinet normal power and loss of alternate power to ESAS Ch D sensor cabinet. Receives normal input failure alarm on Ch A and Alternate input failure alarm on Ch D. All sensor channels remain energized.	39047 Sh. 1 page 1

Attachment 2
120 VAC Vital Instrument Panel VA-10 Load List

(Sheet 9 of 9)

CIRCUIT	LOCATION	CIRCUIT DESCRIPTION	POWER LOSS RESULTS, INDICATIONS	PRINT#
1015	31′6″ Switchgear Room	RIT-8168, RM-8168 high range stack radiation monitor	Deenergizes radiation monitor, Trips A ESAS sensor cabinet (Purge).	28500 Sh. 858
	RC14A	RIT-8139, SFP area radiation monitor (S.W.)	Deenergizes radiation monitor, Trips A ESAS sensor cab (AEAS), Loss of indication (RC-14A, PPC) and high alarm. Annunciator of failure.	28500 Sh. 852
		RIT-8123A/B, containment particulate radiation monitor	Deenergizes radiation monitor, Loss of indication (RC-14A, PPC), signal to recorder. Annunciator of failure. If in Mode 5 or 6, HV-8080 and HV-8082 close.	28500 Sh. 848
		RI-8123A/B, containment particulate digital comparator	Annunciation of failure.	
		RM-4262, SG blowdown radiation monitor	Loss of indication (RC-14A, PPC).	28500 Sh. 497
1016	*Spare*			
1017	Cable Vault	Wide Range Amp Box QEXCIPAA	Loss of Ch A wide range indication	30022 Sh 10S
1018	RC02B	ESAS actuation cabinet 5 (Z1)	Disables ESAS actuation cabinet 5. Ch. 1 Actuation relays are inhibited. Disables automatic sequencer loading of diesel. Loss of indication.	39047 Sh. 11, 12

MILLSTONE POWER STATION

ABNORMAL OPERATING PROCEDURE

Immediate Operator Actions

AOP 2585

Rev. 003 - 00

STOP THINK ACT REVIEW

Approval Date: **11/14/2017**

Effective Date: **11/16/2017**

Level of Use
Continuous

INSTRUCTIONS CONTINGENCY ACTIONS

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."

___11.2 Go To applicable procedure for the lost power supply:

- AOP 2504C, "Loss of 120 VAC Vital Instrument Panel VA- 10,"
- AOP 2504D, "Loss of 120 VAC Vital Instrument Panel VA- 20,"
- AOP 2504A, "Loss of Non- Vital Instrument Panel VR- 11"
- AOP 2504B, "Loss of Non- Vital Instrument Panel VR- 21"

JOB PERFORMANCE MEASURE APPROVAL SHEET

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

JPM Number: S7 Revision: 0/1

Initiated:

John W. Riley – Signature on File	8/8/18
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/18
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/18
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
06/14/2018 jwr	Original issue for 2018 ILT NRC exam	0/0
08/08/18 jwr	Incorporated minor editorial comments from NRC during 2018 ILT NRC prep week.	0/1

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: S7 Revision: 0/1

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 : 0/1

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:

- You are the RO.

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: 0/1

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: 0/1

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: 0/1

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: 0/1

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:

- You are the RO

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Change the Setpoint of the SJAE RM 5099

JPM Number: S8 Revision: 4/1

Initiated:

John W. Riley – Signature on File	8/8/18
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/18
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/18
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
8/8/2018 jwr	Incorporated minor NRC comments from NRC prep week. Added IC number that establishes initial conditions.	4/1

JPM WORKSHEET

Facility: MP2 Examinee: _____

JPM Number: S8 Revision: 4/1

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 : 4/1

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:

- Use IC 225 which includes the conditions listed below or use any Mode 1 IC and include the simulator conditions below.
- 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: 4/1

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: 4/1

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: 4/1

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: 4/1

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

PERFORMANCE INFORMATION

JPM Number: S8 Revision: 4/1

Task Title: Change the Setpoint of the SJAE RM 5099

<table>
<tr><td rowspan="3">STEP #10</td><td>Performance:
4.1.7 PRESS “C/S” button and CHECK button is lit.</td><td>Standard:
Examinee presses “C/S” button and checks that it is lit.</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">STEP #11</td><td>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</td><td>Standard:
After one minute the examinee checks:
• “C/S” light is not lit
• LED channel activity resumes
• “CH 1” light, lit</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:
After one minute the changes are registered and the radiation monitor resumes monitoring radiation.</td></tr>
<tr><td rowspan="3">STEP #12</td><td>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.</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: 4/1

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: 4/1

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: 4/1

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: 4/1

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.

MILLSTONE POWER STATION
SYSTEM OPERATING PROCEDURE

Radiation Monitor Alarm Setpoint Control

OP 2383C
Rev. 016

STOP THINK ACT REVIEW

Approval Date: 04/29/17

Effective Date: 05/02/17

Level of Use
Continuous

Millstone Unit 2
System Operating Procedure

Radiation Monitor Alarm Setpoint Control

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OP 2383C−001, “Alarm Setpoint Control”

1. PURPOSE

1.1 **Objective**

This procedure provides instructions for the control of radiation monitor alarm setpoints under changing radiological conditions.

1.2 **Discussion**

The RM−5099 setpoint is set as specified by Chemistry. This setpoint corresponds to a 75 gpd Primary−to−Secondary leak rate and is based on the most current constituents of the RCS gaseous isotopic results.

To maintain a conservative approach and provide indication of changing radiological conditions, SG blowdown radiation monitor, RM−4262, *alarm* setpoint is *normally* set to five times the actual reading. This setpoint assumes minimal or *no* SG tube leakage, although it accounts for any activity which may be detected, and maintains the setting well below the setpoint for 2 circulating water pumps with maximum blowdown flow. In the event of increased leakage, the setpoint is limited to ensure that the 10 CFR 20 limits are *not* exceeded.

The *alarm* setpoint for SG blowdown radiation monitor, RM−4262, is based on 3×10^{-8} μCi/ml to ensure that applicable limits in 10CFR20, Appendix B, are *not* exceeded..

To be conservative and eliminate the need to frequently change alarm setpoints (i.e., stopping circulating water pumps), the flow value of 100,000 gpm and 700 gpm for dilution flow maximum blowdown are used for *alarm* setpoint calculation. Using these values yields a dilution factor of 286 and a high limit of 4.3×10^{-6} μCi/ml.

Calculations for the fail setpoint are rounded down to ensure optimum margin against spurious trips whereas the alert and alarm setpoints are rounded down to ensure conservative response.

2. PREREQUISITES

2.1 General

2.1.1 Radiation monitors meet appropriate calibration requirements.

2.2 Documents

2.2.1 SP 2833–007, "SJAE Radiation Monitor RM 5099 & PPC Alarm Setpoint Change Request"

2.2.2 Radiation Monitor Setpoint Book

2.2.3 EN 21235, "Radiation Monitor Setpoint Control."

2.3 Tools and Consumables

2.3.1 Allen wrench

2.4 Definitions

2.4.1 REMODCM: MP–22–REC–BAP01, "Radiological Effluent Monitoring and Offsite Dose Calculation Manual"

3. PRECAUTIONS

3.1 The alarm test probe must be disconnected following any setpoint changes.

3.2 Alarm modules in "ALARM DEFEAT" provide *no* alarm or trip protection for the monitored area or process.

3.3 Alarm setpoints must *not* be changed during transient conditions.

3.4 Setpoints of radiation monitors listed on Attachment 1, "Fixed Setpoint Radiation Monitors," require EN 21235, Att. 6 for setpoint approval and documentation.

3.5 To retain early warning of changing radiological conditions, revised setpoints should be selected and implemented in a timely manner.

3.6 This procedure is applicable only to those radiation monitors listed on Attachment 2, "Variable Setpoint Radiation Monitors."

4. INSTRUCTIONS

4.1 **Adjusting Setpoints 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.

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)

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.

NOTE

"RADMONITOR BYPASS, HS 5099E" switch should be placed to "BOTH OUT" if RM−4262 is also out.

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."

4.1.5 PLACE RI−5099 "NORM/SUPV." switch to "SUPV."

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.

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."

NOTE

During check source, LED channel activity does *not* change.

4.1.7 PRESS "C/S" button and CHECK button is lit.

4.1.8 WHEN one minute has elapsed, CHECK the following:

- "C/S" light, *not* lit
- LED channel activity resumes
- "CH 1" light, lit

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.

4.1.9 IF "CH 1" light is *not* lit and "ERROR" light is lit, NOTIFY I&C Department.

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).

4.1.11 IF desired setpoint is *not* displayed, Go To step 4.1.6.

4.1.12 PLACE RI−5099 "NORM/SUPV." switch to "NORM."

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."

4.1.14 REPLACE setpoint sticker with current setpoint.

4.1.15 RETURN keys (Operations key locker).

4.1.16 Using Concurrent Verification, Refer To SP 2833–007, "SJAE Radiation Monitor RM 5099 & PPC Alarm Setpoint Change Request," and ENTER new values into PPC as follows:

a. OPEN PPC screen N16_CHEM.

b. ENTER value for steam jet air ejector instrument background.

c. ENTER value for SJAE DP.

d. ENTER value for RM 5099 response factor.

e. ENTER value for RCS total gas activity.

f. EXIT application.

– End of Section 4.1 –

07/18/11
Approval Date

07/18/11
Effective Date

SJAE Radiation Monitor RM 5099 & PPC Alarm Setpoint Change Request

Date: 10/04/4 Time: 1400

On RC–14D

Current SJAE RM setpoint: 1.0E+3 cpm

Unit 2 Chemistry requests the SJAE RM alarm setpoint REMAIN at/CHANGE to: 1750 cpm

This setpoint corresponds to a 75 gpd Primary–to–Secondary Leak Rate and is based on the most current constituents of the RCS gaseous isotopic results.

On PPC

Unit 2 Chemistry also requests the PPC SJAE Primary–to–Secondary Leak Rate Input Data on the PPC "n16_chem" display page be revised to reflect the following:

Instrument Background: 98 cpm

SJAE DP: 0.400 Inches of Water

RM 5099 Response Factor: 5.840E-07 cpm/μCi/cc

RCS Total Gaseous Activity: 0.070 μCi/cc

Change Request Sheet Submitted By: [signature]

Reviewed By: [signature] Date: 10/04/4

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.

MILLSTONE POWER STATION
EMERGENCY OPERATING PROCEDURE

STOP THINK ACT REVIEW

Aligning Backup Instrument Air

EOP 2541, Appendix 40

Rev. 000–01

Approval Date: 4/20/2015

Effective Date: 5/07/2015

Level of Use
Continuous

INSTRUCTIONS CONTINGENCY ACTIONS

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

___3.. IF placing backup air in service for SI−659 and CH−192, PERFORM the following: (−5′ Aux Bldg near letdown HX room)

a. ADJUST IA−594, backup air PCV to minimum. (full *counterclockwise*)

b. Slowly OPEN IA−602, master stop C−4A.

c. OPEN IA−593, master stop.

d. ADJUST IA−594, backup air PCV *clockwise* and ESTABLISH 100 psig outlet pressure.

e. Slowly OPEN IA−596, “MASTER STOP”.

f. MONITOR backup air bottle pressure every 4 hours.

(continue)

Attachment 40−A **Placing In Service** **Page 6 of 12**

INSTRUCTIONS CONTINGENCY ACTIONS

___3.. (continued)

NOTE

Approximately 50 psi of air is required to cycle a valve. If the supply of air bottles is limited the Shift Manager or TSC may elect to change air bottles at a lower pressure.

g. WHEN pressure lowers to less than 1000 psig OR is expected to fall below 1000 psig before the next pressure check, REPLACE QA air bottle.

NOTE

The next step places Backup Air Supply System in service for SI−660, safety injection minimum flow recirculation header isolation (−5′ Aux Bldg near elevator).

___4.. IF placing backup air in service for SI−660, PERFORM the following: (−5′ Aux Bldg near elevator)

a. ADJUST IA−895,“B/U AIR PCV FOR C−4B” to minimum. (full *counterclockwise*)

b. Slowly OPEN IA−894, master stop C−4B.

c. OPEN IA−896, “REGULATOR ISOL FOR C−4B”.

(continue)

INSTRUCTIONS	CONTINGENCY ACTIONS
___4.. (continued) d. ADJUST IA−895, "B/U AIR PCV FOR C−4B" *clockwise* and ESTABLISH 100 psig outlet pressure. e. Slowly OPEN IA−897, "MANIFOLD ISOLATION FOR B/U AIR C−4B". f. MONITOR backup air bottle pressure every 4 hours.	

NOTE

Approximately 50 psi of air is required to cycle a valve. If the supply of air bottles is limited the Shift Manager or TSC may elect to change air bottles at a lower pressure.

g. WHEN pressure lowers to less than 1000 psig OR is expected to fall below 1000 psig before the next pressure check, REPLACE QA air bottle.

JOB PERFORMANCE MEASURE APPROVAL SHEET

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

JPM Number: P2B Revision: 11/1

Initiated:

John W. Riley – Signature on File	8/01/18
Developer	Date

Reviewed:

Angelo Leone – Signature on File	8/15/18
Technical Reviewer	Date

Approved:

Michael John Cote – Signature on File	8/20/18
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
08/01/2018 jwr	Incorporated NRC comments from NRC prep week.	11/1

JPM WORKSHEET

Facility: MP 2 Examinee: _____

JPM Number: P2B Revision: 11/1

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 : 11/1

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: 11/1

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: 11/1

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

<table>
<tr><td rowspan="3">S T E P
3</td><td>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)</td><td>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.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:
The blue pin for the Shut Down Relay is fully extended.</td></tr>
<tr><td colspan="4">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.
A photo is provided with the JPM for the examiner to use if the door will not be opened. Hand the photo to the examinee if the door is not opened and have the examinee locate the shutdown relay (SDR) and verify it is reset. The relay is reset when the blue pin in the center of the relay is fully extended.</td></tr>
<tr><td rowspan="3">S T E P
4</td><td>Performance:
3) UNLOCK and CLOSE 2-DG-88B, "D/G 13U AIR START VENT HEADER ISOLATION".</td><td>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.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:
Valve is unlocked. Chain is removed. Valve stem lowered to full in position. Hard stop met.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

PERFORMANCE INFORMATION

JPM Number: P2B Revision: 11/1

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. <u>WHEN</u> 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: 11/1

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

S T E P # 7	Performance: e. OPEN and LOCK 2-DG-88B, "D/G 13U AIR START VENT HEADER ISOLATION".	Standard: • 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. • 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: P2B Revision: 11/1

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:

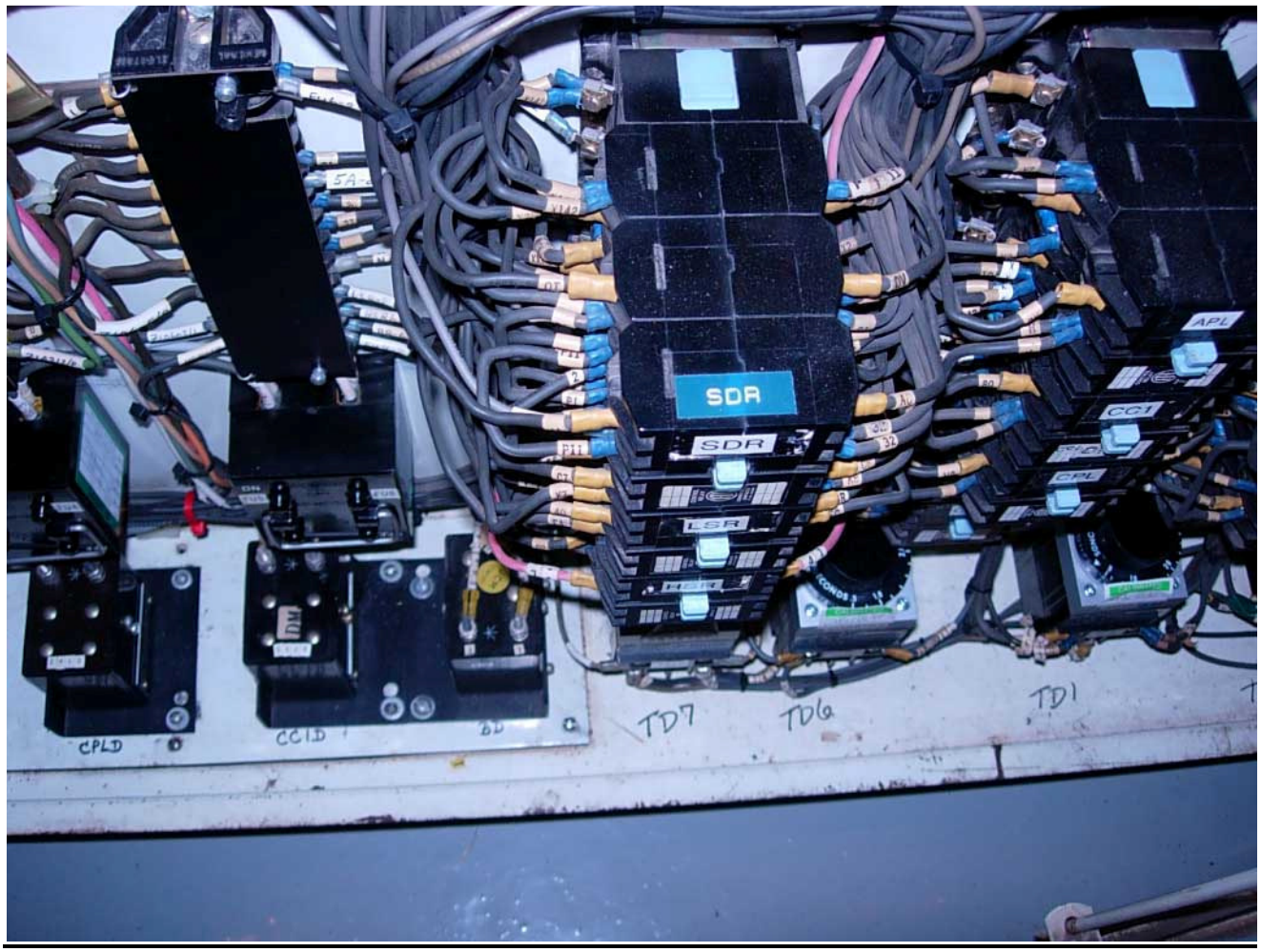
Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	10	Actual Time to Complete (minutes):	
Work Practice Performance:		☐ SAT ☐ UNSAT	
Operator Fundamentals:		☐ SAT ☐ UNSAT	
JPM Question Portion Overall [*NLO only*]:		☐ SAT ☐ UNSAT ☐ N/A	
Attached Question #1		☐ SAT ☐ UNSAT	
Attached Question #2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

Evaluator: _____
Print / Sign

Areas for Improvement / Comments:

STUDENT HANDOUT

JPM Number: P2B Revision: 11/1



STUDENT HANDOUT

JPM Number: P2B Revision: 11/1

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.

INSTRUCTIONS | CONTINGENCY ACTIONS

NOTE

The following equipment may be required to perform the following step:

1. Ice Vest may be obtained from the Maintenance Tool Crib.
2. Cool Suits may be obtained from the HP Control Point.
3. Gloves are part of the PEO normal watch station equipment.

___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.

(continue) (continue)

INSTRUCTIONS	CONTINGENCY ACTIONS
___3.. (continued)	
e. Slowly OPEN MS−464, "TERRY TURBINE AUX FEED PUMP STEAM SUPPLY."	e.1 IF the TDAFW pump trips on overspeed, PERFORM the following: 1) ADJUST the governor speed control knob to minimum speed. 2) CLOSE MS−464, "TERRY TURBINE AUX FEED PUMP STEAM SUPPLY." 3) OPEN MS−436, "LS−4590 INSTRUMENT DRAIN." 4) Slowly OPEN MS−447, "LS−4590 INSTRUMENT BACKUP DRAIN." 5) WHEN the condensate has drained from the steam line drip leg, CLOSE **BOTH** MS−436 and MS−447. 6) RESET the TDAFW pump mechanical overspeed trip latch. 7) Go To Step 3..e.
(continue)	

INSTRUCTIONS	CONTINGENCY ACTIONS
___3.. (continued) 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) 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"	
___4.. ESTABLISH flow to at least one steam generator using the aux feed reg valve: • FW–43A • FW–43B	4.1 ESTABLISH flow to at least one steam generator using the aux feed reg bypass: • FW–56A • FW–56B

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 <u>counterclockwise</u> 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: **<u>Contingency Action</u>** e.1 <u>IF</u> 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.

Attachment 23- F Energizing 4.16 kV Bus 24D From DG B Page 4 of 6

INSTRUCTIONS	CONTINGENCY ACTIONS
___7. (continued) h. RESET UV signal by performing the following: 1) PLACE **ALL** four "UV BUS A4" channel bypass keyswitches to the "INHIBIT" position. (Key 27) (ESF Sensor Cabinets) 2) PRESS Facility 2 "UV RESET" button. (ESF Actuation Cabinet 6)	
___8. START DG B from C- 08 and CHECK "DIESEL GEN 13U READY TO LOAD" annunciator is lit. (window A- 35, C- 08)	8.1 IF the DG B can *not* be started from the Control Room, PERFORM the following to locally start the DG B. a. ENSURE communications established between an operator at DG B and the Control Room. b. PERFORM the following at the DG B: 1) PRESS "ALARM RESET" pushbutton. (DG Gage Board) 2) ENSURE the shutdown relay is reset by observing blue pin in the center of the relay panel fully extended. (northwest corner of the DG) 3) UNLOCK and CLOSE 2- DG- 88B, "D/G 13U AIR START HEADER VENT ISOLATION".

(continue)

(continue)

Attachment 23- F Energizing 4.16 kV Bus 24D From DG B Page 5 of 6

INSTRUCTIONS	CONTINGENCY ACTIONS
___8. (continued)	c. START the DG by performing the following steps at the same time: 1) TURN the B DG "MAN START- STOP" switch to "START". (C- 08) 2) Locally PULL AND HOLD the lever on 2- DG- 94B, "CONTROL AIR 2- DG- 92B SUPPLY VALVE". d. WHEN the DG has started, RELEASE the lever on 2- DG- 94B. e. OPEN and LOCK 2- DG- 88B, "D/G 13U AIR START. HEADER VENT ISOLATION".

SIMULATOR SCENARIO #1

REVISED

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

Examiners: _____ Operators: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: 100% Power **IC-156**, steady state, Ch-X PZR Level OOS, Ch-Y PZR Level in service. **ENSURE "B" Charging pump is aligned to 22F (Facility 2).**

Turnover: 100% Power, steady state, 24E is aligned to 24C. Channel "X" Pressurizer Level Control is OOS for I&C, but is not being worked at this time. Severe electrical storms have been predicted for the area, but none are directly overhead at this time. SP 2654B, ***Forcing Pressurizer Sprays***, is ready to be performed.

Critical Tasks:

1. [SPTA-5] Manually shutdown the reactor (ATC).
2. [ESDE-6] Isolate the most affected SG (BOP).

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)	2

Scenario 1 Summary:

The crew will take the shift with the unit at 100% Power **IC-156**, steady state, Ch-X PZR Level OOS, Ch-Y PZR Level in service, "B" Charging pump aligned to 22F (Facility 2).
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 on the trip.			E-30	Active		6
REMOTE FUNCTIONS							
C06-D01A	TBCCW Pump Trip alarm C06/7-DA1			E-10	NORMAL		3
OVERRIDES							
05A1A2 S23	"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**: **CEA POSITION** **LCO 3.1.3.1:** 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.
	SRO	**Tech. Specs. 3.2.6**: **DNB MARGIN** **LCO 3.2.6:** The DNB margin shall be preserved by maintaining the cold leg temperature, pressurizer pressure, reactor coolant flow rate, and AXIAL SHAPE INDEX within the limits specified in the CORE OPERATING LIMITS REPORT. **APPLICABILITY**: MODES 1. **ACTION**: With any of the above parameters exceeding its specified limits, restore the parameter to within its above specified limits within 2 hours or reduce THERMAL POWER to ≤ 5% of RATED THERMAL POWER within the next 4 hours. **From the COLR** **2.7 DNB Margin (Technical Specification 3/4.2.6)** a. Cold Leg Temperature </= 549°F b. Pressurizer Pressure > 2225 psia*

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
	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.
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.: 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	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.: 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.: ES18LI1 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. *Trigger E-10 to reset trip alarm as appropriate.*		
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.: ES18LI1 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). Be prepared to log the time of MSI Actuation on the ESD.
		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 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.: ES18LI1 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, 25B 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.: ES18LI1 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 within 5 minutes. **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.: ES18LI1 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.: ES18LI1 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.: ES18LI1 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**.
		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 **Examiner Note:** This completes the required actions of CT-2.

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-2/ESDE-6)

TIME Main Steam Isolation Signal (MSIS): (See Simulator Operator)

TIME AFW Isolated EOP 2525 RNO Step 7c.2:_____

Op-Test No.: ES18LI1 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.)** d. CHECK BOTH steam generator's pressures are 880 to 920 psia. **RESPONSE NOT OBTAINED** 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 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 #1 SG boils dry, #2 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.		
	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.

Op-Test No.: ES18LI1 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
		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.: ES18LI1 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.
Maintain containment temperature and pressure control. **Ensure all available equipment cooling and air recirculation systems are operating prior to exceeding containment design limits, (54psig, 289°F).** **CTMT pressure when CTMT Spray was established: _____ (Acceptable band is < 54 psig)**		
	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.: ES18LI1 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 34**.
Examiner Note: The US refers to EOP 2541 Appendix 1, Diagnostic Flowchart to diagnose the event.		
	SRO	**Event Diagnosis**: **[See page 38 of guide for actual Diagnostic Flowchart]** 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 reviewed 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.: ES18LI1 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.: ES18LI1 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.: ES18LI1 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.: ES18LI1 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 of FW-42A 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. **[Local isolation of MS-201 required due to loss of bus 24C]** 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 close FW-42A and/or MS-201, 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.: ES18LI1 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.: ES18LI1 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.: ES18LI1 Scenario No.: 1 Event No.: 7

Event Description: EOP 2541, Followup Actions, Appendix 4-A, Reactor Trip Subsequent Actions

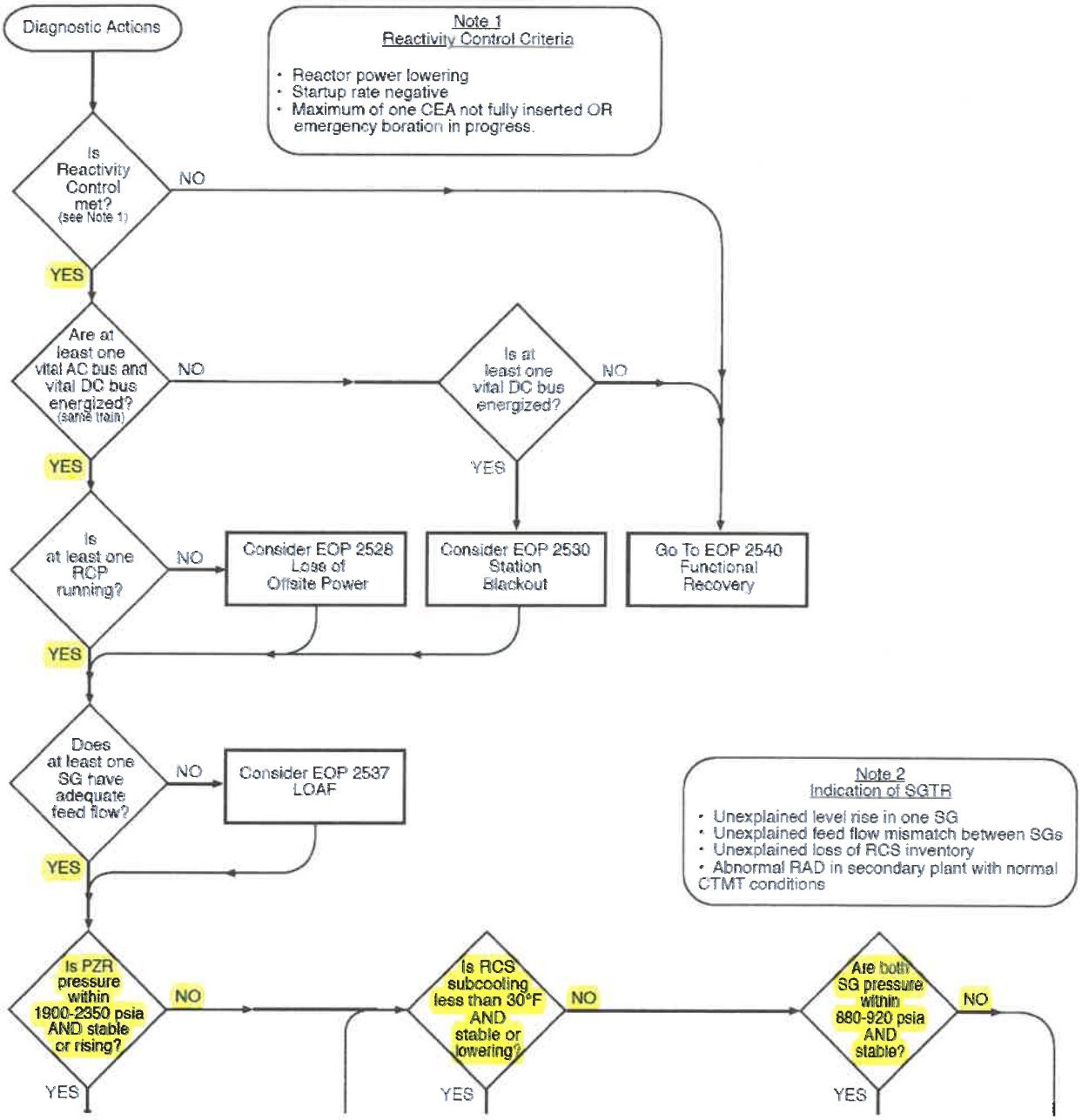
Time	Position	Applicant's Actions or Behavior
	BOP	*7. CHECK Main Condenser is available, as indicated by ALL of the following: • At least ONE MSIV open • Condenser vacuum better than 15 inches HG - ABS (0 to 15 inches) • At least ONE condensate pump operating • At least ONE Circ Water pump operating **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.: ES18LI1 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		

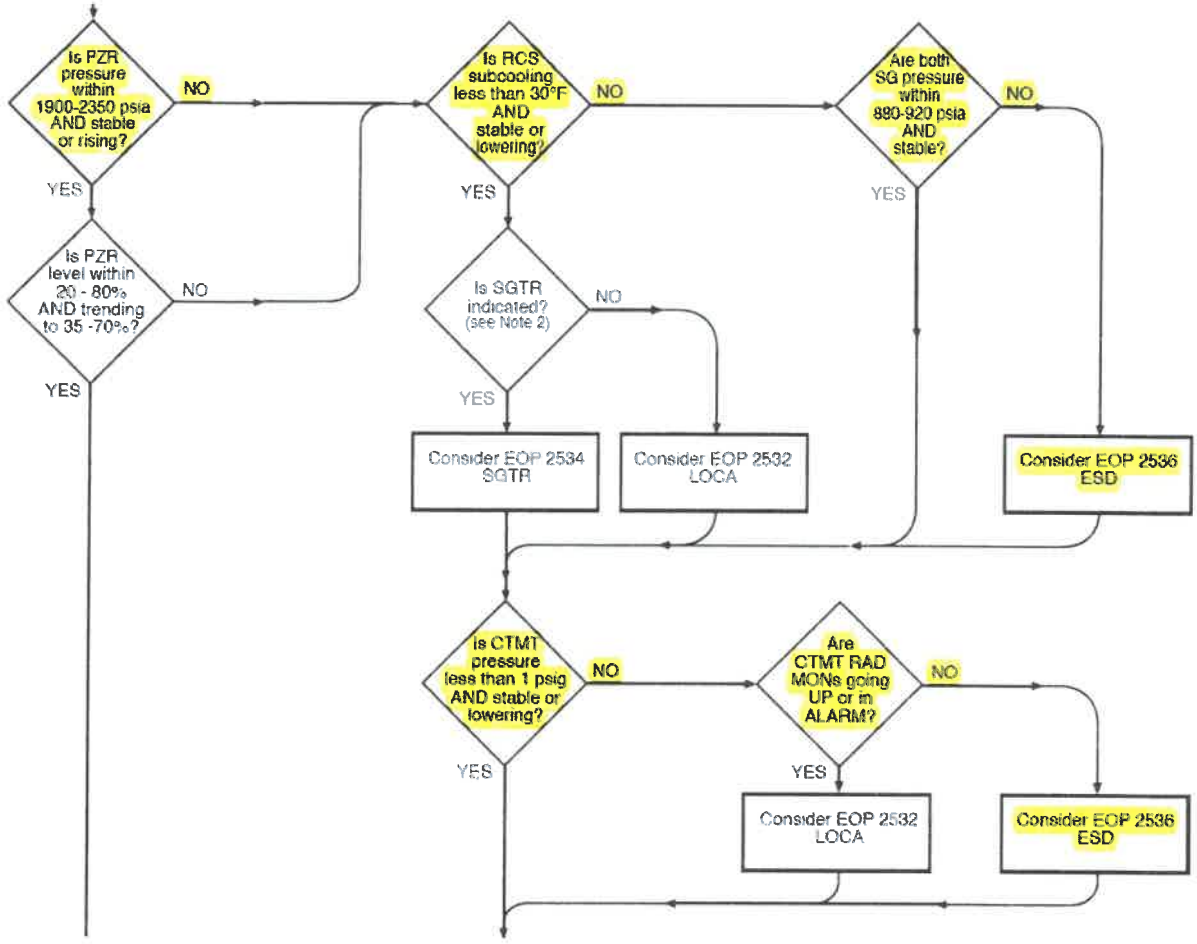
Op-Test No.: ES18LI1 Scenario No.: 1 Event No.: 7		
Event Description: EOP 2541, Appendix 1, Diagnostic Flow Chart		
Time	**Position**	**Applicant's Actions or Behavior**



Op-Test No.: ES18LI1 Scenario No.: 1 Event No.: 7

Event Description: EOP 2541, Appendix 1, Diagnostic Flow Chart

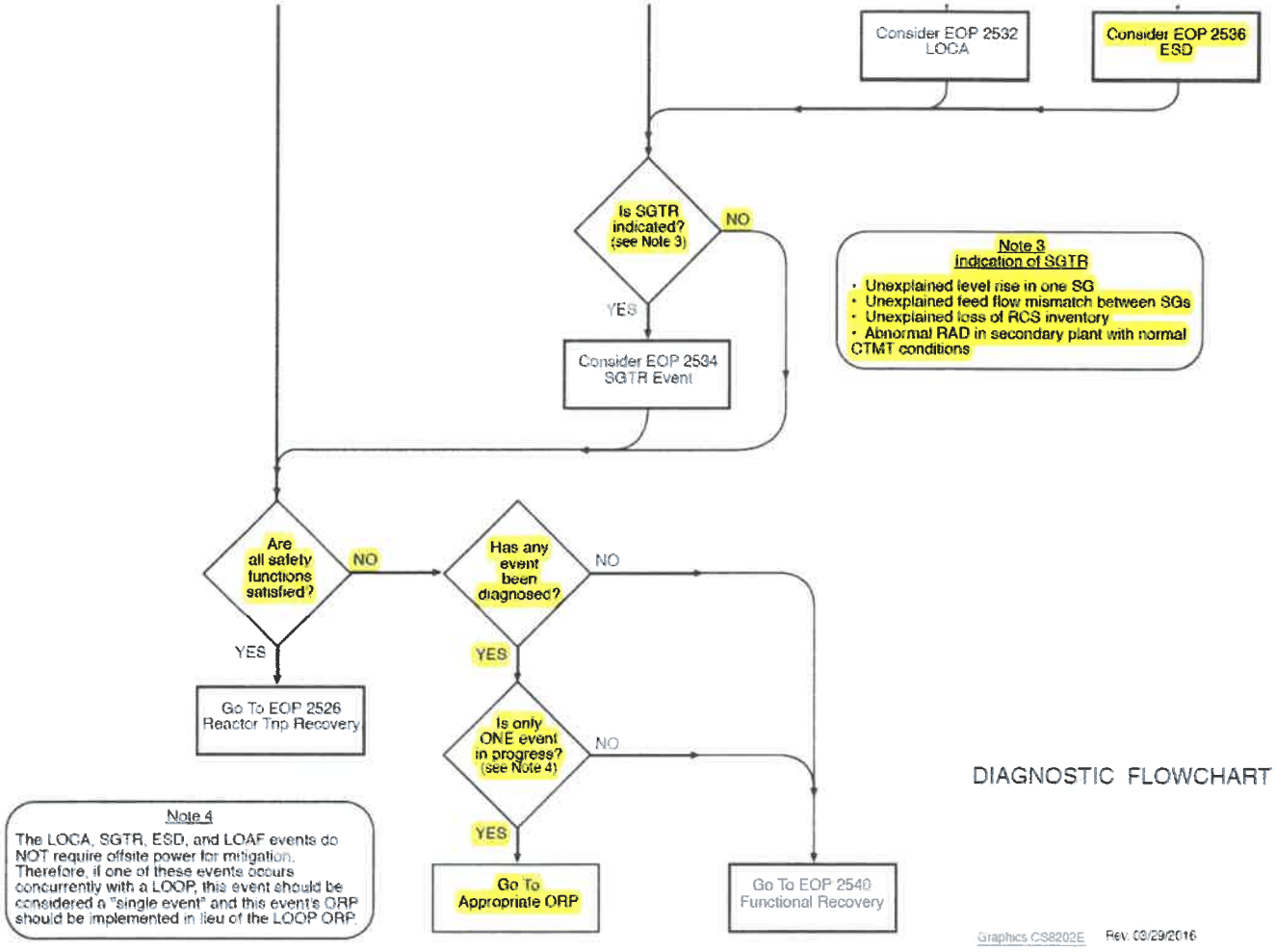
Time	Position	Applicant's Actions or Behavior



Op-Test No.: ES18LI1 Scenario No.: 1 Event No.: 7

Event Description: EOP 2541, Appendix 1, Diagnostic Flow Chart

Time	Position	Applicant's Actions or Behavior



SEG# Sim #1 Rev ; 0

SIMULATOR TRAINING SHIFT TURNOVER REPORT

DATE-TIME	PREPARED BY	SHIFT
Today 0515	Unit Supervisor /"NIGHT" Shift	18:00 - 06:00

PLANT STATUS:

Mode:	1	Rx Power:	100%
Megawatts:	Thermal: 2698 MWTH	PZR Pressure:	2250 psia
	Electric: 888 MWe	RCS T-AVE:	568 °F
RCS Leakage:	Identified: 0.015 gpm	Protected Train/Facility:	**TRAIN A**
	Unidentified: 0.036 gpm		
Date/Time:	Today 0015		

Active Tracking Records and Action Statements

Equipment/Reason

LCO	Action	Date	Time in LCO	Action Requirement	Time Left
None					

OD Compensatory Actions / Temp Logs

Open Date	Class Reason	Reason	Watch Position
None			

PLANT SYSTEMS APC

System	Notes
PZR Lvl Cntrl	Ch. "X" PZR Level Controller, LIC-110X, output erratic. I&C reviewing Tech. Manual for guidance.

CROSS UNIT SYSTEM STATUS

U3 Power to 24E	**34A aligned to 24E**

SURVEILLANCES / EVOLUTIONS IN PROGRESS

OP 2204	Steady State Operation
N/A	CONVEX reports a narrow band of severe thunderstorms is moving east through New England. Moving over us within the hour and expected to be clear of S.E. Conn. in about three hours.

REACTIVITY BRIEFING (SEE REACTIVITY THUMBRULES / SPREAD SHEET FOR ADDITIONAL INFO)

Current Rod Height	ARO @ 180
Xenon Trend	Stable
Current Boron	596 ppm
Boron Pot Setting / Blend Ratio	9 to 1 (corrected)

SIMULATOR SCENARIO #2

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

Examiners: _____ Operators: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: 100% Power **IC-231**, steady state, Ch-X PZR Level OOS, Ch-Y PZR Level in service. **ENSURE "B" Charging pump is aligned to 22F.**

Turnover: 100% Power, steady state, 24E is aligned to 24C. Channel "X" Pressurizer Level Control is OOS for I&C, but is not being worked at this time. Severe electrical storms have been predicted for the area, but none are directly overhead at this time.

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. [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		RCP "B" Upper and Middle Seal failures.
4	N/A	R (ALL)	Plant shutdown required due to 2 RCP failed seals.
5	RC28B	C (ATC/S)	"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	M (ALL)	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)	3

Scenario 2 Summary:

The crew will take the shift with the unit at 100% Power **IC-231**, steady state, Ch-X PZR Level OOS, Ch-Y PZR Level in service, "B" Charging pump aligned to 22F**.**

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 5 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	5 min.		E-29	Active		6
REMOTE FUNCTIONS							
IAR15E	Reset "E" IAC (IAC F3E Start PB)			E-10	START		6
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: • **PRESSURIZER 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 b. **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). **Examiner Note: Actions to adjust pressure controller follows.** 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).
Simulator Operator: If asked to submit a TR to Maintenance report that one has been submitted.		
Simulator Operator: If asked to submit a TR to Maintenance report that one has been submitted.		

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**

Examiner Note: The following steps are from OP 2204, "Load Changes".		
	ATC	4.2.10 Refer To Attachment 3, "Pressurizer Pressure Control Program," and MAINTAIN Pressurizer pressure between 2,225 and 2,300 psia as follows: a. As necessary, PLACE any available Pressurizer "BACKUP HTRS" group handswitch to "CLOSE" (C-02): • GROUP 1 • GROUP 2 • GROUP 3 • GROUP 4 b. ADJUST selected pressure controller setpoint during Pressurizer heaters operation: • "PRES CNTL-X, PIC-100X" • "PRES CNTL-Y, PIC-100Y"
	SRO	4.2.11 IF at any time a proportional heater failure is suspected based on any of the following, Refer To SP 2602E, "Pressurizer Heater Capacity Test," and PERFORM testing as required to verify proportional heater capacity within 12 hours of returning to stable plant conditions: • Pressurizer pressure control problems are evident
Examiner Note: The following steps continue with ARP 2590B-227.		
	SRO	9. LOG exit from Technical Specifications ACTION Statement, 3.4.4, ACTION b. 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.
	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.**

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: 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 (see Bases for reason)**
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: 3.1 MONITOR RCP controlled bleedoff temperature. 3.2 DETERMINE if alarm is caused by changing RBCCW temperature. 3.3 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 FUNCTIONS** 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, 25B 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, 25B 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 within 5 minutes.**
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**
	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 kV 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 10 minutes of the loss of Main Feedwater. *****		
	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: The following steps are from EOP 2541, Appendix 6, *TDAFW Pump Normal 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**
	BOP	___1.. IF a SBO event has occurred OR DC Bus 201B is *not* energized, Go To Appendix 7, "TDAFW Pump Abnormal Operation."
	BOP	CAUTION 1. Operation of the TDAFW pump below 1400 rpm or above 4200 rpm will exceed the governor speed control range. 2. Opening SV---4188 too quickly could overspeed the TDAFP. ___2.. Slowly OPEN SV---4188, TDAFP steam valve.
	BOP	CAUTION Failure to perform TDAFW pump warmup can cause an overspeed trip due to condensate in the steam line or a sluggish governor speed control. ___3.. ADJUST the TDAFW pump "SPD CNTL" switch to maintain minimum governor speed. ___4.. WHEN TDAFW pump parameters have stabilized, RAISE the "SPD CNTL" switch to establish feed flow.
	BOP	___5.. ESTABLISH flow to at least one steam generator using the aux feed reg valve: • FW-43A • FW-43B
	BOP	___6.. WHEN shutdown of the TDAFW pump is desired, PERFORM the following: a. REDUCE the TDAFW pump to minimum speed using the "SPD CNTL." b. CLOSE SV---4188, TDAFP steam valve.
<u>CRITICAL TASK:</u> 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:_____**		
Examiner Note: The guide now continues with EOP 2525, *Standard Post Trip Actions*.		

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	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 sent to check the "A" AFW Pump, inform the crew that the pump was "hot to the touch" and the breaker has an overload trip relays triggered.** **If asked, Unit 3 cannot power 24E for ~ 2 hours due to problems with their 4.16 kV 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 41 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 37.		

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-3.]**

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-3/ 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 33 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-3.]**
	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

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.					

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

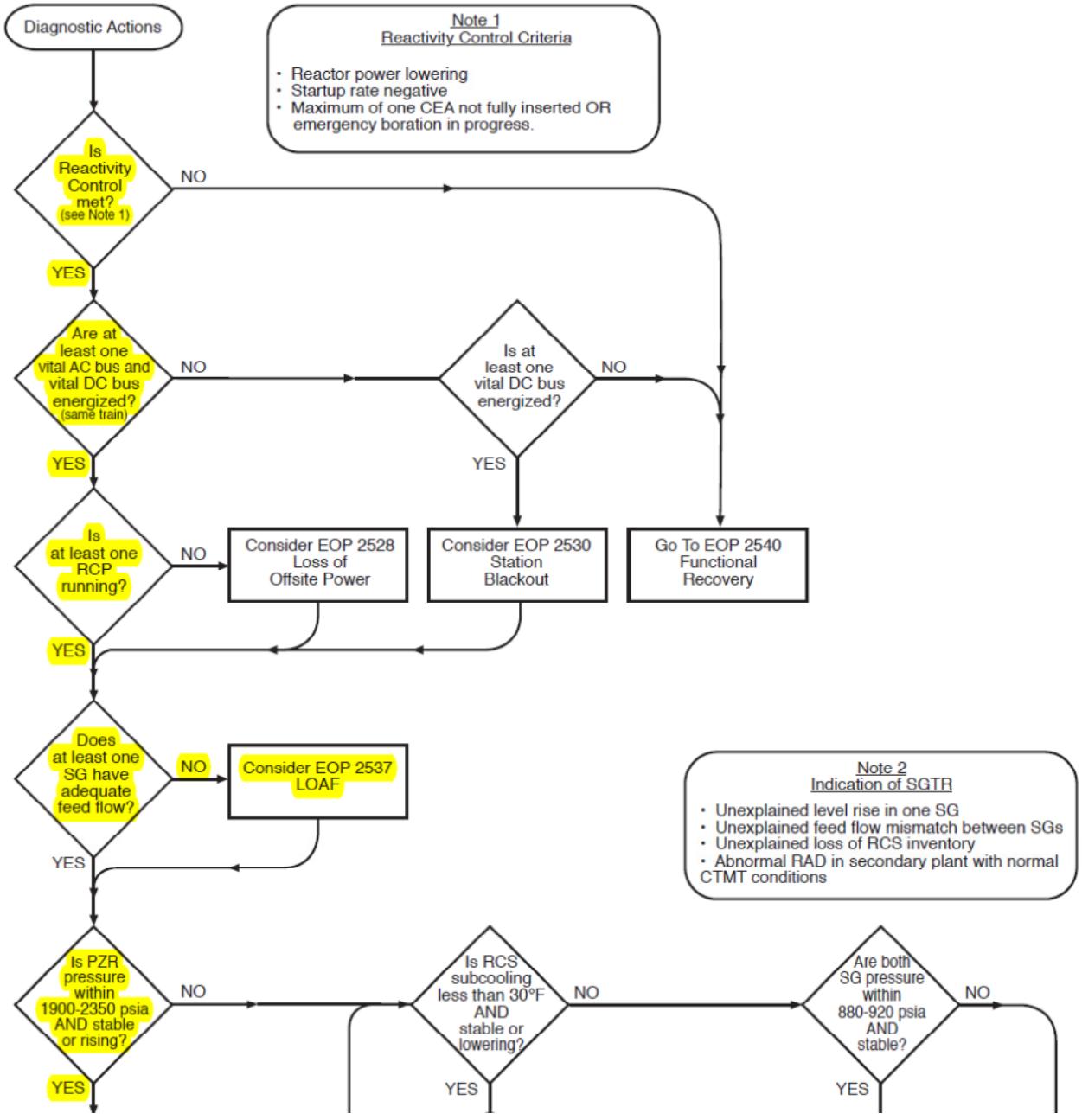
Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 7 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	3. TCOA: IF SIAS not actuated, THEN CHECK ONE facility of CRAC operating, in NORMAL mode, as follows: (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

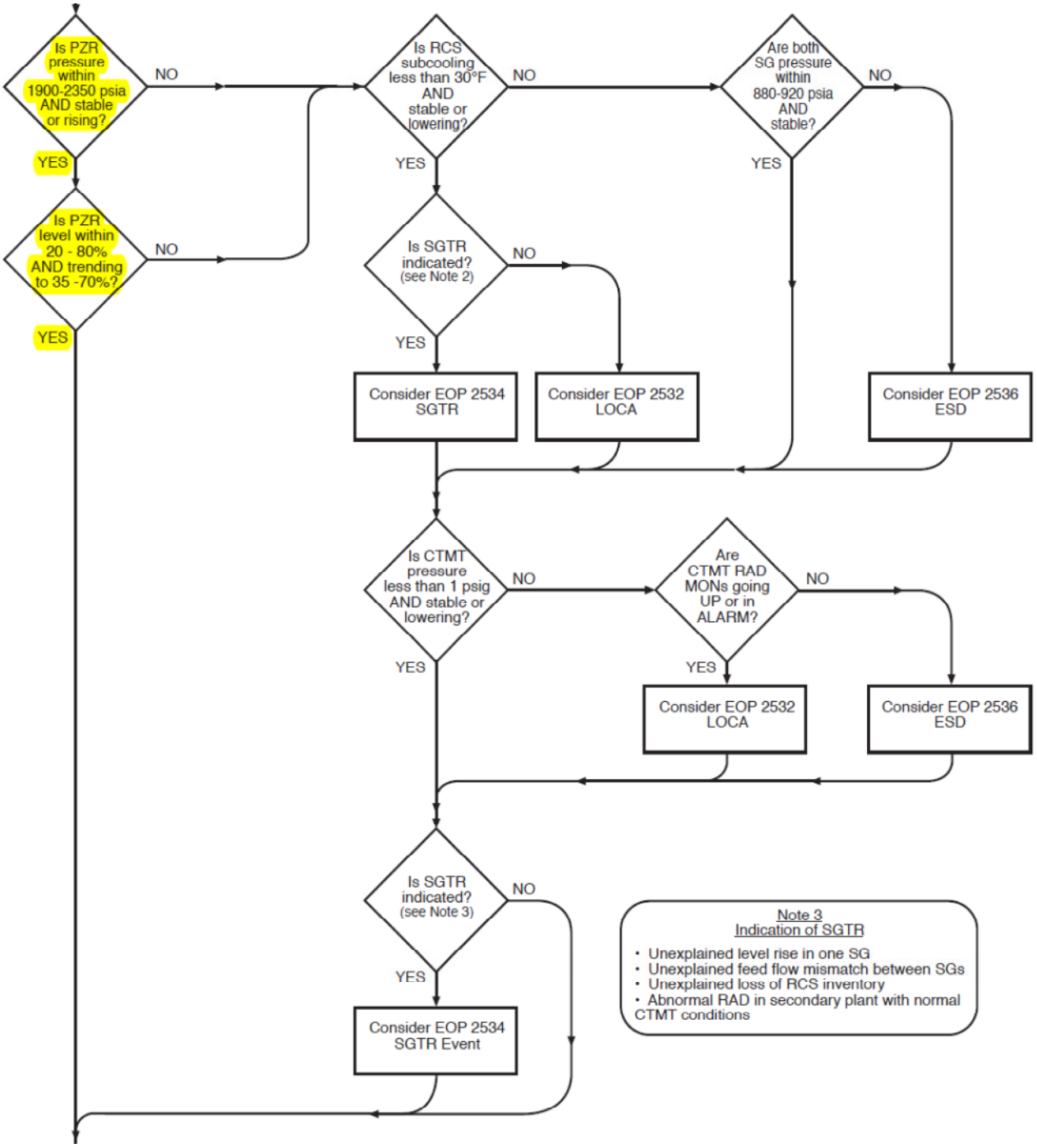
Op-Test No.: __ES18LI1___ Scenario No.: __2__ Event No.: _7__ Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**

	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		

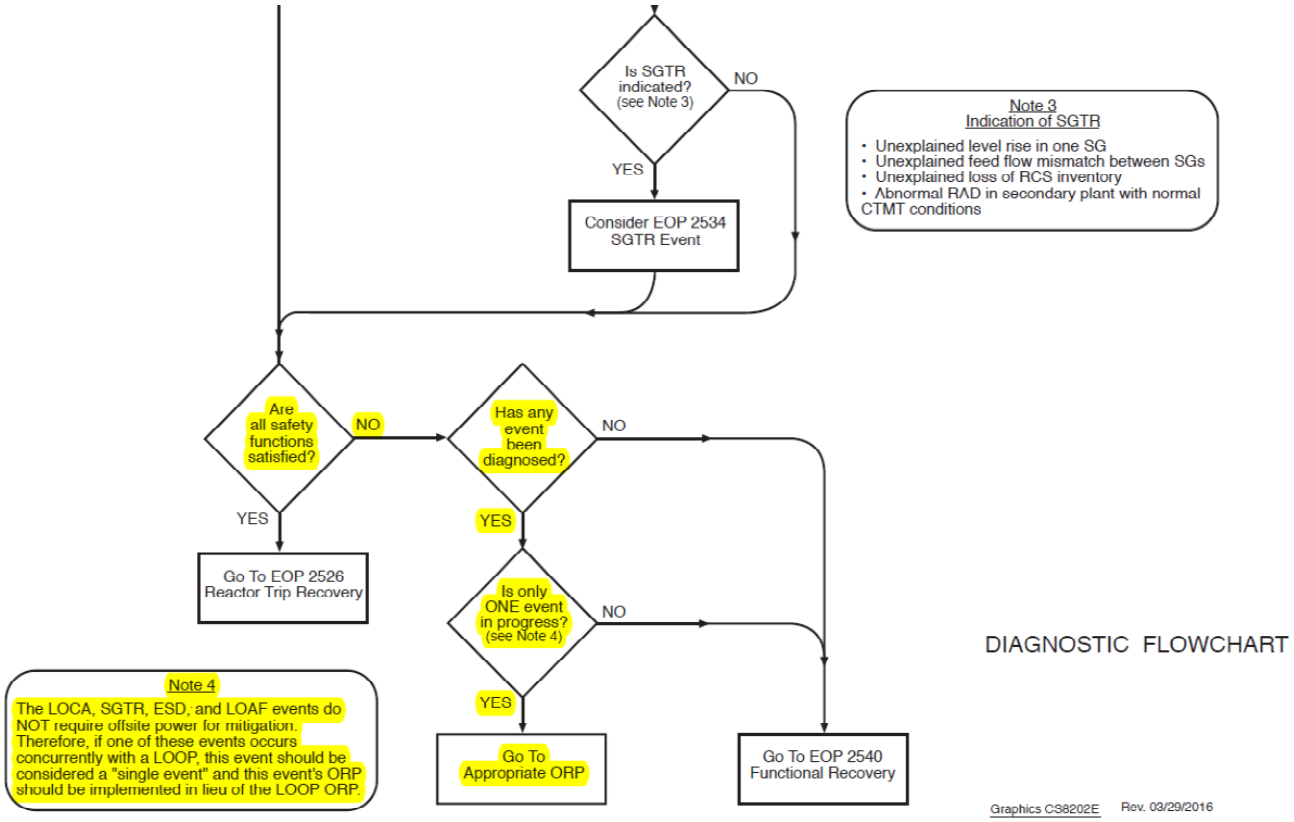
Op-Test No.: ES18LI1 Scenario No.: 2 Event No.: 7 Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**		
Time	**Position**	**Applicant's Actions or Behavior**



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**



SEG# Sim #2 Rev ; 0

SIMULATOR TRAINING SHIFT TURNOVER REPORT

DATE-TIME	PREPARED BY	SHIFT
Today 0515	Unit Supervisor /"NIGHT" Shift	18:00 - 06:00

PLANT STATUS:

Mode:	1	Rx Power:	100%
Megawatts:	Thermal: 2698 MWTH	PZR Pressure:	2250 psia
	Electric: 888 MWe	RCS T-AVE:	568 °F
RCS Leakage:	Identified: 0.015 gpm	Protected Train/Facility:	**TRAIN A**
	Unidentified: 0.036 gpm		
Date/Time:	Today 0015		

Active Tracking Records and Action Statements

Equipment/Reason

LCO	Action	Date	Time in LCO	Action Requirement	Time Left
None					

OD Compensatory Actions / Temp Logs

Open Date	Class Reason	Reason	Watch Position
None			

PLANT SYSTEMS APC

System	Notes
PZR Lvl Cntrl	Ch. "X" PZR Level Controller, LIC-110X, output erratic. I&C reviewing Tech. Manual for guidance.

CROSS UNIT SYSTEM STATUS

U3 Power to 24E	**34A aligned to 24E**

SURVEILLANCES / EVOLUTIONS IN PROGRESS

OP 2204	Steady State Operation
N/A	CONVEX reports a narrow band of severe thunderstorms is moving east through New England. Moving over us within the hour and expected to be clear of S.E. Conn. in about three hours.

REACTIVITY BRIEFING (SEE REACTIVITY THUMBRULES / SPREAD SHEET FOR ADDITIONAL INFO)

Current Rod Height	ARO @ 180
Xenon Trend	Stable
Current Boron	596 ppm
Boron Pot Setting / Blend Ratio	9 to 1 (corrected)

SIMULATOR SCENARIO #3

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

Examiners: _____ Operators: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: 100% Power **IC-48**, steady state, Ch-X PZR Level OOS, Ch-Y PZR Level in service. **ENSURE "B" Charging pump is aligned to 22F (Facility 2)**

Turnover: 100% Power, steady state, 24E is aligned to 24C. Channel "X" Pressurizer Level Control is OOS for I&C, but is not being worked at this time. Severe electrical storms have been predicted for the area, but none are directly overhead at this time.

Critical Tasks:

1. [RC-3, CT-1] Perform a plant cooldown (BOP).
2. [RC-3, CT-2] 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	CVR50, CVR51	C (ATC/S)	CH-192, RWST to CVCS, Failed Closed, requires borating from BAST
5	RX12C	I (BOP/S)	#2 SG "Main" Level Transmitter (LT-5273) fails low.
6	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.
7	CV04C	C (ATC/S)	30 seconds after the plant trip, "C" charging pump trips, requiring "B" charging pump be manually started for Emergency Boration.
8	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)	4
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)	2

Scenario 3 Summary:

The crew will take the shift with the unit at 100% Power **IC-48**, steady state, Ch-X PZR Level OOS, Ch-Y PZR Level in service, "B" Charging pump aligned to 22F (Facility 2).

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 and 4: Based on the guidance of AOP 2568, the crew will perform the actions of AOP 2575, ***Rapid Downpower***, to shut down to Mode 5 (**Event 3**). When the ATC attempts to borate from the RWST (preferred method), CH-192 fails to open on demand, requiring boration from the BAST.
Once the power change evaluation is completed, or at the examiners discretion, Event 5 is triggered.

Event 5: 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 6 is triggered.

Event 6: 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 7: 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 8 is triggered.

Event 8: 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
RD0208	CEA SD-8 Stuck fully withdrawn			E-0	Active		0
RD0209	CEA SD-9 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-5	50%		5
ES02D	Fac. 2 Inadvertent MSI			E-6	Active		6
ED06E	Loss of bus 22E			E-30	Active		6
CV04C	"C" Charging pump trip			E-7	Active		7
C02-C13	"B" Charging Pp Lube Oil Pres Lo			E-8	Cry-Wolf		8
CV04B	"B" Charging pump trip			E-8	Active		8
REMOTE FUNCTIONS							
CVR50	CH-192 Operational Mode			E-0	MANUAL		0
CVR51	RWST Isolation Valve CH-192 (% open)			E-0	0%		0
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 Flow greater than 5 minutes RBCCW HX Outlet Temperature Hi greater than 120°F RCP RBCCW Outlet Temperature greater than 125°F RCP Lower Seal Temperature greater than 170°F RCP Upper/Lower thrust bearing Temperature greater than 194°F RCP Bleedoff Temperature greater than 195°F RCP Anti Reverse Bearing Temperature greater than 250°F RCP Stator Temperature High greater 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 verification 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 Assessment."

	SRO	**Review Tech. Specs.**: **LCO 3.7.3.1 (RBCCW):** Two reactor building closed cooling water loops shall be 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: 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 d. **START** second Charging Pump e. **ADJUST** LTDN FLOW CNTL, HIC-110, to stabilize Pressurizer level f. **CHECK** Pressurizer Level – STABLE RISING **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.
Simulator Operator: If US suggests/requests a CTMT entry, as SM/OMOC state management will evaluate the need and direct the actions if necessary.		
	SRO	**5. MAINTAIN VCT Level 72 to 86%**
	SRO	**6. Evaluate Activities That Could Impact RCS Integrity** **a. CHECK** activities that could affect primary plant leakage - **NONE** IN PROGRESS • Valve alignment • Periodic Testing • Maintenance

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	NOTE: Based on priorities determined in step 7, steps 8 through 16 may be performed in any order. At US discretion, only steps applicable to the observed leak in progress need to be performed. NOTE: ATTACHMENT E, Potential RCS Leak Isolations, provides a listing of valves that may be used to isolate leakage from the RCS. **7. Identify AND Locate RCS Leak** a. Using Table 1 **DETERMINE** priority of steps 8 through 16 for leak identification and isolation
	SRO	**Table 1** Event / Step / Completed RCS Leakage into Auxiliary or Enclosure Buildings — 8 — ☐ RCS Leakage into Containment — 9 — ☐ RCP Vapor Seal Leakage — 10 — ☐ Reactor Vessel Flange Leakage — 11 — ☐ RCS Leakage into Quench Tank — 12 — ☐ RCS Leakage into PDT — 13 — ☐ RCS Leakage into Safety Injection Tanks — 14 — ☐ RCS Leakage into RBCCW System — 15 — ☐ Steam Generator Tube Leakage — 16 — ☐
	SRO	b. PERFORM steps 8 through 16 in any order and as required to identify and isolate RCS leak c. PROCEED TO step 17.
	SRO	**9. Evaluate Containment For RCS Leakage** a. **CHECK all** of the following conditions - MET: • Containment Sump level rate of rise - NORMAL (C-07) • Containment Radiation Monitor readings - NORMAL (RC-14/PPC) • Containment Temperature and Pressure - NORMAL (C-01/PPC)

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	**9. RESPONSE NOT OBTAINED** a. **PERFORM** the following: 1. **ENSURE** RCS Sample valves - CLOSED (C-01X/PPC/C-72): • 2-RC-001, RC Hot Leg Isol • 2-RC-002, PZR Surge Sample Isol • 2-RC-003, PZR Stm Sample Isol • 2-RC-45, RC Combined Sample Isol Valve 2. **NOTIFY** OMOC of the potential need for Containment entry for leak identification. 3. **REQUEST** Work Week Coordinator **PREPARE** for Containment Entry using C OP 200.14, Containment Entry. 4. **USE** ATTACHMENT E, Potential RCS Leak Isolations, to address leakage into Containment. a. **IF** leakage into Containment is indicated **WITHOUT** a resulting loss of RCS inventory, **THEN CONSIDER** other system leakage. 5. **PROCEED TO** step 10. **Examiner Note: There is no need to proceed through the other RCS Leak identification steps. The US should proceed to step 17.**
	SRO	**17. Evaluate RCS Leakage** a. **CHECK** RCS leakage has been reduced to within Tech Spec 3.4.6.2 limits **17. RESPONSE NOT OBTAINED** a. **PERFORM one** of the following to place the plant in MODE 5 within the time constraints of TS 3.4.6.2: • **GO TO** AOP 2575, Rapid Downpower. **OR** • **GO TO** OP 2207, Plant Cooldown.

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.** **Examiner Note: If necessary, as the SM, direct shutdown IAW AOP 2575**
Simulator Booth: If asked to investigate RCS leakage outside of CTMT, wait about 15 minutes and report none found.		
	SRO	**Review Tech. Specs.**: **3.4.6.1** 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.

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.**: **3.3.3.8** 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. **TABLE 3.3-11** **ACCIDENT MONITORING INSTRUMENTATION** Instrument | Total No. of Channels | Minimum Channels OPERABLE | ACTION 8. Containment Water Level (Narrow Range) | 1 | 1 | 7## 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.).
	SRO	Enters AOP 2575, Rapid Downpower

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 3 & 4 Event Description: AOP 2575, Rapid Downpower (due to RCS leakage) and Failure of CH-192 to Open.		
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.
	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, <u>AND</u> 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 & 4 Event Description: AOP 2575, Rapid Downpower (due to RCS leakage) and Failure of CH-192 to Open.		
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 & 4 Event Description: AOP 2575, Rapid Downpower (due to RCS leakage) and Failure of CH-192 to Open.		
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 & 4

Event Description: AOP 2575, Rapid Downpower (due to RCS leakage) and Failure of CH-192 to Open.

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. **Examiner Note:** Crew must borate from the BAST due to failure of CH-192. CONTINGENCY ACTIONS d.1 IF CH-192, RWST isolation, can not be opened, Go To step 3.10. 3.10 IF desired to borate from the BAST BORATE to the charging pump suction with the reactivity plan (or Attachment 7), as follows: a. ENSURE the following: • "MAKEUP MODE SEL" in "DILUTE" • "PRI MAKEUP WTR FLOW" controller, "FC-210X," set to "0" gpm. b. ENSURE the following valves are closed: • "MAKEUP VLV STOP, CH-512" • "VCT MAKEUP BYPASS, CH-196" • "RWST ISOL, CH-192"
Simulator Booth: If asked to investigate CH-192, wait 10 minutes and report no problem is visible.		
	ATC	**Attachment 7** **Boration/Power Reduction Rates** (Sheet 1 of 1)

RWST			
	BOC	MOC	EOC
One pump	29% per hour	35% per hour	40% per hour
Two pumps	56% per hour	68% per hour	78% per hour
Three pumps	82% per hour	100% per hour	115% per hour

BAST							
	10%	20%	30%	40%	50%	60%	70%
BOC (1104ppm)	3 gpm	6 gpm	10 gpm	13 gpm	16 gpm	19 gpm	23 gpm
MOC (616 ppm)	4 gpm	7 gpm	11 gpm	14 gpm	18 gpm	21 gpm	25 gpm
EOC (34 ppm):	4 gpm	8 gpm	12 gpm	16 gpm	20 gpm	23 gpm	27 gpm

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 3 & 4 Event Description: AOP 2575, Rapid Downpower (due to RCS leakage) and Failure of CH-192 to Open.		
Time	**Position**	**Applicant's Actions or Behavior**
	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.
	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.

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 3 & 4 Event Description: AOP 2575, Rapid Downpower (due to RCS leakage) and Failure of CH-192 to Open.		
Time	**Position**	**Applicant's Actions or Behavior**
	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, #2 SG 'Main' Level Transmitter Failure.		

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 5		
Event Description: #2 SG 'Main' Level Transmitter Failure		
Time	**Position**	**Applicant's Actions or Behavior**
Simulator Operator: When directed, initiate Event #5, #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.: 5		
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 • Steam flow 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. • 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 controller(s) in "AUTO."
Simulator Operator : Once Main Feedwater Control is back in automatic mode, or at the examiners discretion, proceed to Event 6, Inadvertent MSI Actuation and Plant Trip.		

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 6, 7 & 8		
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 6, 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.
	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.
Simulator Operator: While the ATC is aligning boric acid injection, initiate Event 7, "C" Charging Pump trip.		

Time	Position	Applicant's Actions or Behavior
	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".		
	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.: 3 Event No.: 6, 7 & 8		
Event Description: Inadvertent MSI Actuation and Plant Trip and Loss of "A" & "C" Charging Pumps		
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: • 6.9kV 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 8, 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
	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.

Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 6, 7 & 8		
Event Description: Inadvertent MSI Actuation and Plant Trip and Loss of "A" & "C" Charging Pumps		
Time	**Position**	**Applicant's Actions or Behavior**

	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.
	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

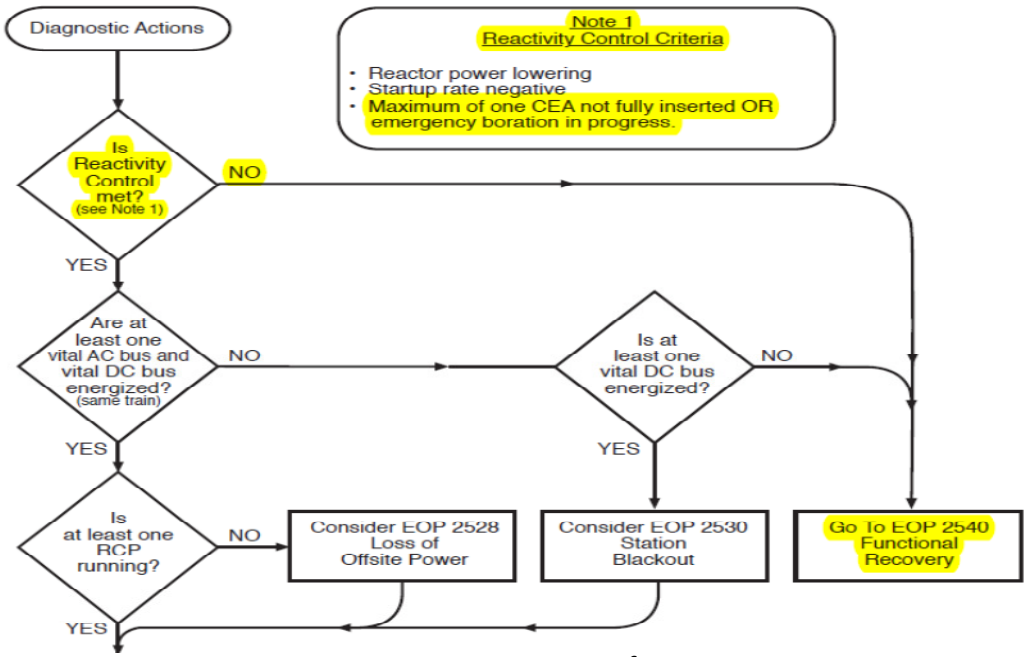
Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 6, 7 & 8		
Event Description: Inadvertent MSI Actuation and Plant Trip and Loss of "A" & "C" Charging Pumps		
Time	**Position**	**Applicant's Actions or Behavior**
	ATC	**Containment Isolation** (cont.) c. CHECK that NONE of the following steam plant radiation 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.
		Step 9b <u>RESPONSE NOT OBTAINED</u> 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.
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.: 6, 7 & 8		
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 31] c. Go To the appropriate EOP
	SRO	

Safety Function	Path	Met?	Priority	Examiner Notes
RC-3	Boration Using SI	Yes	1	If Rx Power is $<10^{-4}$% then SF is met
DC-1	DC Power	Yes	4	
AC-1	RSST	Yes	5	
IC-2	SI	Yes	2	
PC-1	Subcooled	Yes	6	
HR-2	SG and SI Operating	Yes	3	Assuming SIAS
CI-1	Isolated	Yes	7	
CTPC-1	CARs [Normal]	Yes	8	

Examiner Note: Diagnostic Flow Chart Decision Steps.



Op-Test No.: ES18LI1 Scenario No.: 3 Event No.: 8 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: • **Four 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.: 8		
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.: _8__ 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: Perform a Plant Cooldown and Establish Reactivity Control. [CT-1 (BOP) & CT-2 (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		

SEG# Sim #3 Rev ; 0

SIMULATOR TRAINING SHIFT TURNOVER REPORT

DATE-TIME	PREPARED BY	SHIFT
Today 0515	Unit Supervisor /"NIGHT" Shift	18:00 - 06:00

PLANT STATUS:

Mode:	1	Rx Power:	100%
Megawatts:	Thermal: 2698 MWTH	PZR Pressure:	2250 psia
	Electric: 888 MWe	RCS T-AVE:	568 °F
RCS Leakage:	Identified: 0.015 gpm	Protected Train/Facility:	**TRAIN A**
	Unidentified: 0.036 gpm		
Date/Time:	Today 0015		

Active Tracking Records and Action Statements

Equipment/Reason

LCO	Action	Date	Time in LCO	Action Requirement	Time Left
None					

OD Compensatory Actions / Temp Logs

Open Date	Class Reason	Reason	Watch Position
None			

PLANT SYSTEMS APC

System	Notes
PZR Lvl Cntrl	Ch. "X" PZR Level Controller, LIC-110X, output erratic. I&C reviewing Tech. Manual for guidance.

CROSS UNIT SYSTEM STATUS

U3 Power to 24E	**34A aligned to 24E**

SURVEILLANCES / EVOLUTIONS IN PROGRESS

OP 2204	Steady State Operation
N/A	CONVEX reports a narrow band of severe thunderstorms is moving east through New England. Moving over us within the hour and expected to be clear of S.E. Conn. in about three hours.

REACTIVITY BRIEFING (SEE REACTIVITY THUMBRULES / SPREAD SHEET FOR ADDITIONAL INFO)

Current Rod Height	ARO @ 180
Xenon Trend	Stable
Current Boron	596 ppm
Boron Pot Setting / Blend Ratio	9 to 1 (corrected)

SIMULATOR SCENARIO #4

REVISED

Facility: Millstone Unit 2 Scenario No.: 4 Op-Test No.: ES18LI1

Examiners: _____ Operators: _____ SRO

_____ _____ ATC

_____ _____ BOP

Initial Conditions: 100% Power **IC-222**, steady state. Ch-X PZR Level OOS, Ch-Y PZR Level in service. **ENSURE "B" Charging pump is aligned to 22F (Facility 2)**

Turnover: 100% Power, steady state, 24E is aligned to 24C. Channel "X" Pressurizer Level Control is OOS for I&C, but is not being worked at this time. Severe electrical storms have been predicted for the area, but none are directly overhead at this time.

Critical Tasks:

1. [2260 ESD, CT-1] Secure feed flow to the affected SG within 30 minutes (BOP).
2. [ENT-1, CT-2] Trip 2 RCPs or trip RCPs based on RCS pressure (ATC).
3. [PC-1, CT-3] Establish RCS Pressure Control (ATC).

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)	3

Scenario 4 Summary:

The crew will take the shift with the unit at 100% Power **IC-222**, steady state. Ch-X PZR Level OOS, Ch-Y PZR Level in service, "B" Charging pump aligned to 22F (Facility 2).

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 A 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 10 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
		2.2.2 ENSURE all SIT "FILL & DRN" valves closed (C-01): • "SIT 1, SI-611" • "SIT 2, SI-621" • "SIT 3, SI-631" • "SIT 4, SI-641" 2.2.3 OPEN recirculation header "DRAIN, SI-661" (C-01).
Simulator Operator: When SI-638 is opened, trigger E-10 to remove the check valve leakage.		
	ATC	2.2.4THROTTLE 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. 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: 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 Tech. Requirements Manual 7.1 for Appendix R		
	SRO	**7.1 APPENDIX R SAFE SHUTDOWN REQUIREMENTS** **REFERENCE TECHNICAL SPECIFICATION: As Identified In Each TECHNICAL REQUIREMENT** **TECHNICAL REQUIREMENT IS AS SPECIFIED IN THE FOLLOWING COMPONENT SECTIONS.** **APPLICABILITY:** **Is as specified in the following component sections.** **ACTION:** With an Appendix R Safe Shutdown Related (ARSR) component listed in the following component tables nonfunctional (unable to meet its intended Appendix R shutdown function), perform the following: a. Restore FUNCTIONALITY of the affected component(s) within 14 days*, or b. Establish the following compensatory measures to satisfy the FUNCTIONALITY requirements of ARSR components listed in the following component tables unless other compensatory measures are stated: 1. Establish a one-hour roving fire watch for all affected areas identified in the following component tables … d. Restore FUNCTIONALITY of the affected Risk Significant component within 72 hours, or e. Establish the following risk management action (RMA) Defense-In-Depth compensatory measures for the next 30 days to limit transient combustible material and ignition sources identified in the following component tables:
Examiner Note: The following are for Tech. Requirements 7.1.21 pertaining to the above ACTIONS.		

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
	SRO	**REFERENCE TECHNICAL SPECIFICATION: 3.7.4.1 Service Water System** **TECHNICAL REQUIREMENT** **7.1.21** The Appendix R Safe Shutdown Related (ARSR) equipment listed in the TRM Table 7.1.21-1 shall be FUNCTIONAL. APPLICABILITY: MODES 1, 2, 3, and 4. ACTION: With an ARSR component listed in the above referenced component table nonfunctional (unable to meet its intended Appendix R shutdown function), take the ACTION as specified in the above table under Compensatory Measures.

Table 7.1.21-1
Service Water System Components
FUNCTIONALITY Requirements and Compensatory Measures

TR Item	Comp ID	FUNCTIONALITY Description	Compensatory Measures	
			Compensatory Measures if Component Not Restored in 14 Days (see ACTION "a")	Risk Significant Component Not Restored in 72 Hours (see ACTION "d")
A	P5A & L1A P5C & L1C SW Pumps & Strainers	Each Service Water Pump and its associated Strainer must be FUNCTIONAL from the Control Room.	With P5A or its Strainer L1A nonfunctional, perform ACTIONS b.1, b.2 for fire areas R-2, R-3, R-8, R-10, and R-11. With P5C or its Strainer L1C nonfunctional, perform ACTIONS b.1, b.2 for fire areas R-1, R-7, R-9, R-13, R-14, R-16 and R-17.	With P5B supplying A train, Risk Mitigation Areas are: R-2 (FHA T-8,T-10), R-3 (FHA T-1A, T-1C) With P5B supplying B train, Risk Mitigation Areas are: R-11 (FHA A-28) R-14 (FHA T-7)

	SRO	Notes the most limiting TRM requires compensatory measures if "A" Service Water pump functionality is not restored in 72 hours (Action "d", above).

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.

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	4.6.1 **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.
		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.**

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
	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 hypochlorite injection, wait 2 minutes and report done.**		
Examiner Note: The following steps are from AOP 2565, Loss of Service Water (if used).		
	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 at background, #2 frisked 150 cpm above background. Continuing 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.
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.: 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.
Simulator Operator: 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
		Simulator Operator: When directed, initiate Event 5, Steam Generator Tube Rupture.
		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, 25B 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]		
	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. 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 completed within 30 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	1. IF ANY SG pressure is less than 572 psia, THEN ENSURE MSI actuated. (C01) 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."
Simulator Operator: If sent to locally close FW-43B, select remote FWR64 (active at 100%) and lower the value to close the valve as directed by control.		
		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 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 36 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 32.

Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 5, 6 & 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 #1 SG frisked at background and #2 SG frisked at 50 cpm above background.		
	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.: 5, 6 & 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 – **[SRO will stop at CI-1]**
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.: 5, 6 & 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	WARNING 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.: 5, 6 & 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]		
	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.: 5, 6 & 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. _____Tc°F 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
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

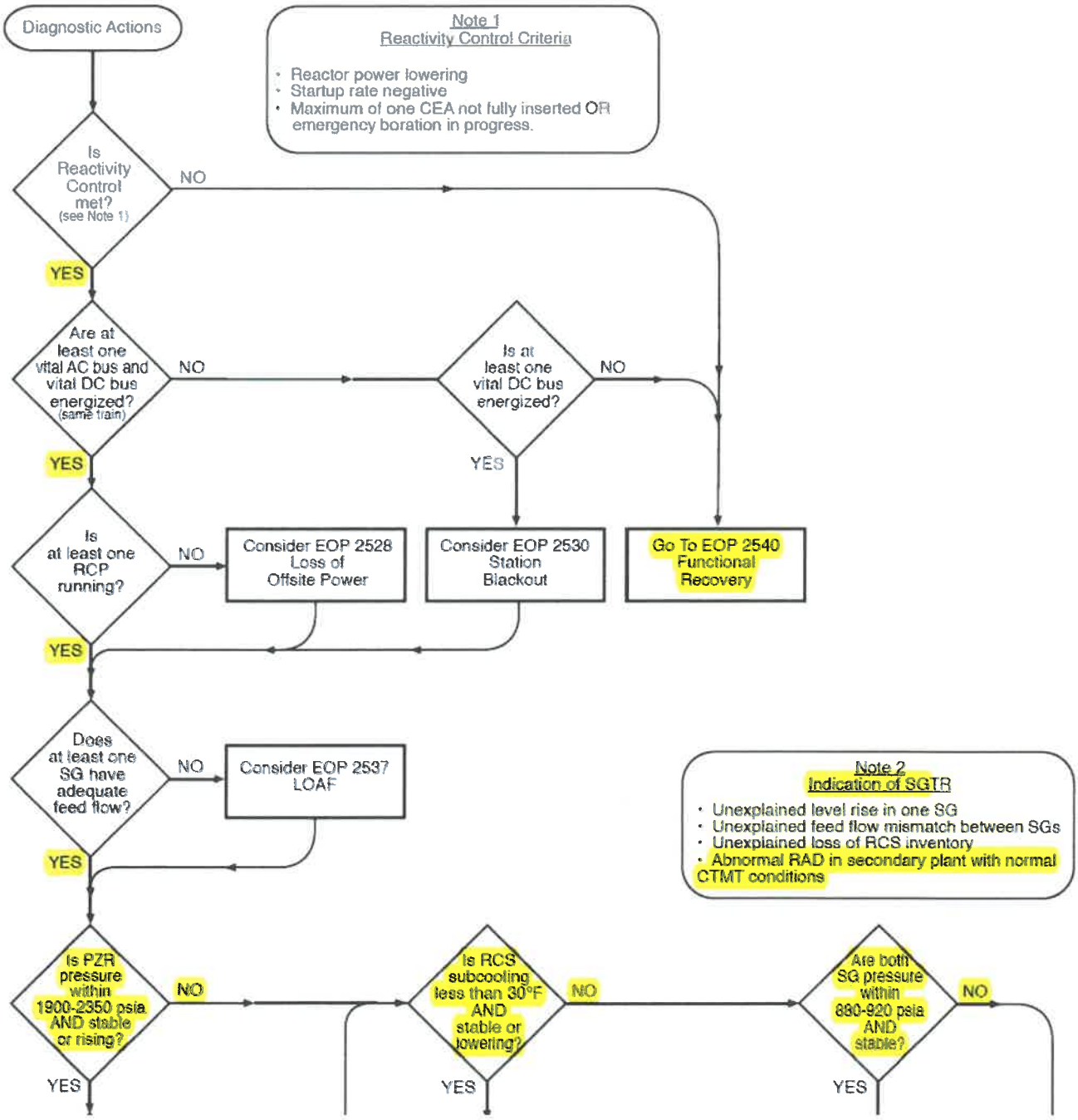
Event Description: **EOP 2541, Followup Actions, Appendix 4A, Reactor Trip Subsequent Actions**

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)**

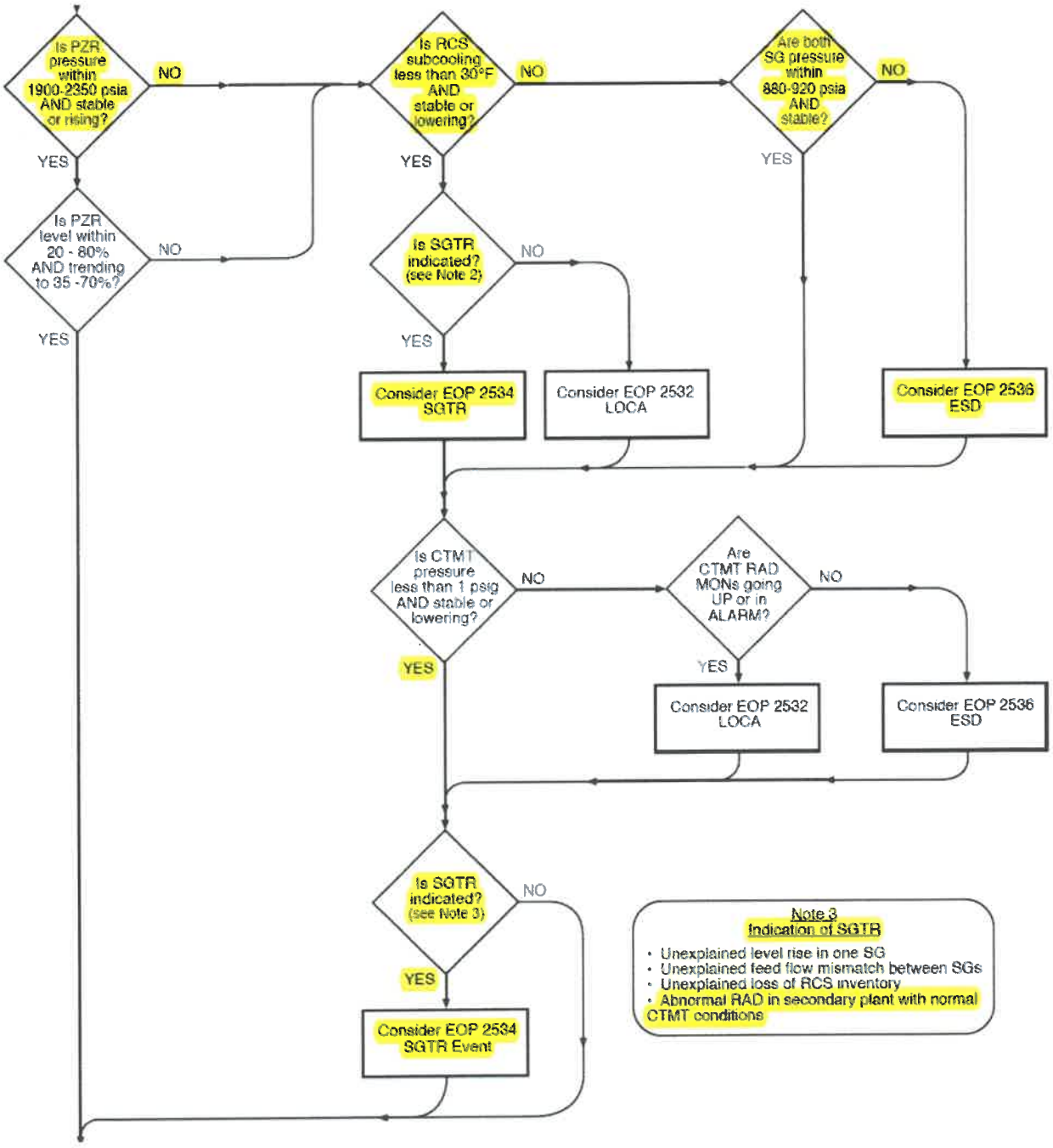
Time	Position	Applicant's Actions or Behavior



Op-Test No.: ES18LI1 Scenario No.: 4 Event No.: 7

Event Description: **EOP 2541, Appendix 1, Diagnostic Flow Chart (from EOP 2525, Step 10)**

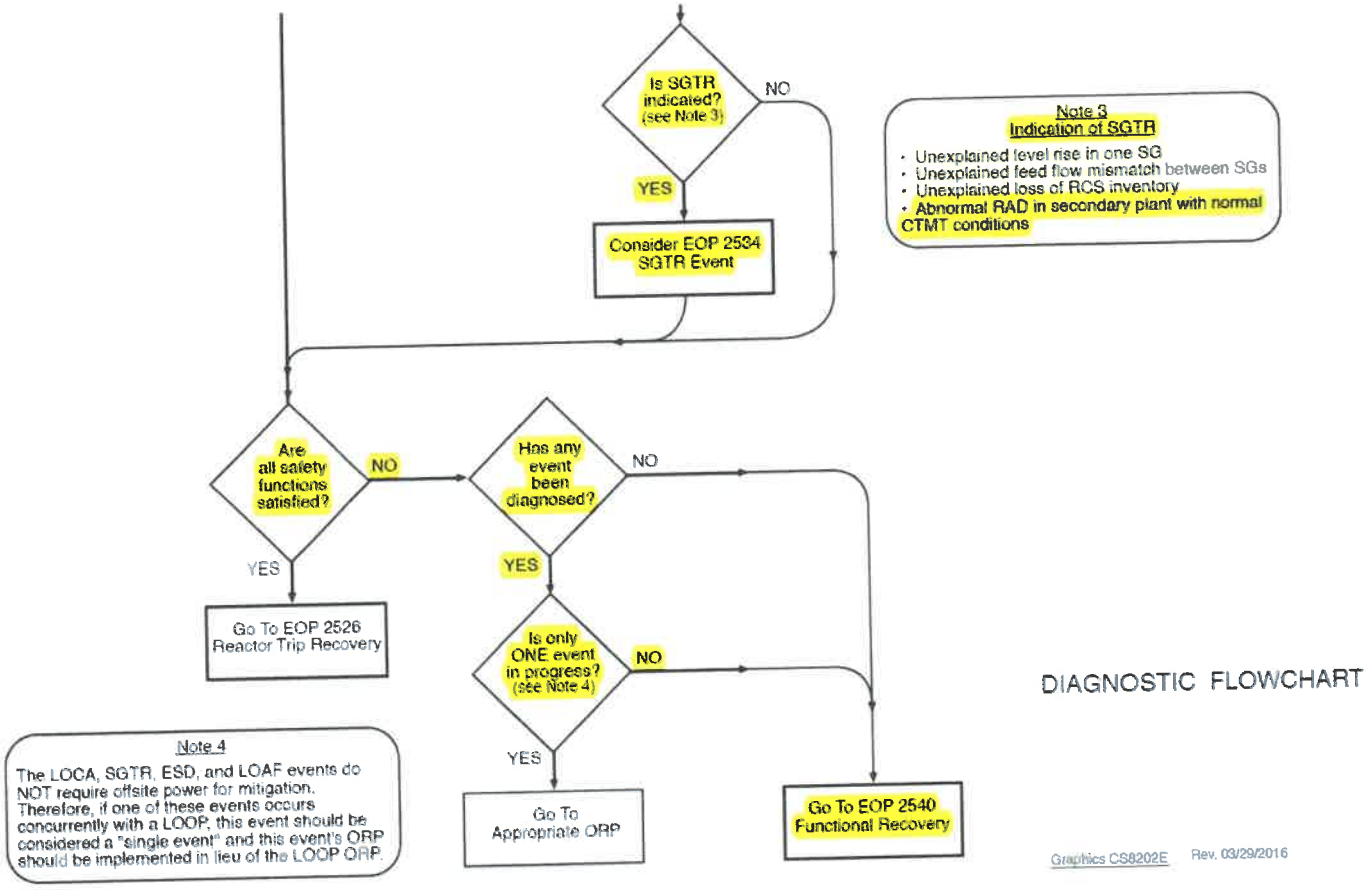
Time	Position	Applicant's Actions or Behavior



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



SEG# Sim #4 Rev ; 0

SIMULATOR TRAINING SHIFT TURNOVER REPORT

DATE-TIME	PREPARED BY	SHIFT
Today 0515	Unit Supervisor /"NIGHT" Shift	18:00 - 06:00

PLANT STATUS:

Mode:	1	Rx Power:	100%
Megawatts:	Thermal: 2698 MWTH	PZR Pressure:	2250 psia
	Electric: 888 MWe	RCS T-AVE:	568 °F
RCS Leakage:	Identified: 0.015 gpm	Protected Train/Facility:	**TRAIN A**
	Unidentified: 0.036 gpm		
Date/Time:	Today 0015		

Active Tracking Records and Action Statements

Equipment/Reason

LCO	Action	Date	Time in LCO	Action Requirement	Time Left
None					

OD Compensatory Actions / Temp Logs

Open Date	Class Reason	Reason	Watch Position
None			

PLANT SYSTEMS APC

System	Notes
PZR Lvl Cntrl	Ch. "X" PZR Level Controller, LIC-110X, output erratic. I&C reviewing Tech. Manual for guidance.

CROSS UNIT SYSTEM STATUS

U3 Power to 24E	**34A aligned to 24E**

SURVEILLANCES / EVOLUTIONS IN PROGRESS

OP 2204	Steady State Operation
N/A	CONVEX reports a narrow band of severe thunderstorms is moving east through New England. Moving over us within the hour and expected to be clear of S.E. Conn. in about three hours.

REACTIVITY BRIEFING (SEE REACTIVITY THUMBRULES / SPREAD SHEET FOR ADDITIONAL INFO)

Current Rod Height	ARO @ 180
Xenon Trend	Stable
Current Boron	596 ppm
Boron Pot Setting / Blend Ratio	9 to 1 (corrected)