

Form 3.2-1 Administrative Topics Outline

Facility: <u>Millstone Unit 2</u>		Date of Examination: <u>09SEPT24</u>
Examination Level: RO ☒ SRO ☐		Operating Test Number: <u>MP2-24</u>
Administrative Topic (Step 1)	Activity and Associated K/A (Step 2)	Type Code (Step 3)
Conduct of Operations	A.1. Calculate Spent Fuel Heatup to 150 F K/A 2.1.20 - Ability to interpret and execute procedure steps. IR - 4.6	R, M
Conduct of Operations	A.3. Maximum Reactor Coolant System Venting Time Determination. K/A 2.1.25 - Ability to interpret reference materials, such as graphs, curves, and tables (reference potential). IR - 3.9	R, D
Equipment Control	A.2. Remove an Individual Annunciator from Service K/A - 2.2.43 Knowledge of the process used to track inoperable alarms. IR - 3.0	R, N
Radiation Control	A4. Determine RM-4262, Steam Generator BlowDown Rad Monitor, Setpoints. K/A 2.3.11 Ability to control radiation releases. IR - 3.8	R, N
Emergency Plan		

Instructions for completing Form 3.2-1, "Administrative Topics Outline"

1. For each license level, determine the number of administrative job performance measures (JPMs) and topic areas as follows:

Topic	Number of JPMs	
	RO*	SRO and RO Retakes
Conduct of Operations	1 (or 2)	2
Equipment Control	1 (or 0)	1
Radiation Control	1 (or 0)	1
Emergency Plan	1 (or 0)	1
Total	4	5

* Reactor operator (RO) applicants do not need to be evaluated on every topic (i.e., "Equipment Control," "Radiation Control," or "Emergency Plan" can be omitted by doubling up on "Conduct of Operations"), unless the applicant is taking only the administrative topics portion of the operating test (with a waiver or excusal of the other portions).

2. Enter the associated knowledge and abilities (K/A) statement and summarize the administrative activities for each JPM.

3. For each JPM, specify the type codes for location and source as follows:

Location:

(C)ontrol room, (S)imulator, or Class(R)oom

Source and Source Criteria:

(P)revious two NRC exams (no more than one JPM that is **randomly selected** from last two NRC exams)

(D)irect from bank (no more than three for ROs, no more than four for SROs and RO retakes)

(N)ew or Significantly (M)odified from bank (no fewer than one)

A1. Calculate Spent Fuel Pool Heatup Time to 150 °F

The examinee uses Attachment 3 of the Shutdown Safety Assessment Checklist to determine heat-up rate of the Spent Fuel Pool. Using the obtained value, the examinee will then determine the amount of time it will take the Spent Fuel Pool to heat up to 150 °F in the event Spent Fuel Pool Cooling is lost.

A2. Remove an Individual Annunciator from Service

The examinee will perform the steps to identify the alarm card location for an annunciator that has become a nuisance. Along with identifying the location, the examinee will determine the correct Contact Status for the annunciator half card being installed to allow the partner annunciator to remain in service.

A3. Maximum RCS Venting Time Determination

The examinee will determine the maximum venting required to eliminate a void in the reactor that is restricting natural circulation flow after a Loss of Coolant Accident. The examinee will also determine the minimum Reactor Coolant System pressure allowed during the venting evolution.

A4. Determine RM-4262, S/G Blowdown Radiation Monitor, Setpoints

The examinee will determine transient radiation monitor setpoints for the Steam Generator Blowdown Radiation Monitor when the radiation reading exceed the current alarm setpoints.

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Examination Level: RO ☐ SRO ☒		Operating Test Number: <u>MP2-24</u>
Administrative Topic (Step 1)	Activity and Associated K/A (Step 2)	Type Code (Step 3)
Conduct of Operations	A.1. Calculate Spent Fuel Heatup to 150 F K/A 2.1.20 - Ability to interpret and execute procedure steps. IR - 4.6	R, M
Conduct of Operations	A.3. Maximum Reactor Coolant System Venting Time Determination. K/A 2.1.25 - Ability to interpret reference materials, such as graphs, curves, and tables (reference potential). IR - 4.2	R, D
Equipment Control	A.2. Remove an Individual Annunciator from Service K/A - 2.2.43 Knowledge of the process used to track inoperable alarms. IR - 3.3	R, N
Radiation Control	A4. Determine RM-4262, Steam Generator BlowDown Rad Monitor, Setpoints. K/A 2.3.11 Ability to control radiation releases. IR - 4.3	R, M
Emergency Plan	A5. Notification and Reportability of Contaminated Injured Individual 2.4.30 Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. IR - 4.1	R, D

Instructions for completing Form 3.2-1, "Administrative Topics Outline"

1. For each license level, determine the number of administrative job performance measures (JPMs) and topic areas as follows:

Topic	Number of JPMs	
	RO*	SRO and RO Retakes
Conduct of Operations	1 (or 2)	2
Equipment Control	1 (or 0)	1
Radiation Control	1 (or 0)	1
Emergency Plan	1 (or 0)	1
Total	4	5

* Reactor operator (RO) applicants do not need to be evaluated on every topic (i.e., "Equipment Control," "Radiation Control," or "Emergency Plan" can be omitted by doubling up on "Conduct of Operations"), unless the applicant is taking only the administrative topics portion of the operating test (with a waiver or excusal of the other portions).

2. Enter the associated knowledge and abilities (K/A) statement and summarize the administrative activities for each JPM.

3. For each JPM, specify the type codes for location and source as follows:

Location:

(C)ontrol room, (S)imulator, or Class(R)oom

Source and Source Criteria:

(P)revious two NRC exams (no more than one JPM that is **randomly selected** from last two NRC exams)

(D)irect from bank (no more than three for ROs, no more than four for SROs and RO retakes)

(N)ew or Significantly (M)odified from bank (no fewer than one)

A1. Calculate Spent Fuel Pool Heatup Time to 150 °F

The examinee uses Attachment 3 of the Shutdown Safety Assessment Checklist to determine heat-up rate of the Spent Fuel Pool. Using the obtained value, the examinee will then determine the amount of time it will take the Spent Fuel Pool to heat up to 150 °F in the event Spent Fuel Pool Cooling is lost. The examinee will then compare their data with that provided as a second check and determine the provided data has an incorrect 'time from shutdown' number.

A2. Remove an Individual Annunciator from Service

The examinee will determine the effect of removing an annunciator from service on plant operation; specifically, the need for compensatory actions due to TS/TRM applicability. The examinee will then perform the steps to identify the alarm card location for an annunciator that has become a nuisance. After identifying the location, the examinee will determine the correct Contact Status for the annunciator half card being installed to allow the partner annunciator to remain in service.

A3. Maximum RCS Venting Time Determination

The examinee will review a recommended maximum venting required to eliminate a void in the reactor that is restricting natural circulation flow after a Loss of Coolant Accident. The examinee will also review the recommended minimum Reactor Coolant System pressure allowed during the venting evolution. The examinee will determine the recommended venting time is incorrect.

A4. Determine RM-4262, S/G Blowdown Radiation Monitor, Setpoints

The examinee will verify provided transient radiation monitor setpoints for the S/G Blowdown Radiation Monitor when the radiation reading exceed the current alarm setpoints. The examinee will determine that the provided radiation setpoints are correct.

A5. Notification and Reportability Associated with a Contaminated Injured Individual

The examinee determines the reportability (notification) requirements for a contaminated, injured individual. After determining what notifications are required, the examinee will fill out RAC 14, Attachment 13, NRC Event Notification Form.

Form 3.2-2 Control Room/In-Plant Systems Outline

Facility: <u>Millstone Unit 2</u>		Date of Examination: <u>09SEPT24</u>
		Operating Test Number: <u>MP2-24</u>
Exam Level: ☒ RO ☐ SRO-I ☐ SRO-U		
System/JPM Title	Type Code	Safety Function
Control Room Systems		
S1. Control Element Drive System/Continuous CEA withdrawal. (001 AA1.05) IR - 4.2	N,A,L,S	1
S2. Charging/ Align Charging Discharge Path. (004 A2.07) IR - 3.8	D,A,E,S	2
S3. Turbine Battery/Perform actions for a deenergized Turbine Battery Charger. (063 A4.03) IR - 3.5	N,A,E,L,S	6
S4. Reactor Coolant/Start a Reactor Coolant Pump 003 A4.09) IR - 3.6	D,L,S	4*
S5. Auxiliary Feedwater/Feed S/Gs from C-21 using MDAFW pumps (068 AA1.02) IR - 4.0	D,E,L,S	4*
S6. Engineered Safeguards Actuation System/Fuel Handling accident in Spent Fuel Area (013A 4.03) IR- 4.4	N,E,EN,S	5
S7. Waste Gas System/Setting up RM-9095 for 'A' Waste Gas Decay Tank Discharge (071 A2.05) IR - 3.1	D,S	9
S8. Closed Cooling Water/Shifting from 'A' RBCCW Pump to 'B' RBCCW Pump (008 A4.01) IR - 3.7	N,A,S	8
In-Plant Systems		
P1. Condensate/Filling Hotwell with Condensate transfer pump (054 AK1.05) IR - 3.6	D,E,L	4
P2. Spent Fuel Pool Cooling/Operation of 2-RB-8.1A (008 A2.05) IR - 3.2	D,E,R	8
P3 Waste Gas System/Shifting Waste Gas Decay Tanks (071 K6.10) IR - 2.6	D,R	9

*S4. Safety Function 4 - Primary (Core Heat Removal)

*S5. Safety Function 4 - Secondary (RCS Heat Removal)

1. Determine the number of control room system and in-plant system job performance measures (JPMs) to develop using the following table:

License Level	Control Room	In-Plant	Total
Reactor Operator (RO)	8	3	11
Senior Reactor Operator-Instant (SRO-I)	7	3	10
Senior Reactor Operator-Upgrade (SRO-U)	2 or 3	3 or 2	5

2. Select safety functions and systems for each JPM as follows:

Refer to Section 1.9 of the applicable knowledge and abilities (K/A) catalog for the plant systems organized by safety function. For pressurized-water reactor operating tests, the primary and secondary systems listed under Safety Function 4, "Heat Removal from Reactor Core," in Section 1.9 of the applicable K/A catalog, may be treated as separate safety functions (i.e., two systems, one primary and one secondary, may be selected from Safety Function 4). From the safety function groupings identified in the K/A catalog, select the appropriate number of plant systems by safety functions to be evaluated based on the applicant's license level (see the table in step 1).

For RO/SRO-I applicants: Each of the control room system JPMs and, separately, each of the in-plant system JPMs must evaluate a different safety function, and the same system or evolution cannot be used to evaluate more than one safety function in each location. One of the control room system JPMs must be an engineered safety feature.

For SRO-U applicants: Evaluate SRO-U applicants on five different safety functions. One of the control room system JPMs must be an engineered safety feature, and the same system or evolution cannot be used to evaluate more than one safety function.

3. Select a task for each JPM that supports, either directly or indirectly and in a meaningful way, the successful fulfillment of the associated safety function. Select the task from the applicable K/A catalog (K/As for plant systems or emergency and abnormal plant evolutions) or the facility licensee's site-specific task list. If this task has an associated K/A, the K/A should have an importance rating of at least 2.5 in the RO column. K/As that have importance ratings of less than 2.5 may be used if justified based on plant priorities; inform the NRC chief examiner if selecting K/As with an importance rating less than 2.5. The selected tasks must be different from the events and evolutions conducted during the simulator operating test and tasks tested on the written examination. A task that is similar to a simulator scenario event may be acceptable if the actions required to complete the task are significantly different from those required in response to the scenario event.

Apply the following specific task selection criteria:

- At least one of the tasks shall be related to a shutdown or low-power condition.
- Four to six of the tasks for RO and SRO-I applicants shall require execution of alternative paths within the facility licensee's operating procedures. Two to three of the tasks for SRO-U applicants shall require execution of alternative paths within the facility licensee's operating procedures.
- At least one alternate path JPM must be new or modified from the bank.
- At least one of the tasks conducted in the plant shall evaluate the applicant's ability to implement actions required during an emergency or abnormal condition.
- At least one of the tasks conducted in the plant shall require the applicant to enter the radiologically controlled area. This provides an excellent opportunity for the applicant to discuss or demonstrate radiation control administrative subjects.

If it is not possible to develop or locate a suitable task for a selected system, return to step 2 and select a different system.

4. For each JPM, specify the codes for type, source, and location:

Code	License Level Criteria		
	RO	SRO-I	SRO-U
(A)lternate path	4–6	4–6	2–3
(C)ontrol room			
(D)irect from bank	≤ 9	≤ 8	≤ 4
(E)mergency or abnormal in-plant	≥ 1	≥ 1	≥ 1
(EN)gineered safety feature (for control room system)	≥ 1	≥ 1	≥ 1
(L)ow power/shutdown	≥ 1	≥ 1	≥ 1
(N)ew or (M)odified from bank (must apply to at least one alternate path JPM)	≥ 2	≥ 2	≥ 1
(P)revious two exams (randomly selected)	≤ 3	≤ 3	≤ 2
(R)adiologically controlled area	≥ 1	≥ 1	≥ 1
(S)imulator			

Simulator

- S1. Continuous CEA Withdrawal (Alternate path) - The examinee is directed to withdrawal CEAs to bring the reactor critical. The CEAs fail to stop moving (continuous CEA withdraw failure). The examinee recognizes the failure and trips the reactor and performs the Reactivity Control immediate actions of verifying the reactor is shutdown.
- S2. Align Charging Discharge Flowpath (Alternate path) - The normal charging flowpath is blocked by a failed closed valve. The examinee enters the Loss of All Charging procedure after the Charging and Letdown flowpaths are secured. The examinee is tasked with aligning the charging flowpath from the Refueling Water Storage Tank (RWST) to the RCS via the High Pressure Safety Injection system.
- S3. Appendix 4-C, Bus 201D Undervoltage (Alternate path) - The examinee is directed to perform Appendix 4-C, Followup actions for a Loss of Off-Site Power/Loss of Forced Circulation. Bus 22A will be de-energized and Bus 22B will be available. The examinee will then cross-tie the buses with 22B supplying 22A. Then the oil systems will be secured to protect the Turbine Battery
- S4. Starting a Reactor Coolant pump - The examinee is directed to start a Reactor Coolant pump, the 4th. The RCP lift pumps are started, oil levels and flows are verified, RBCCW flow is verified and the pump is started. After the pump comes up to speed, the lift pumps are secured.
- S5. Feed S/Gs from Hot Shutdown Panel with Motor Driven AFW pumps -The examinee is directed to feed S/Gs from the Hot Shutdown Panel due to the Control Room being evacuated. The examinee verifies the MDAFW pumps are running (AAFW actuation is a normal occurrence after a plant trip), and the S/Gs are being fed. The AFW components are then aligned to remove the AAFW signal, to allow control of the feedwater to the S/Gs.
- S6. Fuel Handling Accident in the Spent Fuel Pool - The unit experiences a fuel handling accident in the Spent Fuel Pool area. The examinee is directed to initiate Auxiliary Exhaust (uses Enclosure Building Filtration). The examinee pushes the AEAS actuation push buttons and verifies EBFS. The components are not all properly aligned so the examinee repositions components to meet the procedure. The examinee then verifies Control Room ventilation is in Recirculation mode.
- S7. Setting up RM-9095 for 'A' Waste Gas Decay tank discharge - The examinee performs action to prepare the Waste Gas Discharge rad monitor for a discharge. The task requires the applicant to set ALARM, ALERT and FAIL setpoints. The rad monitor is also source checked to verify proper operation of the detector circuitry.
- S8. Swapping RBCCW pumps - The examinee is directed to swap RBCCW pumps. They check the on-coming pump is aligned mechanically and electrically, then start the on-coming pump and secure the off-going pump. After the On-coming pump is aligned, the off-going pump's discharge valve binds closed and the on-coming pump trips on overload. The examinee takes immediate actions to identify there is no RBCCW cooling to a facility and trips the reactor and the affected Reactor Coolant pumps.

In-Plant

- P1. Filling the Hotwell with Condensate Transfer Pump - The unit experienced a Loss of All Feedwater and is feeding the Steam Generators using Condensate. Normal hotwell make up is unavailable due to vacuum being broken. The examinee is directed to fill the Condenser Hotwell from the Condensate Storage tank using the Condensate Transfer pump.
- P2. Manual operation of 2-RB-8.1A (RCA) - 2-RB-8.1A, Spent Fuel Pool Cooling Outlet Isolation valve failed open due to a loss of Instrument Air. The examinee is directed to open the valve manually
- P3. Swap Waste Gas Decay Tanks. (RCA) - The examinee is directed to swap Waste Gas Decay Tanks. They then isolate the on-service tank and align the on-coming tank for service.

Form 3.2-2 Control Room/In-Plant Systems Outline

Facility: <u>Millstone Unit 2</u>		Date of Examination: <u>9/9/2024</u>
		Operating Test Number: <u>MP2-24</u>
Exam Level: ☐ RO ☒ SRO-I ☐ SRO-U		
System/JPM Title	Type Code	Safety Function
Control Room Systems		
S1. Control Element Drive System/Continuous CEA withdrawal. (001 AA1.05) IR - 4.2	N,A,L,S	1
S2. Charging/ Align Charging Discharge Path (004 A2.07) IR - 3.8	D,A,E,S	2
S3. Turbine Battery/Perform actions for a deenergized Turbine Battery Charger. (063 A4.03) IR - 3.5	N,A,E,L,S	6
S4. Reactor Coolant/Start a Reactor Coolant Pump (003 A4.09) IR - 3.6	D,L,S	4*
S5. Auxiliary Feedwater/Feed S/Gs from C-21 using MDAFW pumps (068AA1.02) IR - 4.0	D,E,L,S	4*
S6. Engineered Safeguards Actuation System/Fuel Handling accident in Spent Fuel Area (013 A4.03) IR- 4.4	N,E,EN,S	5
S7.		
S8. Closed Cooling Water/Shifting from 'A' RBCCW Pump to 'B' RBCCW Pump (008 A4.01) IR - 3.7	N,A,S	8
In-Plant Systems		
P1. Condensate/Filling Hotwell with Condensate transfer pump. (054 AK1.05) IR - 3.6	D,E,L	4
P2. Spent Fuel Pool Cooling/Operation of 2-RB-8.1A (008 A2.05 IR - 3.3	D,E,R	8
P3 Waste Gas System/Shifting Waste Gas Decay Tanks (071 K6.10) IR - 2.6	D,R	9

*S4. Safety Function 4 - Primary (Core Heat Removal)

*S5. Safety Function 4 - Secondary (RCS Heat Removal)

1. Determine the number of control room system and in-plant system job performance measures (JPMs) to develop using the following table:

License Level	Control Room	In-Plant	Total
Reactor Operator (RO)	8	3	11
Senior Reactor Operator-Instant (SRO-I)	7	3	10
Senior Reactor Operator-Upgrade (SRO-U)	2 or 3	3 or 2	5

2. Select safety functions and systems for each JPM as follows:

Refer to Section 1.9 of the applicable knowledge and abilities (K/A) catalog for the plant systems organized by safety function. For pressurized-water reactor operating tests, the primary and secondary systems listed under Safety Function 4, "Heat Removal from Reactor Core," in Section 1.9 of the applicable K/A catalog, may be treated as separate safety functions (i.e., two systems, one primary and one secondary, may be selected from Safety Function 4). From the safety function groupings identified in the K/A catalog, select the appropriate number of plant systems by safety functions to be evaluated based on the applicant's license level (see the table in step 1).

For RO/SRO-I applicants: Each of the control room system JPMs and, separately, each of the in-plant system JPMs must evaluate a different safety function, and the same system or evolution cannot be used to evaluate more than one safety function in each location. One of the control room system JPMs must be an engineered safety feature.

For SRO-U applicants: Evaluate SRO-U applicants on five different safety functions. One of the control room system JPMs must be an engineered safety feature, and the same system or evolution cannot be used to evaluate more than one safety function.

3. Select a task for each JPM that supports, either directly or indirectly and in a meaningful way, the successful fulfillment of the associated safety function. Select the task from the applicable K/A catalog (K/As for plant systems or emergency and abnormal plant evolutions) or the facility licensee's site-specific task list. If this task has an associated K/A, the K/A should have an importance rating of at least 2.5 in the RO column. K/As that have importance ratings of less than 2.5 may be used if justified based on plant priorities; inform the NRC chief examiner if selecting K/As with an importance rating less than 2.5. The selected tasks must be different from the events and evolutions conducted during the simulator operating test and tasks tested on the written examination. A task that is similar to a simulator scenario event may be acceptable if the actions required to complete the task are significantly different from those required in response to the scenario event.

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- At least one alternate path JPM must be new or modified from the bank.
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If it is not possible to develop or locate a suitable task for a selected system, return to step 2 and select a different system.

4. For each JPM, specify the codes for type, source, and location:

Code	License Level Criteria		
	RO	SRO-I	SRO-U
(A)lternate path	4–6	4–6	2–3
(C)ontrol room			
(D)irect from bank	≤ 9	≤ 8	≤ 4
(E)mergency or abnormal in-plant	≥ 1	≥ 1	≥ 1
(EN)gineered safety feature (for control room system)	≥ 1	≥ 1	≥ 1
(L)ow power/shutdown	≥ 1	≥ 1	≥ 1
(N)ew or (M)odified from bank (must apply to at least one alternate path JPM)	≥ 2	≥ 2	≥ 1
(P)revious two exams (randomly selected)	≤ 3	≤ 3	≤ 2
(R)adiologically controlled area	≥ 1	≥ 1	≥ 1
(S)imulator			

Simulator

- S1. Continuous CEA Withdrawal (Alternate path) - The examinee is directed to withdrawal CEAs to bring the reactor critical. The CEAs fail to stop moving (continuous CEA withdraw failure). The examinee recognizes the failure and trips the reactor and performs the Reactivity Control immediate actions of verifying the reactor is shutdown.
- S2. Align Charging Discharge Flowpath (Alternate path) - The normal charging flowpath is blocked by a failed closed valve. The examinee enters the Loss of All Charging procedure after the charging and Letdown flowpaths are secured. The examinee is tasked with aligning the charging flowpath from the Refueling Water Storage Tank (RWST) to the RCS via the High Pressure Safety Injection system.
- S3. Appendix 4-C, Bus 201D Undervoltage (Alternate path) - The examinee is directed to perform Appendix 4-C, Followup actions for a Loss of Off-Site Power/Loss of Forced Circulation. Bus 22A will be de-energized and Bus 22B will be available. The examinee will then cross-tie the buses with 22B supplying 22A. Then the oil systems will be secured to protect the Turbine Battery
- S4. Starting a Reactor Coolant pump - The examinee is directed to start a Reactor Coolant pump, the 4th. The RCP lift pumps are started, oil levels and flows are verified, RBCCW flow is verified and the pump is started. After the pump comes up to speed, the lift pumps are secured.
- S5. Feed S/Gs from Hot Shutdown Panel with Motor Driven AFW pumps -The examinee is directed to feed S/Gs from the Hot Shutdown Panel due to the Control Room being evacuated. The examinee verifies the MDAFW pumps are running (AAFW actuation is a normal occurrence after a plant trip), and the S/Gs are being fed. The AFW components are then aligned to remove the AAFW signal, to allow control of the feedwater to the S/Gs.
- S6. Fuel Handling Accident in the Spent Fuel Pool (Alternate path) - The unit experiences a fuel handling accident in the Spent Fuel Pool area. The examinee is directed to initiate Auxiliary Exhaust (uses Enclosure Building Filtration). The examinee pushes the AEAS actuation push buttons and verifies EBFS. The components are not all properly aligned so the examinee repositions components to meet the procedure. The examinee then verifies Control Room ventilation is in Recirculation mode.
- S8. Swapping RBCCW pumps - The examinee is directed to swap RBCCW pumps. They check the on-coming pump is aligned mechanically and electrically, then start the on-coming pump and secure the off-going pump. After the On-coming pump is aligned, the off-going pump's discharge valve binds closed and the on-coming pump trips on overload. The examinee takes immediate actions to identify there is no RBCCW cooling to a facility and trips the reactor and the affected Reactor Coolant pumps.

In-Plant

- P1. Filling the Hotwell with Condensate Transfer Pump - The unit experienced a Loss of All Feedwater and is feeding the Steam Generators using Condensate. Normal hotwell make up is unavailable due to vacuum being broken. The examinee is directed to fill the Condenser Hotwell from the Condensate Storage tank using the Condensate Transfer pump.
- P2. Manual operation of 2-RB-8.1A (RCA) - 2-RB-8.1A, Spent Fuel Pool Cooling Outlet Isolation valve failed open due to a loss of Instrument Air. The examinee is directed to open the valve manually.
- P3. Swap Waste Gas Decay Tanks. (RCA) - The examinee is directed to swap Waste Gas Decay Tanks. They then isolate the on-service tank and align the on-coming tank for service.

Form 3.2-2 Control Room/In-Plant Systems Outline

Facility: <u>Millstone Unit 2</u>		Date of Examination: <u>9/9/2024</u>
		Operating Test Number: <u>MP2-24</u>
Exam Level: ☐ RO ☐ SRO-I ☒ SRO-U		
System/JPM Title	Type Code	Safety Function
Control Room Systems		
S1. Control Element Drive System/Continuous CEA withdrawal. (001 AA1.05) IR - 4.2	N,A,L,S	1
S2. N/A		
S3. N/A		
S4. N/A		
S5. N/A		
S6. Engineered Safeguards Actuation System/Fuel Handling accident in Spent Fuel Area (013 A4.03) IR- 4.4	N,E,EN,S	5
S7. N/A		
S8. Closed Cooling Water/Shifting from 'A' RBCCW Pump to 'B' RBCCW Pump (008 A4.01) IR - 3.7	N,A,S	8
In-Plant Systems		
P1. Condensate/Filling Hotwell with Condensate transfer pump. (054 AK1.05) IR - 3.6	D,E,L	4
P2. N/A		
P3 Spent Fuel Pool Cooling/Operation of 2-RB-8.1A (008 A 2.05) IR - 3.3	D,E,R	9

1. Determine the number of control room system and in-plant system job performance measures (JPMs) to develop using the following table:

License Level	Control Room	In-Plant	Total
Reactor Operator (RO)	8	3	11
Senior Reactor Operator-Instant (SRO-I)	7	3	10
Senior Reactor Operator-Upgrade (SRO-U)	2 or 3	3 or 2	5

2. Select safety functions and systems for each JPM as follows:

Refer to Section 1.9 of the applicable knowledge and abilities (K/A) catalog for the plant systems organized by safety function. For pressurized-water reactor operating tests, the primary and secondary systems listed under Safety Function 4, "Heat Removal from Reactor Core," in Section 1.9 of the applicable K/A catalog, may be treated as separate safety functions (i.e., two systems, one primary and one secondary, may be selected from Safety Function 4). From the safety function groupings identified in the K/A catalog, select the appropriate number of plant systems by safety functions to be evaluated based on the applicant's license level (see the table in step 1).

For RO/SRO-I applicants: Each of the control room system JPMs and, separately, each of the in-plant system JPMs must evaluate a different safety function, and the same system or evolution cannot be used to evaluate more than one safety function in each location. One of the control room system JPMs must be an engineered safety feature.

For SRO-U applicants: Evaluate SRO-U applicants on five different safety functions. One of the control room system JPMs must be an engineered safety feature, and the same system or evolution cannot be used to evaluate more than one safety function.

3. Select a task for each JPM that supports, either directly or indirectly and in a meaningful way, the successful fulfillment of the associated safety function. Select the task from the applicable K/A catalog (K/As for plant systems or emergency and abnormal plant evolutions) or the facility licensee's site-specific task list. If this task has an associated K/A, the K/A should have an importance rating of at least 2.5 in the RO column. K/As that have importance ratings of less than 2.5 may be used if justified based on plant priorities; inform the NRC chief examiner if selecting K/As with an importance rating less than 2.5. The selected tasks must be different from the events and evolutions conducted during the simulator operating test and tasks tested on the written examination. A task that is similar to a simulator scenario event may be acceptable if the actions required to complete the task are significantly different from those required in response to the scenario event.

Apply the following specific task selection criteria:

- At least one of the tasks shall be related to a shutdown or low-power condition.
- Four to six of the tasks for RO and SRO-I applicants shall require execution of alternative paths within the facility licensee's operating procedures. Two to three of the tasks for SRO-U applicants shall require execution of alternative paths within the facility licensee's operating procedures.
- At least one alternate path JPM must be new or modified from the bank.
- At least one of the tasks conducted in the plant shall evaluate the applicant's ability to implement actions required during an emergency or abnormal condition.
- At least one of the tasks conducted in the plant shall require the applicant to enter the radiologically controlled area. This provides an excellent opportunity for the applicant to discuss or demonstrate radiation control administrative subjects.

If it is not possible to develop or locate a suitable task for a selected system, return to step 2 and select a different system.

4. For each JPM, specify the codes for type, source, and location:

Code	License Level Criteria		
	RO	SRO-I	SRO-U
(A)lternate path	4–6	4–6	2–3
(C)ontrol room			
(D)irect from bank	≤ 9	≤ 8	≤ 4
(E)mergency or abnormal in-plant	≥ 1	≥ 1	≥ 1
(EN)gineered safety feature (for control room system)	≥ 1	≥ 1	≥ 1
(L)ow power/shutdown	≥ 1	≥ 1	≥ 1
(N)ew or (M)odified from bank (must apply to at least one alternate path JPM)	≥ 2	≥ 2	≥ 1
(P)revious two exams (randomly selected)	≤ 3	≤ 3	≤ 2
(R)adiologically controlled area	≥ 1	≥ 1	≥ 1
(S)imulator			

Simulator

- S1. Continuous CEA Withdrawal (Alternate path) - The examinee is directed to withdrawal CEAs to bring the reactor critical. The CEAs fail to stop moving (continuous CEA withdraw failure). The examinee recognizes the failure and trips the reactor and performs the Reactivity Control immediate actions of verifying the reactor is shutdown.
- S6. Fuel Handling Accident in the Spent Fuel Pool (Alternate path) - The unit experiences a fuel handling accident in the Spent Fuel Pool area. The examinee is directed to initiate Auxiliary Exhaust (uses Enclosure Building Filtration). The examinee pushes the AEAS actuation push buttons and verifies EBFS. The components are not all properly aligned so the examinee repositions components to meet the procedure. The examinee then verifies Control Room ventilation is in Recirculation mode.
- S8. Swapping RBCCW pumps - The examinee is directed to swap RBCCW pumps. They check the on-coming pump is aligned mechanically and electrically, then start the on-coming pump and secure the off-going pump. After the On-coming pump is aligned, the off-going pump's discharge valve binds closed and the on-coming pump trips on overload. The examinee takes immediate actions to identify there is no RBCCW cooling to a facility and trips the reactor and the affected Reactor Coolant pumps.

In-Plant

- P1. Filling the Hotwell with Condensate Transfer Pump - The unit experienced a Loss of All Feedwater and is feeding the Steam Generators using Condensate. Normal hotwell make up is unavailable due to vacuum being broken. The examinee is directed to fill the Condenser Hotwell from the Condensate Storage tank using the Condensate Transfer pump.
- P2. Manual operation of 2-RB-8.1A (RCA) - 2-RB-8.1A, Spent Fuel Pool Cooling Outlet Isolation valve failed open due to a loss of Instrument Air. The examinee is directed to open the valve manually.

Examinee: _____

JPM A1R

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/3/24	Used JPM-192 for 2024 ILT NRC exam. Changed initial conditions. Incorporated new revision of OU-M2-201	1/0

JPM WORKSHEETFacility: ☒ MP2 ☐ MP3Task/JPM Number: A1RRevision: 0/1Task Title: Calculate Spent Fuel Pool Heatup Time to 150 °FSystem: Conduct of OperationsTime Critical Task: ☐ YES ☒ NOAlternate Path: ☐ YES ☒ NOValidated Time (minutes): 15Task Number(s): 235348Applicable To: SRO STA RO XX PEO K/A Number: 2.1.20 K/A Rating: 4.6/4.6Method of Testing: Simulated Performance: Actual Performance: XLocation: Classroom: X Simulator: In-Plant:

Task Standards: At the completion of this JPM the examinee will have successfully determined SFP Heatup Rate and time to reach 150°F IAW OU-M2-201, Shutdown Safety Assessment Checklist, Attachment 3, Millstone Unit 2 SFP Heatup Calculations

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

- Section 3.2.1.e, Section 2 Spent Fuel Pool Heatup Time
- Attachment 3, Millstone Unit 2 SFP Heatup Calculations

General References: OU-M2-201, Shutdown Safety Assessment Checklist.

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

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

JPM WORKSHEET

Initial Conditions: The following sequence of events has occurred:

- The reactor was shut down 12 days ago for a normal refueling outage.
- The plant is performing a full core offload, currently 12 fuel assemblies have been transferred to the Spent Fuel Pool.
- Present Spent Fuel Pool Level is 36' 10"
- Present Spent Fuel Pool temperature = 90 °F.
- The daily Shutdown Safety Assessment is in progress.

Initiating Cues: The US has directed you to calculate and record the time to reach 150 °F SFP design temperature using OU-M2-201, Shutdown Safety Assessment Checklist, Attachment 3, Millstone Unit 2 SFP Heatup Calculations.

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. OU-M2-201, Shutdown Safety Assessment Checklist, Attachment 3, Millstone Unit SFP Heatup Calculations.

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

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

PERFORMANCE INFORMATION

JPM Number: A1R

Revision: 1/0

Task Title: Calculate Spent Fuel Pool time to 150 °F

START TIME: _____

STEP #1 O U - M 2 - 2 0 1 Att. 3 Page 1/3 Step 1	Performance: 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. 1. IF NO fuel assemblies have been transferred to the SFP OR core reload is complete, go to SFP Time to 200°F.	Critical: ☒ YES ☐ NO
	Standard: Examinee reads note and determines it NOT applicable and marks step 1 as N/A.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #2 O U - M 2 - 2 0 1 Att. 3	Performance: Record Date and Time on Attachment 3.	Critical: ☐ YES ☒ NO
	Standard: Examinee records Date and Time	Grade: S ☐ U ☐
	Cue:	
	Comments: Procedure has no step to record Date and Time. The expectation is that the Date/Time field would be filled out when performing Attachment 3. Not a Critical step.	
STEP #3 O U - M 2 - 2 0 1 Att. 3 Page 1/3 Step 2	Performance: 2. Record time after reactor shutdown (in days), and current SFP temperature (°F).	Critical: ☒ YES ☐ NO
	Standard: Examinee records time after reactor shutdown (12 days) and current SFP temperature (90 F)	Grade: S ☐ U ☐
	Cue:	
	Comments: Refer to answer key (Attachment # 3)	

PERFORMANCE INFORMATION

JPM Number: A1R

Revision: 1/0

Task Title: Calculate Spent Fuel Pool time to 150 °F

STEP #4 OU-M2-201 Att. 3 Page 1/3 Step 3	Performance: 3. Record SFP Heatup Rate from Table 1 based on SFP Offload Condition. Standard: Examinee records 17.7 F/hour heatup rate Cue: Comments: Note on Attachment 3 (3/3) states that the more conservative (higher) heatup rate is used so interpolation is not necessary	Critical: ☒ YES ☐ NO Grade: ☐ S ☐ U
STEP #5 OU-M2-201 Att. 3 Page 1/3 Step 4	Performance: 4. Calculate and record SFP Time to 150°F $\begin{aligned} \text{Time to 150 F} &= (150 \text{ F} - \text{SFP temperature}) / \text{SFP Heatup rate F/hr} \\ &= (150 - 90) \text{ F} / 17.7 \text{ °F/hr} \\ &= 3.4 \text{ hours} \end{aligned}$ Standard: Examinee performs calculation and determines SFP Time to 150 F is 3.4 hours ± 0.4 hours and records value on Attachment #3. Cue: Comments: Refer to answer key (Attachment # 3)	Critical: ☒ YES ☐ NO Grade: ☐ S ☐ U
STEP #6 OU-M2-201 Att. 3 Page 1/3 Step 5 & 6	Performance: 6. Obtain Independent Check (STA or Licensed Operator). Standard: Examinee verifies their calculation against the handout and inputs their name in the Checked by block. Cue: The JPM is complete Comments:	Critical: ☐ YES ☒ NO Grade: ☐ S ☐ U

PERFORMANCE INFORMATION

JPM Number: **A1R**

Revision: **1/0**

Task Title: Calculate Spent Fuel Pool time to 150 °F

TERMINATION CUE: **The evaluation for this JPM is complete.**

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A1R

Revision: 1/0

Task Title: Calculate Spent Fuel Pool time to 150 °F

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: **A1R**

Revision: **1/0**

- Initial Conditions:
- The reactor was shut down 12 days ago for a normal refueling outage.
 - The plant is performing a full core offload, currently 12 fuel assemblies have been transferred to the Spent Fuel Pool.
 - Present Spent Fuel Pool (SFP) Level is 36' 10"
 - Present Spent Fuel Pool (SFP) temperature = 90 °F.
 - The daily Shutdown Safety Assessment is in progress.

Initiating Cues: The US has directed you to calculate and record the time to reach 150 °F SFP design temperature using OU-M2-201, Shutdown Safety Assessment Checklist, Attachment 3, Millstone Unit 2 SFP Heatup Calculations.

Time Critical JPM: ☐ YES ☒ NO

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 (°F).
3. Record SFP Heatup Rate from Table 1 based on SFP Offload Condition.
4. Calculate and record SFP Time to 150°F
5. Sign Performed by (STA or Licensed Operator).
6. Obtain Independent Check (STA or Licensed Operator).

Calculation:

$$\text{SFP Time to 150°F} = \frac{150^{\circ}\text{F} - \text{SFP Temperature} (^{\circ}\text{F})}{\text{SFP Heatup Rate} (^{\circ}\text{F}/\text{hour})}$$

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 (°F).
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 200°F.
5. Sign Performed by (STA or Licensed Operator).
6. Obtain Independent Check (STA or Licensed Operator).

Calculation:

$$\text{SFP Time to 200°F} = \frac{200^{\circ}\text{F} - \text{SFP Temperature}(^{\circ}\text{F})}{\text{SFP Heatup Rate}(^{\circ}\text{F}/\text{hour})}$$

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⁾		Emergency Full Core Offload⁽²⁾	
Time from Shutdown (days)	SFP Heatup Rate (°F/hour)	Time from Shutdown (days)	SFP Heatup Rate (°F/hour)
		5	25.8
6	21.2	6	24.6
7	20.1	7	22.8
8	19.1	8	22.2
9	18.4	9	21.6
10	17.7	10	20.4
15	15.4	15	18.6
20	14.0		
25	13.0	25	16.2
30	12.3		
40	11.1		
		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 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.

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 (°F).
3. Record SFP Heatup Rate from Table 1 based on SFP Offload Condition.
4. Calculate and record SFP Time to 150°F
5. Sign Performed by (STA or Licensed Operator).
6. Obtain Independent Check (STA or Licensed Operator).

Calculation:

$$\text{SFP Time to 150°F} = \frac{150^{\circ}\text{F} - \text{SFP Temperature}(^{\circ}\text{F})}{\text{SFP Heatup Rate}(^{\circ}\text{F}/\text{hour})}$$

Date/Time	Time From Shutdown (Days)	SFP Temperature (°F)	SFP Heatup Rate (°F/hour)	SFP Time to 150°F	Performed by	Checked by
	12	90	17.7	3.4 hours	examinee	

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 (°F).
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 200°F.
5. Sign Performed by (STA or Licensed Operator).
6. Obtain Independent Check (STA or Licensed Operator).

Calculation:

$$\text{SFP Time to 200°F} = \frac{200°F - \text{SFPTemperature}(°F)}{\text{SFPHeatupRate}(°F/\text{hour})}$$

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⁾		Emergency Full Core Offload ⁽²⁾	
Time from Shutdown (days)	SFP Heatup Rate (°F/hour)	Time from Shutdown (days)	SFP Heatup Rate (°F/hour)
		5	25.8
6	21.2	6	24.6
7	20.1	7	22.8
8	19.1	8	22.2
9	18.4	9	21.6
10	17.7	10	20.4
15	15.4	15	18.6
20	14.0		
25	13.0	25	16.2
30	12.3		
40	11.1		
		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 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.

Examinee: _____

JPM A1S

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/3/24	Used JPM-192 for 2024 ILT NRC exam. Changed initial conditions. Incorporated new revision of OU-M2-201	1/0

JPM WORKSHEETFacility: ☒ MP2 ☐ MP3Task/JPM Number: A1SRevision: 0/1Task Title: Verify Calculation for Spent Fuel Pool time to 150 °FSystem: Conduct of OperationsTime Critical Task: ☐ YES ☒ NOAlternate Path: ☐ YES ☒ NOValidated Time (minutes): 15Task Number(s): 235348Applicable To: SRO XX STA RO PEO K/A Number: 2.1.20 K/A Rating: 4.6/4.6Method of Testing: Simulated Performance: Actual Performance: XLocation: Classroom: X Simulator: In-Plant:

Task Standards: At the completion of this JPM the examinee will have successfully verified correct SFP Heatup Rate and time to reach 150°F IAW OU-M2-201, Shutdown Safety Assessment Checklist, Attachment 3, Millstone Unit 2 SFP Heatup Calculations. The examinee will also find an erroneous 'time from shutdown' annotated on the Attachment.

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

- Section 3.2.1.e, Section 2 Spent Fuel Pool Heatup Time
- Attachment 3, Millstone Unit 2 SFP Heatup Calculations

General References: OU-M2-201, Shutdown Safety Assessment Checklist.

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

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

JPM WORKSHEET

Initial Conditions: The following sequence of events has occurred:

- The reactor was shut down 14 days ago for a normal refueling outage.
- The plant is performing a full core offload, currently 12 fuel assemblies have been transferred to the Spent Fuel Pool.
- Present Spent Fuel Pool Level = 36' 10"
- Present Spent Fuel Pool temperature = 90 °F.
- The daily Shutdown Safety Assessment is in progress.

Initiating Cues: The STA has performed a Spent Fuel Pool heatup calculation for the time to reach 150 °F using OU-M2-201, Shutdown Safety Assessment Checklist, Attachment 3, Millstone Unit 2 SFP Heatup Calculations. Perform the second check of the calculation and review the data on the form.

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. OU-M2-201, Shutdown Safety Assessment Checklist, Attachment 3, Millstone Unit SFP Heatup Calculations.

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

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

PERFORMANCE INFORMATION

JPM Number: A1S

Revision: 1/0

Task Title: Verify Calculation for Spent Fuel Pool time to 150 °F

START TIME: _____

STEP #1 OU-M2-201 Att. 3 Page 1/3 Step 1	Performance: 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. 1. IF NO fuel assemblies have been transferred to the SFP OR core reload is complete, go to SFP Time to 200°F.	Critical: ☒ YES ☐ NO
	Standard: Examinee reads note and determines it NOT applicable and marks step 1 as N/A.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #2 OU-M2-201 Att. 3	Performance: Record Date and Time on Attachment 3.	Critical: ☐ YES ☒ NO
	Standard: Examinee verifies Date and Time	Grade: S ☐ U ☐
	Cue:	
	Comments: The date and time provided is “Today/Now” to allow for the JPM to be administered on any day.	
STEP #3 OU-M2-201 Att. 3 Page 1/3 Step 2	Performance: 2. Record time after reactor shutdown (in days), and current SFP temperature (°F).	Critical: ☒ YES ☐ NO
	Standard: Examinee verifies time after reactor shutdown (14 days) and current SFP temperature (90°F).	Grade: S ☐ U ☐
	Cue:	
	Comments: Refer to answer key (Attachment # 3)	

PERFORMANCE INFORMATION

JPM Number: A1S

Revision: 1/0

Task Title: Verify Calculation for Spent Fuel Pool time to 150 °F

STEP #4 OU-M2-201 Att. 3 Page 1/3 Step 3	Performance: 3. Record SFP Heatup Rate from Table 1 based on SFP Offload Condition.	Critical: ☒ YES ☐ NO
	Standard: Examinee verifies 17.7°F/hour heatup rate from 'End-of-Cycle Core Offload' table; Time From Shutdown = 10 days Examinee notes the 15.4°F/hour heatup rate from 'End-of-Cycle Core Offload' table is NOT correct.	Grade: S ☐ U ☐
	Cue:	
	Comments: Note on Attachment 3 (3/3) states that the more conservative (higher) heatup rate is used so interpolation is not necessary	
STEP #5 OU-M2-201 Att. 3 Page 1/3 Step 4	Performance: 4. Calculate and record SFP Time to 150°F $\begin{aligned} \text{Time to 150°F} &= (150°F - \text{SFP temperature}) / \text{SFP Heatup rate } ^\circ\text{F/hr} \\ &= (150 - 90)^\circ\text{F} / 17.7 ^\circ\text{F/hr} \\ &= 3.4 \text{ hours} \end{aligned}$	Critical: ☒ YES ☐ NO
	Standard: Examinee performs calculation and determines SFP Time to 150°F is 3.4 hours ± 0.4 hours and verifies proper value on Attachment #3. Examinee determines that the STA's SFP Time to 150°F of 3.9 hours is NOT correct.	Grade: S ☐ U ☐
	Cue:	
	Comments: Refer to answer key (Attachment # 3)	

PERFORMANCE INFORMATION

JPM Number: A1S

Revision: 1/0

Task Title: Verify Calculation for Spent Fuel Pool time to 150 °F

STEP #6 OU-M2-201 Att. 3 Page 1/3 Step 5 & 6	Performance:	Critical:
	6. Obtain Independent Check (STA or Licensed Operator).	☒ YES ☐ NO
	Standard: The examinee states they would return the form to the STA to fix the error prior to putting their name on Attachment 3.	Grade: S ☐ U ☐
	Cue: The JPM is complete	
	Comments:	

TERMINATION CUE: **The evaluation for this JPM is complete.**

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A1S

Revision: 1/0

Task Title: Verify Calculation for Spent Fuel Pool time to 150 °F

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: A1S

Revision: 1/0

- Initial Conditions:
- The reactor was shut down 12 days ago for a normal refueling outage.
 - The plant is performing a full core offload, currently 12 fuel assemblies have been transferred to the Spent Fuel Pool.
 - Present Spent Fuel Pool (SFP) Level is 36' 10"
 - Present Spent Fuel Pool (SFP) temperature = 90 °F.
 - The daily Shutdown Safety Assessment is in progress.

Initiating Cues: The STA has performed a Spent Fuel Pool heatup calculation for the time to reach 150 °F using OU-M2-201, Shutdown Safety Assessment Checklist, Attachment 3, Millstone Unit 2 SFP Heatup Calculations. Perform the second check of the calculation and review the data on the form.

Time Critical JPM: ☐ YES ☒ NO

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 (°F).
3. Record SFP Heatup Rate from Table 1 based on SFP Offload Condition.
4. Calculate and record SFP Time to 150°F
5. Sign Performed by (STA or Licensed Operator).
6. Obtain Independent Check (STA or Licensed Operator).

Calculation:

$$\text{SFP Time to 150°F} = \frac{150^{\circ}\text{F} - \text{SFP Temperature} (^{\circ}\text{F})}{\text{SFP Heatup Rate} (^{\circ}\text{F}/\text{hour})}$$

Date/Time	Time From Shutdown (Days)	SFP Temperature (°F)	SFP Heatup Rate (°F/hour)	SFP Time to 150°F	Performed by	Checked by
today/now	14	90	15.4	3.9 hours	J. Smith	

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 (°F).
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 200°F.
5. Sign Performed by (STA or Licensed Operator).
6. Obtain Independent Check (STA or Licensed Operator).

Calculation:

$$\text{SFP Time to 200°F} = \frac{200^{\circ}\text{F} - \text{SFP Temperature}(^{\circ}\text{F})}{\text{SFP Heatup Rate}(^{\circ}\text{F}/\text{hour})}$$

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⁾		Emergency Full Core Offload ⁽²⁾	
Time from Shutdown (days)	SFP Heatup Rate (°F/hour)	Time from Shutdown (days)	SFP Heatup Rate (°F/hour)
		5	25.8
6	21.2	6	24.6
7	20.1	7	22.8
8	19.1	8	22.2
9	18.4	9	21.6
10	17.7	10	20.4
15	15.4	15	18.6
20	14.0		
25	13.0	25	16.2
30	12.3		
40	11.1		
		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 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.

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 (°F).
3. Record SFP Heatup Rate from Table 1 based on SFP Offload Condition.
4. Calculate and record SFP Time to 150°F
5. Sign Performed by (STA or Licensed Operator).
6. Obtain Independent Check (STA or Licensed Operator).

Calculation:

$$\text{SFP Time to 150°F} = \frac{150^\circ\text{F} - \text{SFP Temperature}(^\circ\text{F})}{\text{SFP Heatup Rate}(^\circ\text{F}/\text{hour})}$$

Date/Time	Time From Shutdown (Days)	SFP Temperature (°F)	SFP Heatup Rate (°F/hour)	SFP Time to 150°F	Performed by	Checked by
today/now	14	90	15.4	3.9 hours	J. Smith	
The SFP heatup rate of 15.4°F/hour is NOT CORRECT, it is the value from the non-conservative 15 days after shutdown, instead of the correct value of 17.7°F/hour based on the more conservative 10 days after shutdown. 3.9 hours is also NOT CORRECT, and is the time derived from the incorrect heatup rate. The correct value is 3.4 hours.						

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 (°F).
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 200°F.
5. Sign Performed by (STA or Licensed Operator).
6. Obtain Independent Check (STA or Licensed Operator).

Calculation:

$$\text{SFP Time to 200°F} = \frac{200^{\circ}\text{F} - \text{SFPTemperature}(^{\circ}\text{F})}{\text{SFPHeatupRate}(^{\circ}\text{F}/\text{hour})}$$

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⁾		Emergency Full Core Offload ⁽²⁾	
Time from Shutdown (days)	SFP Heatup Rate (°F/hour)	Time from Shutdown (days)	SFP Heatup Rate (°F/hour)
		5	25.8
6	21.2	6	24.6
7	20.1	7	22.8
8	19.1	8	22.2
9	18.4	9	21.6
10	17.7	10	20.4
15	15.4	15	18.6
20	14.0		
25	13.0	25	16.2
30	12.3		
40	11.1		
		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 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.

Examinee: _____

JPM A2R

PERFORMANCE INFORMATION

JPM Number: **A2R**

Revision: **0/0**

Task Title: Remove an Individual Annunciator from Service

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/3/24	Developed new JPM for 2024 ILT NRC exam	0/0

PERFORMANCE INFORMATION

JPM Number: A2R

Revision: 0/0

Task Title: Remove an Individual Annunciator from Service

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: A2R

Revision: 0/0

Task Title: Remove an Individual Annunciator from Service

System: Equipment Control, Annunciators

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): 236435

Applicable To: SRO STA RO XX PEO

K/A Number: 2.2.43 K/A Rating: 3.0

Method of Testing: Simulated Performance: Actual Performance: XX

Location: Classroom: XX Simulator: In-Plant:

Task Standards: At the completion of the JPM, The examinee determines the proper location of the affected alarm card and the proper contact orientation required for the half card being installed as shown on the answer key.

Required Materials: OP 2387, Annunciator System Operation and Control
(procedures, equipment, etc.) DWG 25203-39019 sh. 2Y, Annunciator C06-7 Internal Wiring List

General References: ARP 2590E-086 Containment Elevator Alarm
DWG 25203-32031 sh. 2, Miscellaneous Alarms

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

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

PERFORMANCE INFORMATION

JPM Number: A2R

Revision: 0/0

Task Title: Remove an Individual Annunciator from Service

JPM WORKSHEET

Initial Conditions: Current Conditions are as follows:

- The plant is operating in MODE 1.
- No equipment is out of service.
- Annunciator CONTAINMENT ELEVATOR ALARM (C-06/7, B-18) is determined to be a nuisance.
- The decision has been made to remove the alarm window from service.
- The Containment Elevator is Red tagged OFF.

Initiating Cues: The US has directed you to perform OP 2387, Annunciator System Operation and Control, steps 4.3.14 a and b.

1. Determine and record the alarm card location.
2. Determine and record in Section 5 of Attachment 2 the "Input Contact Status of the affected alarm windows.

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. OP 2387A, Annunciator System Operation and Control
 - a. Sections 1, 2, and 3 (Purpose, Prerequisites, Precautions)
 - b. Section 4.3, Remove Individual Annunciators from Service
2. DWG 25203-39019 sheets 2W-2AC, Annunciator C06-7 Internal Wiring List
3. DWG 25203-32031 sh. 2, Miscellaneous Alarms
4. ARP 2590E-086, Containment Elevator Alarm

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

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

PERFORMANCE INFORMATION

JPM Number: A2R

Revision: 0/0

Task Title: Remove an Individual Annunciator from Service

START TIME: _____

STEP #1 OP2387 Step 4.3.14 NOTE	Performance: NOTE: Attachment 3 provides a graphic of the Annunciator Half Card Configurations.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges NOTE	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #2 OP2387 Step 4.3.14.a	Performance: IF removing annunciator window due to it being a hanging or nuisance alarm, PERFORM the following: a. Refer To appropriate sheet of "Internal Wiring List," 25203-39019 (sheets 2C through 2AK), and DETERMINE the following: • Location of associated alarm card (e.g., TB19-J8) • "Input Contact Status" of associated alarm window AND other affected alarm window(s) (e.g., N.O., N.C., etc.	Grade: S ☐ U ☐
	Standard: Examinee uses dwg 25203-39019 sh. 2Y and determines... • the location of the alarm card to be at J19 (RC22) • The Input Contact Status to be NO/NO (normally open/normally open)	Critical: ☒ YES ☐ NO ☒ YES ☐ NO
	Cue:	
	Comments: The examinee is given ALL the 25203-39019 drawings associated with C-06/7. The key only shows the correct drawing. Both the location and contact status are critical and need to be correct to complete the task properly.	

PERFORMANCE INFORMATION

JPM Number: A2R

Revision: 0/0

Task Title: Remove an Individual Annunciator from Service

STEP #3 O P 2 3 8 7 Step 4 . 3 . 1 4 . b	Performance: RECORD associated alarm card location on Attachment 2, “Part 3” and “Part 4.”	Critical: ☒ YES ☐ NO
	Standard: Examinee fills in Part 3 and Part 4 of Attachment 2	Grade: S ☐ U ☐
	Cue: This concludes the JPM	
	Comments:	

TERMINATION CUE: **The evaluation for this JPM is complete.**

STOP TIME:

VERIFICATION OF JPM COMPLETION

JPM Number: A2R

Revision: 0/0

Task Title: Remove an Individual Annunciator from Service

Date Performed: _____

Examinee: _____

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

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):		Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: A2R

Revision: 0/0

Initial Conditions: Current Conditions are as follows:

- The plant is operating in MODE 1.
- No equipment is out of service.
- Annunciator CONTAINMENT ELEVATOR ALARM (C-06/7, B-18) is determined to be a nuisance.
- The decision has been made to remove the alarm window from service.
- The Containment Elevator is Red tagged OFF.

Initiating Cues: The US has directed you to perform OP 2387, Annunciator System Operation and Control, steps 4.3.14 a and b.

3. Determine and record the alarm card location.
4. Determine and record in Section 5 of Attachment 2 the “Input Contact Status of the affected alarm windows.

Time Critical JPM: ☐ YES ☒ NO

Attachment 2

Review and Approval For Disabling Annunciators

(Sheet 1 of 2)

Part 1	
Panel:	Window Location:
Window Nomenclature:	
Required for MODEs: 1 2 3 4 5 6 All N/A	Multiple Input: ☐ Yes ☐ No
Associated T/S or TRM LCO(s): ☐ N/A	
Requestor/Dept.:	Date/Time:
Reason:	

Part 2	
Compensatory Actions Required: ☐ Yes ☐ No	
Compensatory Actions (if required):	
Frequency of Actions (if required):	
Justification for <i>not</i> implementing compensatory actions:	
10CFR50.59 Applicability Review (CM–AA–400): 50.59 AR Required ☐ Yes ☐ No 50.59 AR Attached ☐ Yes ☐ No 50.59 Screen Required ☐ Yes ☐ No 50.59 Screen Attached ☐ Yes ☐ No	
If No, Reason _____	
SM Approval Signature:	Date/Time:

Level of Use
Information



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Attachment 2

Review and Approval For Disabling Annunciators

(Sheet 2 of 2)

Part 3	
Annunciator alarm card at _____ was removed <u>AND</u> a split window card installed in its place <u>OR</u> desired input was removed by the following method: _____ _____ color dot placed on annunciator window.	
Installer Signature:	Date/Time:
Verifier Signature:	

Part 4	
Split window card was removed from _____ <u>AND</u> correct annunciator alarm card was replaced <u>OR</u> desired input was re-attached. Color dot also removed from annunciator window.	
Installer Signature:	Date/Time:
Verifier Signature:	

Part 5	
Compensatory actions (if applicable), have been terminated <u>AND</u> annunciator has been returned to its original state.	
SM/US Review Signature:	Date/Time:
Comments:	
ALARM CARD CONTACT STATUS -->	

Completed attachments and associated safety evaluation screenings are sent to the Operations Department Technician for retention.

Level of Use Information



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Setpoint: Emergency Call Button (local)**B-18****CONTAINMENT
ELEVATOR
ALARM****AUTOMATIC FUNCTIONS**

1. None

CORRECTIVE ACTIONS

1. NOTIFY the following to respond to scene:
 - Fire Brigade | ②
 - Protective Services
 - Health Physics
2. DISPATCH Operator to scene.
3. CONTACT elevator occupants by telephone x4002 and DETERMINE conditions. | ①
4. NOTIFY outside assistance as necessary.

SUPPORTING INFORMATION

1. Initiating Devices
 - Emergency Call Button containment elevator
2. Control Room Drawings
 - 25203-32031 Sh. 2 | ①
3. Annunciator Card Location:

Attachment 2

Review and Approval For Disabling Annunciators

(Sheet 2 of 2)

Since the drawing nomenclature doesn't match the procedure, the examinee needs to only find the correct row for the location.

Part 3

Annunciator alarm card at TB19 - J-19 was removed AND a split window card installed in its place OR desired input was removed by the following method: N/A
_____ color dot placed on annunciator window.

Installer Signature: Examinee

Date/Time: Date/Time

Verifier Signature:

Part 4

Split window card was removed from TB19 - J-19 AND correct annunciator alarm card was replaced OR desired input was re-attached.
Color dot also removed from annunciator window.

Installer Signature:

Date/Time:

Verifier Signature:

Part 5

Compensatory actions (if applicable), have been terminated AND annunciator has been returned to its original state.

SM/US Review Signature:

Date/Time:

Comments:

Alarm Card contact status = NO/NO

Completed attachments and associated safety evaluation screenings are sent to the Operations Department Technician for retention.

Level of Use
Information

STOP

THINK

ACT

REVIEW

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Examinee: _____

JPM A2S

JPM Number: A2S

Revision: 0/0

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/3/24	Developed new JPM for 2024 ILT NRC exam	0/0

JPM WORKSHEET**JPM WORKSHEET**Facility: ☒ MP2 ☐ MP3Task/JPM Number: A2SRevision: 0/0Task Title: Remove an Individual Annunciator from ServiceSystem: Equipment Control, AnnunciatorsTime Critical Task: ☐ YES ☒ NOAlternate Path: ☐ YES ☒ NOValidated Time (minutes): 15Task Number(s): 236435Applicable To: SRO XX STA RO PEO K/A Number: 2.2.43 K/A Rating: 3.3Method of Testing: Simulated Performance: Actual Performance: XXLocation: Classroom: XX Simulator: In-Plant:

Task Standards: At the completion of the JPM, The examinee completes applicable steps in OP 2387, Annunciator System Operation and Control, Section 4.3 to determine the effect on plant operation by removing an annunciator from service. The examinee also determines the proper location of the affected alarm card and the proper contact orientation required for the half card being installed as shown on the answer key.

Required Materials: OP 2387, Annunciator System Operation and Control
(procedures, equipment, etc.) DWG 25203-39019 sh. 2Y, Annunciator C06-7 Internal Wiring List

General References: ARP 2590E-086 Containment Elevator Alarm
DWG 25203-32031 sh. 2, Miscellaneous Alarms

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

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

JPM WORKSHEET

Initial Conditions: Current Conditions are as follows:

- The plant is operating in MODE 1.
- No equipment is out of service.
- Annunciator CONTAINMENT ELEVATOR ALARM (C-06/7, B-18) is determined to be a nuisance.
- The decision has been made to remove the alarm window from service.
- The Containment Elevator is Red tagged OFF.
- The STA is performing Applicability Reviews (4.3.6, 7, and 8)

Initiating Cues: The US has directed you to perform OP 2387, Annunciator System Operation and Control, Section 4.3, Remove Individual Annunciators from Service, specifically:

1. Initiate the request to remove the annunciator from service. (4.3.1)
2. Determine if compensatory actions are required. (4.3.2 - 4)
3. Determine the effect on the License Basis (4.3.5)
4. Determine and record the alarm card location. (4.3.14.a, b)
5. Determine and record in Section 5 of Attachment 2 the "Input Contact Status of the affected alarm windows. (4.3.14.a, b)

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. OP 2387A, Annunciator System Operation and Control
 - a. Sections 1, 2, and 3 (Purpose, Prerequisites, Precautions)
 - b. Section 4.3, Remove Individual Annunciators from Service
 - c. Attachment 1, Annunciator Compensatory Action Guidelines
 - d. Attachment 2, Review and Approval for Disabling Annunciators
2. DWG 25203-39019 sheets 2W-2AC, Annunciator C06-7 Internal Wiring List
3. DWG 25203-32031 sh. 2, Miscellaneous Alarms
4. ARP 2590E-086, Containment Elevator Alarm

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

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

PERFORMANCE INFORMATION

JPM Number: A2S

Revision: 0/0

Task Title: Remove Individual Annunciators from Service

START TIME: _____

STEP # 1 OP 2387 Step 4.3.1 NOTE	Performance: NOTE 1. Removal of an annunciator alarm card as specified in this section does not require the use of a bypass jumper. An Attachment 2 must be completed for each annunciator or annunciator input being removed from service. 2. Annunciator alarm cards may be removed temporarily for troubleshooting without implementing this section. 3. This section is not intended to be used to disable alarms received during surveillance testing (e.g., I&C, COEL).	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges the note.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP # 2 OP 2387 Step 4.3.1	Performance: Refer To Attachment 2 and COMPLETE “Part 1” to initiate request to remove annunciator from service.	Grade: S ☐ U ☐
	Standard: Examinee completes Attachment 2, Part 1. 1. Panel – C-06/7 Location B18 2. Window Nomenclature – Containment elevator Alarm 3. Required for MODEs: N/A 4. Multiple Input – No 5. Associated TS/TRM LCO(s) – N/A	Critical: ☒ YES ☐ NO ☐ YES ☒ NO ☐ YES ☒ NO ☐ YES ☒ NO ☒ YES ☐ NO
	Cue:	
	Comments: Refer to Answer key.	

PERFORMANCE INFORMATION

JPM Number: A2S

Revision: 0/0

Task Title: Remove Individual Annunciators from Service

STEP #3 OP2387 Step 4.3.2	Performance: Refer To Attachment 1 and DETERMINE if compensatory actions should be implemented.	Critical: ☐ YES ☒ NO
	Standard: Examinee determines NO compensatory Actions are required since there is no TS/TRM implications and fills out Part 2 accordingly.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #4 OP2387 Step 4.3.3 & 4.3.4	Performance: 4.3.3 IF compensatory actions are not required (e.g. informational type alarms), CHECK “No” and INDICATE justification for not implementing those actions on Attachment 2, “Part 2.” 4.3.4 IF compensatory actions are required, PERFORM the following on Attachment 2, “Part 2”: a. CHECK “Yes” and INDICATE compensatory actions. b. INDICATE required frequency for compensatory actions.	Critical: ☐ YES ☒ NO
	Standard: Examinee fills out Part 2 justifying no Compensatory actions due to either 1) informational alarm or 2) Elevator red Tagged out or a similar justification	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: A2S

Revision: 0/0

Task Title: Remove Individual Annunciators from Service

STEP # 5 OP 2387 Step 4.3.3	Performance: 4.3.5 IF annunciator or annunciator input is being controlled under another procedure, go to step 4.3.8. a. REVIEW Attachment 2 and DETERMINE the following: - Does removal of the annunciator affect OPERABILITY of plant equipment or systems as defined in Technical Specifications. - Will plant equipment or systems be operated OR operate differently from descriptions in design documents (e.g., FSAR). - Will compensatory actions be different from any existing ARP Corrective Actions. - Will compensatory actions pose adverse environmental effects of any type (directly or indirectly). - Is annunciator required to provide necessary alarm function for which compensatory actions are not adequate.	Critical: ☒ YES ☐ NO
	Standard: Examinee answers NO to all the questions	Grade: S ☐ U ☐
	Cue: Have the examinee write their answer to the questions next to the bullets under step 4.3.5. When the examinee is finished writing their answers down for step 4.3.5, inform them the STA and SM are determine applicability and direct them to perform step 4.3.14 a & b	
	Comments:	
STEP # 6 OP 2387 Step 4.3.14 NOTE	Performance: NOTE: Attachment 3 provides a graphic of the Annunciator Half Card Configurations.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges NOTE	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: A2S

Revision: 0/0

Task Title: Remove Individual Annunciators from Service

STEP # 7 O P 2 3 8 7 Step 4 . 3 . 1 4 . a	Performance: IF removing annunciator window due to it being a hanging or nuisance alarm, PERFORM the following: a. Refer To appropriate sheet of “Internal Wiring List,” 25203-39019 (sheets 2C through 2AK), and DETERMINE the following: - Location of associated alarm card (e.g., TB19-J8) “Input Contact Status” of associated alarm window AND other affected alarm window(s) (e.g., N.O., N.C., etc.)	Critical: ☒ YES ☐ NO ☒ YES ☐ NO
	Standard: Examinee uses dwg 25203-39019 sh. 2Y and determines... - the location of the alarm card to be at TB19-J19 - the Input Contact Status to be NO/NO (normally open/normally open)	Grade: S ☐ U ☐
	Cue:	
	Comments: Since the drawing nomenclature does not match the procedure nomenclature, the examinee is required to find the correct row on drawing 25203-39019 sh. 2Y for the alarm card location. The location listed on the student’s answer sheet may not completely match the key The examinee is given ALL the 25203-39019 drawings associated with C-06/7. The key only shows the correct drawing.	
STEP # 8 O P 2 3 8 7 Step 4 . 3 . 1 4 . b	Performance: RECORD associated alarm card location on Attachment 2, “Part 3” and “Part 4.”	Critical: ☒ YES ☐ NO
	Standard: Examinee fills in Part 3 and Part 4 of Attachment 2	Grade: S ☐ U ☐
	Cue: This concludes the JPM	
	Comments:	

TERMINATION CUE: The evaluation for this JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: _____

Revision: _____

Task Title: _____

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☐ NO	
Validated Time (minutes):		Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: A2S

Revision: 0/0

Initial Conditions: Current Conditions are as follows:

- The plant is operating in MODE 1.
- No equipment is out of service.
- Annunciator CONTAINMENT ELEVATOR ALARM (C-06/7, B-18) is determined to be a nuisance.
- The decision has been made to remove the alarm window from service.
- The Containment Elevator is Red tagged OFF.
- The STA is performing Applicability Reviews (4.3.6, 7, and 8)

Initiating Cues: The US has directed you to perform OP 2387, Annunciator System Operation and Control, Section 4.3, Remove Individual Annunciators from Service, specifically:

6. Initiate the request to remove the annunciator from service. (4.3.1)
7. Determine if compensatory actions are required. (4.3.2 - 4)
8. Determine the effect on the License Basis (4.3.5)
9. Determine and record the alarm card location. (4.3.14.a, b)
10. Determine and record in Section 5 of Attachment 2 the "Input Contact Status of the affected alarm windows. (4.3.14.a, b)

Time Critical JPM: ☐ YES ☒ NO

4.3.5 IF annunciator or annunciator input is being controlled under another procedure, go to step 4.3.8.

License Basis ➔

a. REVIEW Attachment 2 and DETERMINE the following:

- Circle one -> YES NO • Does removal of the annunciator affect OPERABILITY of plant equipment or systems as defined in Technical Specifications.
- Circle one -> YES NO • Will plant equipment or systems be operated OR operate differently from descriptions in design documents (e.g., FSAR).
- Circle one -> YES NO • Will compensatory actions be different from any existing ARP Corrective Actions.
- Circle one -> YES NO • Will compensatory actions pose adverse environmental effects of any type (directly or indirectly).
- Circle one -> YES NO • Is annunciator required to provide necessary alarm function for which compensatory actions are *not* adequate.

4.3.6 Refer To CM-AA-400, “10 CFR 50.59 and 10 CFR 72.48 – Changes, Tests, and Experiments,” and PERFORM a 10CFR50.59 applicability review as specified:

- a. ATTACH completed Applicability Review form to Attachment 2.
- b. IF a 50.59/72.48 screen is required, Refer To CM-AA-400, “10 CFR 50.59 and 10 CFR 72.48 – Changes, Tests, and Experiments,” and PERFORM 50.59/72.48, ATTACH approved screen to Attachment 2.

4.3.7 IF any condition specified in step 4.3.5a. exists OR any item on safety evaluation screening is checked “YES”, Go To CM-AA-TCC-204, “Temporary Configuration Changes,” and INITIATE the necessary actions to disable applicable alarm.

4.3.8 CHECK appropriate boxes and provide reason if *no* applicability review performed on Attachment 2 for 10CRF50.59 applicability review and screen.

Level of Use
Information

STOP

THINK

ACT

REVIEW

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Attachment 1
Annunciator Compensatory Action Guidelines
(Sheet 1 of 1)

1. WHEN an annunciator is out of service, compensatory actions should be considered if any of the following conditions apply:
 - Annunciator is required to monitor component or system availability or **OPERABILITY**
 - Annunciator monitors the performance or condition of operating equipment OR equipment that is available for operation
 - Annunciator is utilized in AOPs or EOPs for verification or action initiation
 - *No* other annunciator or computer alarm point is available to monitor the affected parameter
 - Annunciator has multiple inputs AND is in solid
 - Bypassing annunciator results in bypassing of an adjacent annunciator which may also require separate compensatory actions
2. WHEN compensatory actions are established, consideration should be given to the following:
 - An alternate means for monitoring the affected parameter (local and remote)
 - Frequency for monitoring the parameter and identification of parameter limits
 - Potential for the affected parameter to change and adverse effects on system or plant operation
 - Compensatory actions that are identified in the ARP (if available)
 - Temporary log changes to implement the compensatory action (if required)
 - Actions that may be required during the implementation of an AOP or EOP with annunciator out of service
 - Their implementation does *not* pose adverse environmental effects of any type, *either* directly or indirectly

Attachment 2

Review and Approval For Disabling Annunciators

(Sheet 1 of 2)

Part 1	
Panel:	Window Location:
Window Nomenclature:	
Required for MODEs: 1 2 3 4 5 6 All N/A	Multiple Input: ☐ Yes ☐ No
Associated T/S or TRM LCO(s): ☐ N/A	
Requestor/Dept.:	Date/Time:
Reason:	

Part 2	
Compensatory Actions Required:	☐ Yes ☐ No
Compensatory Actions (if required):	
Frequency of Actions (if required):	
Justification for <i>not</i> implementing compensatory actions:	
10CFR50.59 Applicability Review (CM-AA-400):	50.59 AR Required ☐ Yes ☐ No
	50.59 AR Attached ☐ Yes ☐ No
If No, Reason _____	50.59 Screen Required ☐ Yes ☐ No
	50.59 Screen Attached ☐ Yes ☐ No
SM Approval Signature:	Date/Time:

Level of Use
Information



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Attachment 2

Review and Approval For Disabling Annunciators

(Sheet 2 of 2)

Part 3	
Annunciator alarm card at _____ was removed <u>AND</u> a split window card installed in its place <u>OR</u> desired input was removed by the following method: _____ _____ color dot placed on annunciator window.	
Installer Signature:	Date/Time:
Verifier Signature:	

Part 4	
Split window card was removed from _____ <u>AND</u> correct annunciator alarm card was replaced <u>OR</u> desired input was re-attached. Color dot also removed from annunciator window.	
Installer Signature:	Date/Time:
Verifier Signature:	

Part 5	
Compensatory actions (if applicable), have been terminated <u>AND</u> annunciator has been returned to its original state.	
SM/US Review Signature:	Date/Time:
Comments:	

Completed attachments and associated safety evaluation screenings are sent to the Operations Department Technician for retention.

Level of Use Information



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Setpoint: Emergency Call Button (local)**B-18****CONTAINMENT
ELEVATOR
ALARM****AUTOMATIC FUNCTIONS**

1. None

CORRECTIVE ACTIONS

1. NOTIFY the following to respond to scene:
 - Fire Brigade | ②
 - Protective Services
 - Health Physics
2. DISPATCH Operator to scene.
3. CONTACT elevator occupants by telephone x4002 and DETERMINE conditions. | ①
4. NOTIFY outside assistance as necessary.

SUPPORTING INFORMATION

1. Initiating Devices
 - Emergency Call Button containment elevator
2. Control Room Drawings
 - 25203-32031 Sh. 2 | ①
3. Annunciator Card Location:

License Basis →

4.3.5 IF annunciator or annunciator input is being controlled under another procedure, go to step 4.3.8.

a. REVIEW Attachment 2 and DETERMINE the following:

- NO • Does removal of the annunciator affect OPERABILITY of plant equipment or systems as defined in Technical Specifications.
- NO • Will plant equipment or systems be operated OR operate differently from descriptions in design documents (e.g., FSAR).
- NO • Will compensatory actions be different from any existing ARP Corrective Actions.
- NO • Will compensatory actions pose adverse environmental effects of any type (directly or indirectly).
- NO • Is annunciator required to provide necessary alarm function for which compensatory actions are *not* adequate.

4.3.6 Refer To CM-AA-400, “10 CFR 50.59 and 10 CFR 72.48 – Changes, Tests, and Experiments,” and PERFORM a 10CFR50.59 applicability review as specified:

- a. ATTACH completed Applicability Review form to Attachment 2.
- b. IF a 50.59/72.48 screen is required, Refer To CM-AA-400, “10 CFR 50.59 and 10 CFR 72.48 – Changes, Tests, and Experiments,” and PERFORM 50.59/72.48, ATTACH approved screen to Attachment 2.

4.3.7 IF any condition specified in step 4.3.5a. exists OR any item on safety evaluation screening is checked “YES”, Go To CM-AA-TCC-204, “Temporary Configuration Changes,” and INITIATE the necessary actions to disable applicable alarm.

4.3.8 CHECK appropriate boxes and provide reason if *no* applicability review performed on Attachment 2 for 10CRF50.59 applicability review and screen.

Level of Use
Information

STOP

THINK

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Attachment 2

Review and Approval For Disabling Annunciators

(Sheet 1 of 2)

Part 1	
Panel: C-06	Window Location: B-18
Window Nomenclature: CONTAINMENT ELEVATOR ALARM	
Required for MODEs: 1 2 3 4 5 6 All N/A	Multiple Input: ☐ Yes ☒ No
Associated T/S or TRM LCO(s): ☒ N/A	
Requestor/Dept.: Examinee/ Unit 2 Operations	Date/Time: Date/Time
Reason: Nuisance Alarm (or equivalent verbiage)	

Part 2	
Compensatory Actions Required: ☐ Yes ☒ No	
Compensatory Actions (if required): N/A	
Frequency of Actions (if required): N/A	
Justification for <i>not</i> implementing compensatory actions:	
Informational Alarm	
10CFR50.59 Applicability Review (CM–AA–400):	50.59 AR Required ☐ Yes ☐ No 50.59 AR Attached ☐ Yes ☐ No If No, Reason _____ 50.59 Screen Required ☐ Yes ☐ No 50.59 Screen Attached ☐ Yes ☐ No
SM Approval Signature:	Date/Time:

**Level of Use
Information**

STOP

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Attachment 2

Review and Approval For Disabling Annunciators

(Sheet 2 of 2)

Since the drawing nomenclature doesn't match the procedure, the examinee needs to only find the correct row for the location.

Part 3

Annunciator alarm card at TB-19 - J-19 was removed AND a split window card installed in its place OR desired input was removed by the following method: N/A
_____ color dot placed on annunciator window.

Installer Signature: Examinee

Date/Time: Date/Time

Verifier Signature:

Part 4

Split window card was removed from _____ AND correct annunciator alarm card was replaced OR desired input was re-attached.
Color dot also removed from annunciator window.

Installer Signature:

Date/Time:

Verifier Signature:

Part 5

Compensatory actions (if applicable), have been terminated AND annunciator has been returned to its original state.

SM/US Review Signature:

Date/Time:

Comments:

Alarm Card contact status = NO/NO

Containment elevator is Red Tagged OFF

Completed attachments and associated safety evaluation screenings are sent to the Operations Department Technician for retention.

Level of Use
Information

STOP

THINK

ACT

REVIEW

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Examinee: _____

JPM A3R

JPM Number: A3R

Revision: 0/3

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/4/24	Used JPM-146 for 2024 ILT NRC exam.	0/3

JPM Number: A3R

Revision: 0/3

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: A3R

Revision: 0/3

Task Title: Maximum RCS Venting Time Determination

System: Conduct of Operations

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☐ YES ☒ NO

Validated Time (minutes): 10

Task Number(s): 235303

Applicable To: SRO STA RO XX 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: The examinee will determine the required venting time to eliminate a RCS void in accordance with EOP 2541, Standard Appendices, Appendix 24, Void Elimination, and determine the lowest RCS pressure allowed during the venting.

Required Materials: EOP 2541, Appendix 24, Void Elimination
(procedures, equipment, etc.)

General References: EOP 2532, Loss of Coolant Accident
EOP 2541, Appendix 24, Void Elimination

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

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

JPM WORKSHEET

Initial Conditions: The plant has experienced a LOCA.

EOP 2541, Appendix 24, Void Elimination, has been entered. Efforts to eliminate the void have failed.

Current Conditions are as follows:

- Plant conditions are as seen on the SPDS printout.
- Containment fans are running.
- Calculations associated with RCS pressure/temperature are NOT functioning on the PPC.

Initiating Cues: The US has directed you to

- Perform the Contingency Actions for EOP 2541, Appendix 24, step 4.1.a and determine the maximum allowable venting time, and
- Evaluate Contingency Actions step 4.1.b. and determine the minimum allowed RCS pressure to begin venting.

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. EOP 2541, Standard Appendices
 - a. EOP 2541, Appendix 2, Figures
 - b. EOP 2541, Appendix 24, Void Elimination
2. PPC SPDS Screenshot

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

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

PERFORMANCE INFORMATION

JPM Number: A3R

Revision: 00/3

Task Title: Maximum RCS Venting Time Determination

START TIME: _____

STEP #1 E O P 2541 A P P 24 Step 4.1	Performance: IF attempts to eliminate the void were not successful AND a non-condensable void is suspected, PERFORM the following to vent the reactor vessel: a. DETERMINE maximum allowable venting time. Refer to Attachment 24-A, "RCS Vent Time Based on Hydrogen Buildup Inside Containment."	Critical: ☐ YES ☒ NO
	Standard: Examinee goes to Attachment 24A, "RCS Vent Time Based on Hydrogen Buildup Inside Containment."	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #2 E O P 2541 A P P 24 A T T 24 A	Performance: This figure is valid <i>only</i> when the following conditions exist: 1. RCS temperature is greater than 212_F. 2. RCS pressure is less than 2250 psia. 3. Containment Temperature is less than 225_F. 4. Containment pressure is greater than 0.0 psig. 5. Containment Hydrogen concentration is less than 2.9%. 6. Containment fans are running.	Critical: ☒ YES ☐ NO
	Standard: Examinee compares figure validity parameters and determines the figure is valid.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: A3R

Revision: 00/3

Task Title: Maximum RCS Venting Time Determination

STEP #3 E O P 2 5 4 1 A P P 2 4 S t e p 4 . 1 . a	Performance: DETERMINE maximum allowable venting time. Refer to Attachment 24-A, "RCS Vent Time Based on Hydrogen Buildup Inside Containment."	Critical: ☒ YES ☐ NO
	Standard: Examinee Uses Initial conditions Pressure (350 psia) and CTMT Hydrogen concentration (1.5 %) and determines the maximum venting time would be ~ 22.5 minutes	Grade: S ☐ U ☐
	Cue: 	
	Comments: Acceptable time would be 22.5 ± 2.5 minutes. Refer to key.	
STEP #4 A P P 2 4 S t e p 4 . 1 . b	Performance: ENSURE RCS subcooling exceeds the minimum subcooling line of the RCS P/T curve by greater than 20°F. Refer to Appendix 2, "Figures."	Critical: ☒ YES ☐ NO
	Standard: Examinee goes to Figure 1, "RCS P/T Curve," and determines saturation pressure for 362°F (20°F above current temperature). Harsh containment 30 degree subcooling = 295 psia	Grade: S ☐ U ☐
	Cue: JPM is complete.	
	Comments: An acceptable range is 280 psia to 310 psia.	

TERMINATION CUE: The evaluation for this JPM is complete.

STOP TIME: _____

Edited due to original answer not being calculated IAW harsh containment conditions

VERIFICATION OF JPM COMPLETION

JPM Number: A3R

Revision: 0/3

Task Title: Maximum RCS Venting Time Determination

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	10	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: A3R

Revision: 0/3

Initial Conditions: The plant has experienced a LOCA.
EOP 2541, Appendix 24, Void Elimination, has been entered. Efforts to eliminate the void have failed.

Current Conditions are as follows:

- Plant conditions are as seen on the SPDS printout.
- Containment fans are running.
- Calculations associated with RCS pressure/temperature are NOT functioning on the PPC.

Initiating Cues: The US has directed you to

- Perform the Contingency Actions for EOP 2541, Appendix 24, step 4.1.a and determine the maximum allowable venting time, and
- Evaluate Contingency Actions step 4.1.b. and determine the minimum allowed RCS pressure to begin venting.

Time Critical JPM: ☐ YES ☒ NO

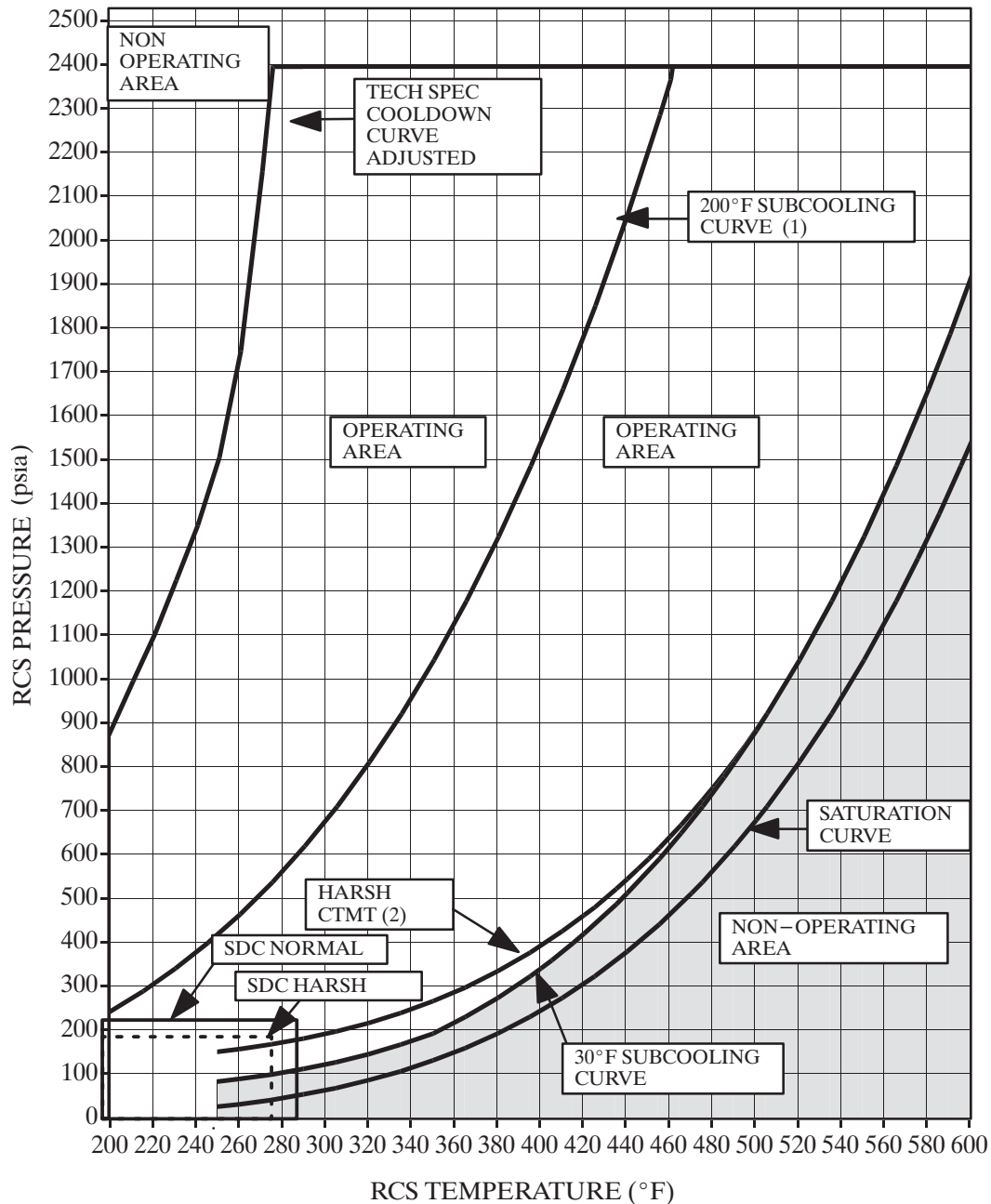
Step 4.1.a

Maximum allowable venting time: _____ minutes

Step 4.1.b

Minimum allowable RCS pressure: _____ psia

Figure 1 – RCS P/T Curve



- (1) This curve supercedes the Tech Spec Cooldown curve any time the RCS has experienced an uncontrolled cooldown to below 500°F.
- (2) This curve supercedes the 30°F Subcooling curve at any time harsh containment exist. Harsh Cmtt values should be used anytime CIAS has actuated on high containment pressure > 4.42 psig.

Level of Use
Continuous

Millstone Unit 2 Figures

EOP 2541, Appendix 2 Revision 002
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Figure 1 – RCS P/T Curve (con't)

RCS Temp (°F)	Saturation Pressure (psia)	30°F non Harsh Ctmt Subcooled Minimum Pressure (psia)	Harsh Ctmt Minimum Pressure (psia)	PTS Limit 200°F Subcooled Maximum Pressure (psia)	Tech Spec Cooldown Curve Maximum Pressure (psia)
600	1543	1920	1920		Upper Limit of 2400 
595	1487	1852	1852		
590	1432	1787	1787		
585	1378	1723	1723		
580	1326	1662	1662		
575	1276	1602	1602		
570	1227	1543	1543		
565	1179	1487	1487		
560	1133	1432	1432		
555	1089	1378	1378		
550	1045	1326	1326		
545	1004	1276	1276		
540	963	1227	1227		
535	923	1179	1179		
530	885	1133	1133		
525	848	1089	1089		
520	813	1045	1045		
515	778	1004	1004		
510	745	963	963		
505	712	923	923		
500	681	885	887		
495	651	848	852		
490	622	813	819		
485	593	778	787		
480	566	745	756	2400	
475	540	712	727		
470	515	681	698		
465	490	651	670		
460	467	622	644		
455	444	593	618		
450	423	566	593		
445	402	540	570		
440	382	515	547		
435	362	490	525		
430	344	467	504		
425	326	444	484		
420	309	423	465		
415	292	402	446		
410	277	382	429		
405	262	362	412		
400	247	344	396		

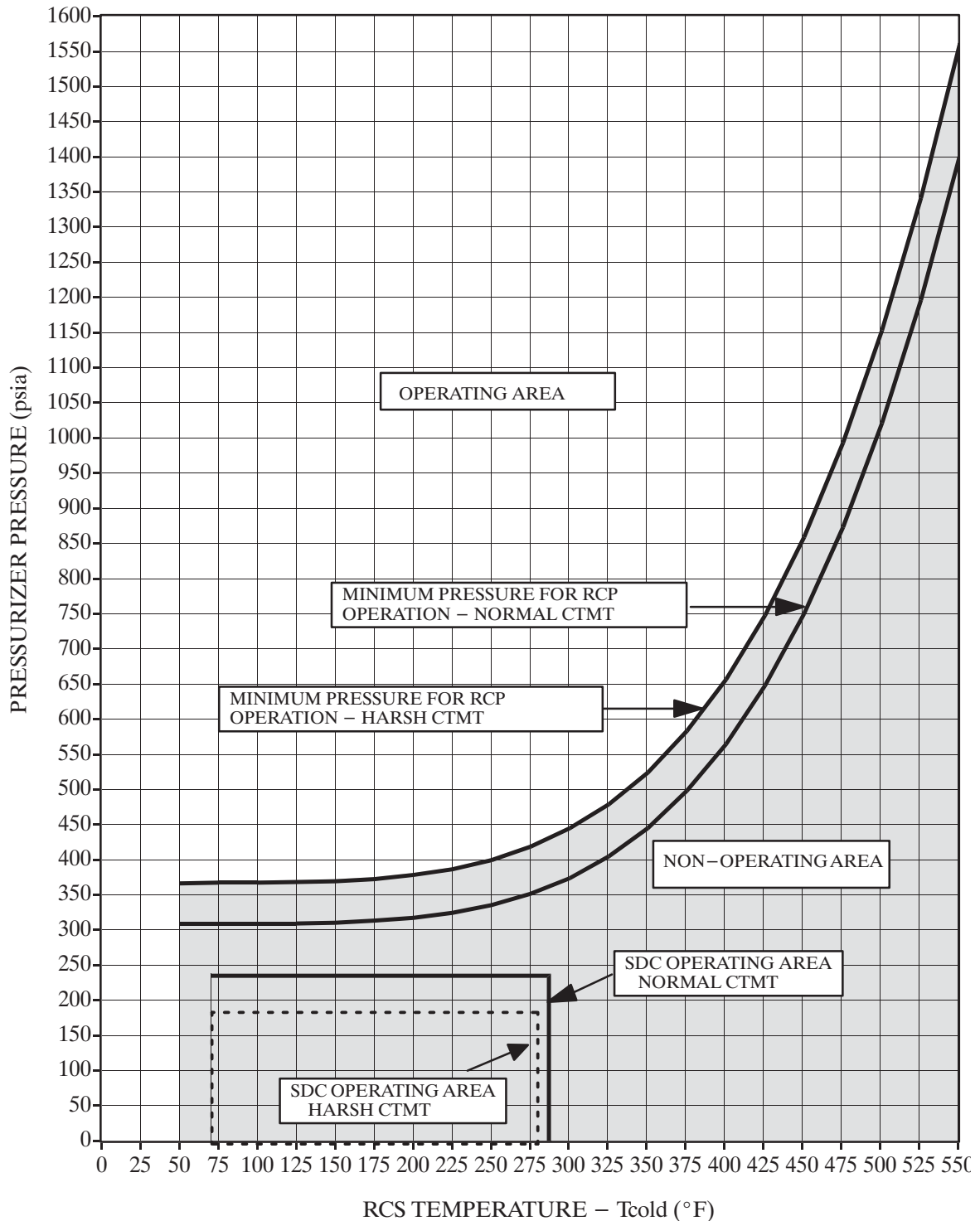
Level of Use
Continuous

Figure 1 – RCS P/T Curve (con't)

RCS Temp (°F)	Saturation Pressure (psia)	30°F non – Harsh Ctmt Subcooled Minimum Pressure (psia)	Harsh Ctmt Minimum Pressure (psia)	PTS Limit 200°F Subcooled Maximum Pressure (psia)	Tech Spec Cooldown Curve Maximum Pressure (psia)
395	234	326	380	1487	Upper Limit of 2400 
390	220	309	366	1432	
385	208	292	351	1378	
380	196	277	338	1326	
375	184	262	325	1276	2400
370	173	247	313	1227	
365	163	234	301	1179	
360	153	220	290	1133	
355	144	208	280	1089	2400
350	135	196	270	1045	
345	126	187	261	1004	
340	118	179	252	963	
335	110	171	243	923	2400
330	103	163	235	885	
325	96	156	228	848	
320	90	149	220	813	
315	84	143	214	778	2400
310	78	137	207	745	
305	72	131	201	712	
300	67	125	196	681	
295	62	120	190	651	2400
290	58	116	185	622	
285	53	111	181	593	
280	49	107	176	566	
275	45	103	172	540	2400
270	42	99	168	515	
265	39	96	164	490	
260	35	93	161	467	
255	33	90	158	444	1611
250	30	87	155	423	
245	27	84	152	402	
240	25	82	150	382	
235	23	80	147	362	1291
230	21	78	145	344	
225	19	76	143	326	
220	17	74	141	309	
215	16	72	139	292	1050
210	14	71	138	277	
205	13	70	136	262	
200	12	68	135	247	

**Level of Use
Continuous**

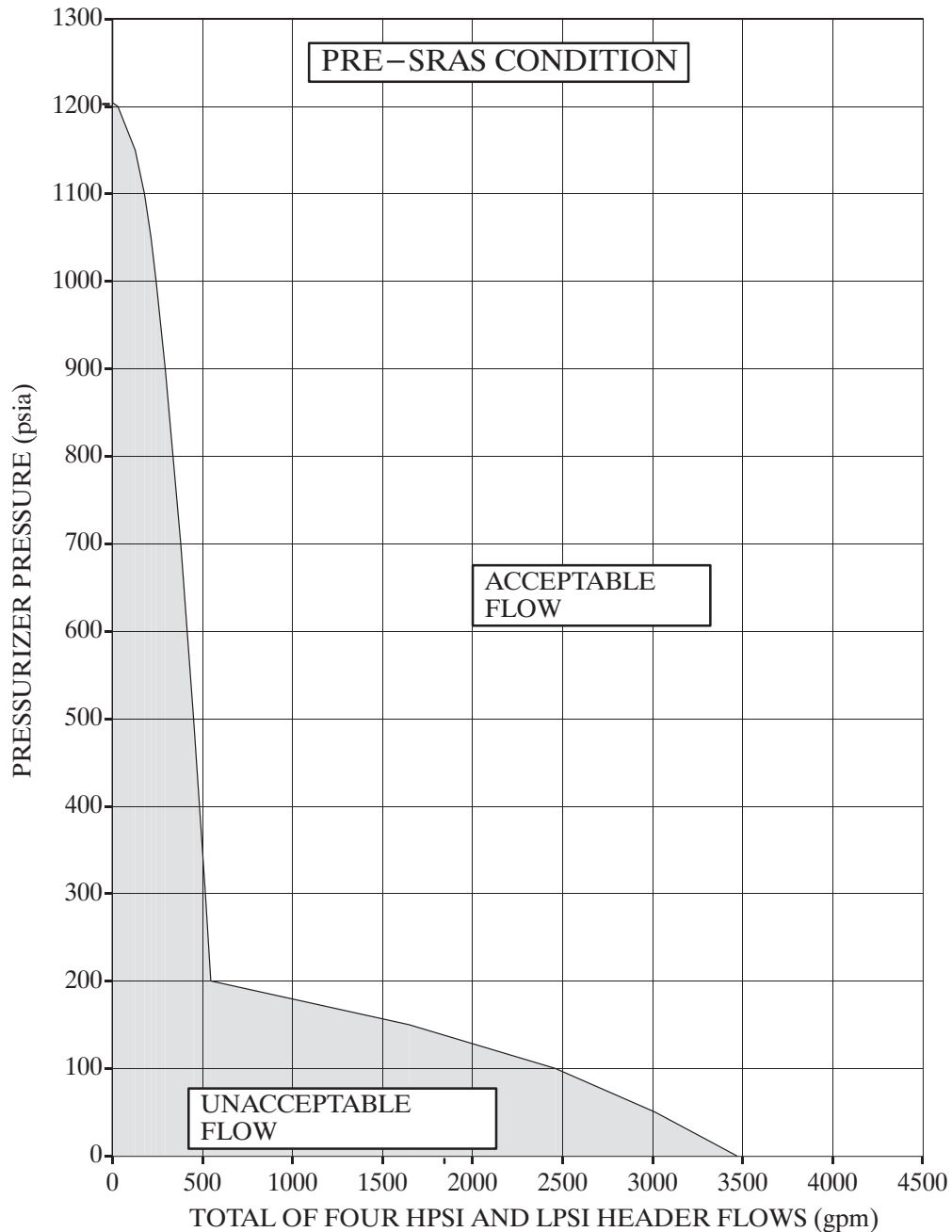
Figure 2 – RCP NPSH Curve



(1) Harsh Ctmt values should be used anytime CIAS has actuated on high containment pressure > 4.42 psig.

Level of Use
Continuous

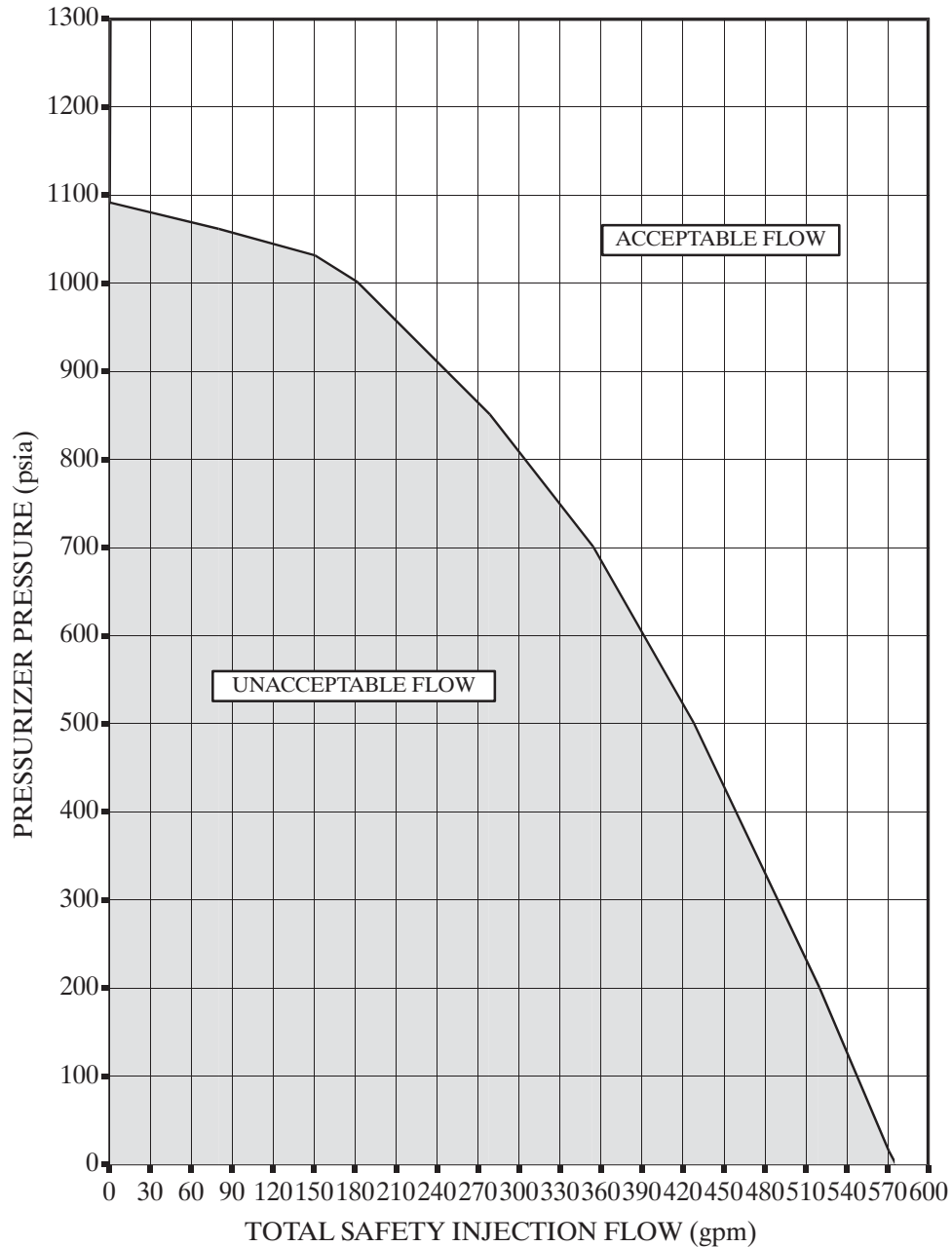
Figure 3 – Pre–SRAS Minimum Required SI Flow



- (1) This curve is based on 1 facility operating.
- (2) If harsh containment exists at any time during an event, the pressurizer pressure inaccuracy can be large, and unacceptable flow may be indicated when the actual delivered flow is acceptable. Therefore, if harsh containment exists and all other safety function parameters meet the criteria, then consider the Safety Function Satisfied.
- (3) Indicated flow should be doubled on loss of VR–11 or VR–21, if associated SI Train is operating.

Level of Use
Continuous

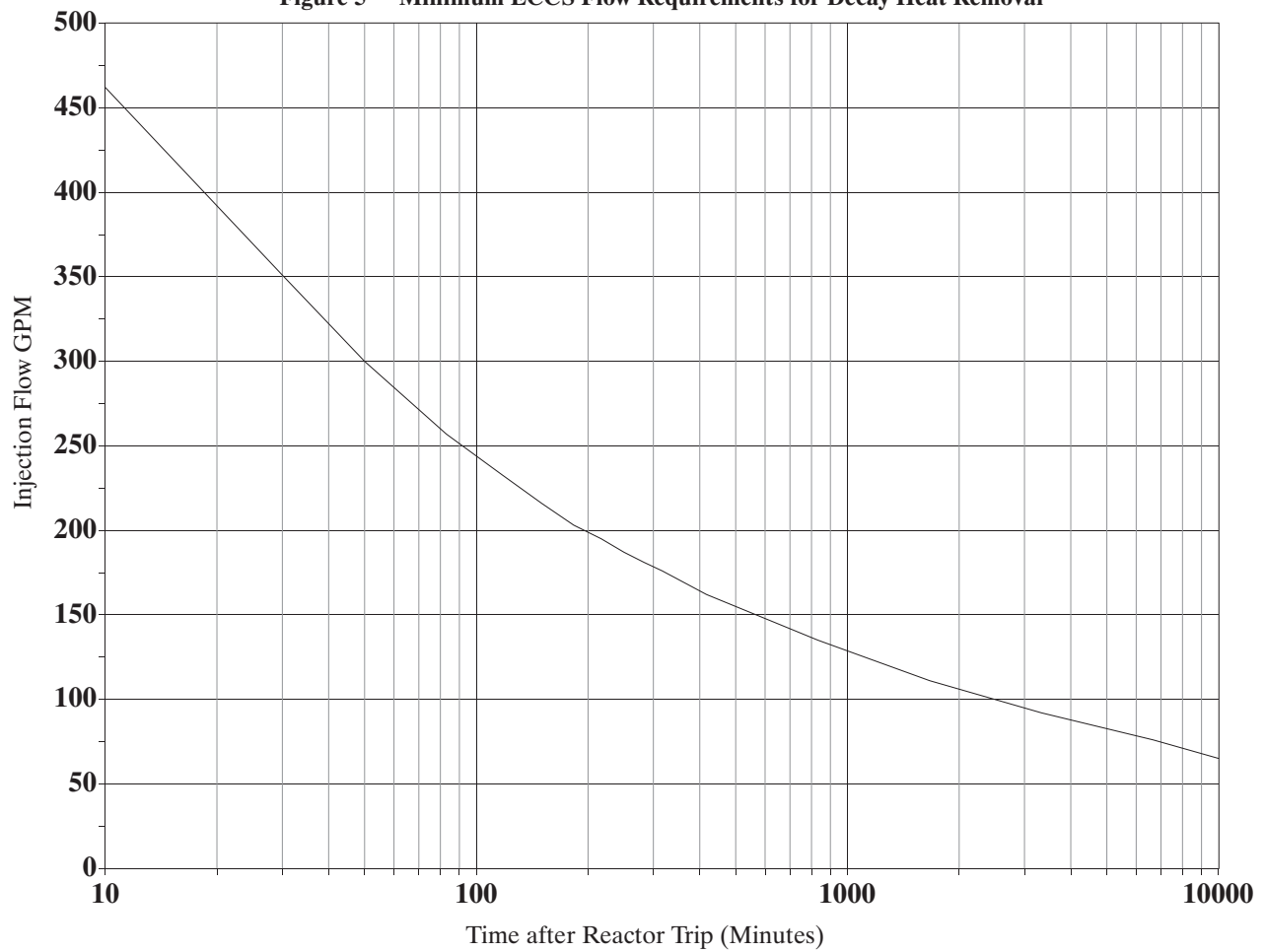
Figure 4 – Post–SRAS Minimum Required SI Flow



- (1) This curve is based on only one HPSI facility operating.
- (2) If harsh containment exists at any time during an event, the pressurizer pressure inaccuracy can be large, and unacceptable flow may be indicated when the actual delivered flow is acceptable. Therefore, if harsh containment exists and all other safety function parameters meet the criteria, then consider the Safety Function Satisfied.
- (3) Indicated flow should be doubled on loss of VR–11 or VR–21, if associated SI Train is operating.

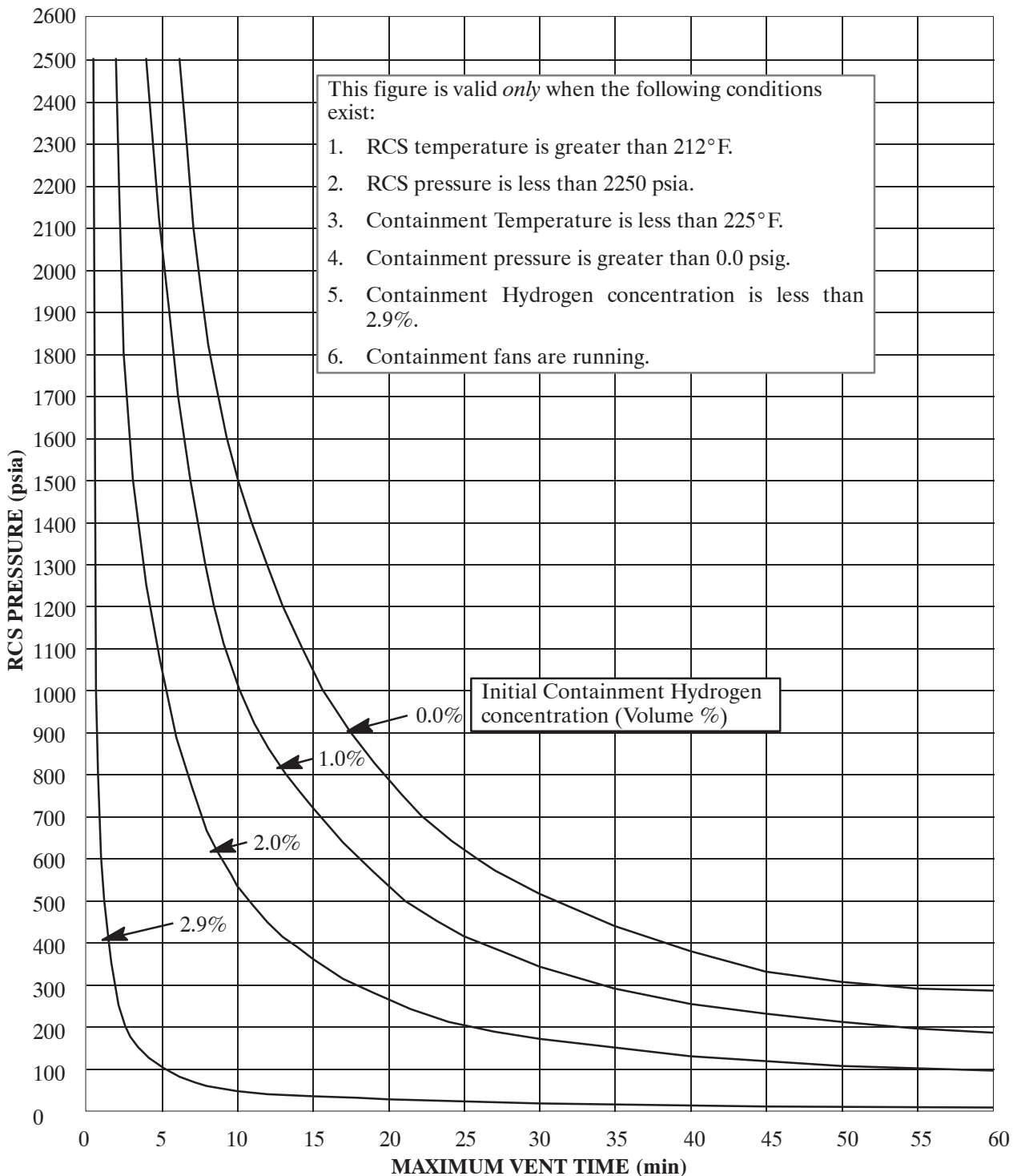
**Level of Use
Continuous**

Figure 5 – Minimum ECCS Flow Requirements for Decay Heat Removal



Attachment 24-A RCS Vent Time Based on Hydrogen Buildup

Page 1 of 1



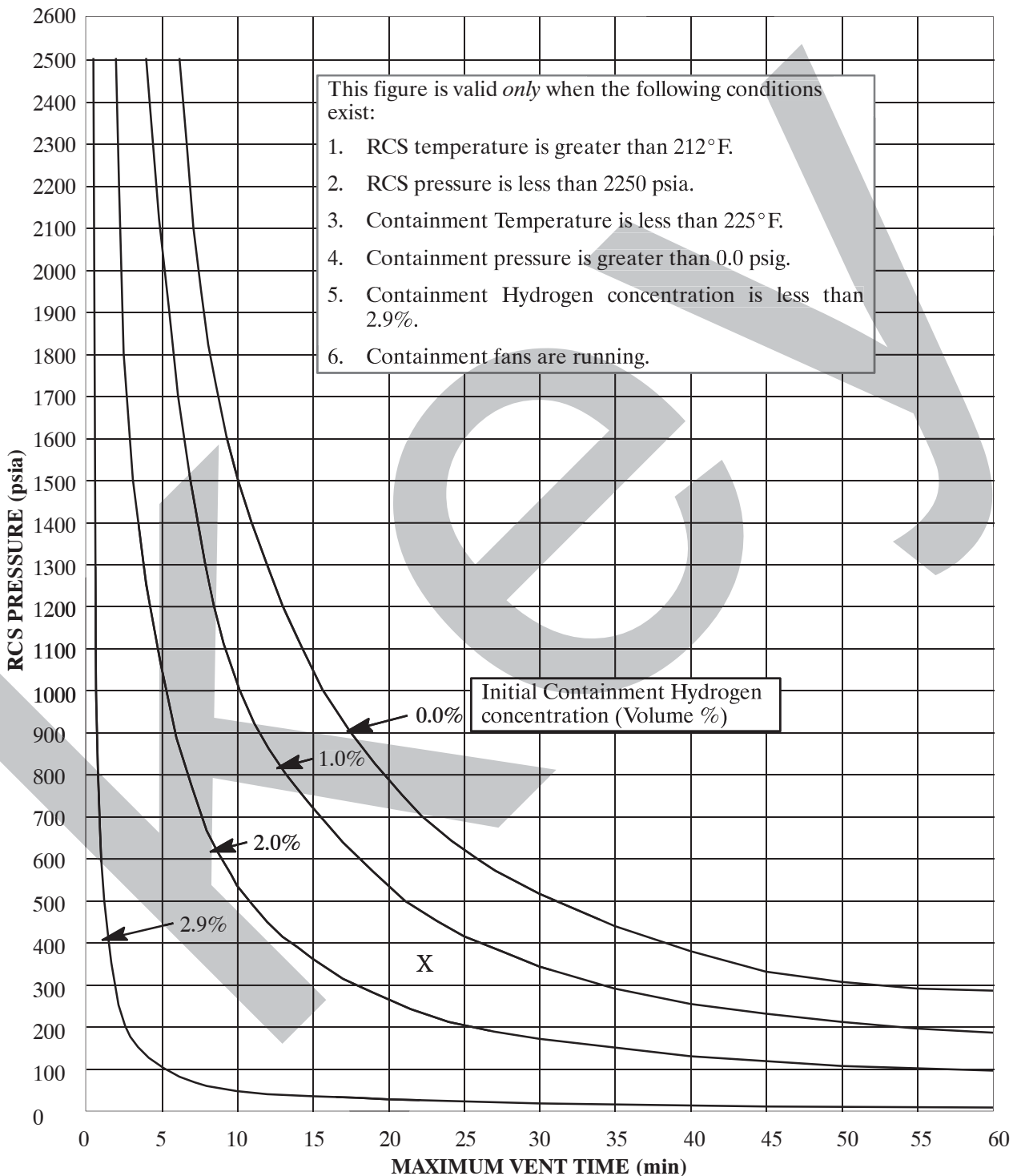
– End of Appendix 1 –

Level of Use
Continuous



Attachment 24-A RCS Vent Time Based on Hydrogen Buildup

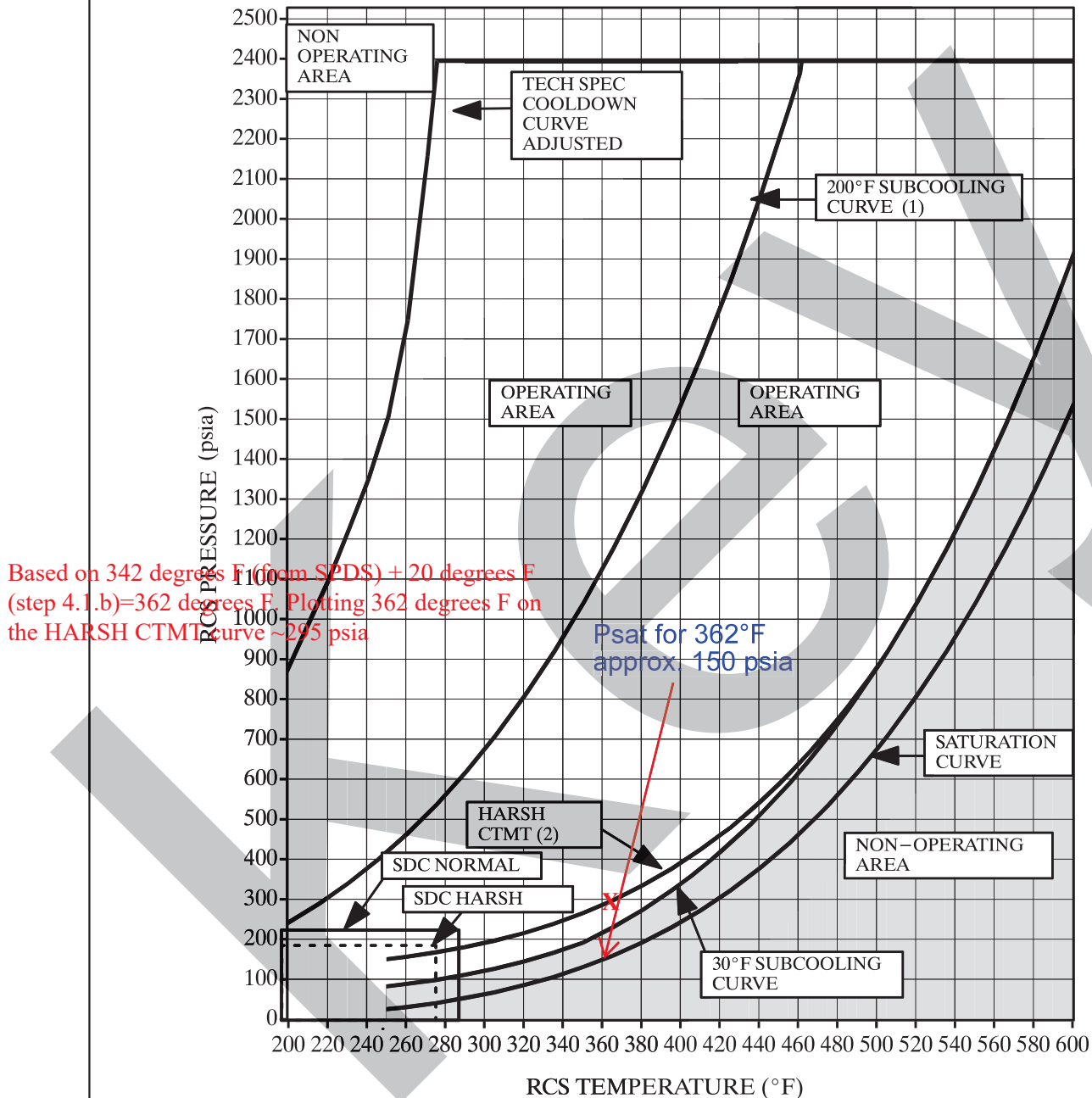
Page 1 of 1



– End of Appendix 1 –

**Level of Use
Continuous**

Figure 1 – RCS P/T Curve



- (1) This curve supercedes the Tech Spec Cooldown curve any time the RCS has experienced an uncontrolled cooldown to below 500°F.
- (2) This curve supercedes the 30°F Subcooling curve at any time harsh containment exist. Harsh Ctmt values should be used anytime CIAS has actuated on high containment pressure > 4.42 psig.

Level of Use
Continuous

Edited due to original answer not being calculated IAW harsh containment conditions

Examinee: _____

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Maximum RCS Venting Time Determination

JPM Number: A3S Revision: 0/3

Initiated:

Shawn Minogue – Signature on File	23AUG24
Developer	Date

Reviewed:

_____ Technical Reviewer	_____ Date
-----------------------------	---------------

Approved:

_____ Supervisor, Nuclear Training	_____ Date
---------------------------------------	---------------

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/4/24	Used JPM-146 for 2024 ILT NRC exam.	0/3
8/23/24	Added supervisory oversight steps to JPM A4R to create A4S.	0/4

JPM Number: A3S

Revision: 0/4

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: A3S

Revision: 0/3

Task Title: Review Maximum RCS Venting Time Determination

System: Conduct of Operations

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☐ YES ☒ NO

Validated Time (minutes): 10

Task Number(s): 235303

Applicable To: SRO XX STA RO XX 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: An RO has recommended values for the allowed venting time and minimum RCS pressure for Void Elimination IAW EOP 2541, Appendix 24, "Void Elimination," RNO steps 4.1.a and 4.1.b. The examinee will:

- Verify the accuracy of the recommended values
- State which values, if any, are incorrect
- If any value is incorrect, determine the correct value

Required Materials: EOP 2541, Appendix 24, Void Elimination
(procedures, equipment, EOP 2541, Appendix 2, Figures
etc.) PPC SPDS Printout

General References: EOP 2532, Loss of Coolant Accident
EOP 2541, Appendix 24, Void Elimination

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

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

JPM WORKSHEET

Initial Conditions: The plant has experienced a LOCA.

EOP 2541, Appendix 24, Void Elimination, has been entered. Efforts to eliminate the void have failed.

Current Conditions are as follows:

- Plant conditions are as seen on the SPDS printout.
- Containment fans are running.
- Calculations associated with RCS pressure/temperature are NOT functioning on the PPC.

Initiating Cues: You are the US.

- The RO has recommended the following IAW EOP 2541, Appendix 24, "Void Elimination":
 - The maximum allowable venting time IAW Contingency Actions step 4.1.a is 35 minutes.
 - The minimum allowable RCS pressure IAW Contingency Actions step 4.1.b is 295 psia.
- You are to review the recommendations from the RO and:
 - Determine whether they are correct
 - State which values, if any, are incorrect
 - Determine the correct value for any incorrect recommendations.

Time Critical JPM: ☐ YES ☒ NO

Edited due to original answer not being calculated
IAW harsh containment conditions

Handouts (handout after cues are read and understood)

1. EOP 2541, Standard Appendices
 - a. EOP 2541, Appendix 2, Figures
 - b. EOP 2541, Appendix 24, Void Elimination
2. PPC SPDS Screenshot

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

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

PERFORMANCE INFORMATION

JPM Number: A3S

Revision: 0/4

Task Title: Maximum RCS Venting Time Determination

START TIME: _____

STEP # 1 E O P 2 5 4 1 A P P 2 4 S t e p 4 . 1	Performance: IF attempts.to eliminate the void were not successful AND a non-condensable void is suspected, PERFORM the following to vent the reactor vessel: a. DETERMINE maximum allowable venting time. Refer to Attachment 24-A, "RCS Vent Time Based on Hydrogen Buildup Inside Containment."	Critical: ☐ YES ☒ NO
	Standard: Examinee goes to Attachment 24A, "RCS Vent Time Based on Hydrogen Buildup Inside Containment."	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP # 2 E O P 2 5 4 1 A P P 2 4 A T T 2 4 A	Performance: This figure is valid <i>only</i> when the following conditions exist: 1. RCS temperature is greater than 212 °F. 2. RCS pressure is less than 2250 psia. 3. Containment Temperature is less than 225 °F. 4. Containment pressure is greater than 0.0 psig. 5. Containment Hydrogen concentration is less than 2.9%. 6. Containment fans are running.	Critical: ☒ YES ☐ NO
	Standard: Examinee compares figure validity parameters and determines the figure is valid.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: A3S

Revision: 0/4

Task Title: Maximum RCS Venting Time Determination

STEP #3 E O P 2 5 4 1 A P P 2 4 S t e p 4 . 1 . a	Performance: DETERMINE maximum allowable venting time. Refer to Attachment 24-A, "RCS Vent Time Based on Hydrogen Buildup Inside Containment."	Critical: ☒ YES ☐ NO
	Standard: Examinee Uses Initial conditions Pressure (350 psia) and CTMT Hydrogen concentration (1.5 %) and determines the maximum venting time would be ~ 22.5 minutes	Grade: S ☐ U ☐
	Cue:	
	Comments: Acceptable time would be 22.5 ± 2.5 minutes. Refer to key.	
STEP #4 A P P 2 4 S t e p 4 . 1 . a	Performance: - Determine recommended venting time of 35 minutes is NOT correct. - Determine correct value (from JPM step 3) is 22.5 ± 2.5 minutes.	Critical: ☒ YES ☐ NO ☒ YES ☐ NO
	Standard: - Examinee determines that recommended venting time of 35 minutes is NOT correct. - Examinee determines that the correct value (from JPM step 3) is 22.5 ± 2.5 minutes.	Grade: S ☐ U ☐ S ☐ U ☐
	Cue:	
	Comments: Any value within 22.5 ± 2.5 minutes is acceptable.	

PERFORMANCE INFORMATION

JPM Number: A3S

Revision: 0/4

Task Title: Maximum RCS Venting Time Determination

STEP # 5 APP 24 Step 4.1.b	Performance: ENSURE RCS subcooling exceeds the minimum subcooling line of the RCS P/T curve by greater than 20°F. Refer to Appendix 2, "Figures."	Critical: ☒ YES ☐ NO
	Standard: Examinee goes to Figure 1, "RCS P/T Curve," and determines saturation pressure for 362°F (20°F above current temperature). Harsh containment 30 degree subcooling = 295 psia	Grade: S ☐ U ☐
	Cue:	
	Comments: An acceptable range is 280 psia to 310 psia. If the examinee determines in JPM step 6 that the RO recommended value of 295 psia is correct, OR determines that the correct value is any value between 280 psia and 310 psia, then this step has been completed satisfactorily.	
STEP # 6 APP 24 Step 4.1.b	Performance: Determine that the recommended value of 295 psia is CORRECT.	Critical: ☐ YES ☒ NO
	Standard: Examinee determines that the recommended value of 295 psia is CORRECT or in the acceptable range of 280-310 psia.	Grade: S ☐ U ☐
	Cue:	
	Comments: An acceptable range is 280 psia to 310 psia. The examinee may determine that the correct value is any number in this range. If they determine something different from the RO recommendation of 295 psia, they may mark the RO recommendation as "Incorrect" and mark their own value as the correct one. This would NOT constitute a JPM failure as long as the examinee determines that the correct pressure is between 280 psia and 310 psia.	

TERMINATION CUE: The evaluation for this JPM is complete.

Edited due to original answer not being calculated IAW harsh containment conditions

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A3S

Revision: 0/4

Task Title: Maximum RCS Venting Time Determination

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	10	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: A3S

Revision: 0/4

Initial Conditions: The plant has experienced a LOCA.
EOP 2541, Appendix 24, Void Elimination, has been entered. Efforts to eliminate the void have failed.

Current Conditions are as follows:

- Plant conditions are as seen on the SPDS printout.
- Containment fans are running.
- Calculations associated with RCS pressure/temperature are NOT functioning on the PPC.

Initiating Cues: You are the US.

- The RO has recommended the following IAW EOP 2541, Appendix 24, “Void Elimination”:
 - The maximum allowable venting time IAW Contingency Actions step 4.1.a is 35 minutes.
 - The minimum allowable RCS pressure IAW Contingency Actions step 4.1.b is 295 psia.
- You are to review the recommendations from the RO and:
 - Determine whether they are correct
 - State which values, if any, are incorrect
 - Determine the correct value for any incorrect recommendations.

Time Critical JPM: ☐ YES ☒ NO

Step 4.1.a Maximum allowable venting time

RO recommendation: 35 minutes. Correct? ☐ YES ☐ NO

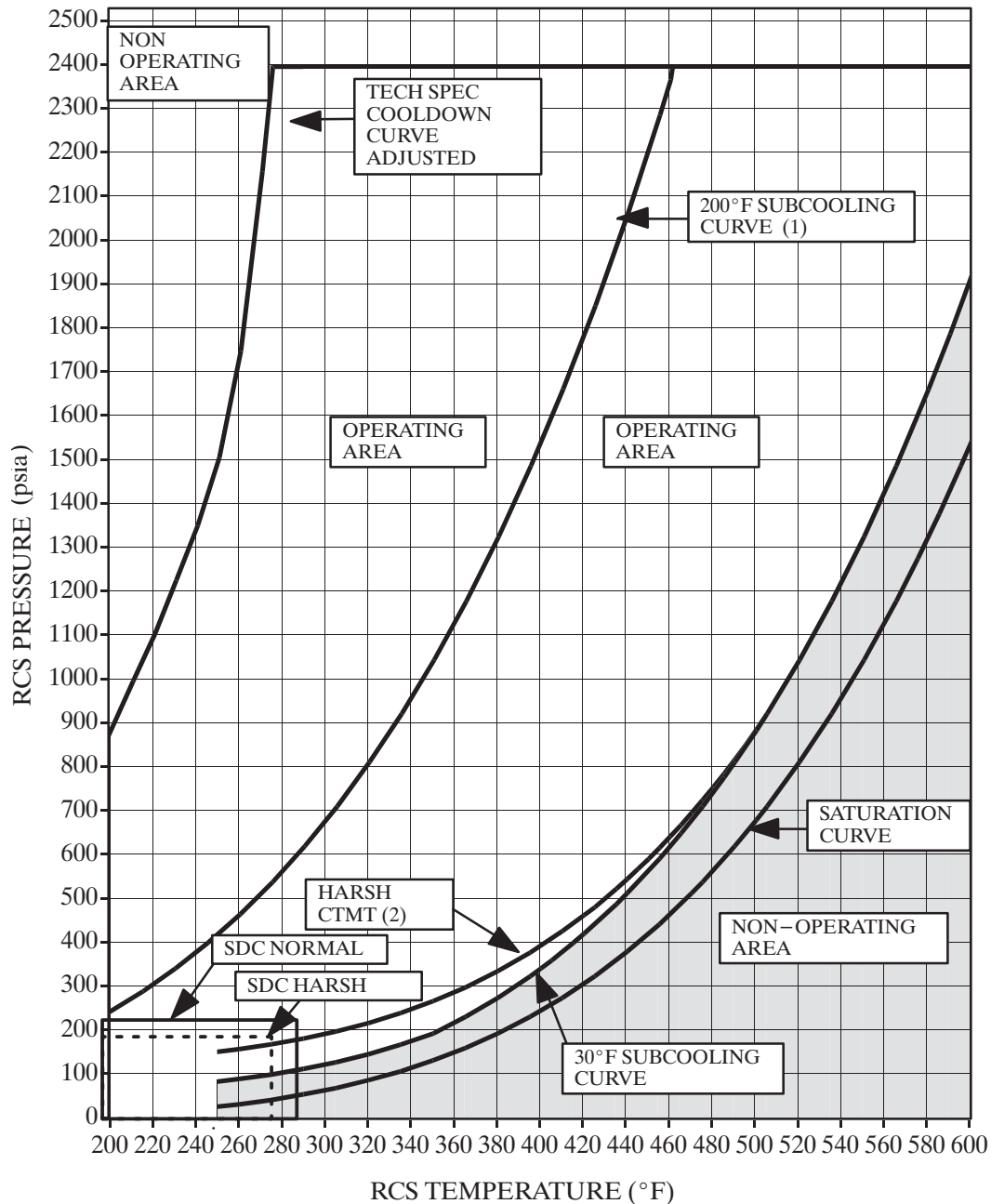
Correct value (if RO recommendation is NOT correct): _____

Step 4.1.b Minimum allowable RCS pressure

RO recommendation: 295 psia Correct? ☐ YES ☐ NO

Correct value (if RO recommendation is NOT correct): _____

Figure 1 – RCS P/T Curve



- (1) This curve supercedes the Tech Spec Cooldown curve any time the RCS has experienced an uncontrolled cooldown to below 500°F.
- (2) This curve supercedes the 30°F Subcooling curve at any time harsh containment exist. Harsh Cmtt values should be used anytime CIAS has actuated on high containment pressure > 4.42 psig.

Level of Use
Continuous

Millstone Unit 2 Figures

EOP 2541, Appendix 2 Revision 002
Page 2 of 7

Figure 1 – RCS P/T Curve (con't)

RCS Temp (°F)	Saturation Pressure (psia)	30°F non Harsh Ctmt Subcooled Minimum Pressure (psia)	Harsh Ctmt Minimum Pressure (psia)	PTS Limit 200°F Subcooled Maximum Pressure (psia)	Tech Spec Cooldown Curve Maximum Pressure (psia)
600	1543	1920	1920		Upper Limit of 2400 
595	1487	1852	1852		
590	1432	1787	1787		
585	1378	1723	1723		
580	1326	1662	1662		
575	1276	1602	1602		
570	1227	1543	1543		
565	1179	1487	1487		
560	1133	1432	1432		
555	1089	1378	1378		
550	1045	1326	1326		
545	1004	1276	1276		
540	963	1227	1227		
535	923	1179	1179		
530	885	1133	1133		
525	848	1089	1089		
520	813	1045	1045		
515	778	1004	1004		
510	745	963	963		
505	712	923	923		
500	681	885	887		
495	651	848	852		
490	622	813	819		
485	593	778	787		
480	566	745	756	2400	
475	540	712	727		
470	515	681	698		
465	490	651	670		
460	467	622	644		
455	444	593	618		
450	423	566	593		
445	402	540	570		
440	382	515	547		
435	362	490	525		
430	344	467	504		
425	326	444	484		
420	309	423	465		
415	292	402	446		
410	277	382	429		
405	262	362	412		
400	247	344	396		

Level of Use
Continuous

Millstone Unit 2 **Figures**

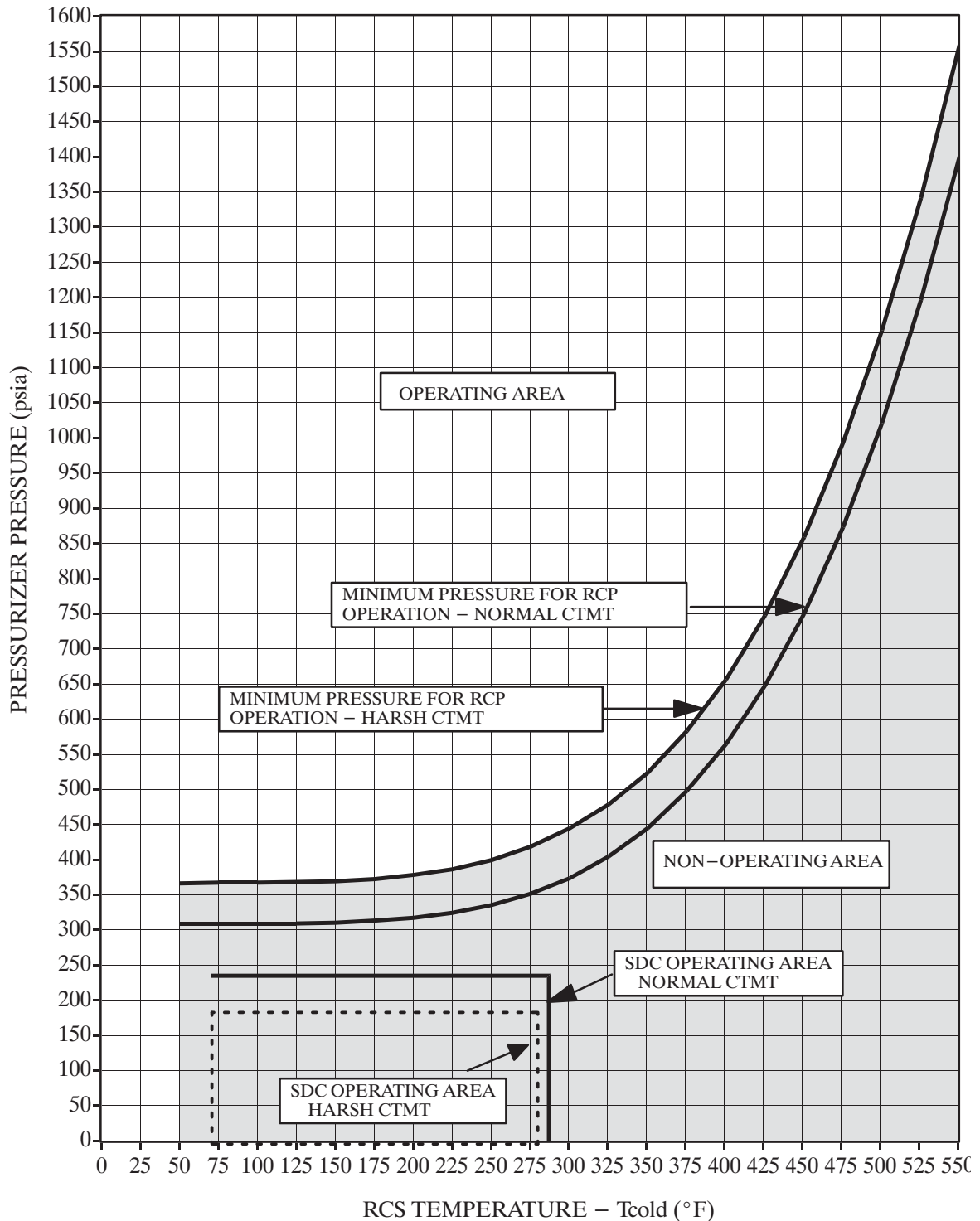
EOP 2541, Appendix 2 Revision 002
Page 3 of 7

Figure 1 – RCS P/T Curve (con't)

RCS Temp (°F)	Saturation Pressure (psia)	30°F non – Harsh Ctmt Subcooled Minimum Pressure (psia)	Harsh Ctmt Minimum Pressure (psia)	PTS Limit 200°F Subcooled Maximum Pressure (psia)	Tech Spec Cooldown Curve Maximum Pressure (psia)
395	234	326	380	1487	Upper Limit of 2400
390	220	309	366	1432	
385	208	292	351	1378	
380	196	277	338	1326	
375	184	262	325	1276	
370	173	247	313	1227	
365	163	234	301	1179	
360	153	220	290	1133	
355	144	208	280	1089	
350	135	196	270	1045	
345	126	187	261	1004	
340	118	179	252	963	
335	110	171	243	923	
330	103	163	235	885	
325	96	156	228	848	
320	90	149	220	813	
315	84	143	214	778	
310	78	137	207	745	
305	72	131	201	712	
300	67	125	196	681	
295	62	120	190	651	2400
290	58	116	185	622	2400
285	53	111	181	593	2400
280	49	107	176	566	2400
275	45	103	172	540	2400
270	42	99	168	515	2157
265	39	96	164	490	1925
260	35	93	161	467	1748
255	33	90	158	444	1611
250	30	87	155	423	1505
245	27	84	152	402	1421
240	25	82	150	382	1351
235	23	80	147	362	1291
230	21	78	145	344	1226
225	19	76	143	326	1164
220	17	74	141	309	1103
215	16	72	139	292	1050
210	14	71	138	277	997
205	13	70	136	262	943
200	12	68	135	247	889

Level of Use
Continuous

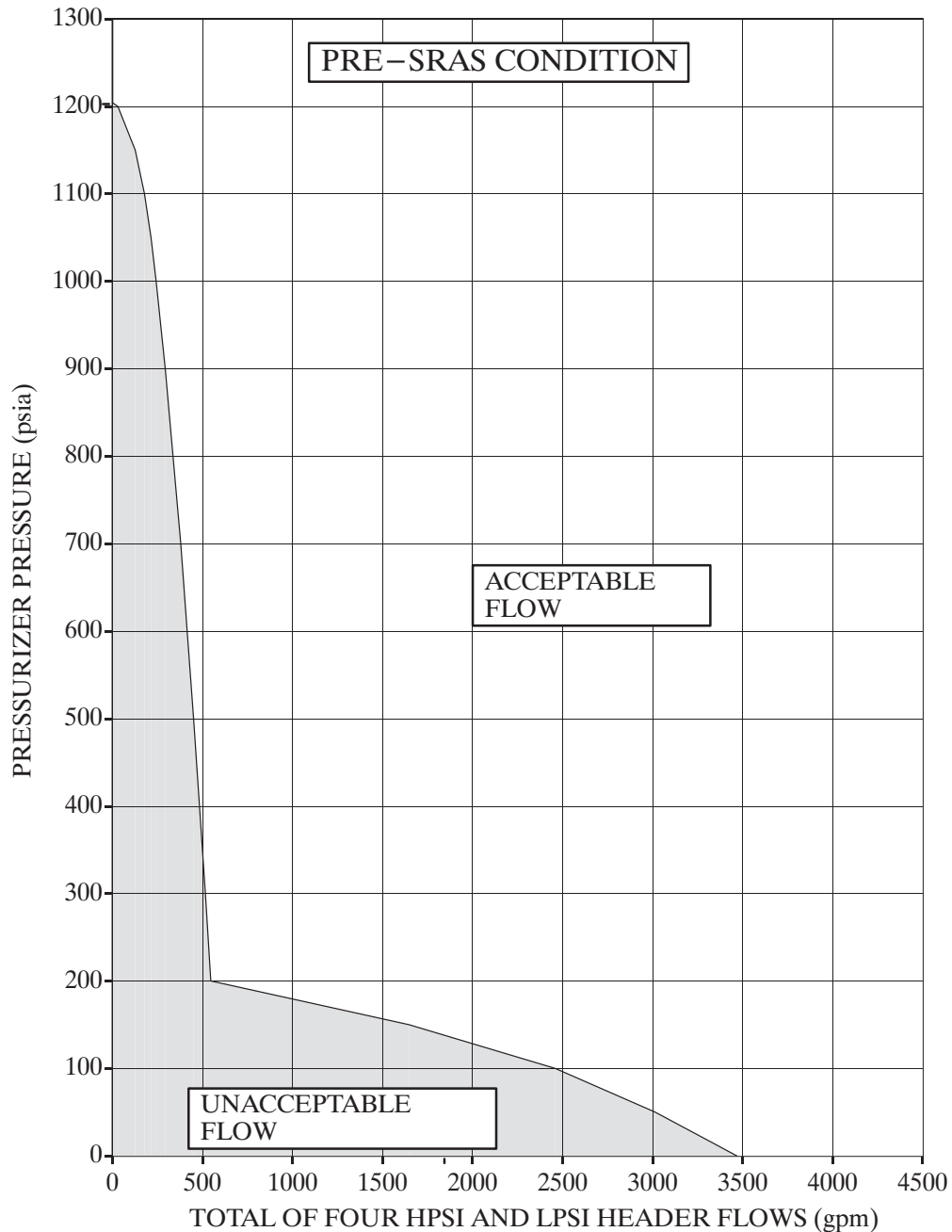
Figure 2 – RCP NPSH Curve



(1) Harsh Ctmt values should be used anytime CIAS has actuated on high containment pressure > 4.42 psig.

Level of Use
Continuous

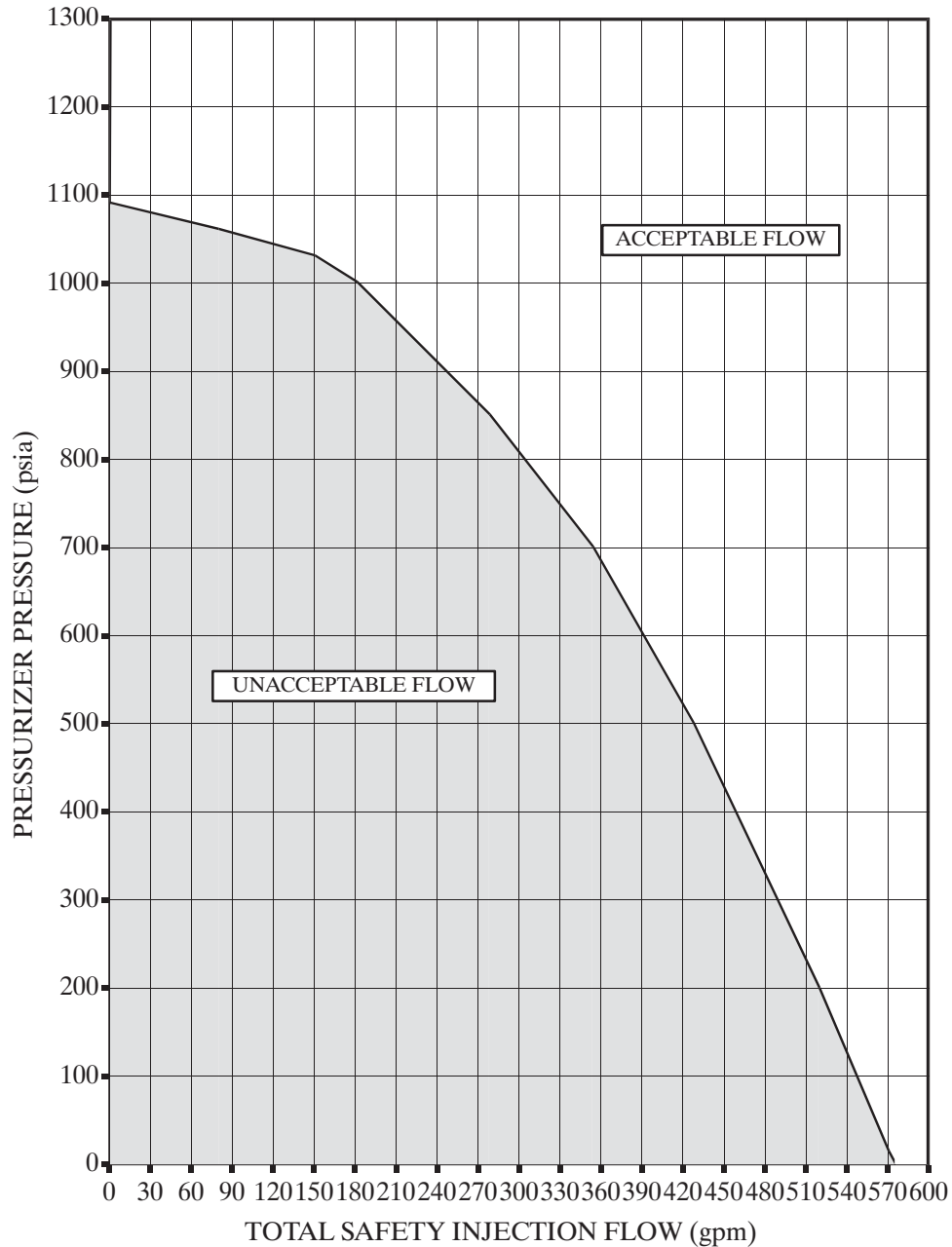
Figure 3 – Pre–SRAS Minimum Required SI Flow



- (1) This curve is based on 1 facility operating.
- (2) If harsh containment exists at any time during an event, the pressurizer pressure inaccuracy can be large, and unacceptable flow may be indicated when the actual delivered flow is acceptable. Therefore, if harsh containment exists and all other safety function parameters meet the criteria, then consider the Safety Function Satisfied.
- (3) Indicated flow should be doubled on loss of VR–11 or VR–21, if associated SI Train is operating.

**Level of Use
Continuous**

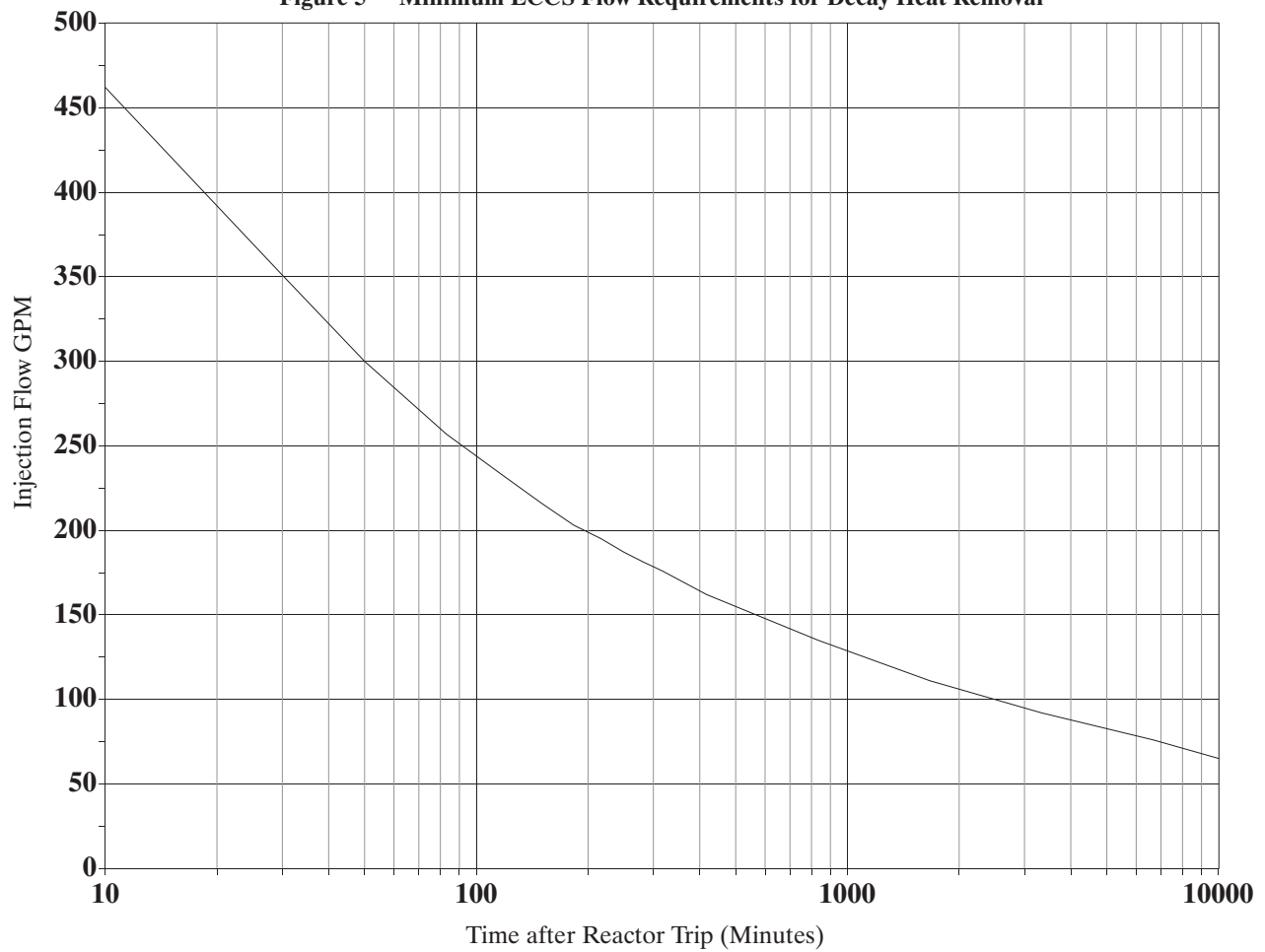
Figure 4 – Post–SRAS Minimum Required SI Flow



- (1) This curve is based on only one HPSI facility operating.
- (2) If harsh containment exists at any time during an event, the pressurizer pressure inaccuracy can be large, and unacceptable flow may be indicated when the actual delivered flow is acceptable. Therefore, if harsh containment exists and all other safety function parameters meet the criteria, then consider the Safety Function Satisfied.
- (3) Indicated flow should be doubled on loss of VR–11 or VR–21, if associated SI Train is operating.

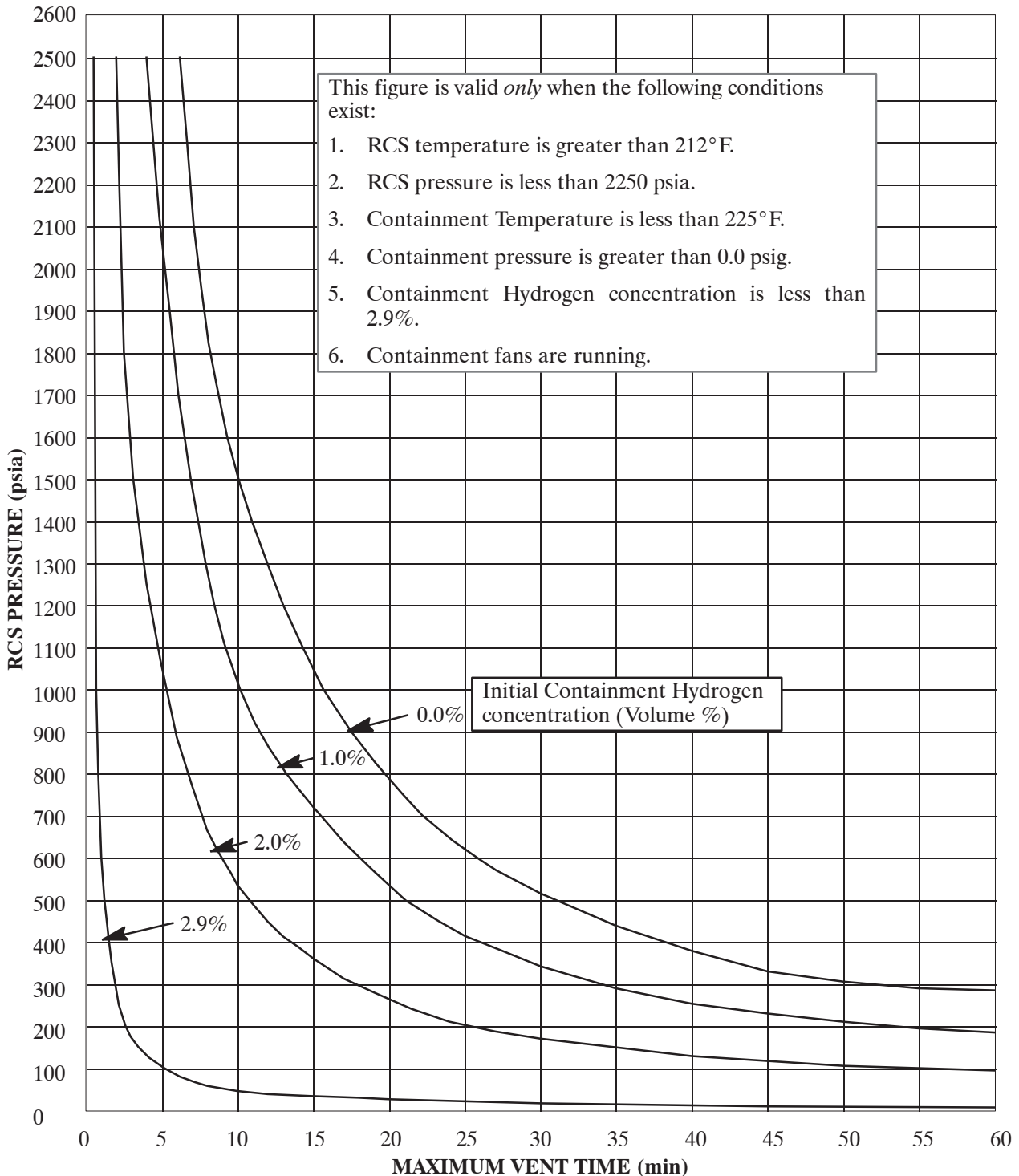
**Level of Use
Continuous**

Figure 5 – Minimum ECCS Flow Requirements for Decay Heat Removal



Attachment 24-A RCS Vent Time Based on Hydrogen Buildup

Page 1 of 1



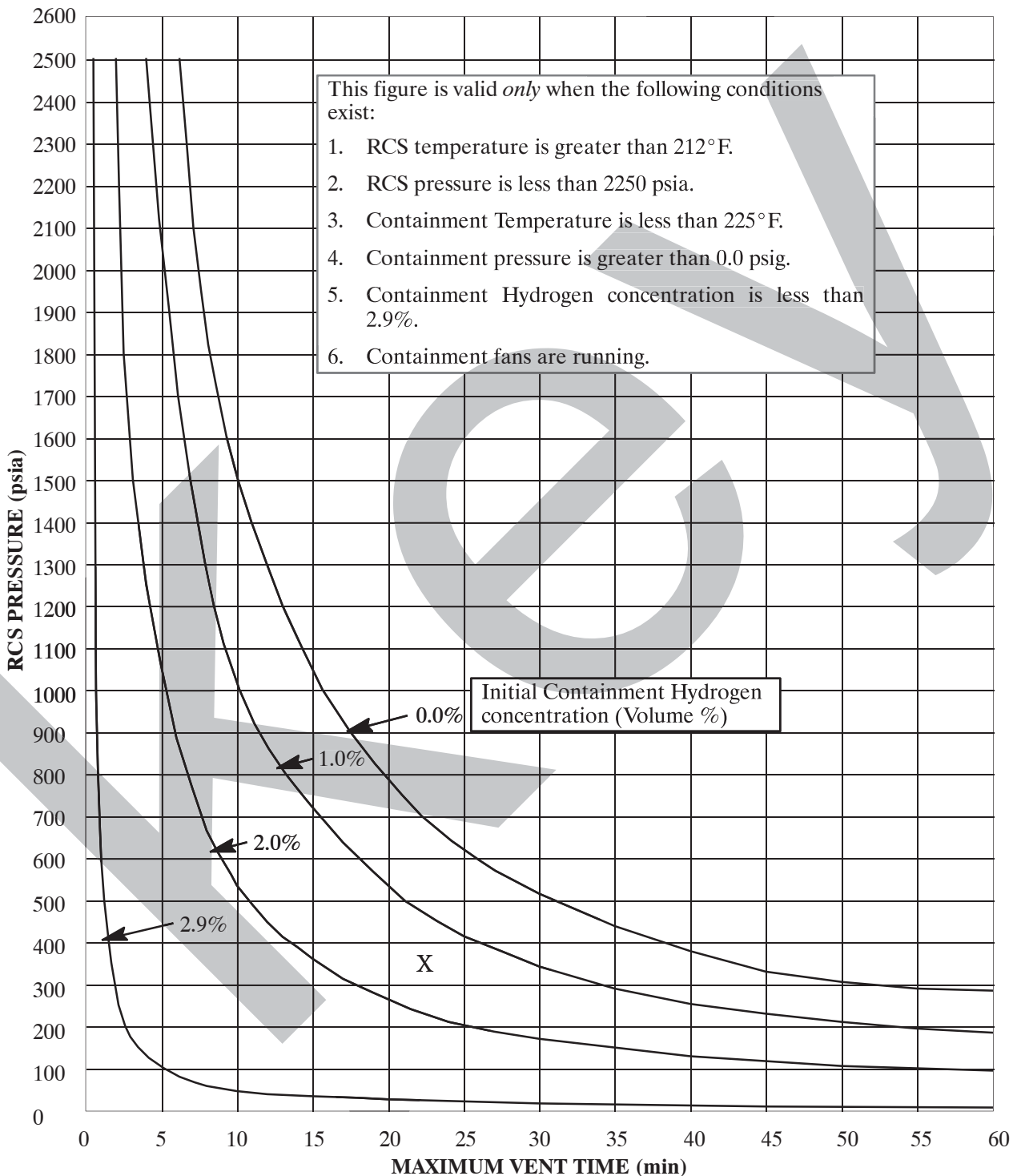
– End of Appendix 1 –

**Level of Use
Continuous**



Attachment 24-A RCS Vent Time Based on Hydrogen Buildup

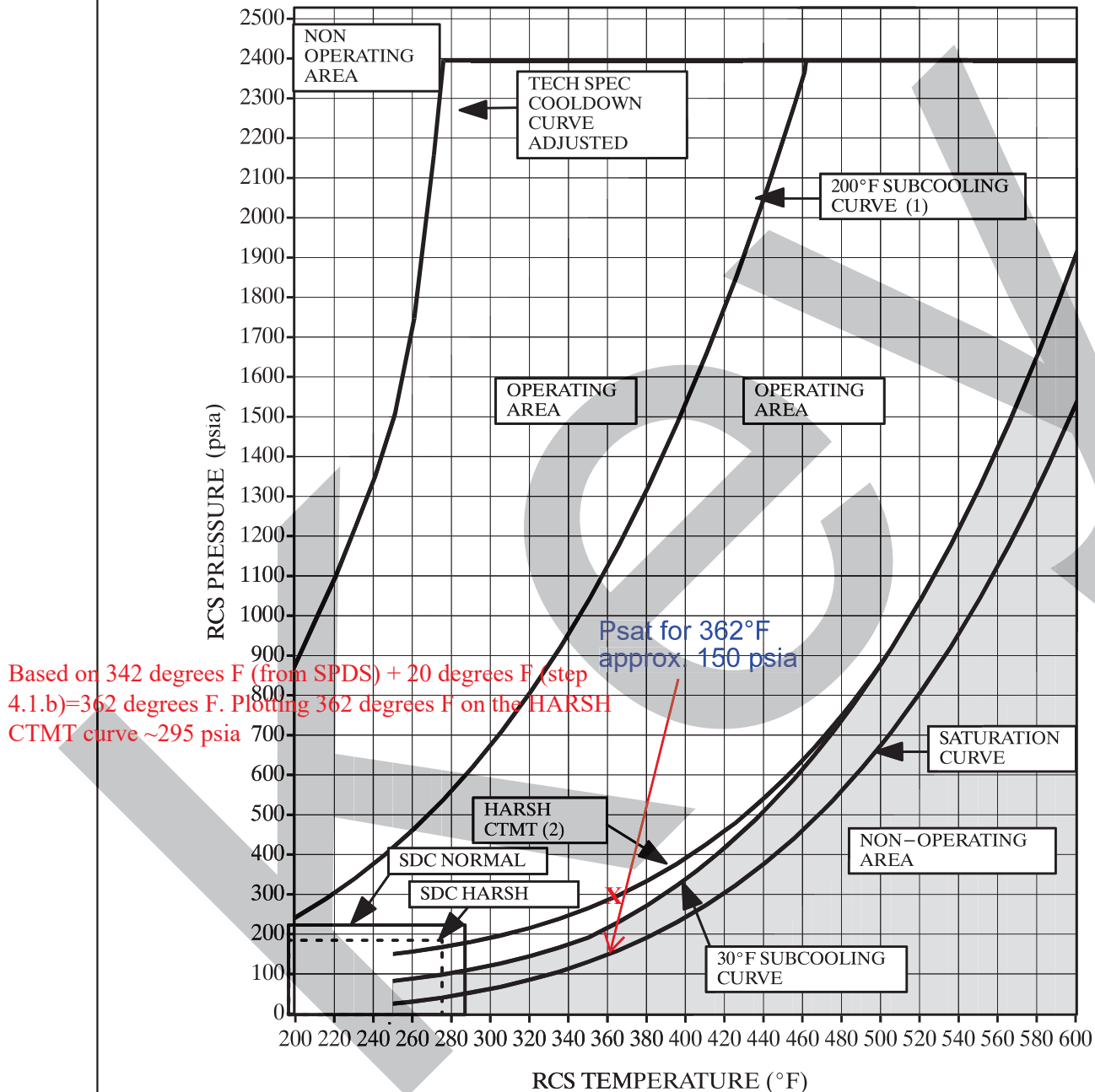
Page 1 of 1



– End of Appendix 1 –

**Level of Use
Continuous**

Figure 1 – RCS P/T Curve



- (1) This curve supercedes the Tech Spec Cooldown curve any time the RCS has experienced an uncontrolled cooldown to below 500°F.
- (2) This curve supercedes the 30°F Subcooling curve at any time harsh containment exist. Harsh Ctmt values should be used anytime CIAS has actuated on high containment pressure > 4.42 psig.

Level of Use
Continuous

Edited due to original answer not being calculated
IAW harsh containment conditions

Examinee: _____

JPM A4R

JPM Number: A4R

Revision: 5/0

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/4/24	Use JPM-140 for 2024 ILT NRC exam	5/0

JPM Number: A4R

Revision: 5/0

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: A4R

Revision: 5/0

Task Title: Determine RM-4262, S/G Blowdown Radiation Monitor, Setpoints

System: Radiation Control

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): 235888

Applicable To: SRO STA RO XX PEO

K/A Number: 2.3.12 K/A Rating: 3.2/3.7

Method of Testing: Simulated Performance: Actual Performance: X

Location: Classroom: Simulator: In-Plant:

Task Standards: The examinee will determine new alarm, alert, and fail setpoints for RM 4262, S/G Blowdown Radiation Monitor, in accordance with OP 2383C, Variable Radiation Monitor Setpoint Control.

Required Materials: OP 2383C, Variable Radiation Monitor Setpoint Control.
(procedures, equipment, Calculator
etc.)

General References: OP 2383C, Variable Radiation Monitor Setpoint Control.
EN 21235, Millstone Unit 2 Radiation Monitor High Radiation Setpoint

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

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

JPM WORKSHEET

Initial Conditions: The following sequence of events has occurred:

- The Unit is operating at 100% power with no equipment out of service.
- RM-4262 is currently reading 230 cpm.
- RM-4262 is above it's current alarm setpoint.
- HS-5099E is in the "RM-4262 OUT" position.
- Blowdown = 125 gpm per S/G
- Engineering states that according to EN 21235, Millstone Unit 2 Radiation Monitor High Radiation Setpoint, the maximum alarm setpoint is 800 cpm.

Initiating Cues: You have been directed to independently verify S/G Blowdown Radiation Monitor Transient Alarm Setpoints in accordance with OP 2383C, Variable Radiation Monitor Setpoint Control, Section 4.3.

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. OP 2383C, Variable Radiation Monitor Setpoint Control
 - a. Sections 1, 2, and 3
 - b. Section 4.3, Calculating and Adjusting S/G Blowdown Radiation Monitor Transient Alarm Setpoints
 - c. Attachment 5, Elevated S/G Blowdown Radiation Monitor, RM-4262, Setpoint Calculation

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

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

PERFORMANCE INFORMATION

JPM Number: A4R

Revision: 5/0

Task Title: Determine RM-4262, S/G Blowdown Radiation Monitor, Setpoints

START TIME: _____

STEP # 1 OP 2383C Step 4.3.1 Note	Performance: 1. The maximum allowed <i>alarm</i> setpoint for SG blowdown radiation monitor, RM-4262, is based on the following: - A base of 6 cpm which is derived from 10CFR20, Appendix B, limit of 3×10^{-8} $\mu\text{Ci/ml}$ and the response factor for SG blowdown radiation monitor, RM-4262 - SG blowdown flow rate - Dilution flow of 100,000 gpm 2. If SG blowdown radiation monitor reading is still above alarm setpoint determined in step 4.2.4.d., a higher alarm setpoint may be calculated e above conditions change, alarm setpoint must be recalculated based on actual conditions.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges note	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP # 2 OP 2383C Step 4.3.2	Performance: Refer to EN 21235, "Millstone Unit 2 Radiation Monitor High Radiation Setpoints," and DETERMINE maximum monitor setpoints.	Critical: ☐ YES ☒ NO
	Standard: Examinee looks at Initial Conditions and recognizes maximum alarm setpoint is 800 cpm. Examinee then goes to Attachment 5 to calculate higher alarm setpoint.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: A4R

Revision: 5/0

Task Title: Determine RM-4262, S/G Blowdown Radiation Monitor, Setpoints

STEP #3 O P 2 3 8 3 C	Performance: CALCULATE circulating water flow as follows RECORD on Attachment 5: Circulating Water Flow = Number of Running Circulating Water Pumps x 100,000 gpm.	Critical: ☒ YES ☐ NO
Step 4 . 3 . 2 . a	Standard: Examinee recognizes that there 4 Circulators running and total Circulating Water Flow = 400,000 gpm and records on Attachment 5	Grade: S ☐ U ☐
	Cue:	
	Comments: Refer to Attachment 5 key.	
STEP #4 O P 2 3 8 3 C	Performance: CALCULATE dilution factor as follows and RECORD on Attachment 5: $DF = \text{Circulating Water Flow} / \text{Blowdown Flow}$	Critical: ☒ YES ☐ NO
Step 4 . 3 . 2 . b	Standard: Examinee divides 400,000 gpm by 250 gpm = 1,600 (no units) and records on Attachment 5	Grade: S ☐ U ☐
	Cue:	
	Comments: Refer to Attachment 5 key.	

PERFORMANCE INFORMATION

JPM Number: A4R

Revision: 5/0

Task Title: Determine RM-4262, S/G Blowdown Radiation Monitor, Setpoints

STEP # 5 OP 2383C Step 4.3.2.c	Performance: DETERMINE “High Alarm Setpoint” limit as follows: 1) CALCULATE high limit as follows: <i>High Limit</i> = Dilution Factor times 6 cpm 2) RECORD current radiation monitor reading on Attachment 5. 3) MULTIPLY current radiation monitor reading by 5 and RECORD on Attachment 5. 4) SELECT <i>lower</i> value of step 4.3.2.c.1) and 4.3.2.c.3) and ENTER “High Alarm Setpoint” on Attachment 5. Standard: Examinee performs the following: 1) Calculates <i>High Limit</i> = 1600 * 6 cpm = 9600 cpm 2) Records current radiation monitor reading = 230 cpm. 3) Records 230 cpm * 5 = 1150 cpm. 4) Selects lower of 9600 cpm and 1150 cpm and records on Attachment 5 Cue: Comments: Refer to Attachment 5 key.	Critical: ☒ YES ☐ NO Grade: S ☐ U ☐
STEP # 6 OP 2383C Step 4.3.2.d	Performance: CALCULATE alert setpoint by multiplying alarm setpoint by 0.75 and RECORD value on Attachment 5. Standard: Examinee multiplies 1150 cpm * 0.75 = 862.5 cpm and records on Attachment 5. Cue: Comments: Refer to Attachment 5 key.	Critical: ☒ YES ☐ NO Grade: S ☐ U ☐

PERFORMANCE INFORMATION

JPM Number: A4R

Revision: 5/0

Task Title: Determine RM-4262, S/G Blowdown Radiation Monitor, Setpoints

STEP # 7 O P 2 3 8 3 C A T T 5	Performance: Fail Setpoint = Current reading / 5	Critical: ☒ YES ☐ NO
	Standard: Examinee determines Fail Setpoint to be $230 / 5 = 46$ cpm and records on Attachment 5.	Grade: S ☐ U ☐
	Cue: The JPM is complete.	
	Comments:	

TERMINATION CUE: The evaluation for this JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A4R

Revision: 5/0

Task Title: Determine RM-4262, S/G Blowdown Radiation Monitor, Setpoints

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: **A4R**

Revision: **5/0**

Initial Conditions: The following sequence of events has occurred:

- The Unit is operating at 100% power with no equipment out of service.
- RM-4262 is currently reading 230 cpm.
- RM-4262 is above it's current alarm setpoint.
- HS-5099E is in the "RM-4262 OUT" position.
- Blowdown = 125 gpm per S/G
- Engineering states that according to EN 21235, Millstone Unit 2 Radiation Monitor High Radiation Setpoint, the maximum alarm setpoint is 800 cpm.

Initiating Cues: You have been directed to independently verify S/G Blowdown Radiation Monitor Transient Alarm Setpoints in accordance with OP 2383C, Variable Radiation Monitor Setpoint Control, Section 4.3.

Time Critical JPM: ☐ YES ☒ NO

Attachment 5

Elevated SG Blowdown Radiation Monitor, RM 4262, Setpoint Calculation

(Sheet 1 of 1)

- | | | | |
|----|------------------------|--|-------------|
| 1. | Circulating Water Flow | A. Number of running
Circulating Water Pumps | _____ |
| | | B. Flow per Pump | 100,000 gpm |
| | | C. Circulating Water Flow
(A. times B.) | Total Flow |
| 2. | Dilution Factor | A. Circulating Water Flow | _____ |
| | | B. Blowdown Flow | _____ |
| | | C. Dilution Factor (DF)
(A. divided by B.) | DF |
| 3. | High Alarm Setpoint | A. Dilution Factor | _____ |
| | | B. ODCM Limit | 6 cpm |
| | | C. High Limit
(A. times B.) | cpm |
| | | D. Current Reading | _____ |
| | | | cpm |
| | | E. 5 times Current Reading | _____ |
| | | | cpm |
| | | F. High Alarm Setpoint
(The <u>lowest</u> of C or E.) | cpm |
| 4. | Alert Setpoint | A. High Alarm Setpoint | _____ |
| | | B. Conversion Factor | 0.75 |
| | | C. Alert Setpoint
(A. times B.) | cpm |
| 5. | Fail Setpoint | A. Current Reading | _____ |
| | | B. Fail Setpoint
(A. divide by 5.) | cpm |

Date

Time

Performed by Sign/Print

Date

Time

I.V. by Sign/Print

Level of Use
Continuous

STOP

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Attachment 5

Elevated SG Blowdown Radiation Monitor, RM 4262, Setpoint Calculation

(Sheet 1 of 1)

1.	Circulating Water Flow	A. Number of running Circulating Water Pumps	4
		B. Flow per Pump	100,000 gpm
		C. Circulating Water Flow (A. times B.)	400,000 gpm
			Total Flow
2.	Dilution Factor	A. Circulating Water Flow	400,000 gpm
		B. Blowdown Flow	250 gpm
		C. Dilution Factor (DF) (A. divided by B.)	1,600
			DF
3.	High Alarm Setpoint	A. Dilution Factor	1,600
		B. ODCM Limit	6 cpm
		C. High Limit (A. times B.)	9,600 cpm
		D. Current Reading	230 cpm
		E. 5 times Current Reading	1,150 cpm
		F. High Alarm Setpoint (The lowest of C or E.)	1,150 cpm
4.	Alert Setpoint		cpm
		A. High Alarm Setpoint	1,150 cpm
		B. Conversion Factor	0.75
		C. Alert Setpoint (A. times B.)	862 cpm
5.	Fail Setpoint		cpm
		A. Current Reading	230 cpm
		B. Fail Setpoint (A. divide by 5.)	46 cpm
			cpm

Date	Time	Performed by Sign/Print
Date	Time	I.V. by Sign/Print

Due to non-inclusion of EN 21235 as a reference for applicants to determine the relevance of 800 cpm, 800 cpm would also be an acceptable answer if the applicants performed calculations correctly, but due to the guidance provided in the cue, chose 800 cpm as the limiting setpoint.

Level of Use
Continuous

STOP

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Attachment 4

Normal SG Blowdown Radiation Monitor, RM 4262, Setpoint Calculation

(Sheet 1 of 1)

- | | | |
|------------------------|--|------------------|
| 1. High Alarm Setpoint | A. High Limit | 800 cpm |
| | B. Current Reading | _____ cpm |
| | C. High Limit plus Current Reading | _____ cpm |
| | D. 5 times Current Reading | _____ cpm |
| | E. High Alarm Setpoint
(The <u>lowest</u> of C or D.) | _____ cpm |
| 2. Alert Setpoint | A. High Alarm Setpoint | _____ |
| | B. Conversion Factor | _____ 0.75 |
| | C. Alert Setpoint
(A. times B.) | _____ cpm |
| 3. Fail Setpoint | A. Current Reading | _____ |
| | B. Fail Setpoint
(A. divide by 5.) | _____ cpm |

_____ Date	_____ Time	_____ Performed by Sign/Print
_____ Date	_____ Time	_____ I.V. by Sign/Print

Level of Use
Continuous



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Attachment 5

Elevated SG Blowdown Radiation Monitor, RM 4262, Setpoint Calculation

(Sheet 1 of 1)

- | | | | |
|----|------------------------|--|--------------------|
| 1. | Circulating Water Flow | A. Number of running
Circulating Water Pumps | _____ |
| | | B. Flow per Pump | <u>100,000 gpm</u> |
| | | C. Circulating Water Flow
(A. times B.) | <u>Total Flow</u> |
| 2. | Dilution Factor | A. Circulating Water Flow | _____ |
| | | B. Blowdown Flow | _____ |
| | | C. Dilution Factor (DF)
(A. divided by B.) | <u>DF</u> |
| 3. | High Alarm Setpoint | A. Dilution Factor | _____ |
| | | B. ODCM Limit | <u>6 cpm</u> |
| | | C. High Limit
(A. times B.) | <u>cpm</u> |
| | | D. Current Reading | <u>cpm</u> |
| | | E. 5 times Current Reading | <u>cpm</u> |
| | | F. High Alarm Setpoint
(The <u>lowest</u> of C or E.) | <u>cpm</u> |
| 4. | Alert Setpoint | A. High Alarm Setpoint | _____ |
| | | B. Conversion Factor | <u>0.75</u> |
| | | C. Alert Setpoint
(A. times B.) | <u>cpm</u> |
| 5. | Fail Setpoint | A. Current Reading | _____ |
| | | B. Fail Setpoint
(A. divide by 5.) | <u>cpm</u> |

Date

Time

Performed by Sign/Print

Date

Time

I.V. by Sign/Print

Level of Use
Continuous

STOP

THINK

ACT

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Examinee: _____

JPM A4S

Examinee: _____

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Verify RM-4262, S/G Blowdown Radiation Monitor, Setpoints

JPM Number: A4S Revision: 5/0

Initiated:

Douglas M Funk – Signature on File	26AUG24
Developer	Date

Reviewed:

 Technical Reviewer

 Date

Approved:

Supervisor, Nuclear Training
Date

JPM Number: A4S

Revision: 5/0

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/4/24	Use JPM-140 for 2024 ILT NRC exam	5/0

JPM WORKSHEETFacility: ☒ MP2 ☐ MP3Task/JPM Number: A4SRevision: 5/0Task Title: Verify RM-4262, S/G Blowdown Radiation Monitor, SetpointsSystem: Radiation ControlTime Critical Task: ☐ YES ☒ NOAlternate Path: ☐ YES ☒ NOValidated Time (minutes): 15Task Number(s): 235888Applicable To: SRO XX STA RO XX PEO K/A Number: 2.3.12 K/A Rating: 3.2/3.7Method of Testing: Simulated Performance: Actual Performance: XLocation: Classroom: Simulator: In-Plant:

Task Standards: A RO has determined new alarm, alert, and fail setpoints for RM 4262, S/G Blowdown Radiation Monitor, in accordance with OP 2383C, Variable Radiation Monitor Setpoint Control. The examinee will

- Verify the accuracy of the setpoints.
- State which setpoints, if any, are incorrect.
- If any setpoint is incorrect, determine the correct value.

Required Materials: OP 2383C, Variable Radiation Monitor Setpoint Control.
(procedures, equipment, Calculator
etc.)General References: OP 2383C, Variable Radiation Monitor Setpoint Control.
EN 21235, Millstone Unit 2 Radiation Monitor High Radiation Setpoint***** READ TO THE EXAMINEE *****

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

JPM WORKSHEET

Initial Conditions: The following sequence of events has occurred:

- The Unit is operating at 100% power with no equipment out of service.
- RM-4262 is currently reading 230 cpm.
- RM-4262 is above its current alarm setpoint.
- HS-5099E is in the "RM-4262 OUT" position.
- Blowdown = 125 gpm per S/G
- Engineering states that according to EN 21235, Millstone Unit 2 Radiation Monitor High Radiation Setpoint, the maximum alarm setpoint is 800 cpm.

Initiating Cues: A RO has determined new alarm, alert, and fail setpoints for RM 4262, S/G Blowdown Radiation Monitor, in accordance with OP 2383C, Variable Radiation Monitor Setpoint Control. You are to review the setpoint calculations and

- Verify the accuracy of the setpoints
- State which setpoints, if any, are incorrect
- If any setpoint is incorrect, determine the correct value
- Sign as the Independent Verifier

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. OP 2383C, Variable Radiation Monitor Setpoint Control
 - a. Sections 1, 2, and 3
 - b. Section 4.3, Calculating and Adjusting S/G Blowdown Radiation Monitor Transient Alarm Setpoints
 - c. Attachment 5, Elevated S/G Blowdown Radiation Monitor, RM-4262, Setpoint Calculation

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

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

PERFORMANCE INFORMATION

JPM Number: A4S

Revision: 5/0

Task Title: Verify RM-4262, S/G Blowdown Radiation Monitor, Setpoints

START TIME: _____

STEP #1 OP 2383C Step 4.3.1 Note	Performance: 1. The maximum allowed <i>alarm</i> setpoint for SG blowdown radiation monitor, RM-4262, is based on the following: - A base of 6 cpm which is derived from 10CFR20, Appendix B, limit of 3×10^{-8} $\mu\text{Ci/ml}$ and the response factor for SG blowdown radiation monitor, RM-4262 - SG blowdown flow rate - Dilution flow of 100,000 gpm 2. If SG blowdown radiation monitor reading is still above alarm setpoint determined in step 4.2.4.d., a higher alarm setpoint may be calculated e above conditions change, alarm setpoint must be recalculated based on actual conditions.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges note	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #2 OP 2383C Step 4.3.2	Performance: Refer to EN 21235, "Millstone Unit 2 Radiation Monitor High Radiation Setpoints," and DETERMINE maximum monitor setpoints.	Critical: ☐ YES ☒ NO
	Standard: Examinee looks at Initial Conditions and recognizes maximum alarm setpoint is 800 cpm. Examinee then goes to Attachment 5 to calculate higher alarm setpoint.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: A4S

Revision: 5/0

Task Title: Verify RM-4262, S/G Blowdown Radiation Monitor, Setpoints

STEP #3 OP 2383C Step 4.3.2.a	Performance: CALCULATE circulating water flow as follows RECORD on Attachment 5: Circulating Water Flow = Number of Running Circulating Water Pumps x 100,000 gpm.	Critical: ☒ YES ☐ NO
	Standard: Examinee verifies that there 4 Circulators running and total Circulating Water Flow = 400,000 gpm.	Grade: S ☐ U ☐
	Cue:	
	Comments: Refer to Attachment 5 key.	
STEP #4 OP 2383C Step 4.3.2.b	Performance: CALCULATE dilution factor as follows and RECORD on Attachment 5: $DF = \text{Circulating Water Flow} / \text{Blowdown Flow}$	Critical: ☒ YES ☐ NO
	Standard: Examinee verifies dividing 400,000 gpm by 250 gpm = 1,600 (no units) and records on Attachment 5	Grade: S ☐ U ☐
	Cue:	
	Comments: Refer to Attachment 5 key.	

PERFORMANCE INFORMATION

JPM Number: A4S

Revision: 5/0

Task Title: Verify RM-4262, S/G Blowdown Radiation Monitor, Setpoints

STEP #5 OP 2383C Step 4.3.2.c	Performance: DETERMINE “High Alarm Setpoint” limit as follows: 1) CALCULATE high limit as follows: <i>High Limit</i> = Dilution Factor times 6 cpm 2) RECORD current radiation monitor reading on Attachment 5. 3) MULTIPLY current radiation monitor reading by 5 and RECORD on Attachment 5. 4) SELECT <i>lower</i> value of step 4.3.2.c.1) and 4.3.2.c.3) and ENTER “High Alarm Setpoint” on Attachment 5. Standard: Examinee verifies the following: 1) Calculated <i>High Limit</i> = 1600 * 6 cpm = 9600 cpm 2) Recorded current radiation monitor reading = 230 cpm. 3) Calculation 230 cpm * 5 = 1150 cpm. 4) Verifies the lower of 9600 cpm and 1150 cpm is selected and recorded on Attachment 5 Cue: Comments: Refer to Attachment 5 key.	Critical: ☒ YES ☐ NO Grade: S ☐ U ☐
STEP #6 OP 2383C Step 4.3.2.d	Performance: CALCULATE alert setpoint by multiplying alarm setpoint by 0.75 and RECORD value on Attachment 5. Standard: Examinee verifies 1150 cpm * 0.75 = 862.5 cpm and value is recorded on Attachment 5. Cue: Comments: Refer to Attachment 5 key.	Critical: ☒ YES ☐ NO Grade: S ☐ U ☐

PERFORMANCE INFORMATION

JPM Number: A4S

Revision: 5/0

Task Title: Verify RM-4262, S/G Blowdown Radiation Monitor, Setpoints

STEP #7 O P 2383 C A T T 5	Performance: Fail Setpoint = Current reading / 5	Critical: ☒ YES ☐ NO
	Standard: Examinee verifies Fail Setpoint to be $230 / 5 = 46$ cpm and is recorded on Attachment 5.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #8 O P 2383 C A T T 5	Performance: Sign as Independent Verifier	Critical: ☐ YES ☒ NO
	Standard: Examinee signs as independent verifier.	Grade: S ☐ U ☐
	Cue: The JPM is complete.	
	Comments:	

TERMINATION CUE: **The evaluation for this JPM is complete.**

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A4S

Revision: 5/0

Task Title: Verify RM-4262, S/G Blowdown Radiation Monitor, Setpoints

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: A4S

Revision: 5/0

Initial Conditions: The following sequence of events has occurred:

- The Unit is operating at 100% power with no equipment out of service.
- RM-4262 is currently reading 230 cpm.
- RM-4262 is above its current alarm setpoint.
- HS-5099E is in the “RM-4262 OUT” position.
- Blowdown = 125 gpm per S/G
- Engineering states that according to EN 21235, Millstone Unit 2 Radiation Monitor High Radiation Setpoint, the maximum alarm setpoint is 800 cpm.

Initiating Cues: A RO has determined new alarm, alert, and fail setpoints for RM 4262, S/G Blowdown Radiation Monitor, in accordance with OP 2383C, Variable Radiation Monitor Setpoint Control. You are to review the setpoint calculations and

- Verify the accuracy of the setpoints
- State which setpoints, if any, are incorrect
- If any setpoint is incorrect, determine the correct value
- Sign as the Independent Verifier

Time Critical JPM: ☐ YES ☒ NO

Attachment 5

Elevated SG Blowdown Radiation Monitor, RM 4262, Setpoint Calculation

(Sheet 1 of 1)

1. Circulating Water Flow	A. Number of running Circulating Water Pumps	_____
	B. Flow per Pump	100,000 gpm
	C. Circulating Water Flow (A. times B.)	Total Flow
2. Dilution Factor	A. Circulating Water Flow	_____
	B. Blowdown Flow	_____
	C. Dilution Factor (DF) (A. divided by B.)	DF
3. High Alarm Setpoint	A. Dilution Factor	_____
	B. ODCM Limit	6 cpm
	C. High Limit (A. times B.)	cpm
	D. Current Reading	cpm
	E. 5 times Current Reading	cpm
	F. High Alarm Setpoint (The <u>lowest</u> of C or E.)	cpm
4. Alert Setpoint	A. High Alarm Setpoint	_____
	B. Conversion Factor	0.75
	C. Alert Setpoint (A. times B.)	cpm
5. Fail Setpoint	A. Current Reading	_____
	B. Fail Setpoint (A. divide by 5.)	cpm

_____	_____	_____
Date	Time	Performed by Sign/Print
_____	_____	_____
Date	Time	I.V. by Sign/Print

Level of Use
Continuous



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Attachment 5

Elevated SG Blowdown Radiation Monitor, RM 4262, Setpoint Calculation

(Sheet 1 of 1)

1.	Circulating Water Flow	A. Number of running Circulating Water Pumps	<u>4</u>
		B. Flow per Pump	<u>100,000 gpm</u>
		C. Circulating Water Flow (A. times B.)	<u>400,000 gpm</u> Total Flow
2.	Dilution Factor	A. Circulating Water Flow	<u>400,000 gpm</u>
		B. Blowdown Flow	<u>250 gpm</u>
		C. Dilution Factor (DF) (A. divided by B.)	<u>1,600</u> DF
3.	High Alarm Setpoint	A. Dilution Factor	<u>1,600</u>
		B. ODCM Limit	<u>6 cpm</u>
		C. High Limit (A. times B.)	<u>9,600 cpm</u> cpm
		D. Current Reading	<u>230 cpm</u> cpm
		E. 5 times Current Reading	<u>1,150 cpm</u> cpm
		F. High Alarm Setpoint (The <u>lowest</u> of C or E.)	<u>1,150 cpm</u> cpm
4.	Alert Setpoint	A. High Alarm Setpoint	<u>1,150 cpm</u>
		B. Conversion Factor	<u>0.75</u>
		C. Alert Setpoint (A. times B.)	<u>862 cpm</u> cpm
5.	Fail Setpoint	A. Current Reading	<u>230 cpm</u>
		B. Fail Setpoint (A. divide by 5.)	<u>46 cpm</u> cpm

Today

Date

Now

Time

JS Ragmann / J. S. Ragmann

Performed by Sign/Print

Date

Time

I.V. by Sign/Print

Level of Use
Continuous

STOP

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Attachment 5

Elevated SG Blowdown Radiation Monitor, RM 4262, Setpoint Calculation

(Sheet 1 of 1)

1.	Circulating Water Flow	A. Number of running Circulating Water Pumps	4
		B. Flow per Pump	100,000 gpm
		C. Circulating Water Flow (A. times B.)	400,000 gpm
			Total Flow
2.	Dilution Factor	A. Circulating Water Flow	400,000 gpm
		B. Blowdown Flow	250 gpm
		C. Dilution Factor (DF) (A. divided by B.)	1,600
			DF
3.	High Alarm Setpoint	A. Dilution Factor	1,600
		B. ODCM Limit	6 cpm
		C. High Limit (A. times B.)	9,600 cpm
		D. Current Reading	230 cpm
		E. 5 times Current Reading	1,150 cpm
		F. High Alarm Setpoint (The lowest of C or E.)	1,150 cpm
4.	Alert Setpoint		cpm
		A. High Alarm Setpoint	1,150 cpm
		B. Conversion Factor	0.75
		C. Alert Setpoint (A. times B.)	862 cpm
5.	Fail Setpoint		cpm
		A. Current Reading	230 cpm
		B. Fail Setpoint (A. divide by 5.)	46 cpm
			cpm

Date	Time	Performed by Sign/Print
Date	Time	I.V. by Sign/Print

Due to non-inclusion of EN 21235 as a reference for applicants to determine the relevance of 800 cpm, 800 cpm would also be an acceptable answer if the applicants performed calculations correctly, but due to the guidance provided in the cue, chose 800 cpm as the limiting setpoint.

Level of Use
Continuous

STOP

THINK

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Examinee: _____

JPM A5

JPM Number: A5

Revision: 0/0

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/4/2024	JPM-347 selected for 2024 ILT NRC exam	0/0

JPM Number: A5

Revision: 0/0

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: A5

Revision: 0/0

Task Title: Notification and Reportability Associated with a Contaminated Injured Individual

System: Emergency Procedures/Plan

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): 236338

Applicable To: SRO XX STA RO PEO

K/A Number: 2.4.30 K/A Rating: 4.1

Method of Testing: Simulated Performance: Actual Performance: X

Location: Classroom: X Simulator: In-Plant:

Task Standards: The Examinee properly determines the reporting requirements (NRC, State) for a contaminated injured individual in accordance with RAC 14, Non-Emergency Station Events.

Required Materials: RAC 14, Non-Emergency Station Events
(procedures, equipment, etc.)

General References: RAC 14, Non-Emergency Station Events

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

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

JPM WORKSHEET

Initial

Conditions:

- Plant is at 100% power
- You are an extra Senior Licensed Operator on shift.
- Ten minutes ago, a mechanic was injured while working in the Auxiliary Building.
- First Aid has been administered to the worker, their condition is stable.
- The worker requires off-site treatment at a medical facility.
- The worker is contaminated.
- An ambulance is en route.
- The work area has been placed in a safe condition.
- The STA will make any required radiopager notifications.

Initiating Cues: The Shift Manager has directed you to perform the following actions IAW RAC 14, Non-Emergency Station Events:

1. Determine the notification requirements associated with this event, and...
2. Make any required notifications to the NRC.

Time Critical JPM:

☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. RAC 14 Non-Emergency Station Events

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

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

PERFORMANCE INFORMATION

JPM Number: A5

Revision: 0/0

Task Title: Notification and Reportability Associated with a Contaminated Injured Individual

START TIME: _____

STEP #1 RAC 14 step 3.1 Note	Performance: NOTE: Attachment 1 through Attachment 6 are tools to provide conservative, prompt reportability assessments of events or conditions. Extensive guidance and examples exist in many documents beyond what is contained in Attachment 1 through Attachment 6. If time permits (generally for 4, 8, and 24-hour notifications), contacting Licensing should be considered for additional guidance and insights for determining event or condition reportability. NOTE: Attachment 1 through Attachment 7 are used to determine prompt (typically 1 to 24 hour) reporting requirements only. There may be other reporting requirements (e.g., 30 days, 60 days) that also apply. Licensing should be consulted to ensure all reporting requirements are met.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges notes	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #2 RAC 14 step 3.1.1.a	Performance: IF sufficient cause exists for reporting a non-emergency event, THEN PERFORM the following: a. ANALYZE available information and DEVELOP a general understanding of event in progress.	Critical: ☐ YES ☒ NO
	Standard: The examinee refers back to the initial conditions to gain a general understanding of the event.	Grade: S ☐ U ☐
	Cue: If more information is requested, inform examinee there is no further information available at this time	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: A5

Revision: 0/0

Task Title: Notification and Reportability Associated with a Contaminated Injured Individual

STEP #3 R A C 14 step 3.1.1.b	Performance: ASSIGN staff to collect and track information.	Critical: ☐ YES ☒ NO
	Standard: Examinee requests additional personnel to collect and track information.	Grade: S ☐ U ☐
	Cue: Inform examinee that extra personnel have been requested	
	Comments:	
STEP #4 R A C 14 step 3.1.1.c	Performance: ENSURE the non-affected unit Emergency Communicator has been contacted and NO other call-outs are in progress.	Critical: ☐ YES ☒ NO
	Standard: Examinee contacts the Unit 3 Emergency Communicator and queries about any other call-outs.	Grade: S ☐ U ☐
	Cue: Report as Unit 3 EC "No other call-outs are in progress".	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: A5

Revision: 0/0

Task Title: Notification and Reportability Associated with a Contaminated Injured Individual

STEP #5 RAC 14 step 3.1.1.d	Performance: IF necessary, THEN PERFORM the following: 1. REQUEST assistance from any of the following, as applicable, to determine reportability and respond to event: • Unit Chemistry Supervision • Environmental Compliance Coordinator (ECC) • On-Shift Chemistry Technician • On-Shift Health Physics Technician • Security Shift Supervisor (SSS) • Licensing • Dominion Energy Environmental Services (DEES) 2. IF applicable, THEN DOCUMENT resulting basis for reportability and Licensing contact who provided input in eSOMS,	Critical: ☐ YES ☒ NO
	Standard: 1. Examinee may request assistance from one or more of the listed. 2. Examinee states need to document information in eSOMS	Grade: S ☐ U ☐
	Cue: 1. If requested, acknowledge the request for assistance. 2. If requested, report that an operator is assigned to log information in eSOMS	
	Comments:	

STEP #6 RAC 14 step 3.1.1.e	Performance: As required, REQUEST Station Duty Officer (typically the non-affected unit STA) and Emergency Communicator (EC) (typically the non-affected unit WC SRO) to report to the Control Room and prepare to send a Non-Emergency Event Report.	Critical: ☐ YES ☒ NO
	Standard: Examinee calls Unit 3 and requests the Station Duty Officer and Emergency Communicator to report to the Unit 2 Control Room.	Grade: S ☐ U ☐
	Cue: Report as Unit 3 that the SDO and EC are enroute to the Unit 2 Control Room	
	Comments: Steps 3.1.1f through j, pertain to event types NOT related to the event in progress. The examinee should recognize these steps do not apply and move to step 3.1.1k.	

PERFORMANCE INFORMATION

JPM Number: A5

Revision: 0/0

Task Title: Notification and Reportability Associated with a Contaminated Injured Individual

STEP # 7 R A C 14 step 3 . 1 . 1 . k	Performance: For all events, REFER to appropriate Attachment 1 through Attachment 7 and Attachment 20 and DETERMINE State and NRC reporting requirements.	Critical: ☐ YES ☒ NO
	Standard: Examinee refers to Attachments 1 through 7 and 20 and determines Attachment 2, Radiological Events, is the correct attachment for this event.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP # 8 R A C 14 Att 2	Performance: Attachment 2, Radiological Events, Event Description: An event requiring the transport of a radioactively contaminated person to an offsite medical facility for treatment. NRC Reporting Requirement (Attachment 7, Note 9) - Within 8 hours via ENS 10CFR50.72(b)(3) State Reporting Requirement (DEEP Division of Radiation) - Within 1 hour of report to NRC State Reg. 22a-135	Critical: ☒ YES ☐ NO ☒ YES ☐ NO
	Standard: Examinee states the NRC reportability requirement is 8 hours and the State is required to be informed within 1 hour of the NRC report.	Grade: S ☐ U ☐
	Cue:	
	Comments: 1. If the examinee reports only the Reportability requirements without continuing on to performing the notifications, prompt them to continue on with the RAC 14 procedure. 2. If the examinee reports there are NO Reportability requirements, inform them the JPM is complete.	

PERFORMANCE INFORMATION

JPM Number: A5

Revision: 0/0

Task Title: Notification and Reportability Associated with a Contaminated Injured Individual

STEP # 9 RAC 14 Att 2 & 7	Performance: The examinee refers to Attachment 7 NOTEs 1, 2, 3 as laid out in Attachment 2 row for contaminated, injured individual. 1. Refer to Attachment 15 for additional notifications. 2. In the event of an incident involving a fatality or serious injury, off-site release or contamination, and for planned exercise, a telephone notification within 1 hour to American Nuclear Insurers (877-680-2644) is warranted. In the event of significant damage such that caused by fire, explosion, lightening or loss of electrical power, a telephone report of circumstances to NEIL (302-888-3000) within 1 hour is warranted. 3. Follow-up notification. Telephone notifications made for non-emergency 1, 4, 8, and 24-hour events will require follow-up notifications in addition to the initial notification during the course of the event as follows: 1. Immediately Report: a. Any further degradation in the level of safety of the plant or other worsening plant conditions, including those that require the declaration of any of the Emergency Classes, if such a declaration has not been previously made, or b. Any change from one Emergency Class to another, or c. A termination of the Emergency Class. 2. Immediately Report: a. The results of ensuing evaluations or assessments of plant conditions, b. The effectiveness of response or protective measures taken, and c. Information related to plant behavior that is not understood. 3. Maintain an open, <i>continuous</i> communication channel with the NRC Operations Center upon request by the NRC.	Critical: ☐ YES ☒ NO
	Standard: The examinee reads and acknowledges the notes.	Grade: S ☐ U ☐
	Cue: The SM is making the Attachment 15 notifications.	
	Comments:	
STEP # 10 RAC 14 step 3.1.1.1	Performance: IF required, THEN PERFORM Section 3.8, NRC Notification	Critical: ☐ YES ☒ NO
	Standard: Examinee goes to Section 3.8	Grade: S ☐ U ☐
	Cue:	
	Comments: 1. If the examinee reports only the Reportability requirements without continuing on to performing the notifications, prompt them to continue on with the RAC 14 procedure. 2. If the examinee reports there are NO Reportability requirements, inform them the JPM is complete.	

PERFORMANCE INFORMATION

JPM Number: A5

Revision: 0/0

Task Title: Notification and Reportability Associated with a Contaminated Injured Individual

STEP # 11 R A C 14 step 3.8.1	Performance: RECORD applicable information for event on Attachment 13	Critical: ☒ YES ☐ NO
	Standard: Examinee records applicable information on Attachment 13, NRC Event Notification Form.	Grade: S ☐ U ☐
	Cue: When Form is completed, the JPM is complete.	
	Comments: Refer to key Critical items include: • Notification time • Facility • Unit • Name of caller • Event time • Event date • Power and MODE before • Power and MODE after • 8 hour notification column Examiner discretion may be used on other sections, such as DESCRIPTION, ACTIONS TAKEN OR PLANNED	

TERMINATION CUE: **The evaluation for this JPM is complete.**

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: A5

Revision: 0/0

Task Title: Notification and Reportability Associated with a Contaminated Injured Individual

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):		Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: A5

Revision: 0/0

- Initial Conditions:
- Plant is at 100% power
 - You are an extra Senior Licensed Operator on shift.
 - Ten minutes ago, a mechanic was injured while working in the Auxiliary Building.
 - First Aid has been administered to the worker, their condition is stable.
 - The worker requires off-site treatment at a medical facility.
 - The worker is contaminated.
 - An ambulance is en route.
 - The work area has been placed in a safe condition.
 - The STA will make any required radiopager notifications.

- Initiating Cues: The Shift Manager has directed you to perform the following actions IAW RAC 14, Non-Emergency Station Events:
1. Determine the notification requirements associated with this event, and...
 2. Make any required notifications to the NRC.

Time Critical JPM: ☐ YES ☒ NO



*Report of Petroleum or Chemical Product
Discharge, Spillage, Seepage, Filtration or
Sewage Discharge to Environment*

RAC 14 - Attachment 9

Page 1 of 1

Facility Latitude: 41°20'9"N Facility Longitude: 72°8'50"W Millstone Power Station 314 Rope Ferry Road, Waterford, Conn. 06385				
Unit	Company Name	Spill Occurred or Discovered	Date	Time
Report Prepared By		Department		Phone
Supervisor in Charge		Employee Reporting Spill		
1. Spill Location Unit: _____ On-site Location: _____ Town: _____ Street: _____		2. Equipment Number/Size Each Unit ☐ Container(s): _____ ☐ Vehicles(s): _____ ☐ Tank: _____ ☐ Other: _____		3. Spill Quantity and Material Gallons: _____ ☐ Oil (Type): _____ ☐ Chemical (Name): _____ ☐ Other (Name): _____
4. Material Has Spilled Onto ☐ Pavement: _____ ☐ Trees: _____ ☐ Persons: _____ ☐ Earth: _____ ☐ Shrubs/Brush: _____ ☐ Structures: _____ ☐ Lawn: _____ ☐ Concrete: _____ ☐ Vehicles: _____ ☐ Other: _____			5. Material Has Spilled Into ☐ Catch Basin or Storm Drain: _____ ☐ Body of Water (Name): _____ ☐ Other: _____	
6. Has Spill Been Contained? ☐ YES ☐ NO				
7. Apparent Spill Cause ☐ Vehicle Accident ☐ Vandalism ☐ Storm Event ☐ Corrosion ☐ Equip. Failure ☐ Human Error ☐ Other: _____		8. Spill Event ☐ Tank or Piping Rupture ☐ Gasket/Fitting Leak ☐ Above Ground ☐ Overfill ☐ Below Ground ☐ Fire ☐ Burn or Corrosion Hole ☐ Other: _____		9. Weather ☐ Fair ☐ Rain ☐ Snow/Sleet ☐ High Wind
Any person injured? ☐ YES ☐ NO If YES, describe:		Property damage? ☐ YES ☐ NO If YES, describe:		
Evacuation (Other than immediate area)? ☐ YES ☐ NO		Actions taken to stop/mitigate spill:		
If Federal RQ, Information obtained from Chemistry Department and Attachment 12, "Reportable Quantity (RQ) of Hazardous Substances." Reportable Quantity (RQ) Released: ☐ YES ☐ NO If YES, fill out RAC 14, Attachment 13, and attach to this form.				
Description of Spill Event:				
Log all calls to regulatory agencies not covered under electronic notification.				
Agency Notified	Contact Name	Telephone Number (REF08B)	Date	Time

Copy of form submitted to DEES ☐



NRC Event Notification Form

RAC 14 - Attachment 13

Page 1 of 2

NRC EVENT NUMBER: _____

NRC CONTACT (NAME) _____

NOTIFICATION TIME	FACILITY OR ORGANIZATION	UNIT	NAME OF CALLER	TELEPHONE NUMBER
-------------------	--------------------------	------	----------------	------------------

EVENT TIME (EST OR EDT) (CLASSIFICATION TIME)	EVENT DATE or ENF#	POWER (%) and MODE BEFORE	POWER (%) and MODE AFTER
---	--------------------	---------------------------	--------------------------

EVENT CLASSIFICATION	1-Hr Non-Emergency 10 CFR 50.72 (b)(1)	4-Hr Non-Emergency 10 CFR 50.72 (b)(2)	8-Hr Non-Emergency 10 CFR 50.72 (b)(3)
☐ GENERAL EMERGENCY			
☐ SITE AREA EMERGENCY	☐ TS Deviation		☐ (ii)(A) Degraded Condition
☐ ALERT		☐ (i) TS Required Shutdown	☐ (ii)(B) Unanalyzed Condition that Degrades Safety
☐ UNUSUAL EVENT	60-Day Optional 10 CFR 50.73(a)(1)	☐ (iv)(A) ECCS Discharge to RCS	☐ (iv)(A) Specified System Actuation
	☐ Invalid Specified System Actuation	☐ (iv)(B) RPS Actuation (Scram)	☐ (v)(A) Safe Shutdown Capability
☐ 50.72 NON-EMERGENCY		☐ (xi) Offsite Notification	☐ (v)(B) RHR Capability
☐ PHYSICAL SECURITY (73.71)			☐ (v)(C) Control of Rad Release
☐ MATERIAL/EXPOSURE			☐ (v)(D) Accident Mitigation
☐ FITNESS FOR DUTY			☐ (xii) Offsite Medical
☐ OTHER UNSPECIFIED REQUIREMENT (IDENTIFY)			☐ (xiii) Lost ENS
☐ INFORMATION ONLY			☐ (xiii) Lost Other Assessment/ Offsite Comms
			☐ (xiii) Emergency Siren INOP

OTHER UNSPECIFIED REQUIREMENT (IDENTIFY):

DESCRIPTION (Fill in as available)
1. SYSTEM(S) AFFECTED:
2. ACTUATIONS & THEIR INITIATION SIGNALS:
3. CAUSES (IF KNOWN):
4. EFFECT OF EVENT ON PLANT:
5. ACTIONS TAKEN OR PLANNED:
6. ADDITIONAL INFORMATION:

NRC Event Notification Form

RAC 14 - Attachment 13

Page 2 of 2

NOTIFICATIONS	YES ☐	NO ☐	WILL BE	ANYTHING UNUSUAL OR NOT UNDERSTOOD?	YES ☐ (EXPLAIN SHEET 1)	NO ☐
NRC RESIDENT	☐	☐	☐	DID ALL SYSTEMS FUNCTION AS REQUIRED?	YES ☐	NO ☐ (EXPLAIN SHEET 1)
STATE	☐	☐	☐	MODE OF OPERATION UNTIL CORRECTED:		
LOCAL	☐	☐	☐	ESTIMATED RESTART DATE:		
OTHER GOV AGENCIES	☐	☐	☐	ADDITIONAL INFO ON BACK: YES ☐ NO ☐		
MEDIA/PRESS RELEASE	☐	☐	☐			
RADIOLOGICAL RELEASES (CHECK OR FILL IN APPLICABLE ITEMS)						
☐ LIQUID RELEASE	☐ GASEOUS RELEASE	☐ UNPLANNED RELEASE	☐ PLANNED RELEASE	☐ ONGOING	☐ TERMINATED	
☐ MONITORED	☐ UNMONITORED	☐ OFFSITE RELEASE	☐ T. S. EXCEEDED	☐ RM ALARMS	☐ AREAS EVACUATED	
☐ PERSONNEL EXPOSED OR CONTAMINATED		☐ OFFSITE PROTECTIVE ACTIONS RECOMMENDED		State release path in description		
		Release Rate (Ci/sec)	%T.S. LIMIT	HOO GUIDE	Total Activity (Ci)	% T.S. LIMIT
Noble Gas				0.1 Ci/sec		1000 Ci
Iodine				10 µCi/sec		0.01Ci
Particulate				1 µCi/sec		1 mCi
Liquid (excluding tritium & dissolved noble gases)				10 µCi/min		0.1 Ci
Liquid (tritium)				0.2 Ci/min		5 Ci
Total Activity						
	PLANT STACK	CONDENSER/AIR EJECTOR	MAIN STEAM LINE	SG BLOWDOWN	OTHER	
RAD MONITOR READINGS						
ALARM SETPOINTS						
% T.S. LIMIT (if applicable)						
RCS OR SG TUBE LEAKS (CHECK OR FILL IN APPLICABLE ITEMS)						
LOCATION OF THE LEAK (e.g., SG#, valve, pipe, etc):						
LEAK RATE:		UNITS gpm/gpd	T. S. LIMITS:		SUDDEN OR LONG-TERM DEVELOPMENT	
LEAK START DATE: TIME:			COOLANT ACTIVITY & UNITS: PRIMARY - SECONDARY -			
LIST OF SAFETY RELATED EQUIPMENT NOT OPERATIONAL:						
SM/DSEO Signature : _____ Time:_____						

NRC EVENT NUMBER: _____

NRC CONTACT (NAME) _____

NOTIFICATION TIME Now	FACILITY OR ORGANIZATION Millstone	UNIT 2	NAME OF CALLER Examinee	TELEPHONE NUMBER (860) 447-1791 x4360
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EVENT TIME (EST OR EDT) (CLASSIFICATION TIME) Now	EVENT DATE or ENF# Today	POWER (%) and MODE BEFORE 100	POWER (%) and MODE AFTER 100
---	------------------------------------	---	--

EVENT CLASSIFICATION	1-Hr Non-Emergency 10 CFR 50.72 (b)(1)	4-Hr Non-Emergency 10 CFR 50.72 (b)(2)	8-Hr Non-Emergency 10 CFR 50.72 (b)(3)
☐ GENERAL EMERGENCY			
☐ SITE AREA EMERGENCY	☐ TS Deviation		☐ (ii)(A) Degraded Condition
☐ ALERT		☐ (i) TS Required Shutdown	☐ (ii)(B) Unanalyzed Condition that Degrades Safety
☐ UNUSUAL EVENT	60-Day Optional 10 CFR 50.73(a)(1)	☐ (iv)(A) ECCS Discharge to RCS	☐ (iv)(A) Specified System Actuation
	☐ Invalid Specified System Actuation	☐ (iv)(B) RPS Actuation (Scram)	☐ (v)(A) Safe Shutdown Capability
☐ 50.72 NON-EMERGENCY		☐ (xi) Offsite Notification	☐ (v)(B) RHR Capability
☐ PHYSICAL SECURITY (73.71)			☐ (v)(C) Control of Rad Release
☐ MATERIAL/EXPOSURE			☐ (v)(D) Accident Mitigation
☐ FITNESS FOR DUTY			☒ (xii) Offsite Medical
☐ OTHER UNSPECIFIED REQUIREMENT (IDENTIFY)			☐ (xiii) Lost ENS
☐ INFORMATION ONLY			☐ (xiii) Lost Other Assessment/ Offsite Comms
			☐ (xiii) Emergency Siren INOP

OTHER UNSPECIFIED REQUIREMENT (IDENTIFY):

DESCRIPTION (Fill in as available)	* Acceptable verbiage left to the discretion of examiner
1. SYSTEM(S) AFFECTED:	None
2. ACTUATIONS & THEIR INITIATION SIGNALS:	None
3. CAUSES (IF KNOWN):	Unknown
4. EFFECT OF EVENT ON PLANT:	None
5. ACTIONS TAKEN OR PLANNED:	Transport contaminated, injured person to off-site medical facility. *
6. ADDITIONAL INFORMATION:	None

NRC Event Notification Form

RAC 14 - Attachment 13

Page 2 of 2

NOTIFICATIONS	YES	NO	WILL BE	ANYTHING UNUSUAL OR NOT UNDERSTOOD?	YES ☐ (EXPLAIN SHEET 1)	NO ☒
NRC RESIDENT *	☒	☐	☒	DID ALL SYSTEMS FUNCTION AS REQUIRED?	YES ☒	NO ☐ (EXPLAIN SHEET 1)
STATE	☐	☐	☒	MODE OF OPERATION UNTIL CORRECTED:		
LOCAL	☐	☐	☐	ESTIMATED RESTART DATE:		
OTHER GOV AGENCIES	☐	☐	☐	ADDITIONAL INFO ON BACK: YES ☐ NO ☐		
MEDIA/PRESS RELEASE	☐	☐	☐	* Up to discretion of examiner, can assume resident is, or will be, notified.		

RADIOLOGICAL RELEASES (CHECK OR FILL IN APPLICABLE ITEMS)							
☐ LIQUID RELEASE	☐ GASEOUS RELEASE	☐ UNPLANNED RELEASE	☐ PLANNED RELEASE	☐ ONGOING	☐ TERMINATED		
☐ MONITORED	☐ UNMONITORED	☐ OFFSITE RELEASE	☐ T. S. EXCEEDED	☐ RM ALARMS	☐ AREAS EVACUATED		
☐ PERSONNEL EXPOSED OR CONTAMINATED		☐ OFFSITE PROTECTIVE ACTIONS RECOMMENDED		State release path in description			

	Release Rate (Ci/sec)	%T.S. LIMIT	HOO GUIDE	Total Activity (Ci)	% T.S. LIMIT	HOO GUIDE
Noble Gas			0.1 Ci/sec			1000 Ci
Iodine			10 µCi/sec			0.01Ci
Particulate			1 µCi/sec			1 mCi
Liquid (excluding tritium & dissolved noble gases)			10 µCi/min			0.1 Ci
Liquid (tritium)			0.2 Ci/min			5 Ci
Total Activity						

	PLANT STACK	CONDENSER/AIR EJECTOR	MAIN STEAM LINE	SG BLOWDOWN	OTHER
RAD MONITOR READINGS					
ALARM SETPOINTS					
% T. S. LIMIT (if applicable)					

RCS OR SG TUBE LEAKS (CHECK OR FILL IN APPLICABLE ITEMS)			
LOCATION OF THE LEAK (e.g., SG#, valve, pipe, etc):			
LEAK RATE:	UNITS gpm/gpd	T. S. LIMITS:	SUDDEN OR LONG-TERM DEVELOPMENT
LEAK START DATE: TIME:	COOLANT ACTIVITY & UNITS: PRIMARY - SECONDARY -		
LIST OF SAFETY RELATED EQUIPMENT NOT OPERATIONAL:			
SM/DSEO Signature : _____ Time:_____			

Examinee: _____

JPM P1 (A11)

JPM Number: P1

Revision: 1/0

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: P1

Revision: 1/0

Task Title: Filling the Hotwell With Condensate Transfer Pump

System: Condensate

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☐ YES ☒ NO

Validated Time (minutes): 15

Task Number(s): 234251

Applicable To: SRO XX STA RO XX PEO XX

K/A Number: 054AK1.05 K/A Rating: 3.6

Method of Testing: Simulated Performance: X Actual Performance:

Location: Classroom: Simulator: In-Plant: X

Task Standards: The task is satisfactorily met when the Condensate Make-Up and Transfer system is aligned from the CST to the Condenser Hotwell and the Condensate Transfer Pump is started in accordance with EOP 2541, Appendix 10, Filling Hotwell with Condensate Transfer Pump.

Required Materials: EOP 2541, Appendix 10, Filling Hotwell with Condensate Transfer Pump
(procedures, equipment, etc.) Component Locator maps to be given to student upon request

General References: N/A

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

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

JPM WORKSHEET

- Initial Conditions:
- A loss of all feedwater (LOAF) event has occurred.
 - That plant was tripped and EOP 2525 completed.
 - The crew has transitioned to EOP 2537.
 - Condensate is feeding the S/Gs.
 - Condenser vacuum has been broken.
 - A plant cooldown is in progress.
 - RCS T_{Average} = 285°F and lowering.
 - Hotwell level is 25% and lowering.
 - Breaker B2102, Condensate Transfer Pump, P71, has been verified 'ON'

Time Critical JPM: ☐ YES ☒ NO

Initiating Cues: The Unit Supervisor has directed you to fill the hotwell with the condensate transfer pump per EOP 2541, Appendix 10.

Handouts (handout after cues are read and understood)

1. EOP 2541, Appendix 10, Filling Hotwell with Condensate Transfer Pump
2. Component locator maps for the affected valves, to be provided upon request (provide only the map for the valve requested).

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

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

PERFORMANCE INFORMATION

JPM Number: P1

Revision: 1/0

Task Title: Filling Hotwell With Condensate Transfer Pump

START TIME: _____

STEP #1 E O P 2 5 4 1 A p p l 0 s t e p 1	Performance: ENSURE breaker B2102, “CONDENSATE TRANSFER PUMP, P71”, is “ON” (31’6” Turbine Building).	Critical: ☒ YES ☐ NO
	Standard: Examinee notes breaker B2102 was verified ‘ON’ in Initial Conditions.	Grade: S ☐ U ☐
	Cue: If examinee starts going to MCC B21, inform them breaker B2102 is ‘ON’.	
	Comments:	
STEP #2 E O P 2 5 4 1 A p p l 0	Performance: NOTE Except as specifically noted in some steps, all the actions of this Standard Appendix are performed in the Northeast corner on the 14’6” elevation of the Turbine Building.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges the note.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #3 E O P 2 5 4 1 A p p l 0 s t e p 2	Performance: ENSURE BOTH of the following valves are closed: 2-CN-226, “CONDENSATE SURGE TANK SUPPLY” 2-CN-546, “CONDENSATE STORAGE TANK TO CHEMICAL ADDITION” (Chemical Add station)	Critical: ☒ YES ☐ NO
	Standard: Examinee simulates checking valves closed (turning valves CW to hard stop)	Grade: S ☐ U ☐
	Cue: If student voices desire to consult the valve locator, query student on which component they are looking for. - If student is looking for CN-226, give the student Map 1. - If student is looking for CN-546, give the student Map 2. Inform the examinee “Valves are closed” after examinee properly simulates operating the valve(s).	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: P1

Revision: 1/0

Task Title: Filling Hotwell With Condensate Transfer Pump

STEP #4 E O P 2 5 4 1 A p p 1 0	Performance: NOTE The Condensate Transfer Pump suction piping is not seismically qualified. If the Condensate Transfer Pump is placed in service without an operator in attendance stationed at the pump, Auxiliary Feedwater cannot be considered OPERABLE. Standard: Examinee reads and acknowledges note. Cue: Comments:	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐
STEP #5 E O P 2 5 4 1 A p p 1 0 s t e p 3	Performance: IF TAVE is greater than or equal to 300 °F, PERFORM the following: a. STATION an operator in attendance at the Condensate Transfer Pump. b. ESTABLISH communications between the condensate transfer pump and the Control Room. Standard: Examinee recognizes step is N/A (current T_{ave} is < 300 °F). Cue: Comments:	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐
STEP #6 E O P 2 5 4 1 A p p 1 0 s t e p 4	Performance: UNLOCK and OPEN 2-CN-187, "CONDENSATE TRANSPORT PUMP SUCTION STOP" Standard: Examinee simulates unlocking and opening valve 2-CN-187 (turn valve CCW to hard stop then CW ¼ turn) Cue: If student voices desire to consult valve locator to find CN-187, provide the student with Map 3. Inform the examinee "Valve is open" after examinee properly simulates operating the valve(s). Comments:	Critical: ☒ YES ☐ NO Grade: S ☐ U ☐

PERFORMANCE INFORMATION

JPM Number: P1

Revision: 1/0

Task Title: Filling Hotwell With Condensate Transfer Pump

STEP #7 E O P 2 5 4 1 A p p l 0 s t e p 5	Performance: OPEN 2-CN-32, "CONDENSATE TRANSFER PUMP DISCHARGE STOP"	Critical: ☒ YES ☐ NO
	Standard: Examinee simulates unlocking and opening valve 2-CN-32 (turn valve CCW to hard stop then CW ¼ turn)	Grade: S ☐ U ☐
	Cue: If student voices desire to use valve locator to find CN-32, provide student with Map 4. Inform the examinee "Valve is open" after examinee properly simulates operating the valve(s).	
	Comments: The procedure does not direct unlocking the valve handwheel. The act of unlocking a valve is understood.	
STEP #7 E O P 2 5 4 1 A p p l 0	Performance: CAUTION Running the Condensate Transfer Pump for long periods of time against shutoff head could result in damage to the pump.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges CAUTION.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #8 E O P 2 5 4 1 A p p l 0 s t e p 6	Performance: START P71, "CONDENSATE STORAGE TANK TRANSFER PUMP".	Critical: ☒ YES ☐ NO
	Standard: Examinee simulates starting P-71 by pressing START button.	Grade: S ☐ U ☐
	Cue: Pump is running. Red light On, Green light Off.	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: **P1**

Revision: **1/0**

Task Title: **Filling Hotwell With Condensate Transfer Pump**

STEP #9 E O P 2 5 4 1 A p p 1 0 s t e p 7	Performance: OPEN 2-CN-223, CONDENSER FILL.	Critical: ☒ YES ☐ NO
	Standard: If student voices desire to use valve locator to find CN-223, provide student with Map 5. Examinee simulates opening valve CN-223 (operating chain to turn valve CCW to hard stop then CW ¼ turn)	Grade: S ☐ U ☐
	Cue: Inform the examinee "Valve is open" after examinee properly simulates operating the valve. Flow noise is heard.	
	Comments: 2-CN-223 is a chain operated valve located in the overhead	
STEP #10 E O P 2 5 4 1 A p p 1 0 s t e p 8	Performance: NOTIFY the Control Room that flow has been initiated to the hotwell.	Critical: ☐ YES ☒ NO
	Standard: Examinee simulates notifying Control Room to report completion of the task.	Grade: S ☐ U ☐
	Cue: Report form Control Room that hotwell level is rising.	
	Comments:	

TERMINATION CUE: **The evaluation for this JPM is complete.**

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: **P1**

Revision: **1/0**

Task Title: **Filling Hotwell With Condensate Transfer Pump**

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:	☐ YES ☒ NO		
Validated Time (minutes):	15	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: **P1**

Revision: **1/0**

- Initial Conditions:
- A loss of all feedwater (LOAF) event has occurred.
 - That plant was tripped and EOP 2525 completed.
 - The crew has transitioned to EOP 2537.
 - Condensate is feeding the S/Gs.
 - Condenser vacuum has been broken.
 - A plant cooldown is in progress.
 - RCS T_{Average} = 285°F and lowering.
 - Hotwell level is 25% and lowering.
 - Breaker B2102, Condensate Transfer Pump, P71, has been verified 'ON'

Time Critical
JPM: ☐ YES ☒ NO

Initiating Cues: The Unit Supervisor has directed you to fill the hotwell with the condensate transfer pump per EOP 2541, Appendix 10.

Examinee: _____

JPM P2 (A11)

JPM Number: P2

Revision: 0/2

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: P2

Revision: 0/2

Task Title: Manual operation of 2-RB-8.1A, 'A' SFPC Hx Outlet valve

System: RBCCW

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☐ YES ☒ NO

Validated Time (minutes): 5

Task Number(s): 234362

Applicable To: SRO XX STA RO XX PEO XX

K/A Number: 008A2.05 K/A Rating: 3.2/3.3

Method of Testing: Simulated Performance: XX Actual Performance:

Location: Classroom: Simulator: In-Plant: XX

Task Standards: The task is satisfactorily met when the examinee has simulated manually opening 2-RB-8.1A, 'A' SFPC HX BS EVAP RBCCW OUTLET ISOLATION.

Required Materials: OP 2563 , Loss of Instrument Air
(procedures, equipment,
etc.)

General References:

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

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

JPM WORKSHEET

Initial Conditions:

The following sequence of events has occurred:

- 2-RB-8.1A, 'A' SFPC HX/BS EVAP RBCCW OUTLET ISOLATION has failed closed.

Current Conditions are as follows:

- The plant is in MODE 1.
- The crew has entered AOP 2563, Loss of Instrument Air

Initiating Cues:

The US has directed you to manually open 2-RB-8.1A in accordance with AOP 2563, Loss of Instrument Air; Attachment P, Manual Operation of 2-RB-8.1A and 2-RB-8.1B.

- The US has entered TSAS 3.7.3.1, Reactor Building Closed Cooling Water System
- The BOP will perform any Control Room required actions.

Time Critical JPM:

☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. AOP 2563, Loss of Instrument Air, Attachment P, Manual Operation of 2-RB-8.1A & 2-RB-8.1B

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

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

PERFORMANCE INFORMATION

JPM Number: P2

Revision: 0/2

Task Title: Manual operation of 2-RB-8.1A, 'A' SFPC Hx Outlet valve

START TIME: _____

STEP #1 A O P 2 5 6 3 A t t . P P . 1 . 1	Performance: IF in MODE 1, 2, 3, or 4, THEN LOG entry in TSAS 3.7.3.1, Reactor Building Closed Cooling Water System.	Critical: ☐ YES ☒ NO
	Standard: Examinee recognizes the ACTION STATEMENT is entered as part of the initial conditions.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #2 A O P 2 5 6 3 A t t . P P . 1 . 2 N O T E	Performance: NOTE: Loss of air pressure will cause 2-RB-8.1A, SFPCHX / BA EVAP RBCCW OUTLET ISOL, to fail CLOSED.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges the note.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #3 A O P 2 5 6 3 A t t . P P . 1 . 2	Performance: CLOSE 2-IA-738, IA to A RBCCW TCV, 2-RB-8.1A.	Critical: ☐ YES ☒ NO
	Standard: Examinee locates and simulates closing 2-IA-738 (Clockwise rotation)	Grade: S ☐ U ☐
	Cue: If the examinee simulates turning CW, notify them that the "valve comes to a hard stop" after a few turns. If the examinee simulates turning CCW, notify them that the "valve does not move".	
	Comments: Instrument line valve	

PERFORMANCE INFORMATION

JPM Number: P2

Revision: 0/2

Task Title: Manual operation of 2-RB-8.1A, 'A' SFPC Hx Outlet valve

STEP # 4 A O P 2 5 6 3 A t t . P P . 1 . 3	Performance: REMOVE RBCCW OUTLET VALVE SFPC HX A, RB-8.1A, fuse block AFU (C-06R).	Critical: ☐ YES ☒ NO
	Standard: Examinee calls to Control and directs Fuseblock AFU (C-06R) be removed.	Grade: S ☐ U ☐
	Cue: Notify examinee that Fuseblock AFU (C-06R) is removed.	
	Comments:	
STEP # 5 A O P 2 5 6 3 A t t . P P . 1 . 4	Performance: CLOSE bypass valve located next to torque motor on valve.	Critical: ☒ YES ☐ NO
	Standard: Examinee locates and simulates closing bypass valve next to torque motor.	Grade: S ☐ U ☐
	Cue: If the examinee simulates turning CW, notify them that the "valve comes to a hard stop perpendicular to the line" If the examinee simulates turning CCW, notify them that the "valve does not move".	
	Comments: The bypass valve is a ¼ turn ball valve	
STEP # 6 A O P 2 5 6 3 A t t . P P . 1 . 5	Performance: IF opening valve, THEN ROTATE TORQUE MOTOR handwheel counterclockwise until 2-RB-8.1A, SFPCHX / BA EVAP RBCCW OUTLET ISOL, is open.	Critical: ☒ YES ☐ NO
	Standard: Examinee locates and simulates rotating torque motor handwheel CCW.	Grade: S ☐ U ☐
	Cue: If the examinee simulates turning CCW, notify them that the position indicator is rotating to the horizontal (open) position AND "handwheel comes to a hard stop" after a few turns. If the examinee simulates turning CW, notify them that the "handwheel does not move" AND "the position indicator does not move".	
	Comments: Turning the handwheel is actually pumping hydraulic fluid to reposition the valve. The hydraulic system is separate and distinct from the air system.	

TERMINATION CUE: **The evaluation for this JPM is complete.**

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: **P2**

Revision: **0/2**

Task Title: Manual operation of 2-RB-8.1A, 'A' SFPC Hx Outlet valve

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	5	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
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Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: **P2**

Revision: **0/2**

Initial Conditions:

The following sequence of events has occurred:

- 2-RB-8.1A, 'A' SFPC HX/BS EVAP RBCCW OUTLET ISOLATION has failed closed.

Current Conditions are as follows:

- The plant is in MODE 1.
- The crew has entered AOP 2563, Loss of Instrument Air

Initiating Cues:

The US has directed you to manually open 2-RB-8.1A in accordance with AOP 2563, Loss of Instrument Air; Attachment P, Manual Operation of 2-RB-8.1A and 2-RB-8.1B.

- The US has entered TSAS 3.7.3.1, Reactor Building Closed Cooling Water System
- The BOP will perform any Control Room required actions.

Time Critical JPM:

☐ YES ☒ NO

ATTACHMENT P
Manual Operation of 2-RB-8.1A and 2-RB-8.1B
(Page 1 of 3)

P.1 Placing 2-RB-8.1A, SFPCHX / BA EVAP RBCCW OUTLET ISOL, in MANUAL

_____ P.1.1 **IF** in MODE 1, 2, 3, or 4, **THEN LOG** entry in TSAS 3.7.3.1, Reactor Building Closed Cooling Water System.

NOTE: Loss of air pressure will cause 2-RB-8.1A, SFPCHX / BA EVAP RBCCW OUTLET ISOL, to fail CLOSED.

_____ P.1.2 **CLOSE** 2-IA-738, IA to A RBCCW TCV, 2-RB-8.1A.

_____ P.1.3 **REMOVE** RBCCW OUTLET VALVE SFPC HX A, RB-8.1A, fuse block AFU (C-06R).

_____ P.1.4 **CLOSE** bypass valve located next to torque motor on valve.

_____ P.1.5 **IF** opening valve, **THEN ROTATE** TORQUE MOTOR handwheel counterclockwise until 2-RB-8.1A, SFPCHX / BA EVAP RBCCW OUTLET ISOL, is open.

_____ P.1.6 **IF** closing valve, **THEN PERFORM** the following:

- _____ a. **OPEN** bypass valve (throw handled ball valve located next to torque motor).
- _____ b. **WHEN** 2-RB-8.1A, SFPCHX / BA EVAP RBCCW OUTLET ISOL, closed, **THEN CLOSE** bypass valve (throw handled ball valve located next to torque motor).

Examinee: _____

JPM P3

(ISRO & RO only)

JPM Number: JPM-P3

Revision: 0

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: P3

Revision: 0/0

Task Title: Waste Gas System/Shifting Waste Gas Decay Tanks

System: Gaseous Radwaste System

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☐ YES ☒ NO

Validated Time (minutes): 7

Task Number(s): 233826

Applicable To: SRO X STA RO X PEO X

K/A Number: 071K6.10 K/A Rating: 2.6

Method of Testing: Simulated Performance: X Actual Performance:

Location: Classroom: Simulator: In-Plant: X

Task Standards: At JPM completion, the examinee will have simulated shifting Waste Gas Decay Tanks by removing the 'B' WGDT from service and placing the 'A' WGDT in service and ensuring the 'A' and 'B' Waste Gas Compressors are returned to their as found condition.

Required Materials: OP 2337, Gaseous Radwaste System, section 4.2
(procedures, equipment,
etc.)

General References: N/A

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

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

JPM WORKSHEET

Initial Conditions:

- Unit 2 is in MODE 1.
- The 'B' WGDТ is in service.

Initiating Cues:

- The Unit Supervisor has directed you to swap Waste Gas Decay Tanks (WGDТ). Remove the 'B' WGDТ from service and place the 'A' WGDТ in service.

Time Critical JPM:

☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. OP 2337, Gaseous Radwaste System
 - a. Sections 1, 2, and 3
 - b. Section 4.2, Shifting Waste Gas Decay Tanks

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

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

PERFORMANCE INFORMATION

JPM Number: JPM-P3

Revision: 0

Task Title: Waste Gas System/Shifting Waste Gas Decay Tanks (071K6.10)

START TIME: _____

STEP #1 OP 2337 step 4.2.1	Performance: <u>NOTE</u> 1. The following Section shifts any of the following Waste Gas Decay Tanks (“A” through “F”): 2. When using this Section, the letter designator is written in the box next to the component’s identification number on a copy of this Section. 4.2 Shifting Waste Gas Decay Tanks <u>NOTE</u> Waste Gas Decay Tanks are normally shifted when the gas pressure in the in-service Waste Gas Decay Tank reaches 135 to 140 psig. Standard: Examinee reads and acknowledges the notes. Cue: If necessary, reiterate that the control room has directed the ‘A’ WGDT be placed in service Comments:	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐
STEP #2 OP 2337 step 4.2.1	Performance: 4.2.1. MARK the boxes in step 4.2.6 with the letter designator of the valve identification number of the Waste Gas Decay Tank being removed from service. Standard: Examinee marks step 4.2.6 empty blocks with ‘B’ for removing the ‘B’ WGDT from service Cue: Comments:	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐
STEP #3 OP 2337 step 4.2.2	Performance: 4.2.2. MARK the boxes in step 4.2.8 with the letter designator of the valve identification number of the Waste Gas Decay Tank which is to be placed in service. Standard: Examinee marks step 4.2.8 empty blocks with ‘A’ to prepare for placing the ‘A’ WGDT in service Cue: Comments:	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐

PERFORMANCE INFORMATION

JPM Number: JPM-P3

Revision: 0

Task Title: Waste Gas System/Shifting Waste Gas Decay Tanks (071K6.10)

STEP #4 OP 2337 step 4.2.3	Performance: 4.2.3 CIRCLE position of Waste Gas Compressor hand switches (C-61): - HS-9188, "WASTE GAS COMPRESSOR F-1A" OFF / AUTO / STANDBY - HS-9189, "WASTE GAS COMPRESSOR F-1B" OFF / AUTO / STANDBY	Critical: ☐ YES ☒ NO
	Standard: Examinee locates the handswitches for "A" and "B" Waste Gas Compressors on panel C-61 and records the positions of the hand switches HS-9188 and HS-9189 by circling the appropriate selection	Grade: S ☐ U ☐
	Cue:	
	Comments: Normal operations are one compressor in AUTO, one compressor in STBY.	
STEP #5 OP 2337 step 4.2.4	Performance: 4.2.4 WRITE in- service Waste Gas Decay Tank pressure _____ psig	Critical: ☐ YES ☒ NO
	Standard: Examinee writes 135 psig in the procedure step	Grade: S ☐ U ☐
	Cue: 'B' WGD T pressure reads 135 psig.	
	Comments:	
STEP #6 OP 2337 step 4.2.5	Performance: 4.2.5 ENSURE the following in "OFF" (C- 61): - HS-9188, "WASTE GAS COMPRESSOR F- 1A" - HS-9189, "WASTE GAS COMPRESSOR F- 1B"	Critical: ☒ YES ☐ NO
	Standard: Examinee states they would place both "A" and "B" Waste Gas Compressor handswitches (HS-9188 and HS-9189) in the "OFF" position	Grade: S ☐ U ☐
	Cue: When these switches are simulated taken to OFF, inform examinee that the compressor GREEN lights are lit, and WHITE light extinguished.	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: JPM-P3

Revision: 0

Task Title: Waste Gas System/Shifting Waste Gas Decay Tanks (071K6.10)

STEP #7 OP 2337 step 4.2.6	Performance: 4.2.6 For Waste Gas Decay Tank being removed from service, CLOSE the following valves: 2-GR-6.1[B], "DECAYTK (T-19[B]) INLET VALVE" (C- 61) 2-GR-6[B], "[B] DECAY TANK INLET STOP" (- 25'6" Auxiliary Building) 2-GR-7[B], "[B] DECAY TANK INLET"	Critical: ** ☒ YES ☐ NO ☒ YES ☐ NO ☒ YES ☐ NO
	Standard: Examinee locates and states that they: - rotate 2-GR-6.1B handswitch to the closed position - rotate 2-GR-6B handle in the CW direction until handle stops - rotate 2-GR-7B handle in the CW direction until handle stops	Grade: S ☐ U ☐ S ☐ U ☐ S ☐ U ☐
	Cue: - When examinee states they would take 2-GR-6.1B handswitch to the CLOSE position, inform examinee that <u>RED</u> light is <u>not</u> lit, and the <u>GREEN</u> light is <u>lit</u> - When the examinee states they are rotating the handle for 2-GR-6B and 2-GR-7B, then inform them that the valve position indicator is pointing to the CLOSE position.	
	Comments: ** ONLY one of the three inlet valves needs to be closed to meet the critical task (valves are in series configuration) - All of the manual valve handles rotate 90° and have a pointer for valve position. - The handles for each of the manual valves may be oriented differently depending on local interference	
STEP #8 OP 2337 step 4.2.7	Performance: 4.2.7 WRITE time decay tank isolated_____.	Critical: ☐ YES ☒ NO
	Standard: Examinee writes the time the 'B' WGDT was isolated.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: JPM-P3

Revision: 0

Task Title: Waste Gas System/Shifting Waste Gas Decay Tanks (071K6.10)

STEP #9 OP 2337 step 4.2.8a	Performance: 4.2.8a PLACE applicable Waste Gas Decay Tank in service as follows: a. ENSURE the following valves closed: 2-GR-8[A], “[A] DECAY TANK OUTLET ISOLATION” (- 25’6” Auxiliary Building) 2-GR-9[A], “[A] DECAY TANK OUTLET STOP” (- 25’6” Auxiliary Building) 2-GR-8.1[A], “DECAY TK (T-19[A]) OUTLET VALVE” (C- 61)	Critical: ☐ YES ☒ NO ☐ YES ☒ NO ☐ YES ☒ NO
	Standard: Examinee locates and states they: - attempt to rotate 2-GR-8A, in the clockwise (close) direction and determines that the handle will NOT move. - attempt to rotate 2-GR-9A, in the clockwise (close) direction and determines that the handle will NOT move. - observe 2-GR-8.1A associated red light is OUT and the green light is LIT.	Grade: S ☐ U ☐
	Cue: For each of the above listed valves, when the examinee states they are rotating a handswitch or a valve handle, inform them that the valves are in the appropriate position or that the appropriate lights are lit as stated in the Standard.	
	Comments:	
STEP #10 OP 2337 step 4.2.8b	Performance: 4.2.8b. PLACE applicable Waste Gas Decay Tank in service as follows: b. OPEN the following valves: 2-GR-6.1[A], “DECAY TK (T-19[A]) INLET VALVE” (C- 61) 2-GR-6[A], “[A] DECAY TANK INLET STOP” (- 25’6” Auxiliary Building) 2-GR-7[A], “[A] DECAY TANK INLET”	Critical: ** ☒ YES ☐ NO ☒ YES ☐ NO ☒ YES ☐ NO
	Standard: Examinee locates and states they would: - place the 2-GR-6.1A, handswitch to the OPEN position. - rotate 2-GR-6A, in the CCW (open) direction until the handle stops (90° ball valve). - rotate 2 GR-7A, in the CCW (open) direction until the handle stops (90° ball valve).	Grade: S ☐ U ☐ S ☐ U ☐ S ☐ U ☐
	Cue: 2-GR-6.1A: When examinee states hand switch taken to OPEN, say Green light is OUT, and RED light is LIT 2-GR-6A, 2-GR-7A, after each valve is simulated rotated 90° CW, say “valve is at hard stop”	
	Comments: ** All three inlet valves need to be open to meet the critical task (valves are in series configuration)	

PERFORMANCE INFORMATION

JPM Number: JPM-P3

Revision: 0

Task Title: Waste Gas System/Shifting Waste Gas Decay Tanks (071K6.10)

STEP # 11 OP 2337 step 4.2.9	Performance: 4.2.9 Refer To step 4.2.3 and PLACE Waste Gas Compressor switches to positions as marked.	Critical: ☒ YES ☐ NO
	Standard: Examinee states they are placing the hand switches for the "A" and "B" WG Compressors on Panel C-61 back to the position recorded in step 4.2.3.	Grade: S ☐ U ☐
	Cue: Inform examinee that compressor GREEN lights are lit. The AUTO compressor white light is lit.	
	Comments:	
STEP # 12 OP 2337 step 4.2.10	Performance: 4.2.10 WRITE in- service Waste Gas Decay Tank pressure. _____ psig	Critical: ☐ YES ☒ NO
	Standard: Examinee reads 'A' WGDТ pressure on C-61 and records	Grade: S ☐ U ☐
	Cue: 'A' WGDТ pressure is 5 psig.	
	Comments: JPM COMPLETE.	

TERMINATION CUE: **The evaluation for this JPM is complete.**

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: JPM-P3

Revision: 0

Task Title: Waste Gas System/Shifting Waste Gas Decay Tanks (071K6.10)

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	7	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
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Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: JPM-P3

Revision: 0

Initial Conditions:

- Unit 2 is in MODE 1.
- The 'B' WGDT is in service.

Initiating Cues:

- The Unit Supervisor has directed you to swap Waste Gas Decay Tanks (WGDT). Remove the 'B' WGDT from service and place the 'A' WGDT in service.

Time Critical JPM: ☐ YES ☒ NO

Examinee: _____

JPM S1 (A11)

JPM Number: S1

Revision: 0

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: S1

Revision: 0

Task Title: **Perform a reactor startup from operational MODE 3 (HOT STANDBY) to operational MODE 2 (STARTUP)**

System: Control Element Drive System

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☒ YES ☐ NO

Validated Time (minutes): 7

Task Number(s): 235493

Applicable To: SRO XX STA RO XX PEO

K/A Number: 001AA1.05 K/A Rating: 4.2

Method of Testing: Simulated Performance: Actual Performance: XX

Location: Classroom: Simulator: XX In-Plant:

Task Standards: The task is satisfactorily met when the student terminates the continuous rod withdrawal by inserting a manual trip prior to exceeding 1 DPM SUR.

Required Materials: OP 2202, Reactor Startup (ICCE)
(procedures, equipment, etc.)

- Section 4.4
- Attachments 5, 8, 9, 11 and 19

General References: OP 2202, Reactor Startup (ICCE)

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

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

JPM WORKSHEET

Initial
Conditions:

The following sequence of events has occurred:

- The reactivity RO has urgent business away from C04.
- You are an additional RO who has attended Reactor Startup Just-In-Time Training (JITT).

Current Conditions are as follows:

- Plant is in MODE 2, Xenon Free.
- CEA withdrawal to criticality IAW OP 2202, "Reactor Startup (ICCE)" is in progress.
 - Section 4.4 is in progress, complete through 4.4.5.
- An additional operator is logging CEA positions as required.
- 1/M plots are complete with $1/M < 0.13$.
- RE has determined that criticality will occur within 0.5% $\Delta\rho$ of the ECP.
 - Group 7 is above the -0.5% $\Delta\rho$ position.
 - The +0.5% $\Delta\rho$ position is ARO (Group 7 at 180 steps).
 - The ECP is group 7 at 95 steps.
- Four doublings have occurred.
- CEAs are at Group 6 at 170 steps.

Initiating
Cues:

The US has directed you to continue starting with OP 2202, step 4.4.6, to continue CEA withdrawal and fully withdraw group 6, then continue withdrawal to achieve criticality and raise power to $10^{-3}\%$ power.

Time Critical JPM: ☐ YES ☒ NO

OPTION 1: (Preferred):

- Simulator Requirements:
1. **Reset to IC-328** (Pull to crit in progress, group 6 at 170 steps)
 2. Load event file **2024 S1.evt** and schedule **2024 S1.sch**
 3. Ensure Trigger 18 (title: CEA 38 > 67 steps) is loaded with syntax "RDCEAPOS(38) > 67"
 4. Ensure Malfunction **RD11I** "CONTINUOUS BANK (RG7) WITHDRAWAL" is set to insert on **Trigger 18**.
 5. Ensure Override **03A1A5A1S98** "MANUAL INSERT-WITHDRAW SWITC (DIGITAL INPUT)" is set to "**N (SRTC)**" on **Trigger 18**.
 6. Ensure Override **03A1A5A1SA2** "OFF SWITCH (DIGITAL INPUT)" is set to "**N (SR out)**" on **Trigger 18**.
 7. Ensure Override **03A1A5A1S83** "CEA MODE MAN SEQ 'MS' (DIGITAL INPUT)" is set to "**MAN SEQ**" on **Trigger 18**.
 8. Ensure CEDS panel insert is in OFF.

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

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

PERFORMANCE INFORMATION

JPM Number: S1

Revision: 0

Task Title: Perform a reactor startup from operational MODE 3 (HOT STANDBY) to operational MODE 2 (STARTUP)

START TIME: _____

STEP #1 OP 2202 Section 4.4	Performance: NOTE: Attachment 11 is provided as a placekeeping aid.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges NOTE	Grade: S ☐ U ☐
	Cue:	
	Comments: Examinee may use procedure body or Attachment 11 to placekeep steps 4.4.6 through 4.4.12, but the attachment is simpler.	
STEP #2 OP 2202 step 4.4.1	Performance: CAUTION: Reactor must be tripped if the sustained SUR is 1.0 dpm.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and understands the CAUTION.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S1

Revision: 0

Task Title: Perform a reactor startup from operational MODE 3 (HOT STANDBY) to operational MODE 2 (STARTUP)

STEP #3 OP 2202 step 4.4.1	Performance: WHEN withdrawing any Regulating Group CEA, MONITOR and PERFORM CHANNEL CHECK of the following (RPS, C-04): • SUR less than 0.5 dpm • Wide Range power instruments • Audible count rate • Group CEA movement on the following: ○ “CEAPDS MONITOR” ○ PPC CEA positions display, “CEA” ○ Core Mimic	Critical: ☐ YES ☒ NO
	Standard: Examinee monitors the listed parameters.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

STEP #4 OP 2202 step 4.4.2	Performance: During approach to criticality, MAINTAIN RCS temperature stable and ENSURE the following: • No significant deviation exists in OPERABLE wide range power instruments (agree within one half decade of each other) (RPS and C-04) • All CEAs aligned within five steps in each group • Proper CEA overlap and sequencing occurs (e.g., next group will start withdrawing when first CEA group is greater than 125 steps)	Critical: ☐ YES ☒ NO
	Standard: Examinee monitors listed parameters.	Grade: S ☐ U ☐
	Cue: If queried, Feed Station operator is maintaining temperature stable.	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S1

Revision: 0

Task Title: Perform a reactor startup from operational MODE 3 (HOT STANDBY) to operational MODE 2 (STARTUP)

STEP # 5 OP 2202	Performance: CAUTION When plotting 1/M data, it should be verified that criticality will take place between the 0.5% $\Delta\rho$ reference marks established on Attachment 4. Critical approach should be stopped and the SM/US and RE notified if this condition will not be met. Standard: Examinee reads and understands CAUTION. Examinee notes that according to the initiating cue, 1/M plots are complete and the reactor is expected to go critical within the 0.5% $\Delta\rho$ reference marks. Cue: If queried, RE reports 1/M plots are complete and reactor is expected to go critical within the 0.5% $\Delta\rho$ reference marks. Comments:	Critical: ☐ YES ☒ NO
STEP # 6 OP 2202	Performance: NOTE 1. The Reactor is declared critical when all of the following conditions occur: • Constant positive SUR • Reactor power rising • No CEA motion or dilution of RCS in progress 2. A time interval of at least two minutes should take place between stopping CEA motion and recording 1/M data. This allows for the effects of delayed neutrons to stabilize. 3. 1/M data and plotting may be terminated after the 1/M value is less than 0.13. Standard: Examinee reads and understands NOTE. Examinee recalls by initiating cue that 1/M is less than 0.13 and 1/M plots are no longer required. Cue: If queried, RE reports 1/M plots are complete. Comments:	Critical: ☐ YES ☒ NO
	Grade: S ☐ U ☐	

PERFORMANCE INFORMATION

JPM Number: S1

Revision: 0

Task Title: Perform a reactor startup from operational MODE 3 (HOT STANDBY) to operational MODE 2 (STARTUP)

STEP #7 OP 2202 step 4.4.3	Performance: IF core reactivity conditions have not changed (e.g., xenon-free startup), Go To step 4.4.5.	Critical: ☐ YES ☒ NO
	Standard: Examinee notes from initiating cue that this is a xenon-free startup, and proceeds to 4.4.5.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #8 OP 2202 step 4.4.5	Performance: Using applicable Attachment, RECORD CEA positions within one hour following movement greater than 10 steps (TSSR 4.1.3.1.1): - Attachment 20, "Group 4 CEA Hourly Position" - Attachment 21, "Group 5 CEA Hourly Position" - Attachment 22, "Group 6 CEA Hourly Position" - Attachment 23, "Group 7 CEA Hourly Position"	Critical: ☐ YES ☒ NO
	Standard: Examinee determines that Attachments 22 and 23 are required for CEA position surveillance.	Grade: S ☐ U ☐
	Cue: Another RO will perform CEA position surveillance.	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S1

Revision: 0

Task Title: Perform a reactor startup from operational MODE 3 (HOT STANDBY) to operational MODE 2 (STARTUP)

STEP # 9 OP 2202 step 4.4.6	Performance: PRESS “MANUAL SEQUENTIAL, MS” pushbutton and CHECK light lit.	Critical: ☒ YES ☐ NO
	Standard: Examinee presses “MANUAL SEQUENTIAL, MS” pushbutton and checks light lit.	Grade: S ☐ U ☐
	Cue:	
	Comments: Steps 4.4.6 through 4.4.12 are repetitive in nature and the examinee may route through more than one iteration of these steps prior to the continuous CEA withdrawal malfunction revealing itself. If at any time in the remaining steps of this JPM, the continuous CEA withdrawal malfunction is triggered, if the examinee recognizes the condition and trips the reactor within the conditions provided in the task standard, the JPM is considered completed satisfactorily. Likewise, if the malfunction is triggered and the examinee does NOT recognize it and respond prior to the conditions provided in the task standard, it constitutes a failure of this JPM. Step 16 of this JPM outlines the procedural guidance for recognizing the conditions required to trip the reactor.	
STEP # 10 OP 2202 step 4.4.7	Performance: PLACE and HOLD CEA control switch to “WITHDRAW.”	Critical: ☒ YES ☐ NO
	Standard: Examinee places and holds CEA control switch in “WITHDRAW.”	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP # 11 OP 2202	Performance: NOTE: At 125 steps (70% withdrawn) the next sequential group starts to withdraw.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and understands NOTE, and recognizes that groups 1 through 5 are fully withdrawn, and groups 6 and 7 are currently being withdrawn with group 6 at 10 steps away from fully withdrawn.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S1

Revision: 0

Task Title: Perform a reactor startup from operational MODE 3 (HOT STANDBY) to operational MODE 2 (STARTUP)

STEP # 12 OP 2202 step 4.4.8	Performance: WHEN CEA motion is stopped due to any of the following, RELEASE CEA control switch and PRESS CEDS “OFF” pushbutton: - Reactor is critical - Predetermined incremental step withdrawal is reached - Count rate doubling - UCS is reached	Critical: ☒ YES ☐ NO
	Standard: Examinee determines that criteria to stop CEA motion are reached and releases CEA control switch and presses CEDS “OFF” pushbutton. IF continuous CEA withdrawal malfunction is triggered, examinee responds IAW step 16 of this JPM.	Grade: S ☐ U ☐
	Cue:	
	Comments: Releasing CEA control switch is a critical step, as the continuous rod withdrawal malfunction will not reveal itself unless switch is released. Pressing the CEDS “OFF” pushbutton is <i>not</i> a critical step as long as it does not interfere with meeting the task standard. Continuous CEA withdrawal malfunction will likely reveal itself after the first iteration of this step, unless the examinee only withdraws group 7 CEAs as a single step.	
STEP # 13 OP 2202 step 4.4.9	Performance: IF CEA motion is stopped because Reactor is critical, Go To step 4.4.13.	Critical: ☐ YES ☒ NO
	Standard: IF continuous CEA withdrawal malfunction is triggered, examinee responds IAW step 16 of this JPM.	Grade: S ☐ U ☐
	Cue:	
	Comments: The continuous CEA withdrawal malfunction should reveal itself prior to reaching critical rod height.	

PERFORMANCE INFORMATION

JPM Number: S1

Revision: 0

Task Title: Perform a reactor startup from operational MODE 3 (HOT STANDBY) to operational MODE 2 (STARTUP)

STEP # 14 OP 2202 step 4.4.10	Performance: IF CEA motion is stopped due to reaching predetermined incremental step withdrawal, PERFORM the following: a. CHECK for proper reactor response. b. Go To step 4.4.6.	Critical: ☐ YES ☒ NO
	Standard: Examinee checks for proper reactor response. IF continuous CEA withdrawal malfunction is triggered, examinee responds IAW step 16 of this JPM. Otherwise, the examinee returns to step 4.4.6, which is step 9 of this JPM.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP # 15 OP 2202 step 4.4.11	Performance: IF CEA motion is stopped due to count rate doubling, PERFORM the following: a. IF 1/M value is greater than 0.13, REQUEST Reactor Engineering Department to perform the following: 1) WHEN at least two minutes has elapsed, CALCULATE 1/M data on Attachment 3. 2) PLOT 1/M data on Attachment 4. b. Go To step 4.4.6.	Critical: ☐ YES ☒ NO
	Standard: Examinee notes that 1/M is less than 0.13 and plots are not required. IF continuous CEA withdrawal malfunction is triggered, examinee responds IAW step 16 of this JPM. Otherwise, the examinee returns to step 4.4.6, which is step 9 of this JPM.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S1

Revision: 0

Task Title: Perform a reactor startup from operational MODE 3 (HOT STANDBY) to operational MODE 2 (STARTUP)

STEP # 16	Performance: IF CEA motion is stopped due to reaching UCS, using the following Attachments WITHDRAW each CEA of the selected Regulating Group to the UEL: a. Attachment 17, "Regulating Group 4" b. Attachment 18, "Regulating Group 5" c. Attachment 19, "Regulating Group 6"	Critical: ☐ YES ☒ NO
OP 2202 step 4.4.12	Standard: If group 6 is at UCS, examinee determines that Attachment 19 is required. Otherwise, step is N/A.	Grade: S ☐ U ☐
	Cue:	
	Comments: This step is expected to be applicable shortly after the start of this JPM. JPM steps 17 through 19 cover the completion of attachment 19.	
STEP # 17	Performance: 1. PRESS "MANUAL INDIVIDUAL, MI" pushbutton and CHECK light, lit. 2. SELECT Regulating Group 6 "+/- 15" scale ("CEAPDS MONITOR"). 3. PRESS "GROUP SELECTION" "6" pushbutton and CHECK light, lit. NOTE: During individual CEA withdrawal, movement is monitored on the following: • "CEAPDS MONITOR" • PPC CEA positions display, "CEA" • Core Mimic	Critical: ☒ YES ☐ NO ☐ YES ☒ NO ☒ YES ☐ NO ☐ YES ☒ NO
OP 2202 Att. 19	Standard: Examinee performs Attachment 19, steps 1 through 3, to set up for withdrawing Group 6 to the UEL.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S1

Revision: 0

Task Title: Perform a reactor startup from operational MODE 3 (HOT STANDBY) to operational MODE 2 (STARTUP)

STEP # 18	Performance: 4. PRESS "INDIVIDUAL CEA SELECTION" pushbutton for CEA to be moved. 5. PLACE and HOLD CEA control switch to "WITHDRAW." 6. WHEN CEA reaches the UEL, RELEASE CEA control switch. 7. REPEAT steps 4. through 6. as necessary to withdraw all CEAs in Regulating Group 6.	Critical: ☒ YES ☐ NO ☒ YES ☐ NO ☒ YES ☐ NO ☐ YES ☒ NO
O P 2202 Att. 19	Standard: Examinee performs steps 4 through 6 for each of CEA 14, 15, 16 and 17, to withdraw them to the UEL (Red light lit on mimic). Step 7 is a routing step.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP # 19	Performance: 8. CHECK all CEAs in the group are within 10 steps. 9. SELECT "CEA POSITION EDITOR" on "CEA POSITIONS MENU" and RESET Group CEA PPC position. 10. WHEN all Regulating Group 6 CEAs have been withdrawn to the UEL, Go To step 4.4.6.	Critical: ☐ YES ☒ NO ☐ YES ☒ NO ☐ YES ☒ NO
O P 2202 Att. 19	Standard: Examinee performs steps 8 through 10 to close out Attachment 19 for withdrawing Group 6 to the UEL.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S1

Revision: 0

Task Title: Perform a reactor startup from operational MODE 3 (HOT STANDBY) to operational MODE 2 (STARTUP)

Begin Alternate Path		
STEP # 20 OP 2202 Att. 5 step 4	Performance: IF a sustained SUR of 1.0 dpm is achieved, TRIP reactor and Go To EOP 2525, "Standard Post Trip Actions."	Critical: ☒ YES ☐ NO
	Standard: Examinee recognizes a SUR rising and approaching 1 DPM and trips the reactor within the time frame allowed by the task standard.	Grade: S ☐ U ☐
	Cue: JPM Complete	
	Comments: SUR reaches 1 DPM approximately 1 minute after the continuous rod withdrawal starts.	
	Evaluator is expected to state when JPM is complete.	
End Alternate Path		

TERMINATION CUE: **The evaluation for this JPM is complete.**

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S1

Revision: 0

Task Title: Perform a reactor startup from operational MODE 3 (HOT STANDBY) to operational MODE 2 (STARTUP)

Date Performed: _____

Examinee: _____

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

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	15	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: S1

Revision: 0

Initial
Conditions:

The following sequence of events has occurred:

- The reactivity RO has urgent business away from C04.
- You are an additional RO who has attended Reactor Startup Just-In-Time Training (JITT).

Current Conditions are as follows:

- Plant is in MODE 2, Xenon Free.
- CEA withdrawal to criticality IAW OP 2202, “Reactor Startup (ICCE)” is in progress.
 - Section 4.4 is in progress, complete through 4.4.5.
- An additional operator is logging CEA positions as required.
- 1/M plots are complete with $1/M < 0.13$.
- RE has determined that criticality will occur within 0.5% $\Delta\rho$ of the ECP.
 - Group 7 is above the -0.5% $\Delta\rho$ position.
 - The +0.5% $\Delta\rho$ position is ARO (Group 7 at 180 steps).
 - The ECP is group 7 at 95 steps.
- Four doublings have occurred.
- CEAs are at Group 6 at 170 steps.

Initiating
Cues:

The US has directed you to continue starting with OP 2202, step 4.4.6, to continue CEA withdrawal and fully withdraw group 6, then continue withdrawal to achieve criticality and raise power to 10^{-3} % power.

Time Critical JPM: ☐ YES ☒ NO

Examinee: _____

JPM S2

(ISRO & RO only)

JPM Number: S2

Revision: 2/0

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: S2

Revision: 2/0

Task Title: Align Charging Discharge Flowpath

System: Chemical & Volume Control System (CVCS)

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☒ YES ☐ NO

Validated Time (minutes): 12

Task Number(s): 236065

Applicable To: SRO XX STA RO XX PEO

K/A Number: 004A2.07 K/A Rating: RO - 3.8 / SRO - 3.8

Method of Testing: Simulated Performance: Actual Performance: XX

Location: Classroom: Simulator: XX In-Plant:

Task Standards: The task is satisfactorily met when charging flowpath is established from the VCT to the RCS through the alternate discharge flowpath ('A' HPSI header via CH-340 and CH-440) and charging flow restored.

Required Materials: Marked up AOP 2512, Loss of All Charging, Sections 1 – 6. Complete through step 3.4.
(procedures, equipment, etc.)

General References: AOP 2512, Loss of All Charging

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

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

JPM WORKSHEET

Initial
Conditions:

- Unit 2 is at 100% power.
- The unit has experienced a loss of charging flow.
- There is no evidence of a charging system rupture.
- ARP 2590B-057 “A-15 Charging Flow LO” has been completed.
- AOP 2512 “Loss of All Charging has been completed through step 3.4.
- A critical parameter has been established to maintain Pressurizer level between 56% and 65%.
- A reactor trip is required if Pressurizer level drops to 55%.

Initiating Cues:

The US has directed you to continue performing actions of AOP 2512, Loss of All Charging, Section 3.0, Assessment of Loss of All Charging, to restore Charging flow path from the VCT and raise PZR level to 65%.

Time Critical
JPM:

☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. Marked up AOP 2512, Loss of All Charging, Sections 1 – 6. Complete through step 3.4.

Simulator Requirements:

OPTION 1: (Preferred):

1. **Reset to any stable 100% IC.**
2. **Place Charging pumps in PTL**
3. **Force sprays**
4. **Insert remote "CVR01" to "OPEN"**
5. **Set Pressurizer level to 57%**

OPTION 2:

1. **Reset to IC- 317**

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

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

PERFORMANCE INFORMATION

JPM Number: S2

Revision: 2/0

JPM Title: Align Charging Discharge Flowpath

START TIME: _____

STEP # 1 AOP 2512 step 3.5	Performance: CHECK charging flowpath as follows: - Suction aligned from one of the following: “VCT OUT ISOL CH-501” open “BA ISOL CH-514” OR “GRAV FD ISOL BAST A, CH-509” OR “GRAV FD ISOL BAST B, CH-508” “RWST ISOL, CH-192” and “RWST TO CHG SUCT, CH-504”, open - Charging header isolation valves open: “CHG HDR ISOL, CH-429” “CHG ISOL, CH-518” OR “CHG ISOL, CH-519” - NO indication of blockage in either the suction or discharge flowpath	Critical: ☐ YES ☒ NO
	Standard: Examinee: - verifies suction flowpath is aligned to the VCT → CH-501 is OPEN - attempts to open CH-429, valve DOES NOT open fully (indicates dual position). - determines discharge flowpath is isolated. - goes to CONTINGENCY ACTION for no charging flowpath	Grade: S ☐ U ☐
	Cue:	
	Comments: When the operator attempts to open CH-429, the valve indicates dual position (both red and green lights lit) or a few moments, then goes closed (green light lit, red lit extinguished) <u>Transition to alternate path</u>	

PERFORMANCE INFORMATION

JPM Number: S2

Revision: 2/0

JPM Title: Align Charging Discharge Flowpath

STEP #2 A O P 2 5 1 2 step 3 . 5 . 1 a - c	Performance: <u>Alternate Path</u> PERFORM the following: a. CLOSE “LTDN ISOL, CH-515.” (C-02) b. PLACE all charging pump handswitches in “PULL-TO -LOCK.” c. WHEN VCT level rises to 86% or as desired, PLACE letdown divert switch, “LTDN DIVERT CH-500 to “RWS” position	Critical: ☐ YES ☒ NO
	Standard: Examinee closes CH-515 and places all charging pump handswitches in ‘PTL’. The examinee may or may not place CH-500 in the ‘RWS’ position	Grade: S ☐ U ☐
	Cue: If queried as the US “is placing CH-500 in ‘RWS’ is desired”, respond “No”.	
	Comments: The examinee may or may not place CH-500 in the ‘RWS’ position depending on VCT level.	
STEP #3 A O P 2 5 1 2 step 3 . 5 . 1 d	Performance: Refer To the following TRM LCOs and DETERMINE applicability: • TRM 3.1.2.2 • TRM 3.1.2.4 • TRM 7.1.1	Critical: ☐ YES ☒ NO
	Standard: Examinee reports to US to refer to the TRM LCO’s	Grade: S ☐ U ☐
	Cue: Acknowledge the report.	
	Comments:	
STEP #4 A O P 2 5 1 2 step 3 . 5 . 1 e	Performance: Refer To the applicable section and PERFORM applicable actions • Section 4.0, “Suction Flowpath Restoration” • Section 5.0, “Discharge Flowpath Restoration” • Section 7.0, “Charging System Leakage”	Critical: ☐ YES ☒ NO
	Standard: Examinee determines discharge flowpath is affected and goes to Section 5.0, “Discharge Flowpath Restoration”	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S2

Revision: 2/0

JPM Title: Align Charging Discharge Flowpath

STEP # 5 A O P 2 5 1 2 5 . 1 a N O T E	Performance: NOTE: If the normal charging flowpath is lost and cannot be reestablished, a plant shutdown is necessary. While shutting down, pressurizer level can be maintained by charging into the RCS through the alternate flow path.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges NOTE	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP # 6 A O P 2 5 1 2 s t e p 5 . 1 a - d	Performance: IF the normal charging path is not available, ESTABLISH alternate charging flowpath as follows: a. ENSURE the following are closed: (C-02). • “LTDN ISOL, CH-515” • “LTDN ISOL, CH-516” b. ENSURE letdown flow has stopped as indicated on “LTDN FLOW, FI-202” (C-02). c. ENSURE all charging pumps are stopped and PLACE hand switches in “PULL TO LOCK” (C-02). d. Refer To the following TRM LCOs and DETERMINE applicability: • TRM 3.1.2.2 • TRM 7.1.1	Critical: ☐ YES ☒ NO
	Standard: The examinee ensures CH-516 is closed. All other actions have been completed in STEPs #2 & #3 above.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP # 7 A O P 2 5 1 2 s t e p 5 . 1 e	Performance: e. CHECK leak is located downstream of CH-429, “CHG HDR ISOL”.	Critical: ☐ YES ☒ NO
	Standard: Examinee recognizes this step is Not Applicable	Grade: S ☐ U ☐
	Cue:	
	Comments: If requested, give permission to N/A the step.	

PERFORMANCE INFORMATION

JPM Number: S2

Revision: 2/0

JPM Title: Align Charging Discharge Flowpath

STEP # 8 A O P 2 5 1 2 step 5.1 f	Performance: OBTAIN key #39 from Operations key locker and CLOSE “HPSI HDR A STOP, SI-656” (C-01). Standard: Examinee obtains key and closes SI-656 Cue: Comments:	Critical: ☒ YES ☐ NO Grade: S ☐ U ☐
STEP # 9 A O P 2 5 1 2 step 5.1 g	Performance: OPEN both of the following valves (14’6” AB Boronometer Room): • CH-340, “CHARGING PUMP DISCHARGE TO HPSI HEADER” • CH-440, “CHARGING PUMP DISCHARGE TO HPSI HEADER” Standard: Examinee directs a PEO to open CH-340 and CH-440. Cue: Inform Examinee that CH-340 and CH-440 are open. Comments: Simulator Booth operator opens CH-340/440 by REMOTE function Critical step even though it’s a phone call, still required to complete the task.	Critical: ☒ YES ☐ NO Grade: S ☐ U ☐
STEP # 10 A O P 2 5 1 2 step 5.1 h - i	Performance: CLOSE the following HPSI injection valves (C-01): • “LOOP 1A, SI-617” • “LOOP 1B, SI-627” • “LOOP 2B, SI-647” ENSURE “LOOP 2A, SI-637,” is open (C-01). Standard: Examinee closes the three Facility 1 HPSI Injection valves SI-617, 627, and 647, then ensure SI-637 is open Cue: Comments:	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐

PERFORMANCE INFORMATION

JPM Number: S2

Revision: 2/0

JPM Title: Align Charging Discharge Flowpath

STEP # 11 A O P 2 5 1 2 s t e p 5 . 1 j	Performance: OBTAIN Key #50 from Operation Key Locker and UNLOCK and CLOSE "CHG HDR ISOL, CH-429" (C-02). Standard: Examinee obtains Key #50 unlocks and closes "CH-429" Cue: . Comments: Valve is already closed	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐
STEP # 12 A O P 2 5 1 2 5 . 1 k N O T E	Performance: NOTE: Expected response will be that PZR level will not be maintained without letdown available. Reactor trip will be required prior to reaching 70% PZR level. Standard: Examinee reads and acknowledges note Cue: Comments: This note reminds the operator that operating charging without letdown will cause pressurizer level to increase without bound.	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐
STEP # 13 A O P 2 5 1 2 s t e p 5 . 1 k	Performance: IF desired, ALIGN charging pump suction to RWST as follows (C-02): 1) CLOSE "VCT MAKEUP BYPASS, CH-196." 2) OPEN "RWST TO CHG SUCT, CH-504." 3) OPEN "RWST ISOL, CH-192." 4) CLOSE "VCT OUT ISOL, CH-501." 5) Refer To AOP 2575, "Rapid Downpower," and SELECT borate from the RWST. Standard: Examinee determines that aligning charging pump suction to the RWST is NOT desired and N/As step Cue: If queried whether the plant is to be shutdown, reply that "a plant shutdown is NOT desired at this time". Direct them to restore pressurizer level to 65%. Comments:	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐

PERFORMANCE INFORMATION

JPM Number: S2

Revision: 2/0

JPM Title: Align Charging Discharge Flowpath

STEP # 14 A O P 2 5 1 2 step 5.11-m	Performance: During operation in this alignment, RECORD the following in the Shift Log: - all charging pump start and stop times - cold leg temperature - temperature of the water source (VCT or RWST) MONITOR charging flow using Loop 2A SI flow, FI-331 or F 331 (C-01, PPC).	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and obtains cold leg temperature and VCT temperature. Examinee locates FI-331 to monitor.	Grade: S ☐ U ☐
	Cue: Inform the Examinee that the STA will record the information in the SM Log.	
	Comments:	
STEP # 15 A O P 2 5 1 2 step 5.1n	Performance: OPERATE Charging pumps as necessary (minimizing starts and stops) to maintain PZR level between 40 and 65%.	Critical: ☒ YES ☐ NO
	Standard: Examinee places a Charging pump in 'Normal After Start' and observe Charging Flow.	Grade: S ☐ U ☐
	Cue: If the examinee is hesitant to start a charging pump, direct them to restore pressurizer level to 65%.	
	Comments: When Charging Flow has been established through the Alternate flow path the JPM task has been completed.	

TERMINATION CUE: The evaluation for this JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S2

Revision: 0/0

Task Title: Align Charging Discharge Flowpath

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	12	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
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Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: S2

Revision: 0/0

Time Critical JPM: ☐ YES ☒ NO

Initial Conditions:

- Unit 2 is at 100% power.
- The unit has experienced a loss of charging flow.
- There is no evidence of a charging system rupture.
- ARP 2590B-057 "A-15 Charging Flow LO" has been completed.
- AOP 2512 "Loss of All Charging has been entered and completed through step 3.4.

Initiating Cues: The US has directed you to continue performing actions of AOP 2512, Loss of All Charging, Section 3.0, Assessment of Loss of All Charging, to restore Charging flow path from the VCT and raise PZR level to 65%.

Examinee: _____

JPM S3

(ISRO & RO only)

JPM Number: S3

Revision: 0/0

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: S3

Revision: 0/0

Task Title: Cross-tie 480VAC Bus 22A to 22B or Bus 22C to 22D

System: _____

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☒ YES ☐ NO

Validated Time (minutes): 7

Task Number(s): 235479

Applicable To: SRO X STA _____ RO X PEO _____

K/A Number: 063A4.03 K/A Rating: 3.5

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 identified that the Turbine Battery Bus, 201D, battery charger, DC4, is not being supplied by Bus 22A which is de-energized. Using the alternate path, Bus 22A is reenergized via cross-tie breaker (B0111) between Bus 22A and Bus 22B. Bus 22A voltage is between 435 and 525 VAC and Bus 201D voltage greater than 126 VDC.

Required Materials: Procedure copy of EOP 2541 APP. 04, Attachment 4C rev. 010 with Steps 1-4 marked as complete
(procedures, equipment, etc.)

General References: EOP 2528, Loss of Offsite Power/Loss of Forced Circulation.
EOP 2541 APP. 04, Attachment 4C, Follow-Up Actions LOOP/LOFC.

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

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

JPM WORKSHEET

- Initial Conditions:
- The plant has tripped from 100% power.
 - On the trip, the 6.9 kV buses did NOT transfer.
 - On the trip, a Facility 1 LNP occurred.
 - EOP 2525, Standard Post Trip Actions, is completed.
 - The crew transitioned to EOP 2528, Loss of Offsite Power/Loss of Forced Circulation.
 - EOP 2541, Standard Appendices, Appendix 04, Followup Actions, Attachment 4C, Follow-Up Actions – LOOP/LOFC, is in progress.
 - Bus 24C and 24D are energized by Emergency Diesel Generators.
 - Power has been restored to bus 24B and bus 22B.

Initiating Cues: The Unit Supervisor has directed you to perform steps 5-10 of EOP 2541, Standard Appendices, Appendix 04, Followup Actions, Attachment 4C, Follow-Up Actions – LOOP/LOFC.

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. EOP 2541, Appendix 4C, Follow-Up Actions – LOOP/LOFC, steps 1-10.

Simulator Requirements: OPTION 1: (Preferred):

1. **Reset to IC- 323**

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

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

PERFORMANCE INFORMATION

JPM Number: S3

Revision: 0/0

JPM Title: Perform actions for a deenergized Turbine Battery Charger

START TIME: _____

STEP #1 EOP 2541 ATT. 4C step 5	Performance: 5. CHECK service water operating on ALL energized buses.	Critical: ☐ YES ☒ NO
	Standard: Examinee may check flow, discharge pressure, amperage, and/or bus power and determines Service Water is operating.	Grade: S ☐ U ☐
	Cue: Provide examinee procedure copy of EOP 2541 APP. 04, Attachment 4C with steps 1-4 marked as complete.	
	Comments:	
STEP #2 EOP 2541 ATT. 4C step 6	Performance: 6. CHECK RBCCW operating with service water cooling on ALL buses energized.	Critical: ☐ YES ☒ NO
	Standard: Examinee may check flow, discharge pressure, amperage, and/or bus power and determines RBCCW is operating.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #3 EOP 2541 ATT. 4C step 7	Performance: 7. MAINTAIN adequate condensate inventory by performing the following: a. CHECK CST level greater than 77%. b. DIRECT Water Treatment Vendor to maintain CST level greater than 77%.	Critical: ☐ YES ☒ NO
	Standard: Examinee verifies CST level is greater than 77%. Examinee directs water treatment vendor to maintain CST level greater than 77%.	Grade: S ☐ U ☐
	Cue: Water Treatment Vendor acknowledges the order to maintain CST level greater than 77%	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S3

Revision: 0/0

JPM Title: Perform actions for a deenergized Turbine Battery Charger

STEP #4 EOP 2541 ATT. 4C step 8	Performance: 8. Periodically MONITOR operation of running auxiliary feedwater pumps.	Critical: ☐ YES ☒ NO
	Standard: Examinee observes AFW pump status lights, discharge pressure, and AFW flow.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #5 EOP 2541 ATT. 4C step 9	Performance: 9. CHECK that the plant process computer is energized from an AC bus as indicated by annunciator C08 B-28 "COMPUTER POWER SUPPLY TROUBLE" <u>NOT</u> lit.	Critical: ☐ YES ☒ NO
	Standard: Examinee verifies annunciator C08 B-28 is not lit.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #6 EOP 2541 ATT. 4C step 10	Performance: <u>CAUTION</u> 1. The Main Turbine or Main Feedwater pumps must be stopped before their Emergency Bearing Oil pumps are stopped 2. If emergency seal oil pump is to be stopped and the turning gear oil pump, P-62 is NOT running, then the Main Generator Hydrogen System must be vented and purged as specified in OP 2324C, "Generator Hydrogen System and Carbon Dioxide Purge."	Critical: ☐ YES ☒ NO
	Standard: Examinee acknowledges caution by reading it.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S3

Revision: 0/0

JPM Title: Perform actions for a deenergized Turbine Battery Charger

STEP #7 EOP 2541 ATT. 4C step 10	Performance: 10. CHECK Turbine Battery Bus 201D meets BOTH of the following conditions: a. Supplied by 201D Battery Charger, DC4, from energized non-vital 480 volt Bus 22A. b. Voltage greater than 126 volts Standard: Examinee identifies Bus 201D is not supplied by bus 22A via DC4. Examinee transitions to RNO step 10.1 Cue: Comments: <u>Transition to alternate path</u>	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐
STEP #8 EOP 2541 ATT. 4C RNO step 10.1.a.1	Performance: <u>ALTERNATE PATH</u> 10.1 <u>IF</u> the following conditions exist: • Bus 22A is de-energized with NO faults indicated • Bus 22B is energized <u>AND</u> available to supply Bus 22A <u>THEN</u> Perform the following: a. Cross-tie buses 22A <u>AND</u> 22B: 1. PLACE the control switches for “GROUP 1” and “GROUP 2” of pressurizer “BACKUP HTRS” in “PULL-TO-LOCK” Standard: Examinee identifies bus 22A is deenergized and bus 22B is available to supply 22A. Examinee places GP1 & GP2 pressurizer B/U heaters in PTL. Cue: Inform examinee as the Unit Supervisor that “No faults are indicated” Comments:	Critical: ☐ YES ☒ NO ☒ YES ☐ NO Grade: S ☐ U ☐
STEP #9 EOP 2541 ATT. 4C RNO step 10.1.a.2	Performance: 2. PLACE “SYN SEL SW 22A/22B” to, “CL TIE/TRIP A.” Standard: Examinee places the 22A/B sync selector switch to CL TIE/TRIP A. Cue: Comments:	Critical: ☒ YES ☐ NO Grade: S ☐ U ☐

PERFORMANCE INFORMATION

JPM Number: S3

Revision: 0/0

JPM Title: Perform actions for a deenergized Turbine Battery Charger

STEP #10 E O P 2 5 4 1 A T T . 4 C R N O step 1 0 . 1 . a . 3	Performance: 3. CLOSE B0111, "22A/22B TIE BKR, 22A-1T-2."	Critical: ☒ YES ☐ NO
	Standard: Examinee closes breaker B0111.	Grade: S ☐ U ☐
	Cue:	
	Comments: When Breaker B0111 closes, breaker B0102 will open, powering Bus 22A to Bus 24B through bus 22B	
STEP #11 E O P 2 5 4 1 A T T . 4 C R N O step 1 0 . 1 . a . 4	Performance: 4. PLACE "SYN SEL SW 22A/22B" to "OFF."	Critical: ☐ YES ☒ NO
	Standard: Examinee places SYN SEL SW 22A/22B to OFF.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #12 E O P 2 5 4 1 A T T . 4 C R N O step 1 0 . 1 . a . 5	Performance: 5. CHECK 480 volt Bus 22A voltage between 435 and 525 volts.	Critical: ☐ YES ☒ NO
	Standard: Examinee checks voltage is approximately 480 volts	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S3

Revision: 0/0

JPM Title: Perform actions for a deenergized Turbine Battery Charger

STEP # 13 E O P 2 5 4 1 A T T . 4 C R N O step 1 0 . 1 . b	Performance: 10.1.b <u>IF</u> 201D battery charger, DC4, is energized from non-vital 480V Bus 22A, <u>AND</u> Bus 201D voltage is greater than 126 VDC, <u>THEN</u> Proceed To step 11.	Critical: ☐ YES ☒ NO
	Standard: Examinee identifies, • 201D battery charger DC4 is powered from 22A • Bus 201D voltage greater than 126 VDC	Grade: S ☐ U ☐
	Cue: A PEO was sent to check voltage locally reports Bus 201D voltage = 129 volts and steady.	
	Comments: JPM Complete	

TERMINATION CUE: **The evaluation for this JPM is complete.**

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S3

Revision: 0/0

Task Title: Perform actions for a deenergized Turbine Battery Charger

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	7	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
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Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: S3

Revision: 0/0

- Initial Conditions:
- The plant has tripped from 100% power.
 - On the trip, the 6.9 kV buses did NOT transfer.
 - On the trip, a Facility 1 LNP occurred.
 - EOP 2525, Standard Post Trip Actions, is completed.
 - The crew transitioned to EOP 2528, Loss of Offsite Power/Loss of Forced Circulation.
 - EOP 2541, Standard Appendices, Appendix 04, Followup Actions, Attachment 4C, Follow-Up Actions – LOOP/LOFC, is in progress.
 - Bus 24C and 24D are energized by Emergency Diesel Generators.
 - Power has been restored to bus 24B and bus 22B.

Initiating Cues: The Unit Supervisor has directed you to perform steps 5-10 of EOP 2541, Standard Appendices, Appendix 04, Followup Actions, Attachment 4C, Follow-Up Actions – LOOP/LOFC.

Time Critical JPM: ☐ YES ☒ NO

Examinee: _____

JPM S4

(ISRO & RO only)

JPM Number: S4

Revision: 0/2

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: S4

Revision: 0/2

Task Title: Start a Reactor Coolant Pump

System: Reactor Coolant System

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☐ YES ☒ NO

Validated Time (minutes): 7

Task Number(s): 235322

Applicable To: SRO XX STA RO XX PEO

K/A Number: 003A4.09 K/A Rating: 3.6

Method of Testing: Simulated Performance: Actual Performance: XX

Location: Classroom: Simulator: XX In-Plant:

Task Standards: The task is satisfactorily met when the examinee starts the 'D' Reactor Coolant pump in accordance with OP 2301C, Reactor Coolant Pump Operation.

Required Materials: (procedures, equipment, etc.)

- OP 2301C, Reactor Coolant Pump Operation
- ARP 2590B-083, RCP A UPR OIL RSVR LEVEL LO (C02/03 BA-19)

General References:

- OP 2201, Plant Heat Up

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

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

JPM WORKSHEET

Initial Conditions: A plant heat-up is in progress following a refueling outage.

- Tc is = 505 °F and stable.
- Three RCPs are running.
- All parameters for the 'D' RCP are normal for this condition.
- OP 2301C, section 4.5 is complete through step 4.5.14.

Initiating Cues: The US has directed you to start the 'D' Reactor Coolant pump.

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. OP 2301C, Reactor Coolant Pump Operation, Section 4.5, Starting the 'D' Reactor Coolant Pump.

Simulator Requirements:

Set up PPC as follows (either option):

- MON 1 displaying **FPT** (P-T curve)
- ATC monitor displaying **RCP_D_TRENDS**
- ATC monitor displaying **RCP_BLEED**

OPTION 1 (Preferred):

Initialize at zero power, ARI.

- Secure the 'D' RCP.
- Cool RCS to ~ 505 °F
- Ensure plant is stable.

OPTION 2:

1. **Reset to IC- 341**

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

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

PERFORMANCE INFORMATION

JPM Number: S4

Revision: 0/2

Task Title: Starting a Reactor Coolant pump

START TIME: _____

STEP #1 OP 2301C step 4.5.15 NOTE	Performance: NOTE: When starting RCPs at low RCS pressure conditions (265 to 1,700 psia), RCP bleedoff flow low alarms may not clear due to insufficient Bleedoff flow. As RCS pressure increases, bleedoff flow increases and alarm should clear at approximately 1,700 psia.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges the note.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #2 OP 2301C step 4.5.15	Performance: IF RCS pressure is greater than 1700 psia, PERFORM the following: - CHECK, "RCP D BLEEDOFF FLOW LO" annunciator (CA-29) not lit (C-02/3). - OBSERVE controlled bleedoff flow on PPC or PR-150B (C-04R) between 0.75 and 2 gpm.	Critical: ☐ YES ☒ NO
	Standard: Examinee: - Verifies annunciator RCP D BLEEDOFF FLOW LO (C-02/3, CA-29) not alarming - Displays and monitors 'D' RCP bleedoff flow on the PPC, or on C-04R.	Grade: S ☐ U ☐
	Cue:	
	Comments: Initial Conditions will have PPC screen set up to view RCP Bleedoff.	
STEP #3 OP 2301C step 4.5.16	Performance: PLACE "RCP-D LIFT PPS, P-51D/53D" switch to "START" (C-03).	Critical: ☒ YES ☐ NO
	Standard: Examinee starts RCP-D LIFT PPS, P-51D/53D.	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S4

Revision: 0/2

Task Title: Starting a Reactor Coolant pump

STEP #4 OP 2301C step 4.5.17	Performance: ENSURE annunciator AB-30, RCP D ANTIREV ROT FLOW LO, clear, indicating bearing oil lift pump operation (C-03).	Critical: ☐ YES ☒ NO
	Standard: Examinee resets and silences RCP D ANTIREV ROT FLOW LO (AB-30, C-03) annunciator.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #5 OP 2301C step 4.5.18	Performance: WHEN the bearing oil lift pumps have run for at least two minutes, PLACE 'RCP-D, P-40D' switch to 'START' (C-03).	Critical: ☒ YES ☐ NO
	Standard: Examinee commences timing two (2) minutes. After the 2 minutes elapse, the examinee starts the 'D' RCP	Grade: S ☐ U ☐
	Cue: If desired, notify the examinee that "two minutes has elapsed".	
	Comments: At the discretion of the examiner, the 2 minutes can be "time-compressed".	
STEP #6 OP 2301C step 4.5.19	Performance: OBSERVE RCP amp meter as RCP starts and ENSURE the following: a. Meter deflects to full scale high when pump switch turned to start (C-03). b. Meter decays to running current, between 450 and 600 amps depending on RCS temperature, as RCP accelerates to operating speed (about 20 seconds) (C-03).	Critical: ☐ YES ☒ NO
	Standard: Examinee notes 'D' RCP amperage peg high, then decay to between 450 and 600 amps (C-03)	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S4

Revision: 0/2

Task Title: Starting a Reactor Coolant pump

STEP # 7 O P 2 3 0 1 C step 4 . 5 . 2 0	Performance: WHEN RCP is above 90% speed ["RCP LO SPEED TRIP CH D" annunciator (BB-4, on C-04) not lit], PLACE "RCP-D LIFT PPS, P-51D/53D" to "AUTO" (C-03).	Critical: ☐ YES ☒ NO
	Standard: Examinee resets and silences RCP LO SPEED TRIP CH D (C-04, BB-4) Examinee secures RCP-D LIFT PPS, P-51D/53D and places switch in 'AUTO'.	Grade: S ☐ U ☐
	Cue: JPM is complete.	
	Comments:	

TERMINATION CUE: The evaluation for this JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S4

Revision: 0/2

Task Title: Starting a Reactor Coolant Pump

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	7	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
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Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: S4

Revision: 0/2

Initial Conditions: A plant heat-up is in progress following a refueling outage.

- Tc is = 505 °F and stable.
- Three RCPs are running.
- All parameters for the 'D' RCP are normal for this condition.
- OP 2301C, section 4.5 is complete through step 4.5.14.

Initiating Cues: The US has directed you to start the 'D' Reactor Coolant pump.

Time Critical JPM: ☐ YES ☒ NO

Examinee: _____

JPM S5

(ISRO & RO only)

JPM Number: S5

Revision: 4/0

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: S5

Revision: 4/0

Task Title: Perform a shutdown from outside the control room

System: Auxiliary Feedwater

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☐ YES ☒ NO

Validated Time (minutes): 7

Task Number(s): 235163

Applicable To: SRO XX STA RO XX PEO

K/A Number: 068AA1.01 K/A Rating: 4.0

Method of Testing: Simulated Performance: Actual Performance: XX

Location: Classroom: Simulator: XX In-Plant:

Task Standards: The task is satisfactorily met when the examinee demonstrates control of Auxiliary Feedwater flow to the Steam Generators by feeding both Steam Generators at 200 ± 50 gpm each in accordance with step 3.16 of AOP 2551, Shutdown from Outside the Control Room.

Required Materials: AOP 2551, Shutdown from Outside the Control Room.
(procedures, equipment, etc.)

General References:

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

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

JPM WORKSHEET

Initial Conditions: The following sequence of events has occurred:

- The Control Room has been evacuated.
- The crew tripped the unit prior to evacuating the Control Room.
- The plant is in MODE 3.

Current Conditions are as follows:

- AOP 2551, Shutdown from Outside the Control Room, is in progress.

Initiating Cues: The US has directed you to perform step 3.16 of AOP 2551, Shutdown from Outside the Control Room, and demonstrate control of Auxiliary Feedwater flow to the Steam Generators by feeding both Steam Generators at 200 ± 50 gpm each.

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood)

1. AOP 2551, Shutdown from Outside the Control Room, step 3.16.

Simulator Requirements: OPTION 1: (Preferred):

1. **Reset to IC- 342**

OPTION 2:

1. **Reset to a 100% IC**
2. **Perform steps in AOP 2551**

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

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

PERFORMANCE INFORMATION

JPM Number: S5

Revision: 4/0

JPM Title: Feed Steam Generators from C-21 using MDAFW pumps

START TIME: _____

STEP #1 A O P 2 5 5 1 3 . 1 6 . a	Performance: MAINTAIN steam generator level 40 to 70% as follows: a. PLACE the following switches to "REMOTE" (C-21): - AUX. FEEDWATER S.G. #1 CONT TRANS SELECTOR SW (HS-5276C) - AUX. FEEDWATER S.G. #2 CONT TRANS SELECTOR SW (HS-5279C)	Critical: ☒ YES ☐ NO
	Standard: Examinee places the following Handswitches in 'REMOTE' - AUX. FEEDWATER S.G. #1 CONT TRANS SELECTOR SW (HS-5276C) - AUX. FEEDWATER S.G. #2 CONT TRANS SELECTOR SW (HS-5279C)	Grade: S ☐ U ☐
	Cue:	
	Comments: This steps transfers control of the AFW components to the Hot Shutdown Panel (C-21)	
STEP #2 A O P 2 5 5 1 3 . 1 6 . b	Performance: b. ENSURE BOTH MDAFW pumps operating	Critical: ☐ YES ☒ NO
	Standard: Examinee ensures both MDAFW pumps are operating by the following: - RED light lit above AFW pump switches - AFW flow indicated to both S/Gs	Grade: S ☐ U ☐
	Cue:	
	Comments: Both AFW pumps will be running due to AAFW actuation	

PERFORMANCE INFORMATION

JPM Number: S5

Revision: 4/0

JPM Title: Feed Steam Generators from C-21 using MDAFW pumps

STEP #3 A O P 2 5 5 1 3 . 1 6 . c	Performance: c. ESTABLISH feed to at least one steam generator using any of the following: - FW-43A - FW-43B - FW-56A - FW-56B	Critical: ☐ YES ☒ NO
	Standard: Examinee notes that both FW-43A and FW43B are full open, feeding the S/Gs. - The AFW FRVs indicate open by their controller - AFW flow is indicated by the flow indicators	Grade: S ☐ U ☐
	Cue:	
	Comments: The AFW Regulating valves will be full open due the AAFW actuation.	
STEP #4 A O P 2 5 5 1 3 . 1 6 . d	Performance: d. IF AFAS has actuated AND at least one steam generator is being restored to between 40 and 70%, THEN PERFORM the following (C-21): 1) PLACE auxiliary feed "OVERRIDE/MAN START RELAY RESET (4188C / 4188D)" handswitches in "PULL TO LOCK".	Critical: ☒ YES ☐ NO
	Standard: Examinee places the following Handswitches in 'PULL TO LOCK' - OVERRIDE/MAN START RELAY RESET (4188C) - OVERRIDE/MAN START RELAY RESET (4188D)	Grade: S ☐ U ☐
	Cue:	
	Comments: This action removes the AAFW actuation signal input to the AFW pumps and AFW Regulating valves. The pumps remain running and the valves remain full open if an AAFW signal was present.	

PERFORMANCE INFORMATION

JPM Number: S5

Revision: 4/0

JPM Title: Feed Steam Generators from C-21 using MDAFW pumps

STEP #5 A O P 2 5 5 1 3 . 1 6 . d	Performance: 2) PLACE the following switches to "OVRD" (C-21): 2-FW-43A (HS-5276B) S/G 1 AUX FEEDWATER REG (22-2E), RESET/NORM/ OVRD SWITCH 2-FW-43B (HS-5279B) S/G 2 AUX FEEDWATER REG (22-2F), RESET/NORM/ OVRD SWITCH	Critical: ☒ YES ☐ NO
	Standard: Examinee places the following Handswitches in 'OVRD' 2-FW-43A (HS-5276B) S/G 1 AUX FEEDWATER REG (22-2E), RESET/NORM/ OVRD SWITCH 2-FW-43B (HS-5279B) S/G 2 AUX FEEDWATER REG (22-2F), RESET/NORM/ OVRD SWITCH	Grade: S ☐ U ☐
	Cue:	
	Comments: This action allows the AFW Regulating valves to be operated by the controller vice being failed open.	
STEP #6 A O P 2 5 5 1 3 . 1 6 . d	Performance: 1) OPERATE ANY of the following to restore and maintain steam generator levels (C-21): - Motor driven auxiliary feedwater pump - Turbine driven auxiliary feedwater pump - AUX. FEEDWATER S.G. #1 VALVE CONTROLLER (HIC-5276B) - AUX. FEEDWATER S.G. #2 VALVE CONTROLLER (HIC-5279B)	Critical: ☒ YES ☐ NO
	Standard: The examinee throttles back on flow to both S/Gs to ensure they have control of the AFW Regulating valves by performing the following: - Place controller selector to 'M' - Operate thumbwheel to establish desired flow rate to the steam generators. Note: The examinee may secure a MDAFW pump to control feed flow.	Grade: S ☐ U ☐
	Cue: Direct the examinee to adjust flow to achieve 200 ± 50 gpm to each S/G.	
	Comments:	
	When control of feedwater is demonstrated, this JPM is complete.	

TERMINATION CUE: The evaluation for this JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S5

Revision: 4/0

Task Title: Complete a shutdown from outside the Control Room

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	7	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: S5

Revision: 4/0

Initial Conditions: The following sequence of events has occurred:

- The Control Room has been evacuated.
- The crew tripped the unit prior to evacuating the Control Room.
- The plant is in MODE 3.

Current Conditions are as follows:

- AOP 2551, Shutdown from Outside the Control Room, is in progress.

Initiating Cues: The US has directed you to perform step 3.16 of AOP 2551, Shutdown from Outside the Control Room, and demonstrate control of Auxiliary Feedwater flow to the Steam Generators by feeding both Steam Generators at 200 ± 50 gpm each.

Time Critical JPM: ☐ YES ☒ NO

Examinee: _____

JPM S6 (A11)

JPM Number: S6

Revision: 0/0

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: S6

Revision: 0/0

Task Title: **Manually initiate an engineered safety features actuation system function.**

System: Engineered Safety Features Actuation System

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☐ YES ☒ NO

Validated Time (minutes): 7

Task Number(s): 235857

Applicable To: SRO XX STA RO XX PEO

K/A Number: 013A4.03 K/A Rating: 4.4

Method of Testing: Simulated Performance: Actual Performance: XX

Location: Classroom: Simulator: XX In-Plant:

Task Standards: The task is satisfactorily met when the examinee manually initiates AEAS from the Control Room, then verifies EBFS is operating in AEAS mode and CRACS is operating in recirculation mode in accordance with AOP 2577, Fuel Handling Accident.

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

General References: None

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

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

JPM WORKSHEET

Initial Conditions: A fuel handling accident has occurred in the Spent Fuel Pool.
The crew has entered AOP 2577, Fuel Handling Accident.

Initiating Cues: The US has directed you to initiate AEAS at C-01 and place CRACS in recirculation mode in accordance with AOP 2577, Fuel Handling Accident, steps 4.3 and 4.4.

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood):

1. AOP 2577, Fuel Handling Accident, Section 4.0, Fuel Handling Accident in the Spent Fuel Pool

Simulator Requirements: OPTION 1: (Preferred):

1. **Reset to any IC**
2. Insert override 05A1A3S6 to START (Keeps F-20 running)
3. Insert override 05A1A3S6 to STOP on event 17
 - a. Edit Event 17 to ZHS8141AD(1) → Secures F-20 when handswitch taken to off

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

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

PERFORMANCE INFORMATION

JPM Number: S6

Revision: 0/0

JPM Title: Initiate Auxiliary Exhaust Actuation System

START TIME: _____

STEP # 1 A O P 2 5 7 7 step 4.3	Performance: Refer To Attachment 1 and VERIFY EBFS is operating in the AEAS mode.	Critical: ☒ YES ☐ NO
	Standard: Examinee pushes Facility 1 and Facility 2 AEAS pushbuttons on C-01	
	Cue: Direct examinee to "Initiate AEAS from C-01."	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S6

Revision: 0/0

JPM Title: Initiate Auxiliary Exhaust Actuation System

STEP # 2 A O P 2 5 7 7 step 4.3	Performance: Refer To Attachment 1 and VERIFY EBFS is operating in the AEAS mode. Standard: The examinee notes that F-20 is still running and places FUEL HANDLE AREA SPLY FAN F20 handswitch to STOP. Attachment 1: At least one OPERABLE EBFS Train operating in the Auxiliary Exhaust Mode as indicated below for Facility 1 and / or Facility 2 <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;">Item</th> <th style="width: 15%;">Facility 1</th> <th style="width: 15%;">Facility 2</th> <th style="width: 10%;">Location</th> <th style="width: 10%;">Required Condition</th> <th style="width: 25%;">Grade: S ☐ U ☐</th> </tr> </thead> <tbody> <tr> <td>EBFS FAN</td> <td>F-25A</td> <td>F-25B</td> <td rowspan="6">C-01</td> <td>ON</td> <td>☐ YES ☒ NO</td> </tr> <tr> <td>HDR ISOL</td> <td>EB-51</td> <td>EB-41</td> <td>OPEN</td> <td>☐ YES ☒ NO</td> </tr> <tr> <td>EBFS SUCT DMPR</td> <td>EB-50</td> <td>EB-40</td> <td>CLOSED</td> <td>☐ YES ☒ NO</td> </tr> <tr> <td>FAN DIS DMPR</td> <td>EB-52</td> <td>EB-42</td> <td>OPEN</td> <td>☐ YES ☒ NO</td> </tr> <tr> <td>FUEL AREA SUCT DMPR</td> <td>EB-60</td> <td>EB-61</td> <td>OPEN</td> <td>☐ YES ☒ NO</td> </tr> <tr> <td>CTMT CLEANUP TO EBFS</td> <td>EB-73</td> <td>EB-72</td> <td>CLOSED</td> <td>☐ YES ☒ NO</td> </tr> <tr> <td>COND AIR RMVL MILLSTONE STACK,</td> <td>EB-56</td> <td>EB-55</td> <td rowspan="3">C-06</td> <td>CLOSED</td> <td>☐ YES ☒ NO</td> </tr> <tr> <td>FUEL HANDLE AREA SPLY FAN</td> <td>F-20</td> <td>F-20</td> <td>OFF</td> <td>☒ YES ☐ NO</td> </tr> <tr> <td>MAKE-UP DMPR</td> <td>EB-171</td> <td>EB-171</td> <td>CLOSED</td> <td>☐ YES ☒ NO</td> </tr> <tr> <td>38' 6" Aux. Bldg. floor plugs (2)</td> <td>38' 6" floor plugs</td> <td>38' 6" floor plugs</td> <td>Aux. Bldg.</td> <td>INSTALLED</td> <td>☐ YES ☒ NO</td> </tr> </tbody> </table>	Item	Facility 1	Facility 2	Location	Required Condition	Grade: S ☐ U ☐	EBFS FAN	F-25A	F-25B	C-01	ON	☐ YES ☒ NO	HDR ISOL	EB-51	EB-41	OPEN	☐ YES ☒ NO	EBFS SUCT DMPR	EB-50	EB-40	CLOSED	☐ YES ☒ NO	FAN DIS DMPR	EB-52	EB-42	OPEN	☐ YES ☒ NO	FUEL AREA SUCT DMPR	EB-60	EB-61	OPEN	☐ YES ☒ NO	CTMT CLEANUP TO EBFS	EB-73	EB-72	CLOSED	☐ YES ☒ NO	COND AIR RMVL MILLSTONE STACK,	EB-56	EB-55	C-06	CLOSED	☐ YES ☒ NO	FUEL HANDLE AREA SPLY FAN	F-20	F-20	OFF	☒ YES ☐ NO	MAKE-UP DMPR	EB-171	EB-171	CLOSED	☐ YES ☒ NO	38' 6" Aux. Bldg. floor plugs (2)	38' 6" floor plugs	38' 6" floor plugs	Aux. Bldg.	INSTALLED	☐ YES ☒ NO	Critical: ☒ YES ☐ NO
Item	Facility 1	Facility 2	Location	Required Condition	Grade: S ☐ U ☐																																																								
EBFS FAN	F-25A	F-25B	C-01	ON	☐ YES ☒ NO																																																								
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38' 6" Aux. Bldg. floor plugs (2)	38' 6" floor plugs	38' 6" floor plugs	Aux. Bldg.	INSTALLED	☐ YES ☒ NO																																																								
Cue: 1. If the examinee verifies proper operation of AEAS from C-01X and continues on to verifying CRAC without addressing Fan 20, query them: "Is step 4.3 complete?" 2. When examinee calls PEO for status of floor plugs, report that "floor plugs are installed". Comments: 1. Even though AEAS is initiated by the C-01 pushbuttons, the examinee is still required to VERIFY the system has actuated properly. 'VERIFY' allows the operator to take actions to reposition component manually. 2. The examinee may verify proper operation of AEAS from C-01X.																																																													

PERFORMANCE INFORMATION

JPM Number: S6

Revision: 0/0

JPM Title: Initiate Auxiliary Exhaust Actuation System

STEP # 3 A O P 2 5 7 7 step 4.4	Performance: CHECK at least one train of CRACS operating in recirculation mode (C25).			Critical: ☐ YES ☒ NO
	Standard: Examinee checks CRACS status:			Grade: S ☐ U ☐
	Facility 1	Required Condition	Facility 2	
	HV-203A, Fan F-21A exhaust damper	OPEN	HV-203B, Fan F-21B exhaust damper	
	Fan F-21A, supply fan	RUNNING	Fan F-21B, supply fan	
	HV-206A, Fan F-31A exhaust damper	OPEN	HV-206B, Fan F-31B exhaust damper	
Fan F-31A, exhaust fan	RUNNING	Fan F-31B, exhaust fan		
HV-212A, Fan F-32A exhaust damper	OPEN	HV-212B, Fan F-32B exhaust damper		
Fan F-32A, filter fan	RUNNING	Fan F-32B, filter fan		
HV-202, minimum fresh air damper	CLOSED	HV-495, fresh air damper		
HV-207, cable vault exhaust damper	CLOSED	HV-496, exhaust air damper		
HV-208, exhaust air damper	CLOSED	HV-497, cable vault exhaust damper		
Cue:				
Comments:				

TERMINATION CUE: The evaluation for this JPM is complete.

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S6

Revision: 0/0

Task Title: Initiate Auxiliary Exhaust Actuation System

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	7	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
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Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: S6

Revision: 0/0

Initial Conditions: A fuel handling accident has occurred in the Spent Fuel Pool.
The crew has entered AOP 2577, Fuel Handling Accident.

Initiating Cues: The US has directed you to initiate AEAS at C-01 and place CRACS in recirculation mode in accordance with AOP 2577, Fuel Handling Accident, steps 4.3 and 4.4.

Time Critical JPM: ☐ YES ☒ NO

Examinee: _____

JPM S7 (RO only)

JPM Number: S7

Revision: 3/0

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: S7

Revision: 3/0

Task Title: **Conduct a gaseous Radwaste discharge.**

System: Waste Gas disposal system

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☐ YES ☒ NO

Validated Time (minutes): 12

Task Number(s): 234873

Applicable To: SRO XX STA RO XX PEO XX

K/A Number: 071A2.05 K/A Rating: 3.5/3.1

Method of Testing: Simulated Performance: Actual Performance: XX

Location: Classroom: Simulator: XX In-Plant:

Task Standards:

- At the completion of this JPM, the examinee has successfully adjusted and tested the HI Radiation Alarm, Alert, and Instrument Fail setpoints as well as performing a source check of the Waste Gas Discharge radiation monitor, RM-9095, in preparation of a Waste Gas Tank discharge in accordance with SP 2617BA, 'A' WGDG Gaseous Waste Discharge steps 4.1.16 to 4.1.19.

Required Materials:
(procedures, equipment,
etc.)

- SP 2617BA, 'A' WGDG Gaseous Waste Discharge
- OPS Form 2617BA-001, 'A' WGDG Gaseous Waste Discharge
- SP 2848-002, Manually Generated Gaseous Discharge Permit - MP 2
- Trip current test patch cord and Allen wrench (at RC-14)

General References:

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

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

JPM WORKSHEET

Initial Conditions: The 'A' Waste Gas Decay Tank has been approved for discharge.

Initiating Cues: The US has directed you to set up the Waste Gas Rad Monitor, RM-9095, for the discharge in accordance with SP 2617BA.

The examiner will perform the following duties for the whole evolution:

- Independent/concurrent verifier.
- Data recorder.

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood):

1. SP 2167BA, 'A' WGDG Gaseous Waste Discharge,
 - a. Sections 1, 2, and 3
 - b. Section 4.1 Preparations for 'A' Waste Gas Decay Tank Discharge
2. SP 2848-003, Discharge Permit

Simulator Requirements:

1. Run potentiometer full scale a few times prior to performing the JPM to 'wipe' the contacts.
2. Run the potentiometer to minimum position prior to performing each individual JPM.

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

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

PERFORMANCE INFORMATION

JPM Number: S7

Revision: 3/0

JPM Title: Setting up RM-9095 for 'A' Waste Gas Decay Tank discharge

START TIME: _____

STEP #1 SP 2617BA 4.1.16 NOTE	Performance: NOTE 1. The blue disk surrounds the "ALERT" potentiometer and the red disk surrounds the "ALARM" potentiometer. 2. The following alarms are expected while setpoints are adjusted: - PPC ALARM RM-9095 C-06/7 DA-24, "PROCESS MON RAD HI HI/FAIL" - C-06/7 DB-24, "PROCESS MON RADIATION HI" - C-06/7 BB-20, "GASEOUS WASTE PANEL TROUBLE" - C-61 A-5, "WASTE GAS DECAY TANK EFF TO STACK RADIATION HI"	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges note.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #2 SP 2617BA 4.1.16 a & b	Performance: Using Concurrent Verification, SET ALERT setpoints on RIT-9095, "WASTE GAS DISCHARGE TO MILLSTONE STACK," as follows (RC-14A): a. CONNECT test lead to RIT-9095 "TEST" jack. b. CONNECT other end of test lead to "CURRENT TRIP TEST OUTPUT" jack (RC-14B).	Critical: ☒ YES ☐ NO
	Standard: Examinee connects test lead between the RM 9095 'TEST' jack and 'CURRENT TRIP TEST OUTPUT' jack	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S7

Revision: 3/0

JPM Title: Setting up RM-9095 for 'A' Waste Gas Decay Tank discharge

STEP # 3 SP 2617BA 4.1.16 c - m	Performance: ALERT setpoint and verification Using Concurrent Verification, SET ALERT setpoints on RIT-9095, "WASTE GAS DISCHARGE TO MILLSTONE STACK," as follows (RC-14A): c. ROTATE "CURRENT TRIP TEST ADJUST" knob <i>clockwise</i> to raise or <i>counterclockwise</i> to lower meter indication until it conservatively indicates ALERT setpoint specified on the following forms: • SP 2848-003, "Gaseous Discharge Permit - MP2" • SP 2848-002, "Manually Generated Gaseous Discharge Permit - MP 2" d. INSERT Allen wrench in "ALERT" potentiometer. e. IF "ALERT" light is lit, PERFORM the following: 1) PRESS and HOLD "ALARM RESET" pushbutton. 2) ROTATE "ALERT" potentiometer counterclockwise until "ALERT" light extinguishes. 3) WHEN "ALERT" light extinguishes, RELEASE "ALARM RESET" pushbutton. f. ROTATE "ALERT" potentiometer clockwise until "ALERT" light is lit. g. REMOVE Allen wrench. h. ROTATE "CURRENT TRIP TEST ADJUST" knob counterclockwise ¼ turn. i. Momentarily PRESS "ALARM RESET" pushbutton. j. ROTATE "CURRENT TRIP TEST ADJUST" knob clockwise to raise meter indication until "ALERT" light is lit. k. COMPARE indication when "ALERT" light is lit to specified alert setpoint. l. IF setpoint is less than or equal to ALERT setpoint specified on the following forms, RECORD actual ALERT setpoint (from RIT-9095 meter) and INITIAL on SP 2617BA-001: • SP 2848-003, "Gaseous Discharge Permit - MP2" • SP 2848-002, "Manually Generated Gaseous Discharge Permit - MP 2" m. IF setpoint is not correct, Go To step 4.1.16.c	Critical: ☒ YES ☐ NO
	Standard: Examinee uses Allen wrench to set ALERT setpoint, then uses Current Trip Test adjust knob to verify Alert setpoint is = 3,250 ± 1000 cpm..	Grade: S ☐ U ☐
	Cue: 1. Inform the examinee that you (the examiner) will record the data on the Surveillance form. 2. If Step h. does not reset ALERT light, have the examinee adjust the potentiometer down more (CCW)	
	Comments: 1. The bolded steps are Critical 2. The Current Trip Test adjustment knob sends a test signal to the rad monitor simulating a radiation reading. The Allen wrench is used to adjust the ALARM radiation setpoint.	

PERFORMANCE INFORMATION

JPM Number: S7

Revision: 3/0

JPM Title: Setting up RM-9095 for 'A' Waste Gas Decay Tank discharge

STEP # 4 SP 2617BA 4.1.17 a - k	Performance: ALARM setpoint and verification Using Concurrent Verification, SET ALARM setpoints on RIT-9095, "WASTE GAS DISCHARGE TO MILLSTONE STACK," as follows (RC-14A): a. ROTATE "CURRENT TRIP TEST ADJUST" knob <i>clockwise</i> to raise or <i>counterclockwise</i> to lower meter indication until it conservatively indicates ALARM setpoint specified on the following forms: • SP 2848-003, "Gaseous Discharge Permit - MP2" • SP 2848-002, "Manually Generated Gaseous Discharge Permit - MP 2" b. INSERT Allen wrench in "ALARM" potentiometer. c. IF "ALARM" light is lit, PERFORM the following: 1) PRESS and HOLD "ALARM RESET" pushbutton. 2) ROTATE "ALARM" potentiometer counterclockwise until "ALARM" light extinguishes. 3) WHEN "ALARM" light extinguishes, RELEASE "ALARM RESET" pushbutton. d. ROTATE "ALARM" potentiometer clockwise until "ALARM" light is lit. e. REMOVE Allen wrench. f. ROTATE "CURRENT TRIP TEST ADJUST" knob counterclockwise ¼ turn. g. Momentarily PRESS "ALARM RESET" pushbutton. h. ROTATE "CURRENT TRIP TEST ADJUST" knob clockwise to raise meter indication until "ALARM" light is lit. i. COMPARE indication when "ALARM" light is lit to specified alert setpoint. j. IF setpoint is less than or equal to ALARM setpoint specified on the following forms, RECORD actual ALARM setpoint (from RIT-9095 meter) and INITIAL on SP 2617BA-001: • SP 2848-003, "Gaseous Discharge Permit - MP2" • SP 2848-002, "Manually Generated Gaseous Discharge Permit - MP 2" k. IF setpoint is not correct, Go To step 4.1.16.c	Critical: ☒ YES ☐ NO
	Standard: Examinee uses Allen wrench to set ALARM setpoint, then uses Current Trip Test adjust knob to verify ALARM setpoint is = 6,250 ± 1000 cpm.	Grade: S ☐ U ☐
	Cue: 1. Inform the examinee that you (the examiner) will record the data on the Surveillance form. 2. If Step f. does not reset ALARM light, have the examinee adjust the potentiometer down more (CCW)	
	Comments: 1. The bolded steps are Critical 2. The Current Trip Test adjustment knob sends a test signal to the rad monitor simulating a radiation reading. The Allen wrench is used to adjust the ALARM radiation setpoint.	

PERFORMANCE INFORMATION

JPM Number: S7

Revision: 3/0

JPM Title: Setting up RM-9095 for 'A' Waste Gas Decay Tank discharge

STEP # 5 SP 2 6 1 7 B A 4 . 1 . 1 8 NOTE	Performance: NOTE The following step causes an "INSTR FAIL" condition. Instrument fail condition is cleared during performance of SOURCE CHECK.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges note.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP # 6 SP 2 6 1 7 B A 4 . 1 . 1 8	Performance: PERFORM the following to check for "INSTR FAIL" response: a. ROTATE "CURRENT TRIP TEST ADJUST," knob counterclockwise to "minimum" position (travel limit of knob or needle indicating less than lowest graduation). b. PRESS "ALARM RESET" pushbutton until "ALARM" light, and "ALERT" light not lit. c. CHECK "INSTR FAIL" light lit. d. DISCONNECT test lead from "CURRENT TRIP TEST OUTPUT" jack (RC-14B). e. DISCONNECT other end of test lead from RIT-9095 "TEST" jack.	Critical: ☒ YES ☐ NO
	Standard: Examinee verifies Instrument Fail by simulating zero current to RM-9095, then disconnects test lead between Test jack and "CURRENT TRIP TEST OUTPUT" jack	Grade: S ☐ U ☐
	Cue: 1. Inform the examinee that you (the examiner) will record the data on the Surveillance form. 2. If Step a. does not reset the ALARM and ALERT lights, have the examinee adjust the potentiometer down more (CCW)	
	Comments: The bolded steps are Critical	

PERFORMANCE INFORMATION

JPM Number: S7

Revision: 3/0

JPM Title: Setting up RM-9095 for 'A' Waste Gas Decay Tank discharge

STEP # 7 SP 2617BA 4.1.19 CAUTION	Performance: CAUTION The meter must be allowed to stabilize prior to performing SOURCE CHECK. If it is still rising to background when released, the meter will not be lowering.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges CAUTION	Grade: S ☐ U ☐
	Cue:	
	Comments: Step 4.1.18 removed any signal (real or simulated) from RIT-9095. After the test leads are removed, the module will be receiving a signal from the rad monitor, causing its indication to rise. The Caution ensures the RM loop is stable prior to proceeding to the SOURCE CHECK.	
STEP # 8 SP 2617BA 4.1.19	Performance: Using Concurrent Verification, PERFORM channel SOURCE CHECK for RIT-9095, "WASTE GAS DISCHARGE TO MILLSTONE STACK," as follows (RC-14A): a. PLACE and HOLD "UPSCALE CHECK" switch to "IN" position. b. OBSERVE meter rate rising. c. RELEASE "UPSCALE CHECK" switch to "OUT" position. d. OBSERVE meter rate lowering. e. IF meter rate does not raise or lower, NOTIFY SM/US. f. PRESS "ALARM RESET" pushbutton to ensure the following lights are reset: • ALARM • ALERT • INSTR FAIL g. INITIAL SP 2617BA-001 for SOURCE CHECK complete.	Critical: ☒ YES ☐ NO
	Standard: Examinee performs Source Check on RM-9095 loop	Grade: S ☐ U ☐
	Cue:	
	Comments: The bolded steps are Critical	

TERMINATION CUE: **The evaluation for this JPM is complete.**

PERFORMANCE INFORMATION

JPM Number: S7

Revision: 3/0

JPM Title: Setting up RM-9095 for 'A' Waste Gas Decay Tank discharge

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S7

Revision: 3/0

Task Title: Setting up RM-9095 for 'A' Waste Gas Decay Tank discharge

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	12	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: S7

Revision: 3/0

Initial Conditions: The 'A' Waste Gas Decay Tank has been approved for discharge.

Initiating Cues: The US has directed you to set up the Waste Gas Rad Monitor, RM-9095, for the discharge in accordance with SP 2617BA.

The examiner will perform the following duties for the whole evolution:

- Independent/concurrent verifier.
- Data recorder.

Time Critical JPM: ☐ YES ☒ NO

MILLSTONE NUCLEAR POWER STATION
Gaseous Discharge permit

Permit no.
Tank

G-EFF2-20230506-232-B (08-SEP-24-20001
MP2 WGDT-A

Unit 2

To: Shift Manager

From: Chemistry

Sampled By:

JP JP

Sample Date/time.:
09/08/2024 18:59

Date tank isolated.:
09/08/2024 12:52

Tritium Concentration ...: 1.170E-07 (uCi/ml)

(A)

(B)

(A) * (B) = (C)

Isotope

Activity

RM Response Factor

RM Response

(uCi/cc)

(cpm/uCi/cc)

(ccpm)

Xe-133

7.2840E-07

2.0000E+05

1.4568E-01

Totals...: (D)

7.2840E-07

(E)

1.4568E-01

Nitrogen (%)

63.3

Hydrogen (%)

37.3

Oxygen (%)

40.10

SM/US Init.

Maximum allowable discharge flow rate*..

[7200.0/(D)]*0.127/20=

6.2768E+07

(cfh)

(actual discharge flow rate not to exceed 3,000 cfh)

*1. Maximum allowable discharge flow rate is the REMODCM limit.

*2. For RM9095 nonfunctional, review by Chemistry Supervision or Radioactive

Effluent Coordinator:

Gaseous monitor alert setpoint.....

rt = 2000 or 5000 + background; otherwise

3.2500E+03

(cpm)

Gaseous monitor alarm setpoint.....

then Alarm = 5000 + background; otherwise

6.2500E+03

(cpm)

=====

Gaseous Effluent Monitor Readings

Oper/Chem Init.

Background prior to discharge

1.240E+03

(cpm)

15 minutes after start of discharge

(cpm)

=====

To: Chemistry

From: SM

Discharge

Start

End

Date

Time

Tank

Pressure

(psig)

Integrator

Reading

(FQI-9097)

Discharge

Flow Rate

(cfh)

Oper

P

KF

SM/US

Date

Time

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Examinee: _____

JPM S8 (A11)

JPM Number: S8

Revision: 0/0

JPM WORKSHEET

Facility: ☒ MP2 ☐ MP3

Task/JPM Number: S8

Revision: 0/0

Task Title: Shift Reactor Building Closed Cooling Water pumps

System: RBCCW

Time Critical Task: ☐ YES ☒ NO

Alternate Path: ☒ YES ☐ NO

Validated Time (minutes): 5

Task Number(s): 235330

Applicable To: SRO XX STA RO XX PEO

K/A Number: 008A4.01 K/A Rating: 3.7

Method of Testing: Simulated Performance: Actual Performance: XX

Location: Classroom: Simulator: XX In-Plant:

Task Standards: The task is satisfactorily met when the examinee recognizes a Loss of Facility 1 RBCCW and performs the actions of AOP 2582, Immediate Operator Actions which include tripping the reactor and then securing the 'A' and 'C' Reactor Coolant Pumps.

Required Materials: OP 2330A, RBCCW System
(procedures, equipment,
etc.)

General References: AOP 2585, Immediate Operator Actions

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

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

JPM WORKSHEET

- Initial Conditions:
- The RBCCW system is operating with the 'A' and 'C' Pumps operating.
 - The 'A' and 'C' RBCCW Heat exchangers are in service.

- Initiating Cues:
- The US has directed you to start the 'B' RBCCW pump and secure the 'A' RBCCW pump in accordance with OP 2330A, RBCCW System, Section 4.2.
 - A PEO is stationed at the RBCCW area. All pre-start checks are done and SAT.
 - A PEO is stationed at breaker A504.

Time Critical JPM: ☐ YES ☒ NO

Handouts (handout after cues are read and understood):

1. OP 2330A, RBCCW System
 - a. Sections 1, 2, and 3
 - b. Section 4.2, Shifting from 'A' RBCCW Pump to 'B' RBCCW Pump

- Simulator Requirements:
1. 'A' and 'C' RBCCW pumps in service.
 2. 'A' and 'C' RBCCW heat exchangers in service.
 3. Bus 24E aligned to 24C.
 4. The following pinned to the ThunderBar desktop:
 - a. Remote CCR06, ISOL VLV 2-RB-3A DOWNSTREAM P-11A (%)
 - b. Malfunction **CC01B**, RBCCW PP P-11B TRIP

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

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

PERFORMANCE INFORMATION

JPM Number: S8

Revision: 0/0

Task Title: Shift Reactor Building Closed Cooling Water pumps

START TIME: _____

STEP #1 OP 2330A Step 4.2.1 CAUTION	Performance: CAUTION: 1. If an RBCCW pump is shutdown, and it is not required to automatically start on SIAS or LNP signal, respective switch must be placed in "PULL-TO -LOCK" (C-06). 2. To minimize the possibility of exceeding DG load limits while shifting swing RBCCW pump, the following must be observed: When two RBCCW pumps are available to start from the same bus (i.e., not in "PULL-TO -LOCK") the "B" RBCCW switch "SIAS/LNP ACTUATION SIGNAL HS 6119D" must be in "BLOCK" position.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges the caution.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #2 OP 2330A Step 4.2.1	Performance: ENSURE the following: - Bus 24E, energized from bus 24C "B" RBCCW pump breaker (A504), "RACKED UP" "SIAS/LNP ACTUATION SIGNAL HS 6119D" (A504) in "BLOCK" position. - P-11B, "RBCCW PP B," in "PULL-TO-LOCK" (C-06) - RB-211D, "RBCCW PP B HDR B SUCT," closed (C-06) - RB-211C, "RBCCW PP B HDR A SUCT," open (C-06) - RB-4.1D, "HDR B HX-B OUT," closed (C-06)	Critical: ☐ YES ☒ NO
	Standard: Examinee Ensures all equipment is stated condition.	Grade: S ☐ U ☐
	Cue: If PEO queried for A504 status, report "A504 racked up" "SIAS/LNP ACTUATION SIGNAL HS 6119D in BLOCK position."	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S8

Revision: 0/0

Task Title: Shift Reactor Building Closed Cooling Water pumps

STEP #3 OP 2330A Step 4.2.2	Performance: ENSURE RB-251A, "PP DIS HDR A/B X-TIE," open (C-06).	Critical: ☐ YES ☒ NO
	Standard: Examinee places RB-251A, PP DIS HDR A/B X-TIE. Switch to 'OPEN' and verifies red light lit and green light out	Grade: S ☐ U ☐
	Cue: 	
	Comments: 	
STEP #4 OP 2330A Step 4.2.3 NOTE	Performance: NOTE 1. With the SIAS/LNP start of the "B" RBCCW pump blocked, the "B" RBCCW pump is not considered OPERABLE. 2. To prevent causing the associated EDG to be not OPERABLE, only one RBCCW pump, capable of SIAS/LNP start, may be running or out of "PULL-TO-LOCK." 3. The values given for normal running amperage and pump discharge pressure are nominal values for normal system alignment.	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges the note.	Grade: S ☐ U ☐
	Cue: 	
	Comments: 	
STEP #5 OP 2330A Step 4.2.3	Performance: LOG entry into the following: - TSAS 3.7.3.1, "Reactor Building Closed Cooling Water System" - TRMAS 7.1.20, "APPENDIX R SAFE SHUTDOWN REQUIREMENTS"	Critical: ☐ YES ☒ NO
	Standard: Examinee requests US log entry into TSAS 3.7.3.1 AND TRMAS 7.1.20	Grade: S ☐ U ☐
	Cue: When requested, report TSAS 3.7.3.1 and TRMAS 7.1.20 are logged into.	
	Comments: 	

PERFORMANCE INFORMATION

JPM Number: S8

Revision: 0/0

Task Title: Shift Reactor Building Closed Cooling Water pumps

STEP #6 OP 2330A Step 4.2.4 NOTE	Performance: NOTE During warm weather and higher systems loads, alarm "RBCCW HDR A FLOW HI" may be received (C-06/07, window A-7).	Critical: ☐ YES ☒ NO
	Standard: Examinee reads and acknowledges the note.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #7 OP 2330A Step 4.2.4	Performance: START P-11B, "RBCCW PP B" (C-06).	Critical: ☒ YES ☐ NO
	Standard: Examinee takes P-11B, RBCCW PPB, handswitch out of PTL, then into START.	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP #8 OP 2330A Step 4.2.5	Performance: CHECK alarm "RBCCW PUMP B SIAS/LNP START MANUALLY BLOCKED," lit (C-06/07, window AA-20).	Critical: ☐ YES ☒ NO
	Standard: Examinee acknowledges alarm is lit	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S8

Revision: 0/0

Task Title: Shift Reactor Building Closed Cooling Water pumps

STEP # 9 OP 2330A Step 4.2.6	Performance: CHECK the following for “B” RBCCW pump (C-06). - Normal running amperage (30 to 44 amps). - Pump discharge pressure (105 to 145 psig).	Critical: ☐ YES ☒ NO
	Standard: Examinee checks normal pump amps and discharge pressure	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP # 10 OP 2330A Step 4.2.7	Performance: CLOSE 2-RB-3A, “RBCCW “P11A” DISCHARGE STOP.”	Critical: ☐ YES ☒ NO
	Standard: Examinee directs PEO at RBCCW pump to close 2-RB-3A	Grade: S ☐ U ☐
	Cue: Report as PEO that “2-RB-3A is closed”	
	Comments: Booth operator places remote CCR06, ISOL VLV 2-RB-3A DOWNSTREAM P-11A (%) to 0%	
STEP # 11 OP 2330A Step 4.2.8	Performance: STOP P-11A, “RBCCW PP A,” and PLACE switch in “PULL-TO -LOCK” (C-06).	Critical: ☒ YES ☐ NO
	Standard: Examinee places P-11A, RBCCW PP A, handswitch in ‘STOP’, then to ‘PULL TO LOCK’	Grade: S ☐ U ☐
	Cue:	
	Comments:	

PERFORMANCE INFORMATION

JPM Number: S8

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Task Title: Shift Reactor Building Closed Cooling Water pumps

STEP # 12 O P 2330A Step 4.2.9	Performance: PLACE “SIAS/LNP ACTUATION SIGNAL HS 6119D” in “NORMAL” (A504). Standard: Examinee directs PEO stationed at breaker A504 to place “SIAS/LNP ACTUATION SIGNAL HS 6119D” in Normal Cue: Signal booth operator to place HS 6119D to NORM. When alarm RBCCW PUMP B SIAS/LNP START MANUALLY BLOCKED clears, report that “HS 6119D is in NORMAL” Comments:	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐
STEP # 13 O P 2330A Step 4.2.10	Performance: CHECK the following alarms, not lit: • “RBCCW PUMP B SIAS/LNP START MANUALLY BLOCKED” (C-06/07, window AA-20) • “RBCCW HDR A FLOW HI” (C-06/07, window A-7) Standard: Examinee clears and resets alarms Cue: Comments:	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐
STEP # 14 O P 2330A Step 4.2.11	Performance: OPEN 2-RB-3A, “‘A’ RBCCW PP DISCHARGE STOP.” Standard: Examinee directs PEO stationed at RBCCW pump to open 2-RB-3A Cue: Report that “the 2-RB-3A valve operator has separated from the valve, the valve cannot be operated” Comments: At this point, the Booth Operator will insert Malfunction CC01B , RBCCW PP P-11B TRIP. Transition to alternate path	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐

PERFORMANCE INFORMATION

JPM Number: S8

Revision: 0/0

Task Title: Shift Reactor Building Closed Cooling Water pumps

STEP # 15 OP 2585 Step 12.1	Performance: <u>Alternate Path</u> Annunciator 'RBCCW PUMP B OVERLOAD/TRIP (C-06/7, B-6) alarms. 'B' RBCCW pump amps go to zero. 'B' RBCCW pump discharge pressure lowers. 'B' RBCCW indicating lights are as follows: Green light lit, Amber light lit, Red light extinguished. From AOP 2585: IF standby pump is available, PERFORM the following: Standard: Examinee recognizes the 'B' RBCCW Pump trips and commences Immediate Operator Actions. Examinee recognizes the standby pump is NOT available Cue: When requested, report TSAS 3.7.3.1 and TRMAS 7.1.20 are exited. Comments:	Critical: ☐ YES ☒ NO
STEP # 16 OP 2585 Step 12.1.1	Performance: IF RBCCW Pump Overload/Trip not lit, as directed by the Shift Manager, RESET and ATTEMPT ONE restart. Standard: Examinee sees Overload/Trip IS lit and does not request any restart Cue: Comments:	Critical: ☐ YES ☒ NO Grade: S ☐ U ☐

PERFORMANCE INFORMATION

JPM Number: S8

Revision: 0/0

Task Title: Shift Reactor Building Closed Cooling Water pumps

STEP # 17 O P 2 5 8 5 Step 1 2 . 1 . 2	Performance: IF pump cannot be restarted, PERFORM the following: a. IF TCBs are closed, PERFORM the following: 1) TRIP the reactor	Critical: ☒ YES ☐ NO
	Standard: Examinee trips the reactor	Grade: S ☐ U ☐
	Cue:	
	Comments:	
STEP # 18 O P 2 5 8 5 Step 1 2 . 1 . 2	Performance: 2) ENSURE affected RCPs secured	Critical: ☒ YES ☐ NO
	Standard: Examinee secures the 'A' and 'C' Reactor Coolant Pumps	Grade: S ☐ U ☐
	Cue: The JPM is Complete	
	Comments:	

TERMINATION CUE: **The evaluation for this JPM is complete.**

STOP TIME: _____

VERIFICATION OF JPM COMPLETION

JPM Number: S8

Revision: 0/0

Task Title: Shift Reactor Building Closed Cooling Water pumps

Date Performed: _____

Examinee: _____

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

EVALUATION SECTION:

Time Critical Task:		☐ YES ☒ NO	
Validated Time (minutes):	5	Actual Time to Complete (minutes):	

Overall Result of JPM:	☐ SAT ☐ UNSAT
------------------------	---

Evaluator: _____

Print / Sign

Areas for Improvement / Comments:

EXAMINEE HANDOUT

JPM Number: S8

Revision: 0/0

- Initial Conditions:
- The RBCCW system is operating with the 'A' and 'C' Pumps operating.
 - The 'A' and 'C' RBCCW Heat exchangers are in service.

Initiating Cues: The US has directed you to start the 'B' RBCCW pump and secure the 'A' RBCCW pump in accordance with OP 2330A, RBCCW System, Section 4.2.
A PEO is stationed at the RBCCW area. All pre-start checks are done and SAT.
A PEO is stationed at breaker A504.

Time Critical JPM: ☐ YES ☒ NO

SIMULATOR SCENARIO #1

Form 3.3-1 Scenario Outline

Facility:	Millstone Unit 2	Scenario #:	1
Scenario Source:		Op. Test #:	ES24LI1
Examiners:		Applicants/	
		Operators:	
Initial Conditions:	IC 327, 100% power, nothing out of service.		
Turnover:	The shift is tasked to shift Z1 Service Water Pumps, by starting the 'B' pump and securing the 'A' pump.		
Critical Tasks:	1. ATC Ensure CRAC in recirc within 50 minutes of SIAS 2. BOP start cooldown within 1 hour of LOCA 3. BOP Isolate inter-system LOCA within 1 hour of LOCA 4. ATC Trip reactor prior to reaching 2200 psia when LOCA occurs		

Event No.	Malf. No.	Event Type*	Event Description
1.	N/A	N-BOP/US	Swap Z1 Service Water Pumps.
2.	C03-A10	I-ATC/US MC-ATC/US	PIC-215 degrades so that RCP seal header pressure rises, bringing in the high pressure alarm. Manual control is required to restore seal header pressure to 40-75 psig.
3.	C06-C04A	C-BOP/US TS-US	The 'B' Service Water Strainer will experience a shear pin break. The crew must log into TSAS 3.7.4.1 and shift Z1 Service Water Pumps back to 'A' running.
4.	RC20A	C-ATC/US TS-US	'A' RCP seal cooler develops a ~0.5 GPM leak.
5.	N/A	R-ATC/BOP	Rapid Downpower to take unit offline.
6.	RC20A	M-All	'A' RCP vapor seal fails requiring a trip.
7.	ED03A-ED03D	(M)	Offsite power lost on trip.
8.	EG11A	C,MC-BOP	'A' EDG fails to auto start, BOP must start 'A' EDG.
9.	CH08C	C,MC- ATC	F32A fails to start on SIAS/CIAS/EBFAS requiring manual start.

* (N)Normal, (R)Reactivity, (I)Instrument, (C)Component, (M)Major, (TS)Tech Spec, (MC)Manual Control

Quantitative Attribute	Target per Scenario	Actual
Events after EOP entry	1–2	2
Abnormal events	2–4	3
Major transients	1–2	1
EOPs entered/requiring substantive actions	1–2	1
Entry into a contingency EOP with substantive actions	1 per scenario set	0
Preidentified CTs	2 or more	2

Scenario Summary:

- Event 1:** The crew is tasked with placing the ‘B’ Service Water pump in service and removing the ‘A’ pump from service. The swap will occur without any issues.
- Event 2:** RCP bleedoff pressure controller, PIC-215, malfunctions so that seal header pressure alarms at 200 psig. The ATC will need to take manual control IAW ARP 2590B-037 and reduce seal header pressure to 40-75 psig.
- Event 3:** The ‘B’ Service Water Strainer will experience a shear pin break. This will become evident with a SW PUMP B STNR TROUBLE annunciator on CA-4 C06/07. PEO will report strainer motor is rotating but strainer shaft is NOT rotating, and strainer D/P is 6.5 psid and rising. Crew will enter TSAS 3.7.4.1 for an inoperable ‘A’ Service Water header, and will have to swap back to the ‘A’ Service Water pump to exit the action statement. The crew may address the issue with AOP 2565, ‘Loss of Service Water’ in which case they may have a situation where ‘A’ and ‘B’ Service Water pumps are momentarily able to start from the same EDG, in which case they would have to enter TSAS 3.8.1.1 for the ‘A’ EDG not OPERABLE.
- Event 4:** The ‘A’ RCP seal cooler will develop a ~0.5 GPM leak (large enough to alarm the RBCCW RM, but small enough so that RCP temperatures will not exceed trip criteria before the crew can begin to downpower the unit). The crew will enter the RCS leak AOP (AOP 2568) and determine that the ‘A’ RCP seal cooler is the likely culprit, which is pressure boundary leakage, which requires entry into TSAS 3.4.6.2.
- Event 5:** To comply with TSAS 3.4.6.2 and AOP 2568, the crew will perform a Rapid Downpower to take the unit offline IAW AOP 2575, “Rapid Downpower.”
- Event 6:** During the downpower, the ‘A’ RCP seal leak will worsen to a 300 GPM LOCA. The crew will perform EOP 2525, “Standard Post Trip Actions,” and transition to EOP 2532, “Loss of Coolant Accident.” The crew will be required to start a controlled cooldown IAW EOP 2532 within 1 hour of the trip.
- Event 7:** Offsite power will be lost upon the trip.
- Event 8:** The “A” EDG will not auto start on the Loss of Offsite Power. The BOP will need to use the RNO actions of the Vital Auxiliaries step in EOP 2525 to manually start the ‘A’ EDG, at which point 24C and the associated loads will sequence on.
- Event 9:** Filter fan F32A will fail to automatically start on SIAS/CIAS/EBFAS, requiring the fan to be manually started IAW the SIAS actuation step of EOP 2532. Control Room AC will be required to be in recirc within 50 minutes of SIAS.

The scenario will end at the Lead Examiner’s discretion.

INPUT SUMMARY								
Either INPUT or VERIFY the following functions:								
ID Num	Description	Delay Time	Ramp Time	Delete after	Event Trigger	Severity or Value	Final Value	Relative Order
MALFUNCTIONS								
EG11A	DG 12U AUTO START FAIL	--	--	--	--	Active	Active	--
RC20A	RCP A THERMAL BARRIER TUBE RUPT	--	--	--	4	0.5 GPM	0.5 GPM	3
RC20A	RCP A THERMAL BARRIER TUBE RUPT	--	30 sec	--	6	300 GPM	300 GPM	4
ED03A	LOSS OF 345 KV LINE #310	--	--	--	30	Active	Active	--
ED03B	LOSS OF 345 KV LINE #371	--	--	--	30	Active	Active	--
ED03C	LOSS OF 345 KV LINE #383	--	--	--	30	Active	Active	--
ED03D	LOSS OF 345 KV LINE #348	--	--	--	30	Active	Active	--
CH03C	LOSS OF F32A (FILTER FAN)	--	--	--	30	Active	Active	--
CH03C	LOSS OF F32A (FILTER FAN)	--	--	1 sec	17	(remove)	(remove)	--
C06-B04B	SW PUMP A STNR TROUBLE	--	--	--	10	CRYWOLF	CRYWOLF	--
C06-C04A	SW PUMP B STNR TROUBLE	--	--	--	3	ON	ON	2
C06-C04A	SW PUMP B STNR TROUBLE	--	--	--	14	CRYWOLF	CRYWOLF	--
REMOTE FUNCTIONS								
IAR10	MP3 INSTRUMENT AIR TO/FROM MP2	--	--	--	11	OPEN	OPEN	--
IAR28	Unit 3 SA TO SA VLV SAS6	--	--	--	11	OPEN	OPEN	--
SWR31	SW PUMP SIAS/LNP BLOCK SW HS-6484A	--	--	--	12	NORM	NORM	--
SWR31	SW PUMP SIAS/LNP BLOCK SW HS-6484A	--	--	--	13	BLOCK	BLOCK	--
OVERRIDES								
02A1A3A1_UP	PIC-215 UP ARROW (DIGITAL INPUT)	--	--	--	2	UP	UP	1
02A1A3A1_UP	PIC-215 UP ARROW (DIGITAL INPUT)	5 sec	--	--	2	N_(SR_O UT)	N_(SR_O UT)	1
02A1A3A1_UP	PIC-215 UP ARROW (DIGITAL INPUT)	--	--	1 sec	18	(remove)	(remove)	--
02A1A3A1_DOW N	PIC-215 DOWN ARROW (DIGITAL INPUT)	--	--	--	2	N_(SR_O UT)	N_(SR_O UT)	1
02A1A3A1_DOW N	PIC-215 DOWN ARROW (DIGITAL INPUT)	--	--	1 sec	18	(remove)	(remove)	--
12A2S7	CONTROLRM FILT F-32A (DIGITAL INPUT)	1 sec	--	5 sec	17	START	START	--
EVENTS								
ES24LI1.evt	Required for the following events: • 17 F-32A handswitch out of AUTO • 18 PIC-215 R/L pushbutton pushed							

Notes:

1. There may be communications between the Control Room crew and the simulator booth that are not noted in this guide. In these cases, the simulator booth operator will acknowledge the request or direction and provide generic information. The following examples are provided:
 - a. If directed to walk down a component that trips on overload; local inspection of the pump would indicate no observable deficiencies and the breaker is in a tripped condition. Do not editorialize with words like 'acrid smell or charring'
 - b. Calls to Work Control or other departments will be acknowledged. Report that CRs are being written, issues are being investigated, etc. If the crew calls for a follow up, report that actions are in progress.
 - c. Personnel are always on station for equipment starts. The line-ups are complete, oil levels are sat, any support equipment is available and operating as required. Post-start checks are sat, normal vibes and indications.

Critical Task Elements

Critical Task Statement	Ensure CRAC in recirc within 50 minutes of SIAS.
Initiating Cue	EOP 2541 Appendix 4, Followup Actions, Attachment 4A, step 2 , IF SIAS actuated, THEN ENSURE ONE complete facility of CRAC operating in RECIRC mode (this step will be performed if SIAS is initiated prior to performing Appendix 4, Attachment 4A). OR EOP 2532 Loss of Coolant Accident, Step 5 b. ENSURE at least ONE complete facility of CRAC is operating in recirc mode (this step will be needed if it was not already covered in Appendix 4, Attachment 4A).
Performance Feedback	A complete facility of CRAC is in RECIRC mode as indicated by closure of associated dampers (minimum fresh air, cable vault exhaust, and exhaust air), and associated fans running with discharge dampers open (supply fan, exhaust fan, recirc fan).
Success Path	One facility of CRAC is placed in recirc mode by either starting filter fan F-32A (which failed to auto start) OR swapping CRAC trains to Facility 2 (i.e. Train B).
Measurable Performance Standard	A complete facility of CRAC is in RECIRC mode no later than 50 minutes after SIAS is initiated.

Critical Task Statement	Perform a plant cooldown.
Initiating Cue	EOP 2532, Loss of Coolant Accident, step 19. Perform Controlled Cooldown.
Performance Feedback	A cooldown of RCS temperatures, within Technical Specification limits (< 100° F/hour), should be observed. Note that the temperature change limits are for a continuous 1 hour period.
Success Path	The plant cooldown is performed by operating either the Atmospheric Dump Valves or the Condenser Steam Dump valves.
Measurable Performance Standard	The operator is observed to commence a plant cooldown no later than one hour after an un-isolable LOCA occurs.

Critical Task Statement	Isolate inter-system LOCA.
Initiating Cue	EOP 2532, Loss of Coolant Accident, step 9. Isolate the LOCA.
Performance Feedback	RBCCW surge tank will stop rising when the LOCA is transferred into Containment.
Success Path	The inter-system LOCA is isolated by closing the RBCCW supply and return valves to Containment on both headers.
Measurable Performance Standard	The operator is observed to isolate the inter-system LOCA no later than one hour after an un-isolable LOCA occurs.

Critical Task Statement	Trip the reactor when RCS leakage exceeds the capacity of the CVCS.
Initiating Cue	AOP 2568 Trip Criteria on foldout page.
Performance Feedback	CEAs insert, power drops, SUR is negative.
Success Path	The reactor is tripped by pressing the four TCB pushbuttons.
Measurable Performance Standard	The operator is observed to trip the reactor prior to pressure falling below 2200 psia.

Event Description: Facility 1 Service Water Pump Swap

Symptoms/Cues: N/A

Time	Position	Applicant’s Actions or Behavior				
Booth Instructor: Load IC 327 (100% power, nothing out of service). Load schedule file ES24LI1.sch and event file ES24LI1.evt.						
	US	OP 2326A 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.”				
	US	TR 7.1.21 The Appendix R Safe Shutdown Related (ARSR) equipment listed in the TRM Table 7.1.21-1 shall be FUNCTIONAL. <u>APPLICABILITY:</u> MODES 1, 2, 3, and 4. <u>ACTION:</u> 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.				
	US	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”)
		B	2-SW-97A 2-SW-97B SW Pump Discharge Hdr Crossconn. AOVs	1. Each Valve must be capable of being cycled by local manual handwheel operation. 2. Valve 2-SW-97A must be maintained in the closed position.	1. With one or both valve(s) nonfunctional, perform ACTIONS b.1, b.2 for fire areas R-1, R-3 and R-16. 2. When 2-SW-97A is open remove the instrument air source from 2-SW-97B so it cannot spuriously open due to a fire or perform ACTIONS b.1, b.2 for fire area R-2.	

Event Description: Facility 1 Service Water Pump Swap

Symptoms/Cues: N/A

Time	Position	Applicant's Actions or Behavior
	US	TR 7.1 APPENDIX R SAFE SHUTDOWN REQUIREMENTS TECHNICAL REQUIREMENT IS AS SPECIFIED IN THE FOLLOWING COMPONENT SECTIONS. <u>APPLICABILITY:</u> Is as specified in the following component sections. <u>ACTION:</u> 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: - Restore FUNCTIONALITY of the affected component(s) within 14 days*, or - 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: - Establish a one-hour roving fire watch for all affected areas identified in the following component tables (except the control room, containment, waste gas decay tanks room, spent resin tank area, ion exchange room, spent fuel pool and cask laydown area and service water cable tunnels). Refer to the Appendix R Compliance Report for fire watch patrol areas. Roving fire watches must monitor the area of the device in question, as a minimum, within the specified time frame, plus or minus 25% of the time interval specified in the ACTION statement for periodic roving fire watches. The 25% extension of the time interval specified does not degrade the reliability that results from performing the rove at the specified interval, based on plant experience, and Fire Protection Engineering analysis as documented in Technical Evaluation M3-EV-02-2005. - Verify the FUNCTIONALITY of all fire suppression and detection systems, note required transient combustibles, and verify the lack of substantial new transient combustibles, in the affected areas (except containment) on a Daily Basis. Bring any changes to the attention of the Shift Manager. Establishment of the above compensatory measures will allow continued operation for up to sixty (60) days pending restoration of the component(s) FUNCTIONALITY - Prepare a FUNCTIONALITY assessment, including a Reasonable Assurance of Safety (RAS) determination, if warranted, for the function described in the Appendix R Compliance Report, if component FUNCTIONALITY cannot be established within 60 days per ACTION Statement b. Applicable time constraints for continued operation with ARSR component(s) nonfunctional will be identified and justified in the assessment. * Compensatory measures will be established prior to the end of the 14 day window when it is apparent that the 14 day restoration period cannot be met.

Event Description: Facility 1 Service Water Pump Swap

Symptoms/Cues: N/A

Time	Position	Applicant's Actions or Behavior
	BOP	OP 2326A CAUTION: To minimize the possibility of exceeding D/G load limits while shifting Service Water pumps, the following must be observed: When two Service Water pumps are available to start from the same bus (i.e., not in "PULL-TO-LOCK"), the "B" Service Water Pump switch "SIAS/LNP ACTUATION SIGNAL HS 6484A" (A502) must be in the "BLOCK" position.
	BOP	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
Booth Operator: - When queried about HS 6484A, report that it is in BLOCK. - When queried about pre-start checks of the 'B' Service Water pump, report that they are done. - When queried about Sodium Hypochlorite, report that it has been suspended to the 'A' Service Water pump.		
	BOP	4.6.3 ENSURE SW-97B, "PP DIS X-TIE," closed (C-06).
	BOP	4.6.4 OPEN SW-97A, "PP DIS X-TIE" (C-06).
	BOP	CAUTION: "B" Service Water Pump and "B" Service Water Strainer must always be supplied by the same engineered safeguards emergency power supply train.
	BOP	4.6.5 Refer To OP 2328A, "Sodium Hypochlorite System," and SUSPEND sodium hypochlorite flow to "A" Service Water Pump.
	BOP	4.6.6 IF "B" Service Water Pump will be started following mussel cooking OR backwash operations, ENSURE respective bay temperature less than 75°F (including local instrument inaccuracy of 1.14°F) by one of the following indications: Operator determines this step is N/A
	BOP	NOTE: With "SIAS/LNP ACTUATION SIGNAL HS 6484A" in "BLOCK" position, the "B" Service Water Pump is considered not OPERABLE.
	US	4.6.7 IF in MODE 1, 2, 3, or, 4, LOG entry in TSAS 3.7.4.1, "Service Water System."
	US	TSAS 3.4.7.1 Two service water loops shall be OPERABLE. <u>APPLICABILITY:</u> MODES 1, 2, 3 and 4. <u>ACTION:</u> 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.
	BOP US	OP 2326A 4.6.8 START P-5B, "SERVICE WATER PP B" (C-06).
	BOP	4.6.9 CHECK alarm "SW PUMP B SIAS/LNP START MANUALLY BLOCKED" (C06/07, window AA-19) lit.

Event Description: Facility 1 Service Water Pump Swap

Symptoms/Cues: N/A

Time	Position	Applicant's Actions or Behavior
	BOP US	4.6.10 STOP P-5A, "SERVICE WATER PP A" (C-06).
	BOP	NOTE: Packing leakoff must be observed from the packing gland. Flow through lube water flow gauge is not required to verify adequate packing cooling. If packing gland leakoff is observed but lube water flow is not observed, the pump is considered OPERABLE as long as pump packing is not overheating.
	BOP	4.6.11 MONITOR the following (Unit 2 Intake Structure): - Packing leakoff from packing gland - Abnormal noise and vibrations - Proper discharge pressure and strainer D/P
Booth Operator: Report proper discharge pressure and strainer D/P, no abnormal noise and vibration, normal packing leakoff observed from the packing gland.		
	BOP	4.6.12 IF packing gland leakoff NOT observed, PERFORM the following (Unit 2 Intake Structure): →N/A
	BOP	NOTE: The associated Service Water strainer that is in HAND will not restart without operator intervention when power is restored after an LNP 4.6.13 VENT PDC-6481, "B" Service Water strainer D/P gauge, as follows (Intake Structure): (All actions are in the field).
Booth Operator: When directed to vent the 'B' Service Water strainer D/P gauge, acknowledge the report. After 30 seconds, insert Trigger #14 to make the SW PUMP B STNR TROUBLE annunciator come in and out, as normally expected when venting a strainer D/P gauge. After an additional 30 seconds, report that venting is complete.		
	BOP	4.6.14 PLACE P-5A, "SERVICE WATER PP A" in "PULL-TO -LOCK" (C-06).
	BOP	4.6.15 PLACE "SIAS/LNP ACTUATION SIGNAL HS 6484A" (A502) in "NORMAL" position.
Booth Operator: When directed to place the SIAS/LNP switch in NORMAL, insert trigger #12 and report that it is done.		
	BOP	4.6.16 CHECK alarm "SW PUMP B SIAS/LNP START MANUALLY BLOCKED" (C06/07, window AA-19) NOT lit. 4.6.17 IF necessary, Refer To SP 2612F, "'B' Service Water Pump Operability Tests," and PERFORM Facility 1 test.
Examiner Note: The surveillance is NOT required.		
	BOP US	4.6.18 IF applicable, LOG exit from TSAS 3.7.4.1., "Service Water System."
	BOP	4.6.19 Refer To OP 2328A, "Sodium Hypochlorite System," and RESTORE Sodium hypochlorite Injection to "B" Service Water Pump.
Booth Operator: When directed to restore NaOCl, report that it is done.		
WHEN the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: PIC-215 fails to approximately 200 psig.

Symptoms/Cues: RCP CONTROL BLEED-OFF PRES HI (C02/3 window A-10) coming in and out of alarm

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed by the lead examiner, insert Trigger #2 to override PIC-215 to approximately 200 psig.		
Examiner note: RCP bleedoff header pressure will rise and "hunt" around 150-250 psig. RCP CONTROL BLEED-OFF PRES HI (C02/3 window A-10) will come in and out of alarm. On high spikes, RCP CONTROL BLEED-OFF PRES HI HI (C02/3 window B-10) may occasionally come in as well, with a momentary lifting of the bleedoff header relief.		
	ATC US	Crew addresses ARP 2590B-037, RCP CONTROL BLEED-OFF PRES HI.
	ATC US	1. CHECK actual pressure at "RCP SEAL HDR PRES , PI-215" (C-02). 2. PLACE "RCP BLD OFF PRES CNTL, PIC-215" in "LOCAL" (C-02). 3. REDUCE pressure to between 40 and 75 psig (C-02). 4. IF problem is determined to be malfunction of "RCP BLD OFF PRES CNTL, PIC-215," SUBMIT Trouble Report to I&C Department.
Booth Operator: When called as I&C to investigate PIC-215, acknowledge the request.		
Examiner note: This scenario causes the PPC to mark all four seals as "FAILED." If the crew notices this, they may spend time referring to ARPs to reset the "FAILED" state of the seals after addressing the event. Validation crew found the guidance in ARP 2590C-054, RCP HIGH VIBRATION (C04 CB-7). The same action that resets latched seal failures on the PPC also resets a latched high vibration condition.		
WHEN the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: Shear pin fails on 'B' Service Water Strainer

Symptoms/Cues: SW PUMP B STNR TROUBLE annunciator (CA-4 on C06/07)

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed by the lead examiner, insert Trigger #3 to bring in the SW PUMP B STNR TROUBLE annunciator. Pin the window for this malfunction to facilitate modification later in this event.		
	BOP US	ARP 2590E-029 1. IF "B" service water pump is operating, CHECK "B" service water strainer backwashing: - Service water strainer rotating - Service water strainer blowdown, 2-SW-90B, open 2. CHECK service water strainer D/P, PDC-6481.
Booth Operator: When sent to investigate the 'B' Service Water strainer, wait two minutes, then call and report the following: - Strainer D/P is 6.5 psig and stable. - Strainer MOTOR is rotating, strainer SHAFT is NOT rotating.		
Examiner note: Crew may enter AOP 2565, Loss of Service Water, based on the 'B' Service Water pump being degraded. This is an acceptable alternate course of action which will achieve the same end state. If the AOP is entered, the pump swap may occur with the SIAS/LNP block switch for the 'B' Service Water pump in NORM (switching it to BLOCK later with OP 2326A cleanup actions). This will require an additional Technical Specification entry, TSAS 3.8.1.1 for the 'A' Diesel not OPERABLE for the few seconds that both the 'A' and 'B' Service Water pumps are out of Pull-To-Lock.		
Examiner note: Crew should proceed as if strainer has not started, and is unable to start. If crew proceeds as if strainer is running, step 4 has some similar guidance for them to follow.		
	BOP US	3. IF strainer D/P is greater than or equal to 6 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.
Booth Operator: If crew determines step 3 is N/A based on strainer motor running, and proceeds to step 4, report that D/P has risen to 15.5 psid.		
	BOP US	3.1 IF in MODE 1, 2, 3, or 4, LOG entry into TSAS 3.7.4.1, "Service Water System." 3.2 PLACE strainer control switch in "HAND" and PRESS "START" pushbutton. → Determines this will have no effect because motor is running. 3.3 IF strainer cannot be started, Refer To OP 2326A, "Service Water System" and PERFORM applicable actions to place spare service water pump on applicable Facility.
	US	TSAS 3.4.7.1 Two service water loops shall be OPERABLE. <u>APPLICABILITY:</u> MODES 1, 2, 3 and 4. <u>ACTION:</u> 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.

Event Description: Shear pin fails on 'B' Service Water Strainer

Symptoms/Cues: SW PUMP B STNR TROUBLE annunciator (CA-4 on C06/07)

Time	Position	Applicant's Actions or Behavior
	BOP	OP 2326A CAUTION: To minimize the possibility of exceeding D/G load limits while shifting Service Water pumps, the following must be observed: When two Service Water pumps are available to start from the same bus (i.e., not in "PULL-TO -LOCK") the "B" Service Water pump switch "SIAS/LNP ACTUATION SIGNAL HS 6484A" (A502) must be in the "BLOCK" position.
	BOP	4.8.1 ENSURE the following: - P-5A, "SERVICE WATER PP A," in "PULL-TO -LOCK" (C-06) - A306, "SERVICE WATER PP A," racked up 4.8.2 IF "A" Service Water Pump will be started following mussel cooking OR backwash operations, ENSURE respective bay temperature less than 75_F (including local instrument inaccuracy of 1.14_F) by one of the following indications: → N/A
	US	4.8.3 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, "Appendix R Safe Shutdown Requirements."
	BOP	NOTE: With "SIAS/LNP ACTUATION SIGNAL HS 6484A" in "BLOCK" position, the "B" Service Water Pump is considered not OPERABLE. 4.8.4 PLACE "SIAS/LNP ACTUATION SIGNAL HS 6484A" (A502) in "BLOCK."
Booth Operator: When directed to place the SIAS/LNP switch in BLOCK, insert trigger #13 and report that it is done.		
	BOP	4.8.5 CHECK alarm "SW PUMP B SIAS/LNP START MANUALLY BLOCKED," (C06/07, window AA-19) lit. 4.8.6 Refer To OP 2328A, "Sodium Hypochlorite System," and SUSPEND sodium hypochlorite flow to "B" Service Water Pump.
Booth Operator: When directed to suspend NaOCl, report that it is done.		
	BOP	4.8.7 START P-5A, "SERVICE WATER PP A" (C-06). 4.8.8 STOP P-5B, "SERVICE WATER PP B" (C-06). 4.8.9 PLACE P-5B, "SERVICE WATER PP B" in "PULL-TO-LOCK" (C-06).
Booth Operator: When the 'B' Service Water pump is stopped, modify malfunction C06-C04A (SW PUMP B STNR TROUBLE) to NORMAL .		

Event Description: Shear pin fails on 'B' Service Water Strainer

Symptoms/Cues: SW PUMP B STNR TROUBLE annunciator (CA-4 on C06/07)

Time	Position	Applicant's Actions or Behavior
	BOP	4.8.10 CLOSE SW-97A, "PP DIS X-TIE," (C-06). 4.8.11 CHECK alarm "SW PUMP B SIAS/LNP START MANUALLY BLOCKED" (C06/07, window AA-19) not lit. NOTE Packing leakoff must be observed from the packing gland. Flow through lube water flow gauge is not required to verify adequate packing cooling. If packing gland leakoff is observed but lube water flow is not observed, the pump is considered OPERABLE as long as pump packing is not overheating. 4.8.12 MONITOR the following 'A' SW Pump (Unit 2 Intake Structure): • Packing leakoff from packing gland • Abnormal noise and vibrations • Proper discharge pressure and strainer D/P
Booth Operator: Report proper discharge pressure and strainer D/P, no abnormal noise and vibration, normal packing leakoff observed from the packing gland.		
	BOP	4.8.13 IF packing gland leakoff is not observed, PERFORM the following (Unit 2 Intake Structure): → N/A NOTE: The associated Service Water strainer that is in HAND will not restart without operator intervention when power is restored after an LNP 4.8.14 VENT PDC---6475, "A" Service Water strainer D/P gauge, as follows (Unit 2 Intake Structure): → Actions are in the field
Booth Operator: When directed to vent the 'A' Service Water strainer D/P gauge, acknowledge the report. After one minute, insert Trigger #10 to make the SW PUMP A STNR TROUBLE annunciator come in and out, as normally expected when venting a strainer D/P gauge. After an additional minute, report that venting is complete.		
	BOP US	4.8.15 IF necessary, Refer To SP 2612A, "'A' Service Water Pump Operability Tests," and PERFORM test.
Examiner Note: The surveillance is NOT required.		
	BOP US	4.8.16 IF applicable, LOG exit from applicable ACTIONS of the following: - TSAS 3.7.4.1., "Service Water System." - TRM 7.1.21, "Appendix R Safe Shutdown Requirements."
	BOP	4.8.17 Refer To OP 2328A, "Sodium Hypochlorite System," and RESTORE Sodium Hypochlorite Injection to "A" Service Water Pump.
Booth Operator: When directed to restore NaOCl, report that it is done.		
WHEN the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: 0.5 gpm "A" RCP seal cooler leak

Symptoms/Cues: PROCESS MON RAD HI HI/FAIL (C06/07 DA-24) in alarm, RBCCW Rad Monitor RM-6038 counts rising and in alarm, RBCCW surge tank level rising

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed by the lead examiner, insert Trigger #4:		
RC20A, RCP A THERMAL BARRIER TUBE RUPT, at 0.5 GPM.		
Examiner note: RNO =Response Not Obtained (actions normally on the RIGHT column of a two-column AOP or EOP).		
Examiner note: the PROCESS MON RAD HI HI/FAIL alarm will come in ~1-2 minutes after the leak is inserted.		
	BOP US	Crew addresses ARP 2590E-135, PROCESS MON RAD HI HI/FAIL (DA-24 on C06/07) and determines: - Actions for RM-8123 and 8262 do not apply because their respective alarms remain OPERABLE. - No waste gas discharge in progress, so REMODCM action statement for Waste Gas RM-9095 does not apply. - REMODCM Table IV.C.1 Table IV.C-1 applies for RBCCW RM-6038 and Blowdown RM-4262. The 12 hour maintenance window would not be expected to be used, as this is unplanned. - RBCCW RM-6038 is in alarm, counts are rising. - If crew attempts to reset alarm in this ARP, they are not successful. - BOP may refer to 2590H-041A to bypass this alarm. This ARP also gets Chemistry samples.
Booth Operator: If called as Chemistry to sample RBCCW, after 10 minutes report that the 'A' header is reading 200 CPM above background and the 'B' header is reading background.		
	BOP US	Upon discovering that RBCCW RM is in alarm, the crew would be expected to check RBCCW surge tank level. Surge tank level will be rising at a rate consistent with 0.5 GPM in-leakage. Crew will recognize entry criteria and enter AOP 2568, "RCS Leak."
	US	AOP 2568 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 <u>AND</u> GO TO EOP 2525, Standard Post Trip Actions
	US	NOTE: Foldout page shall be monitored throughout this procedure.

Event Description: 0.5 gpm "A" RCP seal cooler leak

Symptoms/Cues: PROCESS MON RAD HI HI/FAIL (C06/07 DA-24) in alarm, RBCCW Rad Monitor RM-6038 counts rising and in alarm, RBCCW surge tank level rising

Time	Position	Applicant's Actions or Behavior
	ATC	1. Monitor Loss of RCS Inventory a. CHECK Pressurizer Level – LOWERING • RNO PROCEED TO step 2 (see examiner note) b. ADJUST LTDN FLOW CNTL, HIC-110, to stabilize Pressurizer level c. CHECK Pressurizer level continuing to lower • RNO PROCEED TO step 1.g (see examiner note) d. START second Charging Pump e. ADJUST LTDN FLOW CNTL, HIC-110, to stabilize Pressurizer level f. CHECK Pressurizer Level - STABLE or RISING g. INITIATE Forcing Pressurizer Sprays
Examiner note: With such a small leak size (0.5 gpm), pressurizer level may not be lowering by the time the crew gets to this step (because letdown would have backed off enough to stabilize it). In this case, they would proceed to step 2 without forcing sprays. If the crew does see pressurizer level lowering, they will proceed to make adjustments, which would stop level from lowering, then proceed to 1.g. to force sprays. In either case, starting the second charging pump should NOT be required.		
	ATC US	2. Observe Reactor Power and RCS Temperature a. CHECK Reactor Power – STABLE b. CHECK RCS temperature - STABLE
	US ATC BOP	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. 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

Event Description: 0.5 gpm "A" RCP seal cooler leak

Symptoms/Cues: PROCESS MON RAD HI HI/FAIL (C06/07 DA-24) in alarm, RBCCW Rad Monitor RM-6038 counts rising and in alarm, RBCCW surge tank level rising

Time	Position	Applicant's Actions or Behavior
	US	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 RNO 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.
	US	TSAS 3.4.6.2 REACTOR COOLANT SYSTEM OPERATIONAL 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. <u>APPLICABILITY</u>: MODES 1, 2, 3 and 4. <u>ACTION</u>: a. With PRESSURE BOUNDARY LEAKAGE, isolate affected component, pipe, or vessel from the RCS by use of a closed manual valve, closed and de-activated automatic valve, blind flange, or check valve within 4 hours. b. 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. c. With ACTION and associated completion time not met, or primary to secondary LEAKAGE not within limits, be in HOT STANDBY within 6 hours and be in COLD SHUTDOWN within 36 hours.
	ATC	5. MAINTAIN VCT Level 72 to 86%

Event Description: 0.5 gpm "A" RCP seal cooler leak

Symptoms/Cues: PROCESS MON RAD HI HI/FAIL (C06/07 DA-24) in alarm, RBCCW Rad Monitor RM-6038 counts rising and in alarm, RBCCW surge tank level rising

Time	Position	Applicant's Actions or Behavior
	US	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
Booth Operator: If queried as Work Control about activities which could impact RCS integrity, report that none are in progress.		
	US	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 b. PERFORM steps 8 through 16 in any order and as required to identify and isolate RCS leak c. PROCEED TO step 17.
Examiner note: Crew should note that the leak is into RBCCW and that step 15 is appropriate to address it. As time allows, one board operator may be directed to review steps 8-14 and 16 to see if any actions are applicable.		
	US ATC BOP	NOTE: Any of the following are possible RCS leakage paths to RBCCW System: - RCP Thermal Barrier - Letdown HX - Primary Sample Sink Coolers 15. Evaluate RBCCW System For RCS Leakage a. CHECK the following parameters: - RBCCW Surge Tank level – NORMAL - RM-6038, RBCCW System Radiation Monitor – NORMAL RNO a. PERFORM the following: - REQUEST Chemistry Department sample the RBCCW System using CP 2802G, Sampling Closed Cooling Water Systems. - USE ATTACHMENT E, Potential RCS Leak Isolations, to address leakage into RBCCW System. b. RETURN TO step 7.b

Event Description: 0.5 gpm "A" RCP seal cooler leak

Symptoms/Cues: PROCESS MON RAD HI HI/FAIL (C06/07 DA-24) in alarm, RBCCW Rad Monitor RM-6038 counts rising and in alarm, RBCCW surge tank level rising

Time	Position	Applicant's Actions or Behavior
	US ATC BOP	Crew will request a chemistry sample of RBCCW and use Attachment E to address leakage. Crew should determine based on information available (surge tank going up, 'A' RCP temperatures rising) that the likely leak location is the 'A' RCP seal cooler. The isolations are the supply and return valves for 'A' header RBCCW to Containment, 2-RB-30.1A and 37.2A. The crew will determine that these can't be closed in MODE 1 or 2. The crew will then return to step 7.b, finish step 7 and route to step 17 for a rapid downpower.
	US	17. Evaluate RCS Leakage a. CHECK RCS leakage has been reduced to within Tech Spec 3.4.6.2 limits RNO 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.
	CREW	Transitions to AOP 2575, Rapid Downpower

Event Description: Rapid Downpower

Symptoms/Cues: Directed from AOP 2568, RCS Leak, step 17

Time	Position	Applicant's Actions or Behavior
Examiner Note: AOP 2575, Rapid Downpower, is entered.		
	US	AOP 2575 1. Perform notifications
	ATC	2. Initiate forcing sprays - Places all B/U heaters to 'ON' - Adjusts PRES CNTL-Y, PIC 100Y thumbwheel to achieve 50% output
	ATC BOP	3. Insert Group 7 CEAs 10 steps (8 – 12 steps in procedure) Lower Turbine Load (LOAD SPEED CONTROL switch), maintain $T_{COLD} \pm 2^{\circ}\text{F}$ of program.
	US	4. Determine Reactivity Plan Availability → Borate from RWST using 2 Charging Pumps
	BOP	5. Reduce turbine load AND Maintain T_{COLD} within 2°F of program 1) Set up Turbine controls (Attachment G) - Select 'Load Setpt' and enter desired value → 14%. - Select 'Rate Setpt' and enter desired value → 30%/hour 2) Reduce turbine load when effects of boron are seen (After step 7 is complete). - When ready to commence load reduction, then select 'Load Resume'. - IF Turbine Load Ramp Rate needs adjustment, perform any of the following: (lists all methods of adjusting ramp rate)
	ATC	6. Raise Charging Flow - CHECK AT LEAST one Charging pump – RUNNING - CHECK additional Charging pump -REQUIRED FOR DOWNPOWER - START second Charging pump - BALANCE Charging and Letdown
	ATC	7. Borate from the RWST - CHECK Boration from RWST - SELECTED - CHECK VCT MAKEUP BYPASS, CH-196 - CLOSED - CHECK RWST TO CHG SUCT, CH-504 - OPEN - OPEN RWST ISOL, CH-192 - CLOSE VCT OUT ISOL, CH-501 8. N/A - Borate from the BAST
	ATC	9. Maintain VCT parameters - Level 70 – 90% - Pressure < 30 psig 10. N/A – Temporary Suspension of Boration
	CREW	11. Maintain parameters as specified in Attachment A
AFTER the BOP has seen the effects of the boration and commenced turbine load reduction AND the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: Standard Post Trip Actions, Loss of Coolant Accident

Symptoms/Cues: RCS leakage exceeds capacity of two charging pumps, as indicated by letdown on the limiter with pressurizer level lowering and pressurizer pressure lowering.

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed by the lead examiner, insert Trigger #6:		
RC20A, RCP A THERMAL BARRIER TUBE RUPT, at 300 GPM.		
Examiner note: The crew will trip the reactor and enter EOP 2525. All post trip events (Events 6, 7, 8 and 9) are addressed within this event block.		
Mark START TIME of LOCA: _____		
Critical Task: Trip reactor prior to reaching 2200 psia when LOCA occurs.		
RCS pressure when crew trips reactor _____ psia		
	ATC	EOP 2525 1. CHECK Reactor - TRIPPED BY ALL OF THE FOLLOWING: - All CEAS - FULLY INSERTED - Reactor power – LOWERING - Startup Rate - NEGATIVE
	BOP	2. Trip Main Turbine - CHECK Main Turbine - TRIPPED BY ALL OF THE FOLLOWING: - All Main Stop Valves - CLOSED or All Control Valves – CLOSED - Generator megawatts – ZERO - Turbine speed – LOWERING - CHECK both Main Generator output breakers - OPEN: - SWYD GEN BKR, 15G-8T-2 - SWYD GEN BKR, 15G-9T-2
	BOP	3. Maintain Vital Auxiliaries - CHECK Open Phase Condition (OPC) annunciator, RSST OPEN PHASE, CA-48 on C-06/7 - NOT LIT - CHECK the following Vital and Non-Vital loads – ENERGIZED RNO b. PERFORM the following for associated de-energized buses: - PERFORM the following for Vital Bus: (Event 8) - IF Containment pressure GREATER THAN OR EQUAL TO 20 psig, THEN PLACE RBCCW Pump in PULL TO LOCK. - ENSURE DG STARTED. The 'A' EDG will sequence on and power 24C after it is started. - CHECK both facilities of Service Water System – OPERATING - CHECK both RBCCW facilities - OPERATING WITH SERVICE WATER COOLING

Event Description: Standard Post Trip Actions, Loss of Coolant Accident

Symptoms/Cues: RCS leakage exceeds capacity of two charging pumps, as indicated by letdown on the limiter with pressurizer level lowering and pressurizer pressure lowering.

Time	Position	Applicant's Actions or Behavior
	ATC	4. Control RCS Inventory a. CHECK Pressurizer level - MAINTAINED BY BOTH OF THE FOLLOWING: a. 20 to 80% b. TRENDING TO 35 to 70% RNO a.1 Manually OPERATE Pressurizer Level Control System. → Start 3rd charging pump and isolate letdown. b. CHECK RCS subcooling – GREATER THAN OR EQUAL TO 30°F
	ATC	5. CHECK Pressurizer Pressure - MAINTAINED BY BOTH OF THE FOLLOWING: 1,900 to 2,350 psia - TRENDING TO 2,225 to 2,300 psia RNO PERFORM the following: a. IF Pressurizer Pressure Control System NOT operating properly in automatic, THEN RESTORE AND MAINTAIN Pressurizer Pressure between 2,225 to 2,300 psia by any of the following: - Manually OPERATE Pressurizer Pressure Control System. - Manually OPERATE Pressurizer Heaters AND Spray Valves. b. IF any Pressurizer Spray valve will NOT CLOSE, THEN STOP RCPs as necessary. c. IF any PORV is OPEN AND Pressurizer Pressure is LESS THAN 2,250 psia, THEN CLOSE the associated PORV Block Valve: - PORV ISOL VLV, RC-403 - PORV ISOL VLV, RC-405 d. IF Pressurizer Pressure is LESS THAN 1,714 psia, THEN ENSURE the following ACTUATED: - SIAS (C-01) - CIAS (C-01) - EBFAS (C-01) e. and f. will be N/A because RCPs are not running (LOOP)

Critical Task: ATC Ensure CRAC in recirc within 50 minutes of SIAS. TIME of SIAS _____ (if initiated in EOP 2525)

If SIAS is initiated in EOP 2532, there are blocks in the 2532 section for tracking this Critical Task.

Event Description: Standard Post Trip Actions, Loss of Coolant Accident

Symptoms/Cues: RCS leakage exceeds capacity of two charging pumps, as indicated by letdown on the limiter with pressurizer level lowering and pressurizer pressure lowering.

Time	Position	Applicant's Actions or Behavior
	ATC	6. Evaluate Core Heat Removal a. CHECK RCS - IN FORCED CIRCULATION BY BOTH OF THE FOLLOWING: - At least one RCP – OPERATING - Loop ΔT - LESS THAN 10°F RNO a. PERFORM the following: - PLACE STM DMP TAVG CNTL, TIC-4165, in MANUAL AND CLOSED. - PLACE both Pressurizer Spray Valve controllers in MANUAL AND CLOSE the valves. b. CHECK RCS subcooling – GREATER THAN OR EQUAL TO 30°F
	BOP	7. Maintain RCS Heat Removal a. CHECK At least one Steam Generator - MEETS BOTH OF THE FOLLOWING: - Level - 10 to 80% - Either of the following – OPERATING TO RESTORE LEVEL 40 to 70% - Main Feedwater OR (TCOA) Two Auxiliary Feedwater Pumps RNO If AAFW has not actuated when the BOP reaches this step, they will start the MDAFW pumps and initiate AFW to the S/Gs. b. CHECK RCS TC - 530 to 535°F c. CHECK both Steam Generators pressure - 880 to 920 psia RNO 4. IF any Steam Generator pressure LESS THAN 800 psia AND LOWERING, THEN PERFORM the following: → Due to the LOOP, there will be an uncontrolled cooldown due to the “sneak path” through the MSRs. If S/G pressure is below 800 psia when the BOP reaches this point, they may implement this RNO, otherwise they must wait for the US or 800 psia, whichever comes first. a. CLOSE both MSIVs. b. ENSURE both MSIV Bypass Valves CLOSED. c. IF MSIV closure terminated cooldown, THEN, using Atmospheric Dump Valves, STABILIZE RCS TC AND Slowly RESTORE RCS TC 530 to 535°F.
	ATC	8. Evaluate Containment Isolation a. CHECK Containment pressure - LESS THAN 1 psig b. CHECK Radiation Monitors Inside Containment - MEET BOTH OF THE FOLLOWING: - NO UNEXPLAINED RISE - NO UNEXPLAINED ALARM c. CHECK Steam Plant Radiation Monitors - MEET BOTH OF THE FOLLOWING: - NO UNEXPLAINED RISE - NO UNEXPLAINED ALARM

Event Description: Standard Post Trip Actions, Loss of Coolant Accident

Symptoms/Cues: RCS leakage exceeds capacity of two charging pumps, as indicated by letdown on the limiter with pressurizer level lowering and pressurizer pressure lowering.

Time	Position	Applicant's Actions or Behavior
	ATC	9. CHECK Containment Temperature And Pressure Control - MAINTAINED BY BOTH OF THE FOLLOWING: - Containment temperature - LESS THAN 120°F (PPC or average of Points 5 and 6) - Containment pressure - LESS THAN 1 psig
	US ATC BOP	10. DIAGNOSE Event - Using EOP 2541, Appendix 1, Diagnostic Flowchart, DIAGNOSE event→LOCA - INITIATE EOP 2541, Appendix 4, Attachment 4A, Reactor Trip Subsequent Actions - GO TO the appropriate EOP→EOP 2532
	ATC BOP	Perform EOP 2541, Appendix 4, Attachment 4A, Reactor Trip Subsequent Actions Attachment 4A step 2 (for CRAC critical task, Event 9): 2. TCOA: IF SIAS actuated, THEN 2. ENSURE ONE complete facility of CRAC operating, in RECIRC mode, as follows: (C25A/B) Examiner note: student will align to ONE facility: Facility 1 (preferred) OR Facility 2. Highlighted steps are expected to require action from student for the relevant facility. Facility 1→This is the expected facility the ATC will align. - 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→Student could swap to Facility 2 (also valid). 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

Event Description: Standard Post Trip Actions, Loss of Coolant Accident

Symptoms/Cues: RCS leakage exceeds capacity of two charging pumps, as indicated by letdown on the limiter with pressurizer level lowering and pressurizer pressure lowering.

Time	Position	Applicant's Actions or Behavior
Booth operator: When queried about availability of Unit 3 to supply air, say that air is available. When called as PEO to align air with Unit 3, insert trigger #11 to realign valves.		
Critical Task: ATC Ensure CRAC in recirc within 50 minutes of SIAS If SIAS has been initiated prior to Appendix 4, Attachment 4A, the ATC should note that the Filter Fan, F-32A, failed to start and perform ONE of the following in Step 2: - Start F-32A OR - Swap CRAC to Facility 2 (Train B) TIME that a complete train of CRAC is in recirc: _____ <i>If SIAS is initiated in EOP 2532, there are blocks for tracking this Critical Task in the 2532 section.</i>		
Examiner note: Crew enters EOP 2532.		
	US	EOP 2532 WARNING: - ALL Personnel are required to use ice vests for all tasks associated with a Loss of Coolant Accident (LOCA) performed in Unit 2 Aux. Building or Enclosure Building. - Ice vests are located in Unit One Control Room area. NOTE: Harsh Containment values are designated with brackets []. These values should be used anytime CIAS has actuated on high containment pressure greater than 4.42 psig.
	US	Confirm Diagnosis MONITOR the Safety Function Status Checks AND CHECK Safety Function Status Check Acceptance Criteria are satisfied.
	BOP	Sample S/Gs for Activity and Boron - CHECK steam generator sample available. - CHECK "B" RBCCW header in operation. - ENSURE RB-210 "Degasifier Effluent Cooler Return Outlet" is open. - OPEN BOTH steam generator sample valves: - MS-191A - MS-191B - DIRECT Chemistry to sample BOTH SGs for activity AND boron. - WHEN samples have been taken, THEN CLOSE BOTH steam generator sample valves: - MS-191A - MS-191B

Event Description: Standard Post Trip Actions, Loss of Coolant Accident

Symptoms/Cues: RCS leakage exceeds capacity of two charging pumps, as indicated by letdown on the limiter with pressurizer level lowering and pressurizer pressure lowering.

Time	Position	Applicant's Actions or Behavior
	US BOP	Classify the Event 3. REFER TO MP-26-EPI-FAP06, 2.2.1 Classification And PARS, AND PERFORM the following: a. CLASSIFY the event. b. Using EOP 2541, Appendix 46, Sampling For EAL Determination, DIRECT Chemistry sample for EAL determination.
	US	Implement Placekeeping 4. PERFORM the following: - OPEN the Placekeeper AND ENTER the EOP entry time - ENSURE Alarm Silence Switch is in "NORMAL"
	ATC	SIAS Actuation 5. PERFORM the following actions: a. CHECK SIAS, CIAS, and EBFAS have actuated. (C01) RNO a.1 IF pressurizer pressure is less than 1714 psia, AND NOT controlled, THEN ENSURE BOTH trains SIAS, CIAS, EBFAS actuated. (C01) b. TCOA ENSURE at least ONE complete facility of CRAC is operating in the recirc mode: (C25A/B) Facility 1 → This is the expected facility the ATC will align. - 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 → Student could swap to Facility 2 (also valid). - 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

Event Description: Standard Post Trip Actions, Loss of Coolant Accident

Symptoms/Cues: RCS leakage exceeds capacity of two charging pumps, as indicated by letdown on the limiter with pressurizer level lowering and pressurizer pressure lowering.

Time	Position	Applicant's Actions or Behavior
Critical Task: ATC Ensure CRAC in recirc within 50 minutes of SIAS If SIAS was not actuated prior to entering EOP 2532, it will be actuated or verified here. When performing SIAS Actuation step (step 5), the ATC should note that the Filter Fan, F-32A, failed to start and perform ONE of the following in substep b: - Start F-32A OR - Swap CRAC to Facility 2 (Train B) TIME that SIAS is actuated:_____ TIME that a complete facility of CRAC is in recirc:_____ <i>If SIAS is initiated prior to EOP 2532, there are blocks for tracking this Critical Task in the 2525 section.</i>		
	ATC	Optimize Safety Injection 6. PERFORM ALL of the following actions: - CHECK at least ONE train of SIAS, CIAS, and EBFAS actuated. (C-01X) - ENSURE ALL available SI pumps are operating. - REFER TO EOP 2541, Appendix 2, "Figures." Fig. 3, AND CHECK that safety injection flow is adequate. - START ALL charging pumps. - ENSURE vital switchgear cooling is operating for each operating ECCS train as follows: (Substeps not included here for brevity. Components operate as designed) - CHECK F-112A, OR F-112B, Battery Room Exhaust Fan is running (ZE 689A or ZE 689B)
	ATC	RCP Trip Strategy (step 7) and RCP Operating Limits (step 8) RCPs were de-energized with the loss of offsite power, and actions to take the T_{AVG} controller and spray valves to manual and closed were taken in EOP 2525.

Event Description: Standard Post Trip Actions, Loss of Coolant Accident

Symptoms/Cues: RCS leakage exceeds capacity of two charging pumps, as indicated by letdown on the limiter with pressurizer level lowering and pressurizer pressure lowering.

Time	Position	Applicant's Actions or Behavior
	ATC BOP	Isolate the LOCA 9. ISOLATE potential LOCA locations as follows: - CHECK BOTH PORVs closed. - RC-402 - RC-404 - CHECK BOTH of the following letdown isolation valves are closed: - CH-515 - CH-516 - CHECK ALL of the following RCS sample line isolation valves are closed (C-01X / C-72): - Facility 1 - RC-45, RC combined sample isolation valve - Facility 2 - RC-001, RC hot leg isolation valve - RC-002, pressurizer surge sample isolation valve - RC-003, pressurizer steam sample isolation valve - CHECK NO leakage into the RBCCW system by BOTH of the following: - CHECK RM-6038, "RBCCW Radiation Monitor," is NOT alarming OR increasing - CHECK RBCCW Surge Tank level NOT rising RNO d.2 CLOSE ALL of the following RBCCW CTMT header isolation valves: - Facility 1 - RB-30.1A - RB-37.2A - Facility 2 - RB-30.1B - RB-37.2B
Critical Task: Isolate inter-system LOCA		
TIME of LOCA: _____ TIME inter-system LOCA isolated: _____		
Examiner note: The LOCA will be transferred into Containment (via RBCCW LOCA relief valves) when the RBCCW CTMT header isolation valves are closed.		
	ATC BOP	Confirm LOCA Inside Containment 10. CHECK that the LOCA is occurring inside containment by evaluating the following: (individual components omitted for brevity, actions for LOCA outside containment were already completed in previous step).

Event Description: Standard Post Trip Actions, Loss of Coolant Accident

Symptoms/Cues: RCS leakage exceeds capacity of two charging pumps, as indicated by letdown on the limiter with pressurizer level lowering and pressurizer pressure lowering.

Time	Position	Applicant's Actions or Behavior
	ATC	Place Hydrogen Analyzers in Service 11. USE EOP 2541, Appendix 19, "Hydrogen Analyzer Operation," AND PLACE the hydrogen analyzers in service.
	ATC	Containment Isolation and Containment Cooling 12. PERFORM the following actions: a. CHECK EITHER 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 setpoints b. ENSURE SIAS, CIAS, EBFAS AND MSI have actuated. (C01) c. CHECK that at least ONE train of SIAS, CIAS, EBFAS and MSI has properly actuated. (C01X) d. ENSURE ALL available CAR fans are operating: - CAR fans operating in slow speed - CAR emergency outlet valves open e. START ALL available post-incident recirculation fans. f. CHECK Bus 24C or 24D is energized from offsite power. RNO f.1 PROCEED TO step 13.
Examiner note: Rad monitors inside containment will begin to rise when the RBCCW containment isolations are closed, redirecting the LOCA into Containment. If any go into alarm, MSI will need to be actuated (SIAS/CIAS EBFAS would already be actuated at this point).		
	ATC	Containment Spray Actuation 13. PERFORM the following actions for Containment Spray Actuation: a. CHECK containment pressure is greater than or equal to 9.48 psig. RNO a.1 PROCEED TO step 15. Containment pressure is NOT expected to approach or exceed 9.48 psig.
	BOP	RBCCW Header Operating 15. PERFORM the following actions for EACH RBCCW header: a. CHECK RBCCW AND associated SW pumps operating b. CHECK ALL operating RCPs are supplied with RBCCW cooling flow.
	BOP	Close MSIVs on Loss of Offsite Power 16. CHECK Main Condenser is available, as indicated by ALL of the following: <i>The condenser is NOT available, and RNO actions will have been completed in Appendix 4, Attachment 4A.</i>
	BOP	Align Instrument Air 17. CHECK instrument air pressure greater than 90 psig AND stable. <i>Instrument air will have been cross-tied with Unit 3 in Appendix 4, Attachment 4A.</i>

Event Description: Standard Post Trip Actions, Loss of Coolant Accident

Symptoms/Cues: RCS leakage exceeds capacity of two charging pumps, as indicated by letdown on the limiter with pressurizer level lowering and pressurizer pressure lowering.

Time	Position	Applicant's Actions or Behavior
	US	LOCA In Progress 18. CHECK LOCA is still in progress.
	US	NOTE 1. The operator is required to initiate a plant cooldown following an un-isolable LOCA no later than one hour after the event occurs. 2. After one hour, the operator will establish and maintain an average cooldown rate of greater than 40° F/hr (e.g., At two hours following the LOCA, the RCS is greater than 40° F cooler than it was one hour following the LOCA) until the steam dump bypass valves or ADVs are fully open. 3. The starting point for the RCS cooldown should be the T _C or CET temperatures where RCS has stabilized. The PPC cooldown (° F/hr) display will indicate accurately after "RCS STABLE" is selected. 4. T _C should be used for monitoring RCS cooldown if in forced or natural circulation. CETs should be used for all other cases.
	BOP US	Perform Controlled Cooldown 19. CHECK Steam Dumps to Condenser available. RNO 19.1 PERFORM the following actions: a. TCOA INITIATE a controlled cooldown using the ADVs to establish shutdown cooling entry conditions. b. USE EOP 2541, Appendix 8, "Plant Cooldown," AND PERFORM supplemental cooldown actions.
Critical Task: Perform a Plant Cooldown		
TIME of LOCA: _____ TIME plant cooldown started: _____		
When the event has been addressed to the lead examiner's satisfaction, the scenario is complete.		

SIMULATOR SCENARIO #2

Form 3.3-1 Scenario Outline

Facility:	Millstone Unit 2	Scenario #:	2
Scenario Source:		Op. Test #:	ES24LI2
Examiners:		Applicants/	
		Operators:	
Initial Conditions:	IC 327, 100% power, nothing out of service		
Turnover:	The crew is tasked with doing a stroke and timing of Facility 1 LPSI injection valves IAW SP 2604L. Upon completion, the crew is to do a stroke and timing of Facility 2 LPSI injection valve SI-635 IAW SP 2604M, section 4.1. Engineering has requested this due to a degrading trend on the valve's stroke time. For operational risk considerations, the scheduled SP 2604L is to be done first.		
Critical Tasks:	1. BOP isolate feed to the #2 Steam Generator within 15 minutes of MSI. 2. BOP establish RCS temperature control prior to RCS reaching 535°F. 3. BOP isolate the #2 Steam Generator within 1 hour of event initiation.		

Event No.	Malf. No.	Event Type*	Event Description
1.	N/A	N -ATC/US	LPSI injection valve stroke and timing on Facility 1.
2.	N/A	C-ATC/US TS-US	LPSI injection valve SI-635 stroke and timing, fails stroke time.
3.	C04L-B11B	C-ATC/US	'A' CEDM cooler fan trip
4.	FW13B	C-BOP/US	"B" HD pump trip, IOAs for SGFP suction pressure lowering.
5.	N/A	R-ATC/BOP	Rapid downpower to achieve less than 90% power and HD-110 closed.
6.	C03-C41	TS-US	Group "A" Proportional Heaters trip when forcing sprays, spurious trip, NO overload.
7.	SG02B, MS01B	M-All	A 200 GPM SGTR occurs on #2 Steam Generator, requiring a plant trip. An ESDE in Containment will occur on the same steam generator on the trip.
8.	ES01A	C,MC- BOP	"A" MDAFP fails to start on AAFW, requiring manual start.
9.	ES03L	C,MC-ATC	2-CS-4.1B fails to open on CSAS, requiring manual open.

* (N)Normal, (R)Reactivity, (I)Instrument, (C)Component, (M)Major, (TS)Tech Spec, (MC)Manual Control

Quantitative Attribute	Target per Scenario	Actual
Events after EOP entry	1–2	2
Abnormal events	2–4	3
Major transients	1–2	1
EOPs entered/requiring substantive actions	1–2	1
Entry into a contingency EOP with substantive actions	1 per scenario set	1
Preidentified CTs	2 or more	3

Scenario Summary:

- Event 1:** The ATC will perform a stroke and timing surveillance of the Facility 1 LPSI injection valves IAW SP 2604L. This will be completed with no issues.
- Event 2:** The ATC will be tasked with a stroke and timing of LPSI injection valve SI-635 on Facility 2, IAW SP 2604M. SI-635 will fail its open stroke time. This will require the crew to enter TSAS 3.5.2 (ECCS in MODE 1, 2 and 3 >1750 psia) and TSAS 3.6.3.1 (Containment Isolation valves). The ATC will need to close SI-635, and have a PEO open its breaker, to comply with TSAS 3.6.3.1.
- Event 3:** The 'A' CEDM cooler fan will trip, requiring the ATC to start the standby CEDM cooler fan.
- Event 4:** The 'B' Heater Drain Pump will trip, requiring the BOP to perform Immediate Operator Actions IAW AOP 2585 for SGFP suction pressure lowering.
- Event 5:** The crew will be driven by the Heater Drain Pump Trouble alarm response, ARP 2590D-095, to perform a Rapid Downpower IAW AOP 2575 to reduce power to <90% and to close the Heater Drain Tank high level dump, HD-110.
- Event 6:** When forcing sprays for the downpower, the Group 'A' Proportional Heaters will trip (spurious trip, *no* overload). This will require entry into TSAS 3.4.4 for one group of proportional heaters not OPERABLE. ARP 2590B-227 will direct having Electrical Maintenance investigate the breaker trip. Electrical Maintenance will determine that the trip was spurious, and the heater group is available if needed.
- Event 7:** A 200 GPM SGTR will occur on the #2 Steam Generator, bringing in the Main Steam Line Rad Monitor alarm and requiring a plant trip upon validation (by RCS parameter). Upon the trip, a 1.9M#/hr ESD will occur inside Containment on the same steam generator. The crew will perform EOP 2525, "Standard Post Trip Actions," and transition to EOP 2540, "Functional Recovery," based on the two events, #2 Steam Generator RUPTURED as well as FAULTED inside Containment. Use of the Resource Assessment Trees (RATs) will determine that CI-1 is the priority and the crew will enter EOP 2540E, "Functional Recovery of Containment Isolation." The BOP will be required to isolate feed to the #2 Steam Generator within 15 minutes of MSI signal, IAW the RCS heat removal step of EOP 2525. The BOP will be required to isolate the #2 Steam Generator IAW EOP 2541 Appendix 12, "SGTR Response," within 1 hour of the trip.
- Event 8:** The 'A' MDAFW pump will fail to auto start on AAFW, requiring the BOP to manually start it using the RNO of the RCS heat removal step of EOP 2525.
- Event 9:** When CSAS actuates, discharge valve 2-CS-4.1B fails to automatically open, requiring the ATC to manually open it using the RNO of the Containment Pressure and Temperature Control step of EOP 2525.

The scenario will end at the Lead Examiner's discretion.

INPUT SUMMARY								
Either INPUT or VERIFY the following functions:								
ID Num	Description	Delay Time	Ramp Time	Delete after	Event Trigger	Severity or Value	Final Value	Relative Order
MALFUNCTIONS								
C04L-B11B	CEDM COOLER FAN TRIP	--	--	--	8	ON	ON	2
FW13B	HEATER DRAIN PP P-3B TRIP	--	--	--	4	Active	Active	3
C05-D20A	HEATER DRAIN PUMP TROUBLE	--	--	--	4	Active	Active	3
C03-C41	PRESSURIZER HTR CNTL GP FEEDER BKR TRIP	--	--	--	6	ON	ON	4
C03-C41	PRESSURIZER HTR CNTL GP FEEDER BKR TRIP	--	--	5 sec	19	OFF	OFF	N/A
SG02B	SG #2 TUBE RUPTURE	--	30 sec	--	7	200 GPM	200 GPM	5
MS01B	MN STM HDR #2 RUPTURE IN CTMT	--	60 sec	--	30	1.9 M#/hr	1.9 M#/hr	5
ES01A	AUTO AFW A INITIATION FAIL	--	--	--	--	Active	Active	6
ES03A	ESAS SIGNAL FAIL TO ACTUATE AM-609/610 (Fac 2)	--	--	--	--	Active	Active	7
REMOTE FUNCTIONS								
MSR13	2-MS-202 STATUS	--	--	--	10	RI	RI	--
OVERRIDES								
RHHS-3635_1	LPSI HDR TO LOOP 2A (DO GREEN)	1 sec	--	35 sec	17	G	G	1
RHHS-3635_1	LPSI HDR TO LOOP 2A (DO GREEN)	--	--	--	13	NG	NG	--
RHHS-3635_2	LPSI HDR TO LOOP 2A (DO RED)	--	--	--	13	NR	NR	--
03A1A5S2	CEDM COOLING FAN F-13A (DIGITAL INPUT)	--	--	--	3	TRIP	TRIP	2
02A2A3S9	PZR PROP HTR BKR GP 1 (DIGITAL INPUT)	--	--	5 sec	6	OFF	OFF	4
RXHS-100-D1_3	PZR PROP HTR BKR GP 1 (DO AMBER)	--	--	--	6	A	A	4
RXHS-100-D1_3	PZR PROP HTR BKR GP 1 (DO AMBER)	--	--	5 sec	19	NA	NA	--
01A1A2S19	CTMT SPRAY PUMP B (DIGITAL INPUT)	60 sec	N/A	75 sec	30	START	START	7
EVENTS								
ES24LI2.evt	Required for the following events: • 15 SI-615 switch in OPEN, valve full closed • 16 SI-625 switch in OPEN, valve full closed • 17 SI-635 switch in OPEN, valve full closed • 18 SI-645 switch in OPEN, valve full closed • 19 GR1 Proportional Heater switch in close							

Notes:

1. There may be communications between the Control Room crew and the simulator booth that are not noted in this guide. In these cases, the simulator booth operator will acknowledge the request or direction and provide generic information. The following examples are provided:
 - a. If directed to walk down a component that trips on overload; local inspection of the pump would indicate no observable deficiencies and the breaker is in a tripped condition. Do not editorialize with words like 'acrid smell or charring'
 - b. Calls to Work Control or other departments will be acknowledged. Report that CRs are being written, issues are being investigated, etc. If the crew calls for a follow up, report that actions are in progress.
 - c. Personnel are always on station for equipment starts. The line-ups are complete, oil levels are sat, any support equipment is available and operating as required. Post-start checks are sat, normal vibes and indications.

Critical Task Elements

Critical Task Statement	Isolate feed to the #2 Steam Generator within 15 minutes of MSI.
Initiating Cue	EOP 2525, Standard Post Trip Actions, step 7. RCS Heat Removal, RNO step c.2 (S/G pressure < 572# AND ESD is in progress).
Performance Feedback	Affected S/G will boil dry once feedwater is isolated to it.
Success Path	Isolating feed to a faulted S/G reduces the amount of energy released to the CTMT atmosphere, keeping CTMT within design limits.
Measurable Performance Standard	The operator places both OVERRIDE/MAN/START/RESET switches in 'PULL TO LOCK' and both Auxiliary Feedwater regulating valves, FW-43A&B, are closed.

Critical Task Statement	Establish RCS temperature control prior to RCS reaching 535°F.
Initiating Cue	EOP 2525, Standard Post Trip Actions, step 7. RCS Heat Removal, RNO step c.3 (S/G boiled dry and CET temperature rising).
Performance Feedback	Opening the ADV for the unaffected S/G after the affected S/G boils dry transfers the RCS Heat Removal function to the unaffected S/G. CET temperatures will stabilize, the RCS will not cooldown or heat up.
Success Path	Setting the unaffected S/G's ADV's automatic setpoint to the saturation pressure associated with the CET temperature will stabilize RCS temperature.
Measurable Performance Standard	When the affected S/G boils dry, the operator reduces the unaffected S/G's ADV automatic setpoint to approximately the saturation pressure of the CETs (at the point where the affected S/G boiled dry) using either the PPC SPDS screen or the steam tables.

Critical Task Statement	Isolate the #2 Steam Generator within 1 hour of event initiation.
Initiating Cue	EOP 2541, Appendix 12, SGTR Response; step 7. Isolate Most Affected S/G.
Performance Feedback	The positioning of components is observable by lights, switches and other control indications.
Success Path	The affected S/G is isolated by performing the component manipulations to establish the desired plant condition of the affected S/G being isolated from the outside environment.
Measurable Performance Standard	EOP-directed action that are essential to an event's overall mitigative strategy. Isolation of the affected S/G is assumed in the Safety Analysis to provide a barrier to fission release.

Event Description: LPSI Injection Valve Stroke and Timing

Symptoms/Cues: SI-635 will fail its open stroke time

Time	Position	Applicant's Actions or Behavior
Booth Instructor: Load IC 327 (100% power, nothing out of service). Load ES24LI2.sch and ES24LI2.evt.		
Examiner note: This section includes Event 1 (Successful LPSI stroke and timing) and Event 2 (SI-635 fails stroke time).		
	ATC	SP 2604L NOTE: If SDC is in operation, manipulation of the LPSI injection valves may be required to maintain desired flow during the next step.
Booth Operator: Throughout SP 2604L and SP 2604M, when queried on the stem position of any LPSI injection valve, report that it is as expected, i.e. for an open valve, stem is above housing and for a closed valve the stem is below the housing. (Only the open position is procedurally required to be queried, but some students may query the closed position as well)		
	ATC	4.1.1 IF valve does not stroke full open OR full closed during testing, Go To Attachment 1. 4.1.2 STATION Operator at -5'6" West Pent Area and ESTABLISH communications with Control Room. 4.1.3 OPEN SI-615, "LPSI INJ VLVS, LOOP 1A," and MEASURE stroke time (C-01). 4.1.4 RECORD stroke time on SP 2604L-006. 4.1.5 REQUEST Operator at -5'6" West Pent Area, Refer To Figure - 1 and CHECK top of valve stem at or above top of housing and DOCUMENT Results on SP 2604L-006 and INITIAL. 4.1.6 IF stem position is "UNSAT," PERFORM the following:-- N/A 4.1.7 CLOSE SI-615, "LPSI INJ VLVS, LOOP 1A" (C-01). 4.1.8 DOCUMENT "Operational Readiness" Results on SP 2604L-006 and INITIAL. 4.1.9 IF valve stroke time is not within "Acceptable" Limit, Go To Attachment 1 and PERFORM applicable actions. -- N/A
	ATC	SP 2604L NOTE: If SDC is in operation, manipulation of the LPSI injection valves may be required to maintain desired flow during the next step.

Event Description: LPSI Injection Valve Stroke and Timing

Symptoms/Cues: SI-635 will fail its open stroke time

Time	Position	Applicant's Actions or Behavior
		4.2.1 IF valve does not stroke full open OR full closed during testing, Go To Attachment 1. 4.2.2 STATION Operator at -5'6" West Pent Area and ESTABLISH communications with Control Room. 4.2.3 OPEN SI-625, "LPSI INJ VLVS, LOOP 1B," and MEASURE stroke time (C-01). 4.2.4 RECORD stroke time on SP 2604L-006. 4.2.5 REQUEST Operator at -5'6" West Pent Area, Refer To Figure - 1 and CHECK top of valve stem at or above top of housing and DOCUMENT Results on SP 2604L-006 and INITIAL. 4.2.6 IF stem position is "UNSAT," PERFORM the following:-- N/A 4.2.7 CLOSE SI-625, "LPSI INJ VLVS, LOOP 1B" (C-01). 4.2.8 DOCUMENT "Operational Readiness" Results on SP 2604L-006 and INITIAL. 4.2.9 IF valve stroke time is not within "Acceptable" Limit, Go To Attachment 1 and PERFORM applicable actions. -- N/A
	ATC	SP 2604M NOTE: If SDC is in operation, manipulation of the LPSI injection valves may be required to maintain desired flow during the next step.
	ATC	4.1.1 IF valve does not stroke full open OR full closed during testing, Go To Attachment 1. 4.1.2 STATION Operator at -5'6" West Pent Area and ESTABLISH communications with Control Room. 4.1.3 OPEN SI-635, "LPSI INJ VLVS, LOOP 2A," and MEASURE stroke time (C-01). 4.1.4 RECORD stroke time on SP 2604M-006. 4.1.5 REQUEST Operator at -5'6" West Pent Area, Refer To Figure - 1 and CHECK top of valve stem at or above top of housing and DOCUMENT Results on SP 2604M-006 and INITIAL. 4.1.6 IF stem position is "UNSAT," PERFORM the following:-- N/A 4.1.7 CLOSE SI-635, "LPSI INJ VLVS, LOOP 2A" (C-01). 4.1.8 DOCUMENT "Operational Readiness" Results on SP 2604M-006 and INITIAL. 4.1.9 IF valve stroke time is not within "Acceptable" Limit, Go To Attachment 1 and PERFORM applicable actions.
	US	Attachment 1: Actions for IST Data Outside "Acceptable" Limits 1. IF in MODEs 1, 2, 3*, PERFORM the following: 1.1 ENTER the following TSAS as applicable: • 3.5.2 • 3.6.3.1

Event Description: LPSI Injection Valve Stroke and Timing

Symptoms/Cues: SI-635 will fail its open stroke time

Time	Position	Applicant's Actions or Behavior
	US	TSAS 3.5.2 Two ECCS subsystems shall be OPERABLE. <u>APPLICABILITY:</u> MODES 1, 2 and 3*. * With pressurizer pressure $\geq$ 1750 psia. <u>ACTION:</u> a. With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and reduce pressurizer pressure to less than 1750 psia within the following 6 hours. b. In the event the ECCS is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date.
Examiner note: Crew may enter or review AOP 2515, Loss of Containment Integrity, due to the inoperable containment isolation valve, SI-635.		
	US	TSAS 3.6.3.1 Each containment isolation valve shall be OPERABLE.^{(1) (2)} (1) Containment isolation valves may be opened on an intermittent basis under administrative controls. (2) The provisions of this Specification in MODES 1, 2 and 3, are not applicable for main steam line isolation valves. However, provisions of Specification 3.7.1.5 are applicable for main steam line isolation valves. <u>APPLICABILITY:</u> MODES 1, 2, 3 and 4 <u>ACTION:</u> With one or more of the isolation valve(s) inoperable, either: a. Restore the inoperable valve(s) to OPERABLE status within 4 hours, or b. Isolate the affected penetration(s) within 4 hours by use of a deactivated automatic valve(s) secured in the isolation position(s), or c. Isolate the affected penetration(s) within 4 hours by use of a closed manual valve(s) or blind flange(s); or d. Isolate the affected penetration that has only one containment isolation valve and a closed system within 72 hours by use of at least one closed and deactivated automatic valve, closed manual valve, or blind flange; or e. Be in COLD SHUTDOWN within the next 36 hours.
	ATC	SP 2604M Attachment 1 1.2 CLOSE the applicable LPSI injection valve 1.3 OPEN and TAG the applicable LPSI injection valve breaker on MCC 22-1F

Event Description: LPSI Injection Valve Stroke and Timing

Symptoms/Cues: SI-635 will fail its open stroke time

Time	Position	Applicant's Actions or Behavior
Examiner note: MCCs 22-1E and 22-1F are better known as B51 and B61, respectively. The former nomenclature is used here because it's how it's written in this surveillance procedure.		
Booth Operator: When called to open and tag appropriate breaker, insert trigger #13 to open B6116 and de-energize SI-635.		
	US ATC	2. NOTIFY the following the component is inoperable: • System Engineer • IST Coordinator 3. SUBMIT CR and RECORD CR number on cover sheet.
WHEN the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: 'A' CEDM Cooler Fan Trip

Symptoms/Cues: CEDM COOLER FAN TRIP annunciator

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed by the Lead Examiner, insert Trigger #3 to trip the 'A' CEDM cooler fan.		
Examiner note: Event 8 is out of numerical sequence due to being added after the 150 day submittal. Event 8 is after Event 1, but prior to Event 2.		
	ATC	ARP 2590C-082 1. START idle CEDM cooling fan (C-04). 2. MONITOR the following: • "A" CEDM fan air discharge temperature on computer point, "T8102" • "B" CEDM fan air discharge temperature on computer point, "T8106" • "C" CEDM fan air discharge temperature on computer point, "T8101" 3. IF all three CEDM cooling units fail, Go To one of the following and START a plant and reactor shutdown:-- N/A 4. SUBMIT CR to Electrical Maintenance Department to investigate cause of fan 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 4160V busses must be de-energized from the affected power source and re-energized from the 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 not in).—N/A
WHEN the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: 'B' Heater Drain Pump trip

Symptoms/Cues: HEATER DRAIN PUMP TROUBLE annunciator (DA-20 on C05)

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed by the Lead Examiner, insert Trigger #2 to trip the 'B' Heater Drain Pump.		
	BOP	Answers HEATER DRAIN PUMP TROUBLE annunciator. Notes 'B' Heater Drain Pump tripped. Notes lowering SGFP suction pressure and performs Immediate Operator Actions IAW AOP 2585: [15.1] OPEN CNM-2, "COND DEMIN BYP."
Examiner note: Crew may determine that Immediate Operator Actions are not required because SGFP suction pressure stabilizes with more than adequate margin to trip setpoints. BOP still has a verifiable action of opening HD-106 in the alarm response for Heater Drain Pump Trouble annunciator.		
	US	15.2 Go To the following as applicable: • ARP 2593E-017, "CONDENSATE POLISHER SYS DIFFERENTIAL PRESSURE HIGH" (CPF, window E-3) • ARP 2590D-041, "COND PUMP TROUBLE" (C-05, window A-11) • ARP 2595A, "Alarm Response for SGFP Related PPC Alarms" Crew addresses above alarm responses and finds little to address the pump trip. However, the HEATER DRAIN PUMP TROUBLE annunciator is lit.
	US BOP	Addresses ARP 2590D-095 which requires a Rapid Downpower to less than 90% power, and low enough that HD-110 closes. This ARP also directs opening subcooling valve HD-106.
	CREW	Transitions to AOP 2575, Rapid Downpower

Event Description: Rapid Downpower

Symptoms/Cues: Directed by ARP 2590D-095

Time	Position	Applicant's Actions or Behavior
Examiner Note: AOP 2575, Rapid Downpower, is entered (Event 5).		
Examiner note: Event 6 ('A' Proportional Heater breaker trip) is included in this block.		
	US	AOP 2575 1. Perform notifications
	ATC	2. Initiate forcing sprays - Places all B/U heaters to 'ON' - Adjusts PRES CNTL-Y, PIC 100Y thumbwheel to achieve 50% output
Booth Operator: When the ATC has reported that they are forcing sprays, insert trigger #6 to trip the 'A' Proportional Heater breaker.		
	US ATC	Refers to ARP 2590B-227 which directs entry into TSAS 3.4.4 ACTION b. This ARP also directs the crew to contact Electrical Maintenance to investigate and Engineering to assist.
Booth Operator: When called as Electrical Maintenance to investigate, wait 10 minutes and report as Electrical Maintenance that there are no issues with the feeder breaker and the Group 'A' Proportional Heaters are available if needed.		
Due to simulator limitations, if the 'A' proportional heater breaker is taken to 'OFF' to reset, the amber light and alarm will not clear (as building the trigger to clear the alarm this way will conflict with the original malfunction). The alarm and amber light will clear when the switch is taken to close. If operators are hesitant to close the breaker, Trigger 19 can be manually initiated to clear the amber light and alarm.		
	US	TSAS 3.4.4 The pressurizer shall be OPERABLE with: a. Pressurizer water level $\leq 70\%$, and b. At least two groups of pressurizer heaters each having a capacity of at least 130 kW. <u>APPLICABILITY:</u> MODES 1, 2 and 3 <u>ACTION:</u> b. One group of pressurizer heaters inoperable → 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.
	ATC BOP	AOP 2575 3. Insert Group 7 CEAs 10 steps (8 – 12 steps in procedure) Lower Turbine Load (LOAD SPEED CONTROL switch), maintain $T_{COLD} \pm 2^{\circ}\text{F}$ of program.
	US	4. Determine Reactivity Plan Availability → Borate from RWST using 2 Charging Pumps
	BOP	5. Reduce turbine load AND Maintain T_{COLD} within 2°F of program 1) Set up Turbine controls (Attachment G) Select 'Load Setpt' and enter desired value → 14%.

Event Description: Rapid Downpower

Symptoms/Cues: Directed by ARP 2590D-095

Time	Position	Applicant's Actions or Behavior
		- Select 'Rate Setpt' and enter desired value → 30%/hour 2) Reduce turbine load when effects of boron are seen (After step 7 is complete). - When ready to commence load reduction, then select 'Load Resume'. - IF Turbine Load Ramp Rate needs adjustment, perform any of the following: - SELECT 'Rate Setpt' AND ENTER new value. - SELECT one of the following: 5%, 10%, or 20% per hour - SELECT Raise or Lower (0.25% / hour change).
	ATC	6. Raise Charging Flow - CHECK AT LEAST one Charging pump – RUNNING - CHECK additional Charging pump -REQUIRED FOR DOWNPOWER - START second Charging pump - BALANCE Charging and Letdown
	ATC	7. Borate from the RWST - CHECK Boration from RWST - SELECTED - CHECK VCT MAKEUP BYPASS, CH-196 - CLOSED - CHECK RWST TO CHG SUCT, CH-504 - OPEN - OPEN RWST ISOL, CH-192 - CLOSE VCT OUT ISOL, CH-501 8. N/A - Borate from the BAST
	ATC	9. Maintain VCT parameters - Level 70 – 90% - Pressure < 30 psig 10. N/A – Temporary Suspension of Boration
	CREW	11. Maintain parameters as specified in Attachment A

AFTER the BOP has seen the effects of the boration and commenced turbine load reduction **AND** the event has been addressed to the lead examiner's satisfaction, proceed to the next event.

Event Description: Steam Generator Tube Rupture and ESDE on #2 Steam Generator

Symptoms/Cues: Main Steam Line Radiation Monitor alarm with lowering RCS pressure, #2 Steam Generator pressure lowering after trip

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed by the lead examiner, insert Trigger #7 - SG02B, SG #2 TUBE RUPTURE, at 200 GPM Booth Operator: When the reactor trips, ensure Trigger #30 activates the following: - MS01B, MN STM HDR #2 RUPTURE IN CTMT, at 1.9 M#/hr		
Examiner note: Events 7, 8 and 9 will be addressed in this event block.		
Critical Task: Isolate feed to the #2 Steam Generator within 15 minutes of MSI. Time of MSI _____ Critical Task: Isolate the #2 Steam Generator within 1 hour of event initiation. Time of trip _____		
	ATC	EOP 2525 1. CHECK Reactor - TRIPPED BY ALL OF THE FOLLOWING: - All CEAS - FULLY INSERTED - Reactor power – LOWERING - Startup Rate - NEGATIVE
	BOP	2. Trip Main Turbine a. CHECK Main Turbine - TRIPPED BY ALL OF THE FOLLOWING: - All Main Stop Valves - CLOSED or All Control Valves – CLOSED - Generator megawatts – ZERO - Turbine speed – LOWERING b. CHECK both Main Generator output breakers - OPEN: - SWYD GEN BKR, 15G-8T-2 - SWYD GEN BKR, 15G-9T-2
	BOP	3. Maintain Vital Auxiliaries a. CHECK Open Phase Condition (OPC) annunciator, RSST OPEN PHASE, CA-48 on C-06/7 - NOT LIT b. CHECK the following Vital and Non-Vital loads – ENERGIZED c. CHECK both facilities of Service Water System – OPERATING d. CHECK both RBCCW facilities - OPERATING WITH SERVICE WATER COOLING

Event Description: Steam Generator Tube Rupture and ESDE on #2 Steam Generator

Symptoms/Cues: Main Steam Line Radiation Monitor alarm with lowering RCS pressure, #2 Steam Generator pressure lowering after trip

Time	Position	Applicant's Actions or Behavior
	ATC	4. Control RCS Inventory a. CHECK Pressurizer level - MAINTAINED BY BOTH OF THE FOLLOWING: a. 20 to 80% b. TRENDING TO 35 to 70% RNO a.1 Manually OPERATE Pressurizer Level Control System. → Start 3rd charging pump and isolate letdown. b. CHECK RCS subcooling – GREATER THAN OR EQUAL TO 30°F
	ATC	5. CHECK Pressurizer Pressure - MAINTAINED BY BOTH OF THE FOLLOWING: 1,900 to 2,350 psia - TRENDING TO 2,225 to 2,300 psia RNO PERFORM the following: a. IF Pressurizer Pressure Control System NOT operating properly in automatic, THEN RESTORE AND MAINTAIN Pressurizer Pressure between 2,225 to 2,300 psia by any of the following: - Manually OPERATE Pressurizer Pressure Control System. - Manually OPERATE Pressurizer Heaters AND Spray Valves. b. IF any Pressurizer Spray valve will NOT CLOSE, THEN STOP RCPs as necessary. c. IF any PORV is OPEN AND Pressurizer Pressure is LESS THAN 2,250 psia, THEN CLOSE the associated PORV Block Valve: - PORV ISOL VLV, RC-403 - PORV ISOL VLV, RC-405 d. IF Pressurizer Pressure is LESS THAN 1,714 psia, THEN ENSURE the following ACTUATED: - SIAS (C-01) - CIAS (C-01) - EBFAS (C-01) e. IF Pressurizer Pressure is LESS THAN 1,714 psia AND SIAS ACTUATED, THEN ENSURE one RCP in each loop is stopped. f. IF Pressurizer pressure lowers to LESS THAN the minimum of EOP 2541, Appendix 2, Figures, RCP NPSH Curve, THEN STOP all RCPs.

Examiner note: NPSH will likely be lost for a short time (due in part to harsh containment). Securing all RCPs is not listed as a critical task because the critical task applies to SBLOCA, and scenario validation was unable to rule out the possibility of maintaining NPSH.

Event Description: Steam Generator Tube Rupture and ESDE on #2 Steam Generator

Symptoms/Cues: Main Steam Line Radiation Monitor alarm with lowering RCS pressure, #2 Steam Generator pressure lowering after trip

Time	Position	Applicant's Actions or Behavior
	ATC	6. Evaluate Core Heat Removal a. CHECK RCS - IN FORCED CIRCULATION BY BOTH OF THE FOLLOWING: • At least one RCP – OPERATING • Loop ΔT - LESS THAN 10°F RNO a. PERFORM the following: 1. PLACE STM DMP TAVG CNTL, TIC-4165, in MANUAL AND CLOSED. 2. PLACE both Pressurizer Spray Valve controllers in MANUAL AND CLOSE the valves. b. CHECK RCS subcooling – GREATER THAN OR EQUAL TO 30°F

Event Description: Steam Generator Tube Rupture and ESDE on #2 Steam Generator

Symptoms/Cues: Main Steam Line Radiation Monitor alarm with lowering RCS pressure, #2 Steam Generator pressure lowering after trip

Time	Position	Applicant's Actions or Behavior
		7. Maintain RCS Heat Removal - CHECK At least one Steam Generator - MEETS BOTH OF THE FOLLOWING: - Level - 10 to 80% - Either of the following – OPERATING TO RESTORE LEVEL 40 to 70% - Main Feedwater OR (TCOA) Two Auxiliary Feedwater Pumps RNO If AAFW has not actuated when the BOP reaches this step, they will start the MDAFW pumps and initiate AFW to the S/Gs. (Event 8) - CHECK RCS TC - 530 to 535°F - CHECK both Steam Generators pressure - 880 to 920 psia RNO - IF any Steam Generator pressure LESS THAN 572 psia, THEN ENSURE MSI ACTUATED (C-01). - IF any Steam Generator pressure LESS THAN 572 psia AND ESDE is in progress, THEN ISOLATE AFW to most affected Steam Generator: - PLACE both Auxiliary Feed OVERRIDE/MAN/START/RESET hand switches in PULL TO LOCK. - CLOSE associated SG Auxiliary Feed Regulating valve: - AFW FCV, FW-43B - IF desired to close AUX FD HDR X-TIE, FW-44, to Isolate Auxiliary Feedwater to most affected Steam Generator THEN PERFORM the following: - IF #2 SG faulted, THEN CLOSE AUX FD HDR X-TIE, FW-44, AND ENSURE TDAFW Pump STOPPED. - IF required to isolate Auxiliary Feedwater flow, THEN DISPATCH operator to CLOSE applicable Auxiliary Feed Regulating Valve Manual Isolation Valve: (Local) →N/A - IF any Steam Generator pressure LESS THAN 572 psia AND ESDE is in progress, THEN PERFORM the following: - CLOSE Atmospheric Dump Valve for most affected Steam Generator. - IF the most affected Steam Generator has boiled dry, as indicated by CET temperature rising, THEN OPERATE Atmospheric Dump Valve for least affected Steam Generator to stabilize CET temperature. - PROCEED TO step 8.

Event Description: Steam Generator Tube Rupture and ESDE on #2 Steam Generator

Symptoms/Cues: Main Steam Line Radiation Monitor alarm with lowering RCS pressure, #2 Steam Generator pressure lowering after trip

Time	Position	Applicant's Actions or Behavior
Critical Task: Isolate feed to the #2 Steam Generator within 15 minutes of MSI. Critical Task: Establish RCS Temperature Control. Time of MSI _____ Time feed is isolated to #2 Steam Generator _____ Time CET temperature stabilized _____		
	ATC	8. Evaluate Containment Isolation a. CHECK Containment pressure - LESS THAN 1 psig RNO a. IF Containment pressure GREATER THAN OR EQUAL TO 4.42 psig, THEN ENSURE all of the following ACTUATED: • SIAS (C-01) • CIAS (C-01) • EBFAS (C-01) • MSI (C-01) b. CHECK Radiation Monitors Inside Containment - MEET BOTH OF THE FOLLOWING: • NO UNEXPLAINED RISE • NO UNEXPLAINED ALARM c. CHECK Steam Plant Radiation Monitors - MEET BOTH OF THE FOLLOWING: • NO UNEXPLAINED RISE • NO UNEXPLAINED ALARM The RNO for Steam Plant rad monitors in alarm (throttling feed to maintain #2 S/G 40%-45%) is effectively moot due to the fact that the RUPTURED generator is also FAULTED.

Event Description: Steam Generator Tube Rupture and ESDE on #2 Steam Generator

Symptoms/Cues: Main Steam Line Radiation Monitor alarm with lowering RCS pressure, #2 Steam Generator pressure lowering after trip

Time	Position	Applicant's Actions or Behavior
	ATC	9. CHECK Containment Temperature And Pressure Control - MAINTAINED BY BOTH OF THE FOLLOWING: - Containment temperature - LESS THAN 120°F (PPC or average of Points 5 and 6) - Containment pressure - LESS THAN 1 psig RNO - ENSURE all available normal cooling and ventilation systems OPERATING: - CAR FANS operating on the facility with an operating train of RBCCW - CTMT AUX CIRC fans - IF Containment pressure GREATER THAN OR EQUAL TO 4.42 psig, THEN PERFORM the following: - ENSURE all of the following ACTUATED: - SIAS (C-01) - CIAS (C-01) - EBFAS (C-01) - MSI (C-01) - PLACE all available CTMT AUX CIRC fans in START LOW. - START all available PIR FANS. - IF Containment pressure is GREATER THAN OR EQUAL TO 9.48 psig, THEN ENSURE the following: - CSAS ACTUATED (C-01) - All operating Containment Spray Pumps are delivering at least 1,300 gpm each. → ATC will find 2-CS-4.1B closed and open it. (Event 9)
	US ATC BOP	10. DIAGNOSE Event - Using EOP 2541, Appendix 1, Diagnostic Flowchart, DIAGNOSE event→ESDE in Containment and SGTR, both on #2 Steam Generator - INITIATE EOP 2541, Appendix 4, Attachment 4A, Reactor Trip Subsequent Actions - GO TO the appropriate EOP→EOP 2540
	ATC BOP	Perform EOP 2541, Appendix 4, Attachment 4A, Reactor Trip Subsequent Actions

Examiner note: Crew enters EOP 2540.

Booth Operator: If at any time the crew requests closing the disconnect for 2-MS-202, wait 3 minutes and then **insert trigger #10** and report that it is done.

Event Description: Steam Generator Tube Rupture and ESDE on #2 Steam Generator

Symptoms/Cues: Main Steam Line Radiation Monitor alarm with lowering RCS pressure, #2 Steam Generator pressure lowering after trip

Time	Position	Applicant's Actions or Behavior
	US BOP	EOP 2540 - 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. - 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	- IF pressurizer pressure is less than 1714 psia AND SIAS has initiated, PERFORM the following: - ENSURE ONE RCP in each loop is stopped. - PLACE associated pressurizer spray valve controller RC-100E or RC-100F in manual and CLOSE the valve. - IF pressurizer pressure lowers to less than the minimum RCP NPSH limit, PERFORM the following: - STOP ALL RCPs. - PLACE TIC-4165, steam dump T_{AVG} controller, in manual and closed. - PLACE pressurizer spray valve controllers RC-100E and RC-100F in manual and CLOSE the valves.
	BOP	- SAMPLE steam generators that are available for RCS heat removal as follows: → Students should determine that only #1 S/G is available for heat removal. - CHECK "B" train RBCCW in service. - ENSURE 2-RB-210 "Degasifier Effluent Cooler Return Outlet" is open. - OPEN appropriate steam generator sample valves - MS-191A - MS-191B → N/A, not available for heat removal - 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 - 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"
	ATC	PLACE the hydrogen analyzers in service. Refer To Appendix 19, "Hydrogen Analyzer Operation."

Event Description: Steam Generator Tube Rupture and ESDE on #2 Steam Generator

Symptoms/Cues: Main Steam Line Radiation Monitor alarm with lowering RCS pressure, #2 Steam Generator pressure lowering after trip

Time	Position	Applicant's Actions or Behavior
	US	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 The following success paths were identified performing RATs during validation: - RC-1 → Yes - DC-1 → Yes - AC-1 → Yes - IC-1 → Yes * - PC-1 → Yes * - HR-2 → Yes CI-1 → No - CPTC-3 → Yes * Subcooling is expected to dip below 30°F and recover. If subcooling is below 30°F, IC-2 and PC-2 will apply (and they will be met). The overall priority remains CI-1, which is not met.
	CREW	Proceeds to EOP 2540E to address success path CI-1.
Examiner Note: HPSI throttle and stop criteria will likely be met early in the EOP 2540 procedure set. The guidance is contained in success paths IC-2, PC-1, PC-2, and HR-2. None of these are the first priority but HR-2 is the third priority and the likeliest path the students would use if/when they address the criteria. When developing the scenario, the SGTR and ESDE were sized to allow the students to be successful without having to address HPSI throttle/stop criteria prior to isolating the #2 steam generator.		

Event Description: Steam Generator Tube Rupture and ESDE on #2 Steam Generator

Symptoms/Cues: Main Steam Line Radiation Monitor alarm with lowering RCS pressure, #2 Steam Generator pressure lowering after trip

Time	Position	Applicant's Actions or Behavior
	ATC	EOP 2540E 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: - ENSURE that SIAS, CIAS, EBFAS, and MSI have actuated. (C01) - CHECK at least one train of SIAS, CIAS, EBFAS and MSI has properly actuated. (C01X) - ENSURE ONE complete facility of CRACS is operating in the recirc mode - ENSURE vital switchgear cooling is operating for each operating ECCS train
	US BOP	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: Crew enters EOP 2541 Appendix 12 to isolate the #2 Steam Generator		
	US	WARNING: - 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. - Ice vests are stored in the Unit 1 Control Room area. NOTE: Harsh Containment values are designated with brackets []. These values should be used any time CIAS has actuated on high Containment pressure GREATER THAN 4.42 psig. → Crew should determine that Harsh Containment conditions exist. 1. CHECK Steam Dumps to Condenser available. RNO 1.1 COMMENCE an RCS cooldown to a T_H of LESS THAN 515° F [510° F] in BOTH loops Using EITHER of the following: → T_H will be considerably less than 510°F from the ESDE.

Event Description: Steam Generator Tube Rupture and ESDE on #2 Steam Generator

Symptoms/Cues: Main Steam Line Radiation Monitor alarm with lowering RCS pressure, #2 Steam Generator pressure lowering after trip

Time	Position	Applicant's Actions or Behavior
	ATC	NOTE: Harsh Containment values are designated with brackets []. These values should be used any time CIAS has actuated on high Containment pressure GREATER THAN 4.42 psig. → Crew should determine that Harsh Containment conditions exist. 2. DEPRESSURIZE the RCS in preparation for isolating the affected SG by performing the following: - CONTROL RCS pressure using pressurizer heaters and spray. - ESTABLISH AND MAINTAIN pressurizer pressure to meet ALL of the following criteria: - LESS THAN 920 psia [800 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 RNO b.1 IF HPSI throttle criteria are met, THEN PERFORM ANY of the following to lower RCS pressure: - CONTROL charging AND letdown - THROTTLE HPSI flow
Examiner note: HPSI throttle criteria can be found in success paths IC-2, PC-1, PC-2, and HR-2.		
	US	Steps 3 and 4, MSI and SIAS have actuated and will not be blocked. RNO will be used to ensure the actuations happened and move on.
	BOP	Step 5, condenser is not available and actions will have been taken in Appendix 4, Attachment 4A.
	US	Step 6, Crew has already determined that the #2 Steam Generator is most affected.
Booth Operator: When requested to close the disconnect for 2-MS-202, wait 3 minutes and then insert trigger #10 and report that it is done.		

Event Description: Steam Generator Tube Rupture and ESDE on #2 Steam Generator

Symptoms/Cues: Main Steam Line Radiation Monitor alarm with lowering RCS pressure, #2 Steam Generator pressure lowering after trip

Time	Position	Applicant's Actions or Behavior
	BOP	7. WHEN BOTH RCS TH temperatures are LESS THAN 515° F [510° F], THEN ISOLATE the most affected steam generator by performing the following: - RECORD in the placekeeper, time AND T_c of the operating loop. - ENSURE ALL of the following for the #2 ADV: - ADV controller, PIC-4224, setpoint at 920 psia [800 psia] - ADV controller, PIC-4224, is in A - ADV, MS-190B, is closed - ENSURE the MSIV, MS-64B, is closed. - ENSURE the MSIV bypass valve, MS-65B, is closed. - UNLOCK AND CLOSE "DISC FOR 2-MS-202" (NS6202) - CLOSE steam to turbine driven aux feed pump supply valve, MS-202. - CLOSE BYPASS VALVE, LIC-5216, main feedwater regulating bypass valve. - ENSURE the main feedwater block valve, FW-42B is closed. - PLACE main feed isolation air assisted check valve, FW-5B to "CLOSE." - ENSURE the steam generator blowdown isolation valve, MS-220B is closed. - PLACE BOTH auxiliary feed "OVERRIDE/MAN/START/ RESET" handswitches in "PULL TO LOCK." - CLOSE the aux feedwater regulating valve, FW-43B. - PLACE aux feed isolation air assisted check valve, FW-12B to "CLOSE". - CLOSE main steam leg low point drain, MS-266B. - CHECK the main steam safety valves are closed. - RECORD time #2 steam generator is isolated
Critical Task: BOP isolate the #2 Steam Generator within 1 hour of event initiation. Highlighted steps (above) involve components the BOP will likely reposition (i.e. won't already be found in required position).		
Time of trip _____ Time #2 Steam Generator isolated _____		
When the event has been addressed to the lead examiner's satisfaction, the scenario is complete.		

SIMULATOR SCENARIO #3

Form 3.3-1 Scenario Outline

Facility:	Millstone Unit 2	Scenario #:	3
Scenario Source:		Op. Test #:	ES24LI3
Examiners:		Applicants/	
		Operators:	
Initial Conditions:	IC 327, 100% power, nothing out of service.		
Turnover:	The crew is tasked with performing the quarterly IST on the 'B' MDAFP IAW SP 2610KO.		
Critical Tasks:	1. Start the TDAFP within 10 minutes of loss of MFW and no MDAFPs running. 2. Restore CRAC within 25 minutes of loss of Control Room cooling 3. Establish a primary to secondary heat sink prior to one steam generator reaching 70" AND the other steam generator reaching 165"		

Event No.	Malf. No.	Event Type*	Event Description
1.	FW20B	N-BOP/US TS-US	SP 2610KO-1 "B" MDAFP quarterly surveillance, pump trips ~1 min. after start (spurious trip), TS 3.7.1.2 AFW (No relay drops on breaker, Electrical maintenance will confirm no issues with pump or breaker during diagnostic flow chart).
2.	RC06A	C-ATC/US TS-US	RC-402 PORV opens 10%, AOP 2585 IOAs to close RC-403 block valve, TS 3.4.3 PORVs.
3.	TC06C	R-ATC C-BOP/US TS-US	#3 CV fails to 25% open driving T _{COLD} above 549°F. AOP 2584 Turbine Valve Failure, TS 3.2.6 DNB.
4.	ED03A- ED03D	M-All	Loss of Offsite Power.
5.	EG08A, EG09B	C-ATC,BOP MC-BOP	Neither EDG output breaker closes automatically ('A' is prevented from closure), BOP must trip 'A' EDG and close the 'B' output breaker. RO must swap CRAC in APP 4 att. 4A.
6.	FW20C	C-BOP	TDAFP trips 5 minutes after start. BOP must restore feed using the "B" MDAFP during EOP 2537.
* (N)Normal, (R)Reactivity, (I)Instrument, (C)Component, (M)Major, (TS)Tech Spec, (MC)Manual Control			

Quantitative Attribute	Target per Scenario	Actual
Events after EOP entry	1–2	3
Abnormal events	2–4	2
Major transients	1–2	1
EOPs entered/requiring substantive actions	1–2	1
Entry into a contingency EOP with substantive actions	1 per scenario set	0
Preidentified CTs	2 or more	3

Scenario Summary:

Event 1: The BOP will perform the ‘B’ MDAFP IST, SP 2610KO, and start the ‘B’ MDAFP. About 1 minute into the run, the pump will trip (spurious trip, no relay drops on breaker). TSAS 3.7.1.2 will be entered for the ‘B’ MDAFP not OPERABLE. The spurious nature of the trip will not be revealed to the crew until later in the scenario.

Event 2: RC-402 PORV will open 10%. The ATC will need to take IOAs to close the RC-403 Block Valve. TSAS 3.4.3 (PORVs) will need to be entered. If pressure drops below 2225 psia, TSAS 3.2.6 (DNB) will need to be entered for pressure.

Event 3: #3 Control Valve will fail to 25% open (close direction, remaining valves at ~46% open). The crew will carry out the actions of AOP 2584, “Turbine Valve Failure.” The load reject will cause T_{COLD} to rise above 549°F, requiring entry into TSAS 3.2.6 (DNB) for temperature. Included in the actions of AOP 2584, the ATC will borate and drive CEAs in to restore T_{COLD} to within 2°F of program, and the BOP will take manual control of both SGFP speeds and raise their speeds to pre-event values.

Event 4: Offsite power will be lost, causing a reactor trip. The crew will carry out actions of EOP 2525, “Standard Post Trip Actions.”

Event 5: Neither EDG output breaker will close. On the ‘A’ EDG, output breaker is prevented from closing (no associated alarms or indicated faults) and the BOP must trip the ‘A’ EDG IAW the RNO for Vital Auxiliaries in EOP 2525. On the ‘B’ EDG, the auto close feature will fail on the breaker, requiring the BOP to close the breaker manually. Since Z2 is the only vital facility with power, the ATC will need to swap CRAC to Z2 IAW EOP 2541 Appendix 4, Attachment 4A, within 25 minutes of loss of Control Room cooling.

Event 6: The BOP will start the TDAFP within 10 minutes of the loss of MFW, with no MDAFW pumps running and SG levels dropping. The TDAFP will then trip within 5 minutes after being started. During the Diagnostic Flow Chart, Electrical Maintenance will call to tell the crew there are no issues with the ‘B’ MDAFP or its breaker, and that there is no reason not to run it if needed. The crew will enter EOP 2537, “Loss of All Feed,” and restore feed with the ‘B’ MDAFP prior to either Steam Generator wide range level dropping below 70” with the other one below 165.”

The scenario will end at the Lead Examiner’s discretion.

INPUT SUMMARY								
Either INPUT or VERIFY the following functions:								
ID Num	Description	Delay Time	Ramp Time	Delete after	Event Trigger	Severity or Value	Final Value	Relative Order
MALFUNCTIONS								
FW20B	AFW PP P-9B TRIP	--	--	--	1	Active	Active	1
FWR69	AFW PUMP B BRK (A406) RI/RO	--	--	--	12	RO	RO	--
FWR69	AFW PUMP B BRK (A406) RI/RO	--	--	--	13	RI	RI	--
FW20B	AFW PP P-9B TRIP	--	--	1 sec	12	Active	Active	--
RC06A	PORV (RC-402) FAIL	--	--	--	2	10%	10%	2
TC06C	TURBINE CV 3 FAIL	--	30 sec	--	3	25%	25%	3
ED03A	LOSS OF 345KV LINE #310	--	--	--	4	Active	Active	4
ED03B	LOSS OF 345KV LINE #371	--	--	--	4	Active	Active	4
ED03C	LOSS OF 345KV LINE #383	--	--	--	4	Active	Active	4
ED03D	LOSS OF 345KV LINE #348	--	--	--	4	Active	Active	4
EG08A	DG 12U OUTPUT BRKR 15G-12U-2 FAIL	--	--	--	--	Active	Active	5
EG09B	DG 13U OUTPUT BRKR 15G-13U-2 AUTO CLOSE FAIL	--	--	--	--	Active	Active	5
FW20C	AFW PP P-4 TRIP	5 min	--	--	29	Active	Active	6
REMOTE FUNCTIONS								
IAR16E	IAC F3E RESET PUSH BUTTON	--	--	--	10	RESET	RESET	--
IAR16F	IAC F3F RESET PUSH BUTTON	--	--	--	10	RESET	RESET	--
IAR15E	IAC F3E START PUSH BUTTON	1 sec	--	--	10	START	START	--
IAR15F	IAC F3F START PUSH BUTTON	1 sec	--	--	10	START	START	--
OVERRIDES								
RCHS-1403_1	RC-403 PZR RELIEF ISO (DO GREEN)	--	--	--	11	NG	NG	--
RCHS-1403_2	RC-403 PZR RELIEF ISO (DO RED)	--	--	--	11	NR	NR	--
02A2A2S7	RC-403 PZR RELIEF ISO (DIGITAL INPUT)	--	--	--	11	CLOSE	CLOSE	--

Notes:

1. There may be communications between the Control Room crew and the simulator booth that are not noted in this guide. In these cases, the simulator booth operator will acknowledge the request or direction and provide generic information. The following examples are provided:
 - a. If directed to walk down a component that trips on overload; local inspection of the pump would indicate no observable deficiencies and the breaker is in a tripped condition. Do not editorialize with words like 'acrid smell or charring'

- b. Calls to Work Control or other departments will be acknowledged. Report that CRs are being written, issues are being investigated, etc. If the crew calls for a follow up, report that actions are in progress.
- c. Personnel are always on station for equipment starts. The line-ups are complete, oil levels are sat, any support equipment is available and operating as required. Post-start checks are sat, normal vibes and indications.

Critical Task Elements

Critical Task Statement	Start the TDAFP within 10 minutes of loss of MFW and no MDAFPs running.
Initiating Cue	Zero volts on Bus 24C after Vital Auxiliaries step in EOP 2525 and no lights or current on the 'B' MDAFP. Wide range levels lowering on both Steam Generators.
Performance Feedback	Rising speed on the TDAFP.
Success Path	Start the TDAFP IAW EOP 2541, Appendix 6.
Measurable Performance Standard	TDAFP is running within 10 minutes of loss of MFW.

Critical Task Statement	Restore CRAC within 25 minutes of loss of Control Room cooling.
Initiating Cue	Indicating lights not lit on the Facility 1 CRAC fans.
Performance Feedback	Facility 2 CRAC supply and exhaust fans and dampers' red lights lit and green lights out.
Success Path	Swap from Facility 1 (Train A) CRAC to Facility 2 (Train B) CRAC using EOP 2541 Appendix 4 Attachment 4A
Measurable Performance Standard	Facility 2 (Train B) CRAC is running within 25 minutes of loss of Control Room ventilation.

Critical Task Statement	Establish a primary to secondary heat sink prior to one steam generator reaching 70" AND the other steam generator reaching 165."
Initiating Cue	Zero GPM AFW flow following trip of the TDAFP on startup.
Performance Feedback	AFW flow to either steam generator greater than zero GPM.
Success Path	Start the 'B' MDAFW pump and feed one or both Steam Generators IAW EOP 2537, step 11.
Measurable Performance Standard	Feed is established to at least one steam generator, as indicated by feed flow or rising wide range level, prior to either steam generator wide range level lowering below 70" with the other less than 165."

Event Description: 'B' MDAFW pump trip during surveillance run

Symptoms/Cues: Pump breaker has green and amber indicating lights, zero amps, AUXILIARY FEED PP MTR B TRIP/TROUBLE annunciator in (C05, B-15)

Time	Position	Applicant's Actions or Behavior
Booth Operator: Load IC 327 (100% power, nothing out of service). When queried as PEO, report that FW-56A and FW-56B are closed, and pre-starts are complete on the 'B' MDAFP.		
	BOP	SP 2610KO 4.1 ENSURE the following valves, closed: • "AFW FCV, FW-43A" (C-05) • "AFW FCV, FW-43B" (C-05) • 2-FW-56A, "#1 SG AUX FRV BYPASS" (14'6" TB) • 2-FW-56B, "#2 SG AUX FRV BYPASS" (14'6" TB) 4.2 START "B" AFW Pump as follows: 4.2.1 PLACE "AFP B, P9B," switch to "START" (C-05). NOTE: A mechanical seal leak rate of one quart per minute is roughly equivalent to a steady stream of water, 1/4 to 3/8" in diameter (about the thickness of a pencil). 4.2.2 IF pump mechanical seal leakage is greater than one quart per minute, NOTIFY System Engineer. 4.2.3 OBSERVE the following: • Motor amperage, normal is 15 to 40 amps (C-05) • Bearing temperatures, normal is 125 to 173°F ○ PPC point T5367 ○ PPC point T5368 • Discharge pressure greater than or equal to 1,070 psig, as indicated on either of the following: ○ "AFP B DIS PRES, PI-5281" (C-05) ○ PPC point P5281
Booth Operator: When queried about 'B' MDAFW pump running conditions, report that the pump has good post-starts and seal leakage is 2 drops per minute. 1 minute after the 'B' MDAFW pump is started, insert trigger #1: • FW20B, AFW PP P-9B TRIP		
	US BOP	• Works through Attachment 1 of OP 2610KO, and through ARP 2590D-058 (C05 B-15) • Determines that TSAS 3.7.1.2 is appropriate • Sends PEO, Electrical Maintenance to investigate why the pump tripped.

Event Description: 'B' MDAFW pump trip during surveillance run

Symptoms/Cues: Pump breaker has green and amber indicating lights, zero amps, AUXILIARY FEED PP MTR B TRIP/TROUBLE annunciator in (C05, B-15)

Time	Position	Applicant's Actions or Behavior
Booth Operator: If asked, field PEO for surveillance notes no apparent issues locally with the pump and no relay drops at the breaker. When contacted as Work Control, report that Electrical Maintenance is going to rack down the A406 breaker for the 'B' MDAFW pump and check for issues. Then insert trigger #12 to rack out the breaker.		
	US	TSAS 3.7.1.2 At least three steam generator auxiliary feedwater pumps shall be OPERABLE with: - Two feedwater pumps capable of being powered from separate OPERABLE emergency busses, and - One feedwater pump capable of being powered from an OPERABLE steam supply system. APPLICABILITY: MODES 1, 2 and 3 NOTE: LCO 3.0.4b is not applicable ACTION: One auxiliary feedwater pump not OPERABLE in MODE 1, 2, or 3 for reasons other than a. or b. above, restore the auxiliary feedwater pump to OPERABLE status within 72 hours. If these ACTIONS are not met, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 12 hours.
WHEN the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: RC-402 PORV fails 10% open

Symptoms/Cues: Dual indication on RC-402, lowering pressurizer pressure, PORV RC-402 OPEN annunciator lit (C02/03, C-11)

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed by the lead examiner, insert trigger #2		
RC06A PORV (RC-402) FAIL at 10%		
	ATC	AOP 2585 [5.1] CHECK PORV stuck open by observing RCS Pressure less than 2,250 psia a. IF RC-402, #1 PORV, indicates OPEN, THEN PLACE "RC-403, ISOL VLV" to CLOSE. [5.2] CHECK PORV isolated by observing RCS Pressure greater than 2,200 psia. RNO requires trip if pressure drops below 2200 PSIA, this is <u>NOT</u> expected to happen. 5.3 CHECK if RC-402, #1 PORV, was open, Go To ARP 2590B-043, "PORV RC-402 OPEN" (C-02/3, window C-11).
	US ATC	Refers to ARP 2590D-043, considers TS 3.4.3, 3.4.6.2 and 3.4.9.3 (3.4.9.3 is not expected to be entered). If pressure drops below 2225 psia, DNB (TS 3.2.6) will be entered, as well. As time permits, ATC may address any quench tank parameters in alarm using OP 2301A (such as cooling QT, draining QT to PDT, lowering QT pressure).
	US	TSAS 3.4.3 Both power operated relief valves (PORVs) and their associated block valves shall be OPERABLE. <u>APPLICABILITY:</u> MODES 1, 2 and 3 <u>ACTION:</u> b. One PORV not OPERABLE, not capable of being manually cycled, Within 1 hour either restore the PORV to OPERABLE status or close its associated block valve and remove power from the block valve; restore the PORV to OPERABLE status within the following 72 hours or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. → 1 hour requirement met when block valve is closed with power removed.
Booth Operator: When called as PEO to open the breaker for RC-403, wait 3 minutes and insert trigger #11, then report that it is done.		
	US	TSAS 3.4.6.2 Reactor Coolant System Operational LEAKAGE shall be limited to: d. 10 GPM IDENTIFIED LEAKAGE. <u>APPLICABILITY:</u> MODES 1, 2, 3 and 4 <u>ACTION:</u> b. 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. → Met when RC-402 is closed.

Event Description: RC-402 PORV fails 10% open

Symptoms/Cues: Dual indication on RC-402, lowering pressurizer pressure, PORV RC-402 OPEN annunciator lit (C02/03, C-11)

Time	Position	Applicant's Actions or Behavior
	US	TS 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. <u>APPLICABILITY:</u> MODE 1 <u>ACTION:</u> 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 $\leq$ 5% of RATED THERMAL POWER within the next 4 hours. COLR section 2.7 DNB Margin (Technical Specification 3/4.2.6) The DNB margin shall be preserved by maintaining the cold leg temperature, pressurizer pressure, reactor coolant flow rate, and AXIAL SHAPE INDEX within the following limits: b. Pressurizer Pressure > 2225 psia* * Limit not applicable during either the THERMAL POWER ramp increase in excess of 5% of RATED THERMAL POWER per minute or a THERMAL POWER step increase of greater than 10% of RATED THERMAL POWER.
WHEN the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: #3 Control Valve fails to 25% open

Symptoms/Cues: Rising T_{COLD}, rising pressurizer pressure with pressure deviation alarm, CV 3 moving in closed direction

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed by lead examiner, insert trigger #3 TC06C TURBINE CV 3 FAIL at 25%		
	CREW	- Notes that TCOLD and pressurizer level are rising. - Notes these symptoms are consistent with a load reject and looks for other indications. - Notes that Control Valve #3 is closed or closing beyond pre-event conditions. - Recognizes that AOP 2585 Immediate Operator Actions is NOT appropriate for a turbine valve moving in the CLOSED direction. - Enters AOP 2584, Turbine Valve Failure
	US	AOP 2584 NOTE: Foldout page shall be monitored throughout this procedure. CAUTION: Raising Turbine load to address an actual Reactor power transient is NEVER an appropriate response. Adding negative reactivity with rods or boron is the appropriate operator response in these cases.
	US ATC	1. Reactor Trip Criteria a. CHECK any of the following conditions – MET - Parameters associated with automatic Reactor trip are challenged (C-04) - Parameters associated with automatic Turbine trip are challenged (HMI) - RCS T_C NOT within 10°F of temperature program AND efforts to regain control are unsuccessful b. TRIP the Reactor AND GO TO EOP 2525, Standard Post Trip Actions RNO PROCEED TO step 2
	US	2. Turbine Valve Opening a. CHECK ANY Turbine valve positions - OPEN BEYOND PRE-EVENT POSITION (HMI/PPC) RNO PROCEED TO step 3

Event Description: #3 Control Valve fails to 25% open

Symptoms/Cues: Rising T_{COLD} , rising pressurizer pressure with pressure deviation alarm, CV 3 moving in closed direction

Time	Position	Applicant's Actions or Behavior
	US BOP	3. Turbine Valve Closing - CHECK ANY Turbine valve positions - CLOSED BEYOND PRE-EVENT POSITION (HMI/PPC) - CHECK RCS temperature - RISING due to uncontrolled valve movement (RPS/C-02/3) - SELECT LOAD HOLD (HMI) - Place both SGFPs in MANUAL - PRESS A SGFP control manual pushbutton - PRESS B SGFP control manual pushbutton - RAISE SGFP speeds to ESTABLISH the following: (100% power: 4600-4800 RPM) - FRV D/Ps 50 to 150 psid - SG levels restoring to pre-transient values - Using any of the following: - CEA insertion - Boron Addition PERFORM the following: - STABILIZE RCS T_c - Slowly RESTORE RCS T_c within +/- 2°F of program
	US	TS 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. <u>APPLICABILITY:</u> MODE 1 <u>ACTION:</u> 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. COLR section 2.7 DNB Margin (Technical Specification 3/4.2.6) The DNB margin shall be preserved by maintaining the cold leg temperature, pressurizer pressure, reactor coolant flow rate, and AXIAL SHAPE INDEX within the following limits: Cold Leg Temperature $\leq 549^\circ\text{F}$
	US ATC	AOP 2584 4. Forcing Pressurizer Sprays - CHECK plant in - MODE 1 OR 2 - INITIATE Forcing Pressurizer Sprays
WHEN the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: Loss of offsite power leading to a loss of all feed

Symptoms/Cues: Lights go out in Control Room, reactor and turbine trip.

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed by the lead examiner, insert trigger #4 to cause a loss of offsite power.		
Examiner note: Events 4, 5 and 6 are included in this event block.		
Critical Task: Start the TDAFP within 10 minutes of loss of MFW and no MDAFPs running. Critical Task: Restore CRAC within 25 minutes of loss of Control Room cooling.		
Time MFW is lost _____ Time Control Room cooling is lost _____		
	ATC	EOP 2525 1. CHECK Reactor - TRIPPED BY ALL OF THE FOLLOWING: • All CEAS - FULLY INSERTED • Reactor power – LOWERING • Startup Rate - NEGATIVE
	BOP	2. Trip Main Turbine - CHECK Main Turbine - TRIPPED BY ALL OF THE FOLLOWING: • All Main Stop Valves - CLOSED or All Control Valves – CLOSED • Generator megawatts – ZERO • Turbine speed – LOWERING - CHECK both Main Generator output breakers - OPEN: • SWYD GEN BKR, 15G-8T-2 • SWYD GEN BKR, 15G-9T-2

Event Description: Loss of offsite power leading to a loss of all feed

Symptoms/Cues: Lights go out in Control Room, reactor and turbine trip.

Time	Position	Applicant's Actions or Behavior
	BOP	3. Maintain Vital Auxiliaries - CHECK Open Phase Condition (OPC) annunciator, RSST OPEN PHASE, CA-48 on C-06/7 - NOT LIT - CHECK the following Vital and Non-Vital loads – ENERGIZED RNO b. PERFORM the following for associated de-energized buses: 3. PERFORM the following for Vital Bus: - IF Containment pressure GREATER THAN OR EQUAL TO 20 psig, THEN PLACE RBCCW Pump in PULL TO LOCK. - ENSURE DG STARTED. - ENSURE Vital Bus to Non-Vital Bus TIE BKR OPEN. - ENSURE Diesel Generator output breaker SYN SW ON. - ENSURE DG FDR BKR CLOSED. → This will be successful for 'B' Diesel (Event 5) - IF Diesel Generator output breaker CANNOT be CLOSED, THEN TRIP Diesel Generator. → The 'A' Diesel output breaker WILL NOT close, requiring the 'A' Diesel to be emergency tripped. (Event 5) - CHECK both facilities of Service Water System – FACILITY 2 OPERATING (Facility 1 is dead) - CHECK both RBCCW facilities – FACILITY 2 OPERATING WITH SERVICE WATER COOLING (Facility 1 dead)
	ATC	4. Control RCS Inventory - CHECK Pressurizer level - MAINTAINED BY BOTH OF THE FOLLOWING: 20 to 80% - TRENDING TO 35 to 70% - CHECK RCS subcooling – GREATER THAN OR EQUAL TO 30°F
	ATC	5. CHECK Pressurizer Pressure - MAINTAINED BY BOTH OF THE FOLLOWING: 1,900 to 2,350 psia - TRENDING TO 2,225 to 2,300 psia
	ATC	6. Evaluate Core Heat Removal - CHECK RCS - IN FORCED CIRCULATION BY BOTH OF THE FOLLOWING: - At least one RCP – OPERATING - Loop ΔT - LESS THAN 10°F RNO a. PERFORM the following: - PLACE STM DMP TAVG CNTL, TIC-4165, in MANUAL AND CLOSED. - PLACE both Pressurizer Spray Valve controllers in MANUAL AND CLOSE the valves. - CHECK RCS subcooling – GREATER THAN OR EQUAL TO 30°F

Event Description: Loss of offsite power leading to a loss of all feed

Symptoms/Cues: Lights go out in Control Room, reactor and turbine trip.

Time	Position	Applicant's Actions or Behavior
	BOP	7. Maintain RCS Heat Removal a. CHECK At least one Steam Generator - MEETS BOTH OF THE FOLLOWING: ○ Level - 10 to 80% ○ Either of the following – OPERATING TO RESTORE LEVEL 40 to 70% ▪ Main Feedwater OR ▪ (TCOA) Two Auxiliary Feedwater Pumps RNO The BOP will need to start the TDAFP IAW EOP 2541, Appendix 6. b. CHECK RCS TC - 530 to 535°F c. CHECK both Steam Generators pressure - 880 to 920 psia
	BOP	EOP 2541 Appendix 6 1. IF a SBO event has occurred OR DC Bus 201B is not energized, Go To Appendix 7, "TDAFW Pump Abnormal Operation." → N/A 2. Slowly OPEN SV-4188, TDAFP 2. steam valve. 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. 5. ESTABLISH flow to at least one steam generator using the aux feed reg valve
Critical Task: Start the TDAFP within 10 minutes of loss of MFW and no MDAPs running.		
Time MFW lost _____ Time TDAFW pump started _____		
Examiner note: The TDAFP will trip 5 minutes after its speed exceeds 500 RPM during startup. (Event 6)		
Booth Operator: When called to reset the TDAFP, wait 1 minute and report that the trip linkage is broken and the TDAFP CANNOT be reset.		
	ATC	EOP 2525 8. Evaluate Containment Isolation a. CHECK Containment pressure - LESS THAN 1 psig b. CHECK Radiation Monitors Inside Containment - MEET BOTH OF THE FOLLOWING: • NO UNEXPLAINED RISE • NO UNEXPLAINED ALARM c. CHECK Steam Plant Radiation Monitors - MEET BOTH OF THE FOLLOWING: • NO UNEXPLAINED RISE • NO UNEXPLAINED ALARM
	ATC	9. CHECK Containment Temperature And Pressure Control - MAINTAINED BY BOTH OF THE FOLLOWING: • Containment temperature - LESS THAN 120°F (PPC or average of Points 5 and 6) • Containment pressure - LESS THAN 1 psig

Event Description: Loss of offsite power leading to a loss of all feed

Symptoms/Cues: Lights go out in Control Room, reactor and turbine trip.

Time	Position	Applicant's Actions or Behavior
	US ATC BOP	10. DIAGNOSE Event - Using EOP 2541, Appendix 1, Diagnostic Flowchart, DIAGNOSE event → Loss of All Feed - INITIATE EOP 2541, Appendix 4, Attachment 4A, Reactor Trip Subsequent Actions - GO TO the appropriate EOP → EOP 2537
	ATC BOP	Perform EOP 2541, Appendix 4, Attachment 4A, Reactor Trip Subsequent Actions Step 3 is where critical task of restoring control room ventilation is performed: 3. TCOA: IF SIAS is NOT actuated, THEN CHECK ONE facility of CRAC operating, in NORMAL mode, as follows: (C25A/B) Facility 2 - Fan F-21B, supply fan running - HV-203B, Fan F-21B exhaust damper open - Fan F-31B, exhaust fan running - HV-206B, Fan F-31B exhaust damper open
Booth Operator: If at any time, the crew calls Unit 3 requesting power or air, report that power or air or both (i.e. whichever is requested) are available.		
Critical Task: Restore CRAC within 25 minutes of loss of Control Room cooling. (Event 5)		
Time Control Room cooling lost: _____ Time CRAC restored: _____		
Booth Operator: When BOTH of the following have occurred: - Diagnostic Flow Chart complete - TDAFP has tripped PERFORM the following: - Call as Electrical Maintenance and say that the inspection of the 'B' MDAFP breaker is complete with no issues found, and that the work order is en route to Work Control. - Insert trigger #13 to rack up the 'B' MDAFP breaker. - Report as Work Control that the 'B' MDAFP is available for use.		
Examiner note: the crew enters EOP 2537.		
Examiner note: If the crew restores power from Unit 3 and powers up 24C, they may pursue feed restoration with the 'A' MDAFP. This is an acceptable success path, however, the 'B' MDAFP is still the faster success path because its bus is already live.		

Event Description: Loss of offsite power leading to a loss of all feed

Symptoms/Cues: Lights go out in Control Room, reactor and turbine trip.

Time	Position	Applicant's Actions or Behavior
	US	- CONFIRM diagnosis of a Loss of All Feedwater by performing the following: - CHECK that Safety Function Status Check acceptance criteria are satisfied. - IF a fire is diagnosed, Refer To AOP 2559, "Fire." - 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. - PERFORM ALL of the following: - OPEN the placekeeper and ENTER the EOP entry time. - ENSURE the master alarm silence switch is in "NORMAL".
	ATC	PERFORM the following: → RCPs were lost on the trip with the Loss of Offsite Power. Actions for TIC-4165 and the spray valves were taken in EOP 2525.
	BOP	- PERFORM ALL of the following to conserve steam generator inventory: - ENSURE MS-220A, blowdown isolation valve is closed. - ENSURE MS-220B, blowdown isolation valve is closed. - CLOSE BOTH steam generator sample isolation valves: - MS-191A - MS-191B
	US 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: - Main or auxiliary feedwater is not expected to be restored. - Less than TWO trains of HPSI, PORVs and ADVs are available. - Less than THREE charging pumps are available. - 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 T_c stable or controlled within 5° F or less

Event Description: Loss of offsite power leading to a loss of all feed

Symptoms/Cues: Lights go out in Control Room, reactor and turbine trip.

Time	Position	Applicant's Actions or Behavior
	BOP	7. WHEN feedwater source becomes available, THEN RESTORE feedwater to the affected steam generators as follows: - CHECK steam generator level is less than 33%. - 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). - 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%.
	US	8. IF a main feedwater line break is indicated, ISOLATE the affected portion of the main feedwater system by performing the following: → N/A 9. IF a auxiliary feedwater line break is indicated, ISOLATE the affected portion of the auxiliary feedwater system by performing the following: → N/A
	BOP	10. IF offsite power has been lost, OR the condenser is not available, PERFORM the following: - CLOSE BOTH MSIVs. - ENSURE BOTH MSIV bypass valves are closed. - OPEN AR-17, condenser vacuum breaker.
	BOP	11. RESTORE feedwater flow to at least ONE steam generator using the motor-driven AFW pumps as follows: - PLACE BOTH "OVERRIDE/MAN/START RESET" switches to "PULL-TO-LOCK" - ADJUST FW-43A, "AFW-FCV, HIC-5276A" controller to "0." - PLACE FW-43A, "AFW-FCV, HIC-5276A" controller to "M". - ADJUST FW-43B, "AFW-FCV, HIC-5279A" controller to "0." - PLACE FW-43B, "AFW-FCV, HIC-5279A" controller to "M". - START at least ONE motor-driven AFW pump as follows: - PLACE AFW pump to be started handswitch to "STOP" - PLACE AFW pump to be started handswitch to "START" - As necessary, manually ADJUST AFW flow rate to No. 1 SG. - As necessary, manually ADJUST AFW flow rate to No. 2 SG.

Event Description: Loss of offsite power leading to a loss of all feed

Symptoms/Cues: Lights go out in Control Room, reactor and turbine trip.

Time	Position	Applicant's Actions or Behavior
Critical Task: Establish a primary to secondary heat sink prior to one steam generator reaching 70" AND the other steam generator reaching 165."		
Levels when feed is greater than zero to at least 1 S/G: S/G #1 _____ S/G #2 _____		
When the event has been addressed to the lead examiner's satisfaction, the scenario is complete.		

SIMULATOR SCENARIO #4

Form 3.3-1 Scenario Outline

Facility:	Millstone Unit 2	Scenario #:	4
Scenario Source:		Op. Test #:	ES24LI4
Examiners:		Applicants/	
		Operators:	
Initial Conditions:	IC 329, Power between POAH and 1%. Both MDAFW pumps running. Vacuum in condenser, both SGFPs on turning gear. 24E is on 24C. The following procedures are in progress: • OP 2203, Plant Startup, complete through Step 4.4.4. 4.4.4 is N/A, no overspeed required for the SGFP turbines. ○ Step 4.2.1 is in progress for maintaining power. Current band is POAH to 1%. Maintaining with short CEA movements. ○ Permission is being obtained to N/A step 4.5.1a and allow proceeding to raise power and start the 'A' SGFP with minimum staffing. • OP 2321 section 4.3 steps 4.3.1 through 4.3.5 are complete, as they are preparatory in nature.		
Turnover:	Crew directed to maintain plant conditions while Operations management approves proceeding to raise power and start the 'A' SGFP with minimum staffing.		
Critical Tasks:	1. Secure 'B' and 'D' RCPs within 5 minutes of loss of RBCCW cooling. 2. Establish a primary to secondary heat sink prior to one steam generator reaching 70" AND the other steam generator reaching 165."		

Event No.	Malf. No.	Event Type*	Event Description
1.	RP24D	I-ATC/US TS-US	'D' channel of Containment Pressure fails HIGH.
2.	CC01A	C-BOP/US TS-US	'A' RBCCW pump trips requiring IOAs.
3.	RX04B	C,MC-ATC	Pressurizer Level CH-Y fails to 45% (HIGH) requiring IOAs.
4.	N/A	R-ATC/BOP	Raise power to 1%-2%.
5.	FW06AB	N-BOP/US	Start 'A' SGFP. 'A' SGFP trips on the way up to 1000 RPM.
6.	FW36A, FW36B	M-All C- BOP	AFW header rupture (both flanges of FW-44) requires plant trip, LOAF. Fastest success path is to start the 'B' SGFP (Condensate is also available).
7.	SW01C	C-ATC, BOP	'C' SW pump trips on overload upon plant trip, requiring RNO to place 'C' RBCCW pump in PTL and secure 'B' and 'D' RCPs.
* (N)Normal, (R)Reactivity, (I)Instrument, (C)Component, (M)Major, (TS)Tech Spec, (MC)Manual Control			

Quantitative Attribute	Target per Scenario	Actual
Events after EOP entry	1–2	1
Abnormal events	2–4	3
Major transients	1–2	1
EOPs entered/requiring substantive actions	1–2	1
Entry into a contingency EOP with substantive actions	1 per scenario set	0
Preidentified CTs	2 or more	2

Scenario Summary:

- Event 1:** The ‘D’ channel of Containment Pressure will fail HIGH (60 psig). The ATC will need to bypass channel ‘D’ of Containment Pressure at RPS and ESAS (both HI and HI HI) IAW ARP 2590A-084, ARP 2590A-088 or ARP 2590C-048 (all 3 ARPs contain the guidance). TSAS 3.3.1.1 (Table 3.3-1) and TSAS 3.3.2.1 (Table 3.3-2) will need to be entered for RPS and ESAS instrumentation.
- Event 2:** The ‘A’ RBCCW pump will trip, requiring the BOP to perform IOAs to place the ‘B’ RBCCW pump in service on Z1. TSAS 3.7.3.1 (RBCCW) will be entered until SIAS/LNP start capability is placed in service for the ‘B’ RBCCW pump.
- Event 3:** Pressurizer Level Channel ‘Y’ will fail to 45% (high), causing letdown to rise and actual pressurizer level to lower. The ATC will need to take IOAs for Pressurizer Level Control Malfunctions IAW AOP 2585 and take manual control of letdown and stabilize pressurizer level. The ATC will then work through ARP 2590B-217 to swap to channel ‘X’ and restore letdown to automatic.
- Event 4:** The crew will raise power from current level to between 1% and 2%, using CEAs, dilutions and control of the ‘A’ Steam Dump IAW OP 2203, “Plant Startup,” in preparation to start the ‘A’ SGFP.
- Event 5:** The BOP will start the ‘A’ SGFP as the first SGFP IAW OP 2321. While initially speeding up to 1000 RPM, the pump will trip and be unable to be reset. The crew will need to stay on AFW and limit power to <3%. The crew may discuss starting the ‘B’ SGFP, but the scenario will progress before they can take any actions.
- Event 6:** An AFW header rupture will occur on both flanges of FW-44, requiring AFW to be secured. Since no MFW pump is in service, a plant trip is required. The crew will carry out EOP 2525, “Standard Post Trip Actions,” and transition to EOP 2537, “Loss of All Feed.” The BOP will restore feed prior to any steam generator wide range level going below 70” with the other one below 165.” The preferred feed source is the ‘B’ SGFP. If the crew does not recognize the availability of the ‘B’ SGFP, they may restore feed by depressurizing the steam generators and using condensate.
- Event 7:** The ‘C’ Service Water pump will trip on overload upon the plant trip. IAW the RNO for the Vital Auxiliaries step of EOP 2525, the BOP will place the ‘C’ RBCCW pump in PTL and the ATC will secure the ‘B’ and ‘D’ RCPs within 5 minutes of a loss of RBCCW cooling.

The scenario will end at the Lead Examiner’s 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							
RP24D	CTMT Press Fail Hi CH 'D'	--	--	1	60 psig	60 psig	1
CC01A	RBCCW P-11A TRIP	--	--	2	--	--	2
RX04B	PZR LVL XMITTR (LT-110Y) FAIL	--	--	3	45%	45%	3
FW06AB	SGFP A low vacuum trip PS-5126B/C open	45 sec	--	18	--	--	4
FW36A	AFW Header A (MDAFW) Pipe Break	--	30 sec	6	200 gpm	200 gpm	5
FW36B	AFW Header B (TDAFW) Pipe Break	--	30 sec	6	200 gpm	200 gpm	5
FW36A	AFW Header A (MDAFW) Pipe Break	--	30 sec	30	200 gpm	200 gpm	5
FW36B	AFW Header B (TDAFW) Pipe Break	--	30 sec	30	200 gpm	200 gpm	5
C05-A13	CONDENSATE SURGE TANK LEVEL HI	--	--	--	OFF	OFF	--
SW01C	SERVICE WATER PUMP C TRIP	--	--	30	--	--	5
REMOTE FUNCTIONS							
CCR40	CC PUMP B SIAS/LNP BLOCK SW HS-6119D	--	--	10	NORM	NORM	--
OVERRIDES							
EVENTS							
ES24LI4.evt	Required for the following event: 18 MFW A start button pressed						

Notes:

1. There may be communications between the Control Room crew and the simulator booth that are not noted in this guide. In these cases, the simulator booth operator will acknowledge the request or direction and provide generic information. The following examples are provided:
 - a. If directed to walk down a component that trips on overload; local inspection of the pump would indicate no observable deficiencies and the breaker is in a tripped condition. Do not editorialize with words like 'acrid smell or charring'
 - b. Calls to Work Control or other departments will be acknowledged. Report that CRs are being written, issues are being investigated, etc. If the crew calls for a follow up, report that actions are in progress.
 - c. Personnel are always on station for equipment starts. The line-ups are complete, oil levels are sat, any support equipment is available and operating as required. Post-start checks are sat, normal vibes and indications.

Critical Task Elements

Critical Task Statement	Secure 'B' and 'D' RCPs within 5 minutes of loss of RBCCW cooling.
Initiating Cue	EOP 2525 step 3, Maintenance of Vital Auxiliaries, RNO 3 d.3, STOP RCPs NOT supplied with RBCCW.
Performance Feedback	Green lights are lit and red lights are out, and motor current indicates zero amps, for the 'B' and 'D' RCPs.
Success Path	'B' and 'D' RCPs are stopped by opening their breakers with handswitches on C03.
Measurable Performance Standard	The operator is observed to stop the 'B' and 'D' RCPs using their handswitches on C03 within 5 minutes of the 'C' RBCCW pump being secured in EOP 2525 RNO step 3 d.1.

Critical Task Statement	Establish a primary to secondary heat sink prior to one steam generator reaching 70" AND the other steam generator reaching 165."
Initiating Cue	No SGFP running after trip of 'A' SGFP on startup, and zero GPM AFW flow due to AFW pipe rupture.
Performance Feedback	MFW flow to either steam generator greater than 0 K#/hr AND/OR Wide Range Level rising on either steam generator.
Success Path	Establish feed to at least one steam generator with the 'B' SGFP IAW step 15 of EOP 2537 (preferred) OR with condensate flow IAW steps 18 and 21 of EOP 2537 (acceptable, but takes longer and uses more inventory than the SGFP start).
Measurable Performance Standard	Feed is established to at least one steam generator, as indicated by feed flow or rising wide range level, prior to either steam generator wide range level lowering below 70" with the other less than 165."

Event Description: 'D' Containment Pressure fails high

Symptoms/Cues: 'D' Containment Pressure indicates approximately 60 psig, with associated alarms on C01 and C04

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed by the lead examiner, insert trigger #1		
RP24D CTMT Press Fail Hi CH 'D' at 60 psig		
	US ATC	- Refers to one or more of the following ARPs (all three contain the required guidance to bypass the channel and refer to Technical Specifications): - ARP 2590A-084, CTMT PRES HI D (C01 D-21) - ARP 2590A-088, CTMT PRES HI HI D (C01 D-22) - ARP 2590C-048, CTM HI PRES TRIP CH D (C04 DB-6) - Obtains keys and bypasses CTMT High Pressure at RPS and CTMT pressure HI and HI HI at ESAS - Refers to the following Technical Specifications 3.3.1.1, Table 3.3-1 3.3.2.1, Table 3.3-3
	US	TSAS 3.3.1.1 As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1 shall be OPERABLE. <u>APPLICABILITY</u> and <u>ACTION</u>: As shown in Table 3.3-1 From Table 3.3-1: Containment Pressure – High 4 Total Channels 2 Channels to Trip 3 Minimum Channels OPERABLE - Applicable in MODEs 1 and 2 - ACTION 2 ACTION 2: With the number of OPERABLE channels one less than the Total Number of Channels, operation may continue provided the following conditions are satisfied: - The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. The inoperable channel shall either be restored to OPERABLE status, or placed in the tripped condition, within 48 hours. - Within 1 hour, all functional units receiving an input from the inoperable channel are also declared inoperable, and the appropriate actions are taken for the affected functional units. - The Minimum Channels OPERABLE requirement is met; however, one additional channel may be removed from service for up to 48 hours, provided one of the inoperable channels is placed in the tripped condition.

Event Description: 'D' Containment Pressure fails high

Symptoms/Cues: 'D' Containment Pressure indicates approximately 60 psig, with associated alarms on C01 and C04

Time	Position	Applicant's Actions or Behavior
	US	TS 3.3.2.1 The engineered safety feature actuation system instrumentation channels and bypasses shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4. <u>APPLICABILITY:</u> As shown in Table 3.3-3 <u>ACTION:</u> b. With an engineered safety feature actuation system instrumentation channel inoperable, take the ACTION shown in Table 3.3-3. From Table 3.3-3: For the following functional units: • SAFETY INJECTION (SIAS), Containment Pressure - High • CONTAINMENT SPRAY (CSAS), Containment Pressure – High – High ○ Per note b, requires SIAS for actuation logic to be enabled • CONTAINMENT ISOLATION (CIAS), Containment Pressure – High • MAIN STEAM LINE ISOLATION, Containment Pressure – High • ENCLOSURE BUILDING FILTRATION, Containment Pressure – High The following apply (they are the same for all of the above functional units): • 4 Total Channels • 2 Channels to Trip • 3 Minimum Channels OPERABLE • Applicable in MODEs 1, 2 and 3 • ACTION 2 ACTION 2: With the number of OPERABLE channels one less than the Total Number of Channels, operation may continue provided the following conditions are satisfied: a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. The inoperable channel shall either be restored to OPERABLE status, or placed in the tripped condition, within 48 hours. b. Within 1 hour, all functional units receiving an input from the inoperable channel are also declared inoperable, and the appropriate actions are taken for the affected functional units. c. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be removed from service for up to 48 hours, provided one of the inoperable channels is placed in the tripped condition.
WHEN the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: 'A' RBCCW Pump Trip

Symptoms/Cues: Zero amps 'A' RBCCW pump, zero flow on 'A' RBCCW header, alarms for 'A' RBCCW pump overload trip and for low flow on CEDM coolers

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed by the lead examiner, insert trigger #2		
CC01A RBCCW P-11A TRIP		
	BOP	AOP 2585 [12.1] IF standby pump is available, PERFORM the following: - ENSURE RBCCW pump suction and discharge header cross-ties closed to opposite facility. - ENSURE RBCCW pump suction and discharge header cross-ties open to desired facility. - START standby RBCCW pump. 12.2 Go To AOP 2564, "Loss of RBCCW."
	ATC	AOP 2564 3.1 MONITOR Attachment 2, "Reactor Trip Criteria" fold out page, throughout this procedure.
	BOP	3.2 IF any RBCCW pump trips, 3.2. PERFORM the following: → 'B' RBCCW pump was started in AOP 2585.
	ATC	NOTE: Annunciator locations specified in Step 3.3 have setpoints equal to the RCP trip criteria. 3.3 CHECK the following: → Monitors listed annunciators. If any of them come in, trips reactor and affected RCPs. Annunciators are <i>not</i> expected to come in based on scenario.
	US	3.4 and 3.5 are N/A in MODE 2. 3.6 IF "A" RBCCW pump tripped, Go To Section 4.0, "A RBCCW Trip."
Examiner note: Steps 4.1 b through g should be completed in AOP 2585		
	BOP	4.1 IF the "A" RBCCW pump has 4.1. tripped, PERFORM the following: - PLACE "A" RBCCW pump in "PULL TO LOCK." - CHECK ALL the following conditions exist: "B" RBCCW pump is available "B" RBCCW HX is not in service on Facility 2 - ENSURE RB-211D, pump "B" header "B" suction, closed. - ENSURE RB-251B, pump discharge header B/C cross-tie, closed. - ENSURE RB-211C, pump "B" header "A" suction, open. - IF "A" RBCCW HX is in service, OPEN RB-251A, pump discharge header A/B cross-tie. - START RBCCW pump "B". - CHECK alarm AA20, "RBCCW PUMP B SIAS/LNP START MANUALLY BLOCKED" is lit.

Event Description: 'A' RBCCW Pump Trip

Symptoms/Cues: Zero amps 'A' RBCCW pump, zero flow on 'A' RBCCW header, alarms for 'A' RBCCW pump overload trip and for low flow on CEDM coolers

Time	Position	Applicant's Actions or Behavior
	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:
	US	4.4 Go To Section 7.0, "Plant Assessment."
	US	TSAS 3.7.3.1 Two reactor building closed cooling water loops shall be OPERABLE. <u>APPLICABILITY:</u> MODES 1, 2, 3 and 4 <u>ACTION:</u> 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 'A' Train of RBCCW is not OPERABLE until the 'B' RBCCW SIAS/LNP BLOCK switch is in NORM. The alarm response for AA20, "RBCCW PUMP B SIAS/LNP START MANUALLY BLOCKED" will address this.		
	BOP	ARP 2590E-097 NOTE: If "B" RBCCW pump is the only operating RBCCW pump, the facility is not OPERABLE. 1. IF "B" RBCCW pump is to remain in service as the OPERABLE pump, PERFORM the following: 1.1 ENSURE pump is operating on same facility 24E is aligned to. 1.2 ENSURE the idle pump on the facility the "B" RBCCW pump is supplying is in "PULL- TO- LOCK." 1.3 PLACE "SIAS/LNP ACTUATION SIGNAL HS 6119D," in "NORMAL." (A504)
WHEN the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: Pressurizer Level Channel 'Y' fails to 45%

Symptoms/Cues: Letdown flow rises, pressurizer level and pressure lower, VCT level rises.

Time	Position	Applicant's Actions or Behavior
Booth Operator: When directed by the lead examiner, insert trigger #3		
RX04B PZR LVL XMITTR (LT-110Y) FAIL at 45%		
	ATC	AOP 2585 [9.1] SHIFT "LTDN FLOW CNTL, HIC-110" to "MAN" (C-02). [9.2] ADJUST "LTDN FLOW CNTL, HIC-110" to stabilize Pressurizer level (C-02). 9.3 IF affected Pressurizer Level control is channel PRESSURIZER CH X, Go To ARP 2590B-213, "PRESSURIZER CH X LEVEL HI/LO" (C-02/3, window A-38). 9.4 IF affected Pressurizer Level control is channel PRESSURIZER CH Y, Go To ARP 2590B-217, "PRESSURIZER CH Y LEVEL HI/LO" (C-02/3, window A-39).
Examiner note: The PPC may flag the "good" (L110X) channel as faulted ("F" quality tag).		
	US ATC	Refers to ARP 2590B-217 to transfer Pressurizer Level Control to Channel X and restore automatic control. Considers related Technical Specifications, <i>no</i> action statements are expected to be entered based on magnitude of malfunction.
WHEN the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: Raise power to 1%-2% in preparation to start the 'A' SGFP.

Symptoms/Cues: Direction from the Outage Control Center (OCC)

Time	Position	Applicant's Actions or Behavior
Examiner Note: Events 4 and 5 will be included in this block.		
Booth Operator: Call as the OCC and inform the crew that concurrence from the organization has been obtained to proceed with plant startup with minimum staffing (i.e. no third RO, step 4.4.5a of OP 2203 can be marked N/A). Direct crew to raise power to 1%-2% and then start the 'A' SGFP.		
	US ATC BOP	- Raises power to 1% to 2% (OP 2203 open step 4.2.1b) using CEAs (OP 2302A) and/or dilutions (OP 2304C). (Event 4) - Maintains temperature with 'A' Steam Dump (OP 2203 open step 4.4.2c)
Examiner note: When power is between 1% and 2% and crew proceeds to start the 'A' SGFP, event 4 is complete and the scenario has progressed to event 5.		
Booth Operator: If crew reports that power is in the band of 1% to 2% and requests permission to proceed, or is not making forward progress towards starting the 'A' SGFP when power is in band, direct (as OCC) crew to proceed to start the 'A' SGFP.		
	BOP	OP 2321 (Steps 4.3.1 through 4.3.5 are complete) 4.3.6 OPEN the following "SGFP A STM DRNS" (C-05): "MS - 100C/D" "HP SPLY" "MS - 100G/F" "EXT SPLY" "MS - 184A" "TB 1st STAGE" "MS - 88A" "HP BELOW SEAT" "MS - 88B" "HP ABOVE SEAT" "MS - 87A" "EXT BELOW SEAT" "MS - 87B" "EXT ABOVE SEAT" 4.3.7 OPEN FW-38A, "A" SGFP "DIS VLV" (C-05).
Examiner note: Both SGFPs will roll off the turning gear when FW-38A is opened. Since the BOP is not yet up to the step in OP 2321 which addresses SGFPs rolling off the turning gear, the associated ARPs for SGFP A (B) TURNING GEAR TROUBLE (D-1 and D-2 on C05) will need to be consulted.		
	BOP	ARP 2590D-004/008 If either or both SGFPs roll off the turning gear, BOP addresses ARP 2590D-004 and -008 as appropriate to reset the affected trouble alarm and place affected pump back on the turning gear.
	BOP	OP 2321 4.3.8 STATION an Operator at "A" SGFP to locally monitor start. 4.3.9 PRESS "SEL" on "A" SGFP "MIN FLOW RECIRC, FIC-5237" controller until cursor appears above controller output (right hand bar graph) (C-05).

Event Description: Raise power to 1%-2% in preparation to start the 'A' SGFP.

Symptoms/Cues: Direction from the Outage Control Center (OCC)

Time	Position	Applicant's Actions or Behavior
	BOP	CAUTION: SGFPs should not be rotated at low speed using minimum flow recirculation for any time longer than that required to start or stop pump (operation at low speed for prolonged periods results in water leakage along the pump shaft into the bearings and contamination of the oil with water). NOTE: - Opening "MIN FLOW RECIRC" results in rolling turbine off turning gear. - Within five seconds of disengagement, "SGFP A TURNING GEAR TROUBLE" alarm is expected (C-05, D-1). 4.3.10 PLACE "A" SGFP "TURN GEAR CNTL" to "NORM" and CHECK the following (C-05): - Red "TURN GEAR ENGAGE" light, lit - White "TURN GEAR CNTL" light, not lit (zero speed switch) "A" SGFP rotor, turning
	BOP	4.3.11 SET "A" SGFP "MIN FLOW RECIRC, FIC-5237," controller to 65 to 70% open signal in manual control (C-05). 4.3.12 IF "A" SGFP is on the turning gear, WHEN "A" SGFP rotor spins faster than turning gear, PERFORM the following: - PULL down on turning gear manual lever to disengage. - PLACE "A" SGFP "TURN GEAR CNTL" to "STOP" (C-05). - CHECK "A" SGFP speed greater than 100 rpm.
	BOP	4.3.13 WHEN "A" SGFP speed stabilizes, PRESS "SGFP A" "ALARM" "ACK" pushbutton (SGFP insert). 4.3.14 PRESS "SGFP A" "ALARM" "RESET" pushbutton (SGFP insert). 4.3.15 ENSURE "SGFP A" "TRIP" alarm reset (SGFP insert). 4.3.16 PERFORM one of the following to open "A" SGFP steam stop valves: - PRESS "SGFP, A" "RESET" pushbutton (C-05) - PULL "A" SGFP "RESET" T-handle (54i6I Turb. Bldg. "A" SGFP front standard) 4.3.17 ENSURE the following (C-05): - MS-67A, "HP STM STOP," open - MS-66A, "EXT STM STOP," open "SGFP A TURBINE TRIP," not lit (C-05, window A-4)

Event Description: Raise power to 1%-2% in preparation to start the 'A' SGFP.

Symptoms/Cues: Direction from the Outage Control Center (OCC)

Time	Position	Applicant's Actions or Behavior
	BOP	NOTE - When step 4.3.19 is performed, the following should occur: - If speed is less than 250 rpm, the controller will open the valve limiter to 20% at a rate of 2%/sec. - If speed is greater than 250 rpm, or the Valve Limiter Override Permissive switch is ON, the controller will open the valve limiter to 100% at a rate of 2%/sec or until the speed increases by more than 20 rpm/sec. - The speed setpoint will ramp from zero to the minimum controlling speed setting (1,000 rpm) at 20 rpm/sec. - When the turbine reaches 1,000 rpm, the start sequence is complete and turbine speed may not be lowered to less than 1,000 rpm in manual or auto mode. - Within 7.5 seconds of pushing the "START" button, the SGFP must be greater than 50 rpm, or it will trip on #21, "SGFP started, no speed sensed." 4.3.18 IF "A" SGFP speed is less than 250 rpm, PLACE "A" SGFP "VALVE LIMITER OVERRIDE" permissive keyswitch (key #218) to "ENABLE" (C531A).
	BOP	4.3.19 PRESS "SGFP A" "CONTROL" "START" pushbutton (SGFP insert). 4.3.20 Locally CHECK "A" SGFP for the following: - No leakage on SGFP seals and TCVs operating properly - Bearing lube oil supply temperature being maintained between 90 and 120_F (local or PPC point "T7173") - No rubs, squeaks, or other unusual noises are observed
Examiner note: the 'A' SGFP will trip 45 seconds after it is started. ARP 2590D-013, SGFP A TURBINE TRIP, which is the most plausible alarm the crew would address, directs a plant trip. If the crew addresses other alarms, or hesitates to trip because AFW is maintaining generator level, and is not making progress towards tripping the unit, the lead examiner may direct the booth operator to insert the AFW header rupture. At this point, the crew should recognize they have no feed and trip the unit.		
	US BOP	Refers to ARP 2590D-013, SGFP A TURBINE TRIP, which directs a plant trip if no SGFPs are running. Proceeds to EOP 2525.
Booth Operator: When the crew trips the reactor, OR if directed by the lead examiner, insert trigger #6 for an AFW rupture on both sides of FW-44. If PEO sent to investigate, wait 2 minutes and report there is water spraying in AFW cage from both sides of FW-44. If no PEO is sent , wait 2 minutes and report as Security that there is water spraying in the AFW cage without mentioning FW-44.		
When the crew proceeds to EOP 2525, the next event has begun.		

Event Description: LOAF due to 'A' MFP trip and feed header rupture

Symptoms/Cues: 'A' SGFP Turbine Trip alarm with lowering speed, AFW flow lowering to zero with condenser pit sump alarms, report from the field of water spraying in AFW cage

Time	Position	Applicant's Actions or Behavior
Examiner Note: The crew proceeds to EOP 2525. Events 6 and 7 are included in this event block.		
	ATC	EOP 2525 1. CHECK Reactor - TRIPPED BY ALL OF THE FOLLOWING: • All CEAS - FULLY INSERTED • Reactor power – LOWERING • Startup Rate - NEGATIVE
	BOP	2. Trip Main Turbine a. CHECK Main Turbine - TRIPPED BY ALL OF THE FOLLOWING: • All Main Stop Valves - CLOSED or All Control Valves – CLOSED • Generator megawatts – ZERO • Turbine speed – LOWERING b. CHECK both Main Generator output breakers - OPEN: • SWYD GEN BKR, 15G-8T-2 • SWYD GEN BKR, 15G-9T-2
	BOP	3. Maintain Vital Auxiliaries a. CHECK Open Phase Condition (OPC) annunciator, RSST OPEN PHASE, CA-48 on C-06/7 - NOT LIT b. CHECK the following Vital and Non-Vital loads – ENERGIZED c. CHECK both facilities of Service Water System – OPERATING (Event 7) RNO c2. IF Service Water CANNOT be supplied to a running Diesel Generator, THEN TRIP affected Diesel Generator. → Operator may press emergency trip buttons for the 'B' EDG to prevent it from starting. d. CHECK both RBCCW facilities - OPERATING WITH SERVICE WATER COOLING RNO d1. IF Service Water Pump NOT running, THEN PLACE associated RBCCW Pump in PULL TO LOCK. → 'C' RBCCW pump d3. IF RBCCW cooling is lost to an RCP, THEN STOP RCPs NOT supplied with RBCCW. → 'B' and 'D' RCPs
Critical Task: Secure 'B' and 'D' RCPs within 5 minutes of loss of RBCCW cooling		
Time 'C' RBCCW pump in PTL _____ Time 'B' and 'D' RCPs off _____		
	ATC	4. Control RCS Inventory a. CHECK Pressurizer level - MAINTAINED BY BOTH OF THE FOLLOWING: a. 20 to 80% b. TRENDING TO 35 to 70% b. CHECK RCS subcooling – GREATER THAN OR EQUAL TO 30°F

Event Description: LOAF due to 'A' MFP trip and feed header rupture

Symptoms/Cues: 'A' SGFP Turbine Trip alarm with lowering speed, AFW flow lowering to zero with condenser pit sump alarms, report from the field of water spraying in AFW cage

Time	Position	Applicant's Actions or Behavior
	ATC	5. CHECK Pressurizer Pressure - MAINTAINED BY BOTH OF THE FOLLOWING: 1,900 to 2,350 psia - TRENDING TO 2,225 to 2,300 psia
	ATC	6. Evaluate Core Heat Removal - CHECK RCS - IN FORCED CIRCULATION BY BOTH OF THE FOLLOWING: - At least one RCP – OPERATING - Loop ΔT - LESS THAN 10°F - CHECK RCS subcooling – GREATER THAN OR EQUAL TO 30°F
Examiner Note: Due to being in MODE 2 prior to the trip, temperature was being controlled with the 'A' Steam Dump, therefore the 'A' Steam Dump controller (PIC-4216) will be set lower than its normal setpoint of 860 psig. This may require the BOP to take the RNO for steam generator pressure being below the normal post-trip band of 880-920 psia.		
	BOP	7. Maintain RCS Heat Removal - CHECK At least one Steam Generator - MEETS BOTH OF THE FOLLOWING: - Level - 10 to 80% - Either of the following – OPERATING TO RESTORE LEVEL 40 to 70% - Main Feedwater OR (TCOA) Two Auxiliary Feedwater Pumps → No AFW available due to header rupture. Operator will secure AFW if not already done and pumps haven't tripped on their own. - CHECK RCS TC - 530 to 535°F - CHECK both Steam Generators pressure - 880 to 920 psia RNO 5. IF any Steam Generator pressure LESS THAN 880 psia AND LOWERING, THEN PERFORM the following: - ENSURE Condenser Steam Dump Valves CLOSED. - ENSURE affected Atmospheric Dump Valves CLOSED. - OBSERVE Main Steam Safety valves CLOSED.
Booth Operator: if sent to investigate AFW leak or investigate why the AFW pumps tripped or why there is no flow, wait 2 minutes and report that there is water coming out of both sides of FW-44 (report it as residual flow if pumps are off, report it as water spraying in the AFW cage if pumps are running).		

Event Description: LOAF due to 'A' MFP trip and feed header rupture

Symptoms/Cues: 'A' SGFP Turbine Trip alarm with lowering speed, AFW flow lowering to zero with condenser pit sump alarms, report from the field of water spraying in AFW cage

Time	Position	Applicant's Actions or Behavior
	ATC	8. Evaluate Containment Isolation - CHECK Containment pressure - LESS THAN 1 psig - CHECK Radiation Monitors Inside Containment - MEET BOTH OF THE FOLLOWING: - NO UNEXPLAINED RISE - NO UNEXPLAINED ALARM - CHECK Steam Plant Radiation Monitors - MEET BOTH OF THE FOLLOWING: - NO UNEXPLAINED RISE - NO UNEXPLAINED ALARM
	ATC	9. CHECK Containment Temperature And Pressure Control - MAINTAINED BY BOTH OF THE FOLLOWING: - Containment temperature - LESS THAN 120°F (PPC or average of Points 5 and 6) - Containment pressure - LESS THAN 1 psig
	US ATC BOP	10. DIAGNOSE Event - Using EOP 2541, Appendix 1, Diagnostic Flowchart, DIAGNOSE event→Loss of All Feed - INITIATE EOP 2541, Appendix 4, Attachment 4A, Reactor Trip Subsequent Actions - GO TO the appropriate EOP→EOP 2537
	ATC BOP	Perform EOP 2541, Appendix 4, Attachment 4A, Reactor Trip Subsequent Actions
Examiner note: the crew enters EOP 2537.		
	US	1. CONFIRM diagnosis of a Loss of All Feedwater by performing the following: - CHECK that Safety Function Status Check acceptance criteria are satisfied. - IF a fire is diagnosed, Refer To AOP 2559, "Fire." 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. 3. PERFORM ALL of the following: - OPEN the placekeeper and ENTER the EOP entry time. - ENSURE the master alarm silence switch is in "NORMAL".
	US	4. PERFORM the following: - STOP ALL RCPs. - PLACE HIC-4165, steam dump T_{AVG} controller, in manual AND closed. - PLACE the following pressurizer spray valve controllers in manual and CLOSE the valves: - HIC-100E - HIC-100F

Event Description: LOAF due to 'A' MFP trip and feed header rupture

Symptoms/Cues: 'A' SGFP Turbine Trip alarm with lowering speed, AFW flow lowering to zero with condenser pit sump alarms, report from the field of water spraying in AFW cage

Time	Position	Applicant's Actions or Behavior
	BOP	5. PERFORM ALL of the following to conserve steam generator inventory: - ENSURE MS-220A, blowdown isolation valve is closed. - ENSURE MS-220B, blowdown isolation valve is closed. - CLOSE BOTH steam generator sample isolation valves: - MS-191A - MS-191B
	US 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: - Main or auxiliary feedwater is not expected to be restored. - Less than TWO trains of HPSI, PORVs and ADVs are available. - Less than THREE charging pumps are available. 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 T_c stable or controlled within 5° F or less
	BOP	7. WHEN feedwater source becomes available, THEN RESTORE feedwater to the affected steam generators as follows: - CHECK steam generator level is less than 33%. - 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). - 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%.
	US	8. IF a main feedwater line break is indicated, ISOLATE the affected portion of the main feedwater system by performing the following: → N/A

Event Description: LOAF due to 'A' MFP trip and feed header rupture

Symptoms/Cues: 'A' SGFP Turbine Trip alarm with lowering speed, AFW flow lowering to zero with condenser pit sump alarms, report from the field of water spraying in AFW cage

Time	Position	Applicant's Actions or Behavior
	BOP	9. IF a auxiliary feedwater line break is indicated, ISOLATE the affected portion of the auxiliary feedwater system by performing the following: - CLOSE FW-44, auxiliary feedwater cross-connect valve. - STOP ANY auxiliary feedwater pumps on the side with the affected header. - ESTABLISH feedwater to the unaffected header. → N/A both headers affected - SECURE steaming the steam generator with feedwater isolated.
	BOP	10. IF offsite power has been lost, OR the condenser is not available, PERFORM the following: - CLOSE BOTH MSIVs. - ENSURE BOTH MSIV bypass valves are closed. - OPEN AR-17, condenser vacuum breaker.
	US	11. RESTORE feedwater flow to at least ONE steam generator using the motor-driven AFW pumps as follows: → Not available 12. IF auxiliary feedwater flow is restored, Go To step 23. 13. RESTORE feedwater flow to at least one steam generator using the TDAFW pump as follows: → Not available 14. IF auxiliary feedwater flow is restored, Go To step 23.
Examiner note: There are two possible paths to success to restore feed. By far, the most expeditious one is to start the 'B' SGFP in step 15. If the crew does not start the 'B' SGFP (such as if they believe there is a common mode failure with the 'A' SGFP), Condensate is running and the crew can be successful restoring feed by lowering S/G pressure and feeding with Condensate, using steps 17 through 21.		

Event Description: LOAF due to 'A' MFP trip and feed header rupture

Symptoms/Cues: 'A' SGFP Turbine Trip alarm with lowering speed, AFW flow lowering to zero with condenser pit sump alarms, report from the field of water spraying in AFW cage

Time	Position	Applicant's Actions or Behavior
	BOP	15. START ONE SG feedwater pump by performing the following for the pump to be started: - ENSURE that at least ONE condensate pump is running. - ENSURE applicable SGFP discharge valve, is open: - FW-38B - SET applicable SGFP "MIN FLOW RECIRC," controller to 65 to 70% open signal, in manual control: - FIC-5240 - WHEN SGFP speed is greater than 250 rpm, PRESS applicable SGFP alarm "ACK." - PRESS applicable SGFP alarm "RESET" pushbutton. - ENSURE applicable SGFP "TRIP" alarm reset. - PRESS applicable reset pushbutton and CHECK that the high pressure steam stop and the extraction steam stop are open. - PRESS applicable SGFP control "START" pushbutton. - Simultaneously PERFORM the following: - ADJUST speed to maintain pump discharge pressure 50 to 150 psi above SG pressure. - Manually ADJUST minimum flow between 4,200 and 4,500 gpm. - PLACE applicable SGFP "MIN FLOW RECIRC," controller in AUTO: - FIC-5240 - IF desired to place SGFP in automatic speed control, PERFORM the following: - ADJUST speed to achieve a difference between actual speed and auto speed setpoint less than or equal to 100 rpm AND discharge pressure greater than 975 psig. - PRESS and HOLD applicable SGFP control "AUTO" pushbutton for three seconds. - ESTABLISH flow to at least one SG using applicable main feed reg bypass valve: - LIC-5215 - LIC-5216

Critical Task: Establish a primary to secondary heat sink prior to one steam generator reaching 70" AND the other steam generator reaching 165."

Levels when level starts to rise in at least 1 S/G: S/G #1 _____ S/G #2 _____

When the event has been addressed to the lead examiner's satisfaction, the scenario is complete.

Examiner note: the subsequent steps in this guide are only required if the crew does NOT restore feed with the 'B' SGFP and instead proceeds to feed using Condensate.

Event Description: LOAF due to 'A' MFP trip and feed header rupture

Symptoms/Cues: 'A' SGFP Turbine Trip alarm with lowering speed, AFW flow lowering to zero with condenser pit sump alarms, report from the field of water spraying in AFW cage

Time	Position	Applicant's Actions or Behavior
	US	16. IF SG feedwater flow is restored, Go To step 23.
	BOP	17. ENSURE at least ONE condensate pump is running. 18. ESTABLISH a flowpath from the hotwell to at least ONE steam generator as follows: - ENSURE BOTH SGFP discharge valves are open - CLOSE BOTH SGFP "MIN FLOW RECIRC" - OPEN CNM-2, CPF bypass valve. - OPEN BOTH main feed reg bypass valves - ENSURE BOTH main feed isolation air assisted check valves are open
	ATC	19. IF SIAS is not present AND SIAS Block is permitted, THEN BLOCK the automatic initiation as the cooldown and depressurization proceeds. 20. IF MSI is not present AND MSI Block is permitted, THEN BLOCK the automatic initiation as the cooldown and depressurization proceeds.
	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.
	ATC	COMMENCE emergency boration. Refer To Appendix 3, "Emergency Boration."
Critical Task: Establish a primary to secondary heat sink prior to one steam generator reaching 70" AND the other steam generator reaching 165."		
Levels when level starts to rise in at least 1 S/G: S/G #1 _____ S/G #2 _____		
When the event has been addressed to the lead examiner's satisfaction, the scenario is complete.		

SIMULATOR SCENARIO #5

Form 3.3-1 Scenario Outline

Facility:	Millstone Unit 2	Scenario #:	5
Scenario Source:		Op. Test #:	ES24LI5
Examiners:		Applicants/	
		Operators:	
Initial Conditions:	IC-334 100% power, 24E aligned to 24C, 'C' Charging Pump in service. A and C TBCCW pumps are running. Condensate slipstreaming purification is in progress with 5 demineralizers in service.		
Turnover:	Crew is tasked with starting the 'A' Charging Pump and balancing Charging and Letdown IAW OP 2304C.		
Critical Tasks:	1. Manually close the MSIVs on the failure of the Turbine trip prior to proceeding to Maintenance of Vital Auxiliaries Safety Function. 2. Isolate Auxiliary feedwater to the affected S/G within 15 minutes of a MSI signal. 3. Establish RCS pressure and temperature control to maintain the RCS less than 200° F subcooling.		

Event No.	Malf. No.	Event Type*	Event Description
1.	N/A	ATC - N	Start a second charging pump.
2.	RM01P CH08D	I, MC - ATC/US TS - US	Control Room Air Conditioning (CRAC) system Radiation Monitor, RM-9799B, fails high and 'B' CRAC Filter Fan 32B trips spuriously.
3.	ED06A	C - BOP/US TS - US	Loss of Non-Vital 480VAC Bus 22A. BOP will manually start the "B" TBCCW Pump due to loss of power to the "A" TBCCW pump. Also, Loss of power to MFW containment isolation valves requiring TS entry.
4.	CW04D	C - BOP/US R - ATC/US	Main Condenser tube leak 'D' water box, resulting in a rapid downpower, closing 2-CNM-2, Condensate Demin Bypass, and Isolating the 'D' water box.
5.	MS01A	M - All	Excess Steam Demand Event (ESDE) from the #1 SG inside Containment, requiring reactor trip and entry into EOP 2525.
6.	TC10H TC10I	C - BOP	Turbine fails to fully trip on reactor trip (stuck stop valve and control valve), requiring manual action to trip the turbine. Manual trip also fails, which will require BOP to close MSIVs.
7.	MS19A	C - BOP	MS-220A has mechanical binding and sticks in mid position after CIAS and AAFW. In order to isolate the #1 SG, BOP will have to take RNO to close MS-145A and ensure MS-117A is closed.
* (N)Normal, (R)Reactivity, (I)Instrument, (C)Component, (M)Major, (TS)Tech Spec, (MC)Manual Control			

Quantitative Attribute	Target per Scenario	Actual
Events after EOP entry	1–2	2
Abnormal events	2–4	3
Major transients	1–2	1
EOPs entered/requiring substantive actions	1–2	1
Entry into a contingency EOP with substantive actions	1 per scenario set	0
Pre-identified CTs	2 or more	3

Scenario Summary: The crew assumes the shift with the unit at 100% power and is directed to start the “A” charging pump.

Event 1: The ATC starts a second charging pump (“A”) which will result in the “C” and “A” pumps running and the “B” pump in Pull-to-Lock.

Event 2: Control Room Air Conditioning (CRAC) Radiation Monitor will fail high, causing the ventilation system to shift into recirculation mode. Five seconds after starting, the “B” Filter Fan, F32B, will trip. Per ARP 2590A-159, the crew should verify proper operation of the CRAC system and note the loss of the filter fan. When either train of CRAC is selected from OA to RECIRC, as directed by the ARP, the malfunction will clear and the fan will start. The crew will follow the ARP to ensure ‘B’ Train of CRAC is the complete train. The US will enter TSAS 3.7.6.1a for an inoperable train of CRAC, TSAS 3.3.3.1 for the failed rad monitor, and call Maintenance/Work Planning for the needed equipment repairs.

Event 3: While the work order for fan 32B is being prepared, A loss of Non-Vital 480VAC Bus 22A occurs. The crew will respond using AOP 2503A, Loss of Non-Vital 480 VAC Bus 22A, requiring the BOP to manually start the “B” TBCCW pump. The US will need to evaluate TS implications and enter TS LCO 3.7.1.6 ACTION b.

Event 4: A seawater leak will develop in the ‘D’ waterbox. Chemistry will report the leak and the crew will enter AOP 2516, Condenser Tube Leak. Based on the number of in-service demineralizers, AOP 2575, Rapid Downpower, must be completed to reduce power to below 95%. Once power is reduced, 2-CNM-2, Demin Bypass Valve, must be closed. As soon as the tube leak in the ‘D’ waterbox is confirmed, isolate the ‘D’ waterbox without delay.

Event 5: Excess Steam Demand Event (ESDE) occurs on the #1 SG inside containment. Crew will identify the symptoms, diagnose the ESDE, and trip the reactor. US directs entry and completion of EOP 2525, Standard Post Trip Actions. The ESDE will start small (to give students time to perform verifiable actions in Event 6) and will get bigger as soon as any MSIV is closed by the students.

Event 6: Upon reactor trip, the Main Turbine fails to fully trip. The #1 Stop Valve will be stuck full open and the #3 Control Valve will be stuck at 25% open. **This manner of turbine trip failure allows more time for verifiable actions than the turbine trip failing outright.** EOP 2525 RNO directs manual trip of the turbine which will be unsuccessful. BOP action to shut MSIVs is required.

Event 7: Blowdown valve MS-220A has mechanical binding and sticks in the mid position after Containment Isolation Actuation Signal (CIAS) and Auto Auxiliary Feedwater (AAFW). This will require the BOP to take RNO to close MS-145A to Blowdown Tank and ensure MS-117A to Blowdown Quench Tank is closed when isolating the #1 Steam Generator.

The scenario will end at the Lead Examiner's discretion.

INPUT SUMMARY								
Either INPUT or VERIFY the following functions:								
ID Num	Description	Delay Time	Ramp Time	Delete In	Event Trigger	Severity or Value	Final Value	Relative Order
MALFUNCTIONS								
RM01P	CR ARM R9799B	--	--	--	2	30 mR/hr	30 mR/hr	1
CH08D	LOSS OF F32B(FILTER FAN-THM OVLD)	5 sec	--	--	2	Active	Active	1
CH08D	LOSS OF F32B(FILTER FAN-THM OVLD)	--	--	1 sec	17	Active	Active	1
ED06A	LOSS OF 480V BUS 22A	--	--	--	3	Active	Active	2
CW04D	CONDENSER D TUBE RUPTURE(MINOR)	--	--	--	4	5 gal/min	5 gal/min	3
MS01A	MN STM HDR #1 RUPTURE IN CTMT	--	120 sec	--	5	0.19 M#/hr	0.19 M#/hr	4
MS01A	MN STM HDR #1 RUPTURE IN CTMT	--	120 sec	--	18	1.9 M#/hr	1.9 M#/hr	5
MS19A	MECHANICAL BINDING OF MS220A (STUCK AT MID POS)	--	--	--	--	Active	Active	--
TC05A	TURBINE SV (MSV 1) FAIL	--	--	--	30	100%	100%	--
TC06C	TURBINE CV 3 FAIL	--	--	--	30	25%	25%	--
REMOTE FUNCTIONS								
FWR54	COND 1B EVAC SUCT VLV 2AR1D	--	--	--	10	CLOSE	CLOSE	--
FWR02	SJAE B STM VLV AR2B & 2-MS-59B(%)	--	--	--	11	100%	100%	--
CHR05	RESET CHILERS 169A/B,196A/B	--	--	--	12	RESET	RESET	--
OVERRIDES								
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
EVENTS								
ES24LI5. evt	Required for the following event: • 17 Any NORM/RECIRC switch in RECIRC • 18 Both MSIVs Full Closed							

Notes:

- There may be communications between the Control Room crew and the simulator booth that are not noted in this guide. In these cases, the simulator booth operator will acknowledge the request or direction and provide generic information. The following examples are provided:
 - If directed to walk down a component that trips on overload; local inspection of the pump would indicate no observable deficiencies and the breaker is in a tripped condition. Do not editorialize with words like 'acrid smell or charring'
 - Calls to Work Control or other departments will be acknowledged. Report that CRs are being written, issues are being investigated, etc. If the crew calls for a follow up, report that actions are in progress.

- c. Personnel are always on station for equipment starts. The line-ups are complete, oil levels are sat, any support equipment is available and operating as required. Post-start checks are sat, normal vibes and indications.

Critical Task Elements

Critical Task Statement	Manually close the MSIVs on the failure of the turbine trip prior to proceeding to Maintenance of Vital Auxiliaries Safety Function.
Initiating Cue	EOP 2525, Standard Post Trip Actions, step 2. Reactivity Control – Turbine Trip.
Performance Feedback	Main Steam Isolation Valves go closed, turbine speed starts lowering and switchyard breakers 15G-9T-8T & 9T open.
Success Path	The MSIVs are closed by operating their respective handswitches on C-05.
Measurable Performance Standard	The operator is observed to placing the MSIV handswitches on C-05 to 'CLOSE' prior to the US addressing the Maintenance of Vital Auxiliaries safety function.

Critical Task Statement	Isolate Auxiliary feedwater to the affected S/G within 15 minutes of a MSI signal.
Initiating Cue	EOP 2525, Standard Post Trip Actions, step 7. RCS Heat Removal, RNO step c.2 (S/G pressure < 572# AND ESD is in progress).
Performance Feedback	Affected S/G will boil dry once feedwater is isolated to it.
Success Path	Isolating feed to a faulted S/G reduces the amount of energy released to the CTMT atmosphere, keeping CTMT within design limits.
Measurable Performance Standard	The operator places both OVERRIDE/MAN/START/RESET switches in 'PULL TO LOCK' and both Auxiliary Feedwater regulating valves, FW-43A&B, are closed.

Critical Task Statement	Establish RCS pressure and temperature control to maintain the RCS less than 200 °F subcooling.
Initiating Cue	EOP 2525, Standard Post Trip Actions, step 7. RCS Heat Removal, RNO step c.3 (S/G boiled dry and CET temperature rising).
Performance Feedback	Opening the ADV for the unaffected S/G after the affected S/G boils dry transfers the RCS Heat Removal function to the unaffected S/G. CET temperatures will stabilize, the RCS will not cooldown or heat up.
Success Path	Setting the unaffected S/G's ADV's automatic setpoint to the saturation pressure associated with the CET temperature will stabilize RCS temperature.
Measurable Performance Standard	When the affected S/G boils dry, the operator reduces the unaffected S/G's ADV automatic setpoint to approximately the saturation pressure of the CETs (at the point where the affected S/G boiled dry) using either the PPC SPDS screen or the steam tables.

Event Description: Start second charging pump

Symptoms/Cues: Direction to the crew

Time	Position	Applicant's Actions or Behavior
Booth Operator: Load IC 334 (100% power, 5 demineralizers in service). Load schedule file ES24LI5.sch and event file ES24LI5.evt.		
	ATC	OP 2304E CAUTION: Any longer than momentary interruption in charging flow through the regenerative HX results in letdown flow being isolated on high letdown temperature at the outlet of regenerative HX. ALARA: Changing charging or letdown flow conditions, or both, changes radiation dose rates in the -5' West Piping Pent Area. Health Physics Department and personnel working in the vicinity must be informed of changing conditions.
	ATC	4.2.1 NOTIFY Health Physics Department of any change in charging or letdown flow. 4.2.2 IF starting "A" or "C" charging pump in a non-emergency situation, PERFORM the following to pre-lubricate the pump packing (-25'6" Aux Bldg): - Manually START associated plunger flush pump. - OBSERVE the following for running flush pump: - No abnormal noise or vibration - Normal seal lube tank level (greater than 1/2 full) and pump pressure (6 to 12 psig) (PI-234X or PI-234Z) - Seal lube flow indicated in sightglass (FI-234X or FI-234Z) - ALLOW flush pump to operate for at least 1 minute.
Booth Operator: When queried, pre-starts on the 'A' Charging Pump are complete, and the flush pump has been running for 1 minute with proper operation.		
	US	4.2.4 IF RCS pressure is >2,100 psia, AND the control switch for the desired charging pump to be started is in "PULL-TO LOCK", PERFORM the following to ensure three charging pumps are not capable of auto starting: → N/A
	ATC	4.2.5 ENSURE control switch for the charging pump desired to be started is in the "Normal After Close" position (C-02). NOTE When "CHG PP BACK-UP CNTL" switch position is changed, the selected combination of pump operation occurs automatically. 4.2.6 Refer To Table-2 and ALIGN charging pumps for operation as desired (C-02):

Event Description: Start second charging pump

Symptoms/Cues: Direction to the crew

Time	Position	Applicant's Actions or Behavior																							
	ATC	<table><tr><th colspan="3">Table- 2, Charging Pump Combinations</th></tr><tr><th>IF desired to shift to the following charging pump(s) operating,</th><th>POSITION "CHG PP BACK-UP CNTL" switch to:</th><th>and PLACE "CHG PP OVERRIDE" switch to:</th></tr><tr><td>"A"</td><td>"2 & 3"</td><td rowspan="3">"AUTO"</td></tr><tr><td>"B"</td><td>"3 & 1"</td></tr><tr><td>"C"</td><td>"1 & 2"</td></tr><tr><td>"A" and "B"</td><td>"2 & 3"</td><td rowspan="3">"LEV 1"</td></tr><tr><td>"B" and "C"</td><td>"3 & 1"</td></tr><tr><td>"A" and "C"</td><td>"1 & 2"</td></tr><tr><td>"A," "B," and "C"</td><td>"1 & 2"</td><td>"LEV 2"</td></tr></table>	Table- 2, Charging Pump Combinations			IF desired to shift to the following charging pump(s) operating,	POSITION "CHG PP BACK-UP CNTL" switch to:	and PLACE "CHG PP OVERRIDE" switch to:	"A"	"2 & 3"	"AUTO"	"B"	"3 & 1"	"C"	"1 & 2"	"A" and "B"	"2 & 3"	"LEV 1"	"B" and "C"	"3 & 1"	"A" and "C"	"1 & 2"	"A," "B," and "C"	"1 & 2"	"LEV 2"
Table- 2, Charging Pump Combinations																									
IF desired to shift to the following charging pump(s) operating,		POSITION "CHG PP BACK-UP CNTL" switch to:	and PLACE "CHG PP OVERRIDE" switch to:																						
"A"		"2 & 3"	"AUTO"																						
"B"		"3 & 1"																							
"C"		"1 & 2"																							
"A" and "B"		"2 & 3"	"LEV 1"																						
"B" and "C"		"3 & 1"																							
"A" and "C"		"1 & 2"																							
"A," "B," and "C"	"1 & 2"	"LEV 2"																							
	ATC	4.2.7 CHECK the following: - Desired charging pumps stop (as applicable) and selected charging pumps automatically start (C-02) "CHG HDR PRES, PI-212" (C-02) is above RCS pressure - Charging header flow stabilizes at appropriate value (approximately 44 gpm for each pump operating) as indicated on any of the following: "CHG HDR FLOW, FI-212" (C-02) - F212 (PPC) - Portable flow meter installed at FP9869A/B - No respective operating charging pump alarms remain lit (C-02). 4.2.8 IF a charging pump was started, OBSERVE the following for running charging pumps: - No abnormal noise or vibration - Normal power-end oil pressure (PI-233X, PI-233Y, PI-233Z, 25 to 45 psig) - Normal power-end oil temperature (TI-233X, TI-233Y, TI-233Z, less than 155_F) - Normal power-end oil level (LG-233X, LG-233Y, LG-233Z, level between center and top of sightglass) - Normal seal lube tank level (greater than 1/2 full) and pump pressure (6 to 12 psig) (PI-234X, PI-234Y, or PI-234Z) - Seal lube flow indicated in sightglass (FI-234X, FI-234Y, or FI-234Z) - Seal leakage 4.2.9 IF "A" or "C" charging pump is started, ENSURE associated plunger flush pump switch is in "AUTO" (-25'6" Aux Bldg). 4.2.10 As necessary, ADJUST "LTDN FLOW CNTL, HIC-110" bias or "LTDN BACK PRES, PIC-201" to match letdown flow with charging flow (C-02).																							
Booth operator: When queried, report proper operation of the 'A' Charging Pump and report the flush pump is in AUTO.																									
When the event has been addressed to the lead examiner's satisfaction, proceed to the next event.																									

Event Description: CRAC RM-9799B fails high and filter fan F-32B trips

Symptoms/Cues: C.R.A.C.S. IN AUTO RECIRC MODE annunciator (C01 C-40)

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed by lead examiner, insert trigger #2 RM01P RM-9799B fails high.		
Examiner note: F-32B will not be running because it trips after 5 seconds. F-32A will not be running because there is no start signal (RM-9799B starts F-32B, RM-9799A starts F-32A).		
	ATC	ARP 2590A-159 <u>AUTOMATIC FUNCTIONS</u> 1. CRACS transfers to recirculation mode. <u>CORRECTIVE ACTIONS</u> 1. PLACE "NORM/RECIRC MODE, HS-8346" AND "NORM/RECIRC MODE, HS-8359" switches in "RECIR" (C-25A and C-25B). 2. Check damper positions. 3. VERIFY "CRACS FLTR FAN F32A" (HS-8006) OR F32B (HS-8007) or both, operating.
Examiner Note: Step 1 will insert trigger #17 and clear the malfunction on the 'B' filter fan. The fan will start and damper will open.		

Event Description: CRAC RM-9799B fails high and filter fan F-32B trips

Symptoms/Cues: C.R.A.C.S. IN AUTO RECIRC MODE annunciator (C01 C-40)

Time	Position	Applicant's Actions or Behavior
	ATC	4. N/A because F32A is not running 5. IF "CRACS FLTR FAN, F32B, HS-8007," is operating AND it is desired to operate Facility 2 as the complete CRACS train, PERFORM the following: 5.1 VERIFY "CRACS SPLY FAN F21B, HS-8010" and "CRACS EXH FAN F31B, HS-8000" running (C-25B). 5.2 CHECK "F-21B, EXH DMPR, HV-203B" and "F-31B, EXH DMPR, HV-206B" open (C-25B). 5.3 VERIFY "CRACS SPLY FAN F21A, HS-8009" and "CRACS EXH FAN F31A, HS-8001" not running (C-25A). 5.4 CHECK "F-21A, EXH DMPR, HV-203A" and "F-31A, EXH DMPR, HV-206A" closed (C-25A). 5.5 CHECK "F-32B EXH DMPR, HV-212B," indicates open (red light lit) (C-25B). 6. DETERMINE if recirculation mode was initiated by radiation detectors or ESAS actuation. → Radiation monitor, failed high. 7 and 8 are N/A 9. MONITOR system operation and VERIFY one complete CRACS train remains in operation. 9.1. IF sudden change in Control Room pressure occurs, VERIFY proper supply and exhaust fan operation (local). 9.2. IF fan belt failure occurs, STOP affected train AND START other train. 10. OBTAIN run hours for running filter fan (F-32A or F-32B) and LOG in eSOMS. 11 is N/A
	US	12. IF radiation monitor is a result of a failure (Green "OPERATE" Light is out), SUBMIT a CR to I&C Dept and Refer to Tech. Spec. LCO 3.3.3.1

Event Description: CRAC RM-9799B fails high and filter fan F-32B trips

Symptoms/Cues: C.R.A.C.S. IN AUTO RECIRC MODE annunciator (C01 C-40)

Time	Position	Applicant's Actions or Behavior
	US	TSAS 3.3.3.1 The radiation monitoring instrumentation channels shown in Table 3.3-6 shall be OPERABLE with their alarm/trip setpoints within the specified limits. APPLICABILITY: As shown in Table 3.3-6. ACTION: With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 2 hours or declare the channel inoperable. With the number of OPERABLE channels less than the number of MINIMUM CHANNELS OPERABLE in Table 3.3-6, take the ACTION shown in Table 3.3-6. The provisions of Specification 3.0.3 are not applicable. <i>TABLE 3.3-6, #1.b. Control Room Isolation: Minimum Channels Operable= 2, Action 16</i> <i>Action 16-1: with the number of OPERABLE channels one less than required, restore within 7 days.</i>
Examiner Note: Crew should consider Train B CRAC not OPERABLE because manual action (NORM/RECIRC switches) was required to start the filter fan.		
	US	TSAS 3.7.6.1: Two independent Control Room Emergency Ventilation Trains shall be OPERABLE.* APPLICABILITY: MODES 1, 2, 3, 4, 5 and 6. ACTION: MODES 1, 2, 3, and 4: <i>a. One Control Room Emergency Ventilation Train</i> <i>Required ACTION: Restore the inoperable ventilation train to OPERABLE status within 7 days or shutdown.</i>
When Event #2 has been addressed to the lead examiner's satisfaction, proceed to the next event.		

Event Description: Loss of Non-Vital 480 VAC bus 22A

Symptoms/Cues: Multiple alarms, zero VAC indicated on bus 22A, supply breaker tripped for bus 22A.

Time	Position	Applicant's Actions or Behavior
Booth Operator: WHEN directed by Lead Examiner, INSERT Trigger #3 ED06A Loss of Non-Vital 480 VAC Bus 22A		
Examiner note: Crew may immediately recognize entry criteria to AOP 2503A, or may arrive there by addressing alarms. The following ARPs for lit annunciators send the crew to AOP 2503A: 480V BUS 22A SUPPLY BKR B0102 TRIP (C-08, A-14) 480V BUS 22A/B/C/D GROUND (C-08, A-16) 480V BUS 22A/B/C/D VOLTS LO (C-08, A-17)		
	BOP	AOP 2503A 3.1 Ensure the following equipment in service: "B" TBCCW pump, P-7B "C" TBCCW pump, P-7C → BOP starts the "B" TBCCW pump "B" hydraulic fluid pump, P-81B "B" stator coolant pump, P-65B - Emergency seal oil pump, P-67 "B" steam packing exhauster, F-7B "B" water box priming pump, F-6B "B" screen wash pump, P-8B
	BOP	3.2 Place the following in "STOP" or "PULL TO LOCK" as applicable: "A" TBCCW pump, P-7A "A" hydraulic fluid pump, P-81A "A" steam packing exhauster, F-7A "A" water box priming pump, F-6A
	US BOP	CAUTION: Cross-tying the buses with a fault on 480 volt bus 22A could result in the loss of 480 volt bus 22B. NOTE - Steps 3.3 through 3.14 cross-tie bus 22A and 22B. - The following may indicate a fault on 480 volt bus 22A: - B0102, "22A SPLY BKR," tripped open and A103, "24A/22A FDR BKR," remaining closed - Receipt of annunciator "480V BUS 22A/B/C/D GROUND" (A-16, C-08) prior to the bus trip (This alarm may not be present after the bus is deenergized.)
Examiner note: 480 BUS 22A/B/C/D GROUND (C-08, A-16) is evidence that 22A is faulted and cannot be restored.		

Event Description: Loss of Non-Vital 480 VAC bus 22A

Symptoms/Cues: Multiple alarms, zero VAC indicated on bus 22A, supply breaker tripped for bus 22A.

Time	Position	Applicant's Actions or Behavior
	US BOP	3.3 Determine through the NOTE and CAUTION that there is a fault on bus 22A Go To step 3.15
Examiner note: Upcoming Event 4 has approximately 7 minutes worth of lead time from the time the condenser tube leak (trigger #4) is inserted and the time the board alarm comes in for high conductivity in the 'D' hotwell.		
	BOP	Dispatch operator to swap loads and perform walkdowns: 3.15 CW intake structure and "A" and "C" CW pump traveling screens 3.16 Isophase Cooling 3.17 NSST / RSST cooling
Booth Operator: If directed to reset the non-vital chiller, wait 1 minute and insert trigger #12 and report that it is done. CCR05 RESET CHILERS 169A/B,196A/B		
	BOP	3.18 Ensure the following Chill water equipment is in service (OP 2330C): "B" non-vital Chill Water pump, P149B, OR "C" non-vital Chill Water pump, P149C, is in service "B" non- vital chiller, X196B, is in service
	BOP	3.19 Ensure the following breakers are open - A103, "24A/22A FDR BKR, 24A1-2" - B0102, "22A SPLY BKR, 24A1-1X3-2" - B0111, "22A/22B TIE BKR, 22A-1T-2" 3.20 Dispatch an operator to investigate status of 125VDC Bus 201D 3.21 Review load summary Attachment 1
Booth Operator: When directed to investigate status of 201D, report local reading of 129 VDC. Then report as Work Control that 22A is expected to be back in about 1 hour (restoring the charger for 201D) and that load shed of 201D is not recommended at this time.		
	US	3.22 LOG entry into TS LCO 3.7.1.6, "Main Feedwater Isolation Components," for loss of power to FW-38A, A MFP Discharge and FW-42A, A MFW Block valves

Event Description: Loss of Non-Vital 480 VAC bus 22A

Symptoms/Cues: Multiple alarms, zero VAC indicated on bus 22A, supply breaker tripped for bus 22A.

Time	Position	Applicant's Actions or Behavior				
	US	TSAS 3.7.1.6 MAIN FEEDWATER ISOLATION COMPONENTS (MFICS) Each feedwater isolation component listed in Table 3.7-3 shall be OPERABLE.				
		<table><tr><td>FW-38A</td><td>A FP Discharge MOV</td></tr><tr><td>FW-42A</td><td>A FW Block MOV</td></tr></table>	FW-38A	A FP Discharge MOV	FW-42A	A FW Block MOV
FW-38A		A FP Discharge MOV				
FW-42A		A FW Block MOV				
		<u>APPLICABILITY:</u> MODES 1, 2 & 3				
	<u>ACTION:</u>					
	b. With two or more of the feedwater isolation components inoperable in the same flow path, either: 1. Restore the inoperable component(s) to OPERABLE status within 8 hours until ACTION 'a' applies, or 2. Isolate the affected flow path within 8 hours, and verify that the inoperable feedwater isolation components are closed or isolated/secured once per 7 days, or 3. Be in HOT SHUTDOWN within the next 12 hours.					
When the event has been addressed to the lead examiners satisfaction, proceed to the next event.						

Event Description: Condenser Tube Leak in the 'D' Water Box

Symptoms/Cues: 'D' HOTWELL COND LEVL HI annunciator, confirmation from Chemistry

Time	Position	Applicant's Actions or Behavior
Booth Operator: WHEN directed by lead examiner, INSERT trigger #4 for Main Condenser Tube Leak.		
CW04D at 100% - 5 GPM, "D" Waterbox		
Examiner Note: There is approximately 7 minutes between the time trigger 4 is inserted and the time that the 'D' HOTWELL COND LEVL HI annunciator alerts operators to the condenser tube leak.		
	BOP	ARP 2590D-068 - Validate alarm: U2 chemistry screen on PPC & observe D hotwell conductivity and sodium concentration - Observe Cross connected hotwell for corresponding changes - IF seawater leak is suspected, Go To AOP 2516, "Condesner Tube Leak" and - Notify chemistry.
Booth Operator: When contacted as Chemistry by control room, inform crew that there is a confirmed condenser tube leak (seawater). Also INFORM US that: - Slip streaming CPF in progress and 5 Demineralizers are in service. - Restoration from slip streaming should be completed as soon as conditions allow to avoid reaching an action level. 'D' Water Box should be isolated as soon as conditions allow to minimize accumulation of CEI points and avoid reaching an action level.		
	US	AOP 2516 3.1 DIRECT Chemistry to perform CP 2802B, "Secondary Chemistry Control," AND IDENTIFY leaking water box 3.2 N/A
	US	NOTE: If Slip-streaming CPF is in progress and indications of a condenser tube leak are confirmed, it may be necessary to reduce power to eliminate the slip-streaming operation. Approximate power levels to support closing 2-CNM-2, "COND DEMIN BYPASS" are: 95% power – 5 Demins in service 75% power – 4 Demins in service 60% power – 3 Demins in service 3.3 CHECK BOTH of the following conditions exist: - Slip-Streaming CPF is in progress, AND - Indications of a condenser tube leak are confirmed a. USE AOP 2575, "Rapid Downpower," AND REDUCE power, as required, to restore from slip-stream operation, while continuing with this procedure.
Examiner Note: Crew may perform a Rapid Downpower in parallel while Isolating "D" waterbox. Crew can only FULLY close 2-CNM-2, Cond Demin Bypass AFTER downpower is complete, but should be able to work it closed while the downpower progresses. Step 3.4 provides guidance for limiting parameters when working 2-CNM-2 closed.		
Booth Operator: If called as CPF operator at any time to request demin flows, report that all flows are less than 3200 GPM.		
	US	AOP 2575 1. Perform notifications

Event Description: Condenser Tube Leak in the 'D' Water Box

Symptoms/Cues: 'D' HOTWELL COND LEVL HI annunciator, confirmation from Chemistry

Time	Position	Applicant's Actions or Behavior
	ATC	2. Initiate forcing sprays - Places all B/U heaters to 'ON' - Adjusts PRES CNTL-Y, PIC 100Y thumbwheel to achieve 50% output
		3. Insert Group 7 CEAs 10 steps (8 – 12 steps in procedure) Lower Turbine Load (LOAD SPEED CONTROL switch), maintain TCOLD $\pm 2^{\circ}\text{F}$ of program.
	ATC	4. Determine Reactivity Plan Availability → Borate from RWST using 2 Charging Pumps
	BOP	5. Reduce turbine load AND Maintain TCOLD within 2°F of program 1. Set up Turbine controls (Attachment G) - Select 'Load Setpt' and enter desired value → 14%. - Select 'Rate Setpt' and enter desired value → 30%/hour 2. Reduce turbine load when effects of boron are seen (After step 7 is complete). - When ready to commence load reduction, then select 'Load Resume'. - IF Turbine Load Ramp Rate needs adjustment, perform any of the following: - o SELECT 'Rate Setpt' AND ENTER new value. - o SELECT one of the following: 5%, 10%, or 20% per hour - o SELECT Raise or Lower (0.25% / hour change).
	ATC	6. Raise Charging Flow → N/A because two charging pumps are running.
	BOP	7. Borate from the RWST - CHECK Boration from RWST - SELECTED - CHECK VCT MAKEUP BYPASS, CH-196 - CLOSED - CHECK RWST TO CHG SUCT, CH-504 - OPEN - OPEN RWST ISOL, CH-192 - CLOSE VCT OUT ISOL, CH-501 8. N/A - Borate from the BAST
		9. Maintain VCT parameters - Level 70 – 90% - Pressure < 30 psig 10. N/A – Temporary Suspension of Boration
	ATC	11. Maintain parameters as specified in Attachment A
Examiner Note: Once downpower is complete, Crew may continue AOP 2516 actions at step 3.4 (below) to fully close 2-CNM-2. Actions to isolate "D" waterbox may also be completed in parallel at any point.		
Booth Operator: If called as CPF operator at any time to request demin flows, report that all flows are less than 3200 GPM.		

Event Description: Condenser Tube Leak in the 'D' Water Box

Symptoms/Cues: 'D' HOTWELL COND LEVL HI annunciator, confirmation from Chemistry

Time	Position	Applicant's Actions or Behavior
	BOP	AOP 2516 CAUTION: Operating 2-CNM-2, "COND DEMIN BYPASS", will affect SGFPs suction pressure. Changes in SGFPs suction pressure will affect SGFPs speed when SGFPs are operating in automatic. NOTE: Waterbox Isolation should NOT be delayed while restoring from slip-streaming operations. 3.4 PERFORM the following actions to close 2-CNM-2 a. THROTTLE CLOSED 2-CNM-2, "COND DEMIN BYP" <u>AND</u> ENSURE the following: • CPF D/P CND-PDI20B, "COND DEMIN D/P," is less than 70 psid • Individual CP Demin flows are less than 3200 gpm • SG Levels between 60 and 75% • SGFP Operation stable as follows: ○ SGFP suction pressure greater than 280 psig ○ SGFP speeds within 200 RPM of each other (with two operating) • FRV D/P between: ○ 50 <u>AND</u> 90 psid for steady state ○ 40 <u>AND</u> 150 psid for transient conditions
	BOP	3.5 <u>IF</u> EITHER of the following conditions are met: • A condenser tube leak has occurred, <u>AND</u> the leaking waterbox can be identified prior to receiving Chemistry sample results <u>OR</u> • Chemistry confirms the presence of a condenser tube leak <u>AND</u> identified the leaking waterbox <u>THEN</u> CONSIDER the following as needed, to determine if waterbox isolation is required: • OMOC • Chemistry recommendation • For sustained leakage greater than or equal to 5mL/min, waterbox isolation should be accomplished as soon as plant conditions support.
	BOP	3.6 N/A 3.7 IF Water box isolation is required <u>THEN</u> PERFORM the following as applicable: • <u>IF</u> "D" water box is leaking, <u>THEN</u> GO TO Section 7.0 → "D" Waterbox will be isolated, crew will use Section 7.0
	BOP	NOTE: When three circulating water pumps will remain operating at 100% speed, with minimal waterbox fouling, any single waterbox may be isolated, at any time of the year, with NO plant down power required prior to waterbox isolation. CAUTION: Condenser backpressure should NOT be allowed to exceed 4.5 inHg

Event Description: Condenser Tube Leak in the 'D' Water Box

Symptoms/Cues: 'D' HOTWELL COND LEVL HI annunciator, confirmation from Chemistry

Time	Position	Applicant's Actions or Behavior
	BOP	7.1 During the evolution, CHECK condenser backpressure maintained less than or equal to 4.5 in. Hg abs. - If greater than 6.5 in. Hg Abs., <u>THEN</u> TRIP reactor and <u>GO TO</u> EOP 2525 - If greater than 4.5 in. Hg Abs., <u>THEN</u> Perform a rapid down power <u>AND</u> AOP 2574 to maintain condenser backpressure less than 4.5 in. Hg Abs.
	BOP	7.2 CHECK BOTH of the following conditions exist: "D" <u>AND</u> "C" waterboxes are split "C" circulating water pump is supplying "C" waterbox
	BOP	NOTE: If "D" circulating water pump is shutdown, the warm water from "D" water box draining back to "D" circulating water bay (service water pump suction) may cause temporary elevated TBCCW and RBCCW temperatures. 7.3 NOTIFY Security Supervisor AND Unit 3 that the "D" CW pump will be secured. 7.4 ENSURE operating CW pumps are at 100% speed
	BOP	7.5 PERFORM the following actions: - CLOSE CW-11E, "D" waterbox inlet <u>WHEN</u> CW-11E indicates closed, <u>THEN</u> CHECK P-6D pump stopped <u>ENSURE</u> green "STOP" indicating light, lit (HS-6661A)
	BOP	7.6 MONITOR RBCCW AND TBCCW temperatures 7.7 START ALL available TBCCW pumps 7.8 ENSURE CW-11D, "D" waterbox outlet, is open
Examiner note: Major actions of isolating the "D" waterbox are complete when AOP 2516 section 7 has been completed through step 7.8.		
	BOP	7.9 CLOSE 2-AR-1D, condenser "D" isolation stop (14'6" Turbine building) 7.10 USE OP 2329, "Condenser Air Removal System" <u>AND</u> START second SJAE
Booth Operator: When directed to close AR-1D, insert trigger #10 and report that the step is complete. When directed to start second SJAE, insert trigger #11 and report that the step is complete.		
	BOP	7.11 CLOSE the following water box priming stops (31'6" Turbine Building) 2-VP-1D, "D" waterbox outlet stop 2-VP-1H, "D" waterbox inlet stop 7.12 PERFORM the following actions - ESTABLISH communications with local operator - DIRECT operator to open 2-VP-9D, "D" waterbox inlet vent (31'6" Turbine bldg.) 7.13 CHECK condenser backpressure <u>NOT</u> rising unexpectedly RNO if backpressure can't be maintained involves reclosing VP-9D and putting the mechanical vacuum pumps in service.
	BOP	7.14 DEENERGIZE "D" waterbox cathodic protection by placing PO36 ("D" waterbox), "MAIN SUPPLY BREAKER for PO 36 (D WATERBOX)" in "OFF" 7.15 <u>WHEN</u> waterbox priming vacuum has been broken <u>AND</u> waterbox has been allowed to drain for at least 30 minutes <u>THEN</u> CLOSE CW-11D, "D" waterbox outlet. 7.16 <u>GO TO</u> Section 12.0 "Follow-up Actions"

Event Description: Condenser Tube Leak in the 'D' Water Box

Symptoms/Cues: 'D' HOTWELL COND LEVL HI annunciator, confirmation from Chemistry

Time	Position	Applicant's Actions or Behavior
When the event has been addressed to the lead examiner's satisfaction, proceed to the next event.		
(i.e., Downpower completed, Isolated "D" waterbox, & 2-CNM-2 is closed) - Major actions of isolating the "D" waterbox are complete when AOP 2516 section 7 has been completed through step 7.8.		

Event Description: ESDE in Containment on #1 S/G

Symptoms/Cues: Lowering RCS pressure and temperature, lowering S/G pressure, rising CTMT temperature and pressure

Time	Position	Applicant's Actions or Behavior
Examiner Note: Events 5, 6 and 7 are addressed within this event block. Examiner Note: The leak ramps in over a two minute period. Containment pressure reaches 1 psig at about the 2 minute mark. Some crews may enter AOP 2589, Excess Steam Load, before realizing they are not going to win and tripping the reactor.		
Booth Operator: WHEN directed by Lead Examiner, INSERT Trigger #5 MS01A, #1 S/G Excess Steam Demand inside CTMT (0.19 Mlbm/hr), 2 minute ramp		
Examiner Note: Leak will get worse when crew closes MSIVs. BOTH MSIVs Fully Closed (red lights out) will automatically insert Trigger #18 MS01A, #1 S/G Excess Steam Demand inside CTMT (1.9 Mlbm/hr), 2 minute ramp		
Critical Task: Isolate Auxiliary feedwater to the affected S/G within 15 minutes of a MSI signal. Time of MSI signal: _____		
	ATC	EOP 2525 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. →BOP identifies the #1 Stop Valve failed open and the #3 Control Valve failed to 25% open. RNO a.1 PERFORM the following: - TRIP turbine - IF turbine can NOT be tripped, THEN CLOSE MSIVs →Turbine cannot be tripped, BOP will close MSIVs (Event 6)
Critical Task: Manually shutdown the Turbine on the reactor trip prior to proceeding to Maintenance of Vital Auxiliaries Safety Function.		

Event Description: ESDE in Containment on #1 S/G

Symptoms/Cues: Lowering RCS pressure and temperature, lowering S/G pressure, rising CTMT temperature and pressure

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: - CHECK OPC annunciator (C-06/7,CA-48) not lit - CHECK vital and non-vital busses energized: 6.9kV Electrical Buses energized: 25A, 24B 4.16kV Vital & Non-Vital Electrical Buses energized: 24A, 24B, 24C, 24D - Vital DC Buses & AC Instrument buses energized: 201A, 201B, DV-10, DV-20, VA-10, VA-20 - CHECK that BOTH facilities of service water are operating. - CHECK that BOTH facilities of RBCCW are operating with service water cooling.
	ATC	RCS Inventory Control 4. ENSURE RCS Inventory Control are met by ALL the following conditions: - CHECK BOTH of the following conditions exist: - Pressurizer level is between 20 to 80% - Pressurizer level is trending to 35 to 70% RNO a.1 <u>IF</u> the Pressurizer Level Control System is <i>not</i> operating properly in automatic, <u>THEN</u> RESTORE and MAINTAIN pressurizer level 35 to 70% by performing ANY of the following: - OPERATE the Pressurizer Level Control System. - Manually OPERATE charging and letdown. - CHECK that RCS subcooling is greater than or equal to 30°F
	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. RNO 5.1 <u>IF</u> the Pressurizer Pressure Control System is <i>not</i> operating properly in automatic, <u>THEN</u> RESTORE and MAINTAIN pressurizer pressure between 2225 to 2300 psia by performing ANY of the following: - OPERATE the Pressurizer Pressure Control System. - Manually OPERATE pressurizer heaters and spray valves. 5.2 <u>IF</u> ANY pressurizer spray valve will <i>not</i> close, <u>THEN</u> STOP RCPs as necessary. 5.3 <u>IF</u> <u>any</u> PORV is open <u>AND</u> pressurizer pressure is less than 2250 psia, <u>THEN</u> CLOSE the associated PORV block valve

Event Description: ESDE in Containment on #1 S/G

Symptoms/Cues: Lowering RCS pressure and temperature, lowering S/G pressure, rising CTMT temperature and pressure

Time	Position	Applicant's Actions or Behavior
	ATC	5.4 IF <u>pressurizer</u> pressure is less than 1714 psia, <u>THEN</u> 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. ATC will secure 2 RCPs 1. 'RCP – A' and 'RCP – C' handswitches to 'STOP' OR 2. 'RCP – B' and 'RCP – D' handswitches to 'STOP' 5.6 <u>TCOA</u>: IF Pressurizer pressure lowers to less than the minimum of Fig. 2 "RCP NPSH Curve" <u>THEN</u> 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. RNO a.1 IF RCPs are not operating, OR loop ΔT is greater than 10° F, THEN PERFORM the following: 1) PLACE TIC-4165, steam dump TAVG controller, in manual and closed. 2) PLACE BOTH pressurizer spray valve controllers in manual and CLOSE the valves. • HIC-100E • HIC-100F 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 (TCOA)TWO auxiliary feedwater pumps are operating to restore level 40 to 70%. b. CHECK that RCS T_c is being maintained between 530°F to 535°F RNO 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) STABILIZE RCS T_c using steam dumps or ADVs <u>THEN</u> slowly restore T_c to between 530°F and 535°F 3) IF MSI has actuated and terminates the cooldown <u>THEN</u> OPERATE ADVs to stabilize RCS T_c

Event Description: ESDE in Containment on #1 S/G

Symptoms/Cues: Lowering RCS pressure and temperature, lowering S/G pressure, rising CTMT temperature and pressure

Time	Position	Applicant's Actions or Behavior
	BOP	c. CHECK BOTH steam generator pressures are 880 to 920 psia RNO c.1 IF ANY SG pressure is less than 572 psia <u>THEN</u> ENSURE MSI actuated. (C01) c.2 (TCOA): IF ANY SG pressure is less than 572 psia <u>AND</u> an ESDE is in progress, <u>THEN</u> PERFORM the following to isolate AFW to the most affected SG 1) PLACE BOTH auxiliary feed "OVERRIDE/MAN/START/RESET" handswitches in "PULL TO LOCK" 2) CLOSE applicable Aux Feed Reg Valve: • 2-FW-43A • 2-FW-43B 3) IF necessary, consider use of 2-FW-44 • IF #1 SG faulted, THEN CLOSE 2-FW-44 and STOP the motor driven AFW pumps 4) IF necessary, DISPATCH operator to to close applicable AFRV manual isolation valve: • 2-FW-11A • 2-FW-11B 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, <u>THEN</u> OPERATE the ADV for the least affected steam generator to stabilize CET temperature. →BOP places #2 ATMOS DUMP CNTL, PIC-4223 in MAN and adjusts setpoint to CET temperature PSAT (from PPC or Steam Tables) 3) Proceed to Step 8
Critical Task: Isolate Auxiliary feedwater to the affected S/G within 15 minutes of a MSI signal.		
Time of MSI signal: _____ Time AFW isolated to #1 S/G: _____		
Critical Task: Establish RCS pressure and temperature control to maintain the RCS less than 200°F subcooling.		
Time CET temperature stabilized with #2 ADV: _____		

Event Description: ESDE in Containment on #1 S/G

Symptoms/Cues: Lowering RCS pressure and temperature, lowering S/G pressure, rising CTMT temperature and pressure

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. RNO 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) b. CHECK that NONE of the following primary plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity c. CHECK that NONE of the following steam plant radiation monitors have an unexplained alarm or indicate an unexplained rise in activity
	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) RNO 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. CHECK Containment pressure is less than 1.0 psig. RNO 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.

Event Description: ESDE in Containment on #1 S/G

Symptoms/Cues: Lowering RCS pressure and temperature, lowering S/G pressure, rising CTMT temperature and pressure

Time	Position	Applicant's Actions or Behavior
	US ATC BOP	10. PERFORM the following: - DIAGNOSE the event. Refer To Appendix 1, "Diagnostic Flowchart." →ESDE based on lowering RCS and S/G pressure with rising subcooling - INITIATE Appendix 4, Attachment 4A "Reactor Trip Subsequent Actions." - Go To the appropriate EOP →2536
Examiner Note: Crew transitions to EOP 2536, Excess Steam Demand		
	US	1. Confirm diagnosis of Excess Steam Demand Event - Monitor SFSCs using attachment A - Check acceptance criteria - MET
	BOP	2. Sample SGs and RCS - Align sample cooling as follows: - CHECK "B" train RBCCW in service - OPEN RB-210 sample effluent cooler isolation - Open both SG sample valves: - MS 191A <u>and</u> MS 191B - Direct chemistry to sample both SGs for activity and boron - Use EOP 2541 APP. 46, direct chemistry to sample for EAL determination - Monitor for indications of SG tube leakage (SJAЕ activity, SGBD activity, Rising SGWL when not feeding, Feed/Steam flow mismatch, Main steam & N16 rad. mon.) - Check SG sample valves open - When samples have been taken close SG sample valves: - MS 191A <u>and</u> MS 191B
	US	3. Refer to MP-26-FAP06, classification and PARS. Classify event.
	US	4. Initiate attachment B, Placekeeper, and perform the following Record EOP entry time, and Place Master Silence alarm in-NORMAL
Examiner Note: Crew may pull forward steps 19 (Maintain RCS within upper limits of RCS P/T curve) and Step 26 (letdown restoration). Both of these steps reference the HPSI Throttle Criteria of Step 14b. Step 14b is not written to be pulled forward on its own, but is referenced by steps 19 and 26.		

Event Description: ESDE in Containment on #1 S/G

Symptoms/Cues: Lowering RCS pressure and temperature, lowering S/G pressure, rising CTMT temperature and pressure

Time	Position	Applicant's Actions or Behavior
	ATC	5. SIAS Actuation 5a. Check the following actuated: • SIAS • CIAS • EBFAS 5b. Check ONE complete facility of CRACS is operating in the recirc mode: →Facility 1 is in recirc
	ATC	8. RCP Trip Strategy 8a. Check at least one RCP – OPERATING RNO 8a. Proceed to step 9 → Some larger ESDE scenarios have a subcooling “dip” because pressure leads temperature, this dip could go below NPSH limits. 8b. CHECK both of the following conditions exist: • Pressurizer pressure is LESS THAN 1714 psia • SIAS has actuated 8c. CHECK one RCP in each loop STOPPED (C-02/3) 8d. PLACE associated Pressurizer Spray Valve controller to MAN AND CLOSE applicable spray valve (C-02/3) 8e. REFER to EOP 2541, Appendix 2, RCS P/T Limit Curve, Figure 2, AND CHECK RCP NPSH within limits. → If NPSH limits were met entering EOP 2536, it is unlikely P/T will go outside limits for the remainder of the scenario.
	ATC	9. RCPs Operating Within Limits 9a. Check at least one RCP – OPERATING 9b. REFER to RCP Operating Parameters, EOP 2541, Appendix 22, AND CHECK RCP operating limits satisfied.
	US BOP	10. Determine Most Affected SG Considering All Of The Following: • High steam flow from SGs • Lowering SG pressures • Lowering SG levels • Lowering RCS cold leg temperatures →Determines #1 SG Most Affected

Event Description: ESDE in Containment on #1 S/G

Symptoms/Cues: Lowering RCS pressure and temperature, lowering S/G pressure, rising CTMT temperature and pressure

Time	Position	Applicant's Actions or Behavior
	BOP	11. Isolate Most Affected SG 11a. Check ESDE leak path -REMAINS UNISOLATED 11b. Check #1 SG – MOST AFFECTED 11c. Isolate #1 SG by performing the following: Number 1 Steam Generator 1) Close #1 ADV by both of the following: • PIC-4223, ATMOS DUMP CTL, in “M” (manual) • MS-190A, ATMOS DUMP, - CLOSED 2) Place ADV Quick Open Permissive switch to “OFF” 3) Check MSIV MS-64A – CLOSED 4) Check BYPASS, MS65A – CLOSED 5) Close TDAFP SPLY VLV, MS-201 6) Check Blowdown Isolation Valve, MS220A- CLOSED →RNO: Ensure MS-145A and MS-117A are closed (MS-145A will require operator action, MS-117A will already be closed) (Event 7) 7) Place both Auxiliary Feed OVERRIDE/MAN/START/RESET handswitches in PULL TO LOCK 8) Close AFW FCV, FW-43A 9) Close AFW ISOL CK, FW12A 10) Close FW REG BYPASS VLV, LIC-5215 11) Check BLK VLV, FW-42A - CLOSED →RNO: Ensure FW-51A is CLOSED (Will have closed on MSI) 12) Close FW ISOL, FW-5A 13) Close MAIN STM LEG LOW PT DR, MS-265B 14) Check MSSVs – CLOSED 15) Record time #1 SG Isolated 16) Proceed to Step 12
	US BOP	12. Check most affected SG isolated by evaluating all the following: • Steam Generator pressures • Steam Generator levels • RCS cold leg temperatures

Event Description: ESDE in Containment on #1 S/G

Symptoms/Cues: Lowering RCS pressure and temperature, lowering S/G pressure, rising CTMT temperature and pressure

Time	Position	Applicant's Actions or Behavior
	BOP	13. Stabilize RCS Temperature and Pressure 13a. Check ESDE Leak Path – isolated by MSIVs 13b. Stabilize RCS temperature by operating the ADVs C-05 - PIC-4223, Atmospheric Dump Control - PIC-4224, Atmospheric Dump Control 13c. Control feedwater flow to Steam Generators 13d. Check RCS temperature within limits of EOP 2541 Appendix 2 Figures, Figure 1 RCS P/T Curve 13e. Maintain stable RCS temperature and pressure within limits of EOP 2541, appendix 2, figure 1 RCS P/T curve using any of the following: - ADVs - Pressurizer heaters and sprays 13f. Record time, temperature and pressure when control was regained 13g. Check RCS temperature cooldown limit exceeded by either of the following criteria - RCS T_c cooldown greater than 100°F/hr - RCS T_c cooldown greater than 50°F/hr when RCS $T_c \leq 220^\circ\text{F}$ 13h. Soak until RCS T_c is within cooldown limits, while continuing with this procedure
	ATC	14. HPSI Throttle Criteria 14a. Check at least one HPSI pump – OPERATING 14b. Check all of the following conditions are satisfied: - Refer to EOP 2541, Appendix 2, Figures, and check RCS subcooling is above the minimum operating limit of the RCS P/T curve based on CETs or T_H - Pressurizer level – Greater than 20% <u>AND</u> Stable or rising - Reactor Vessel level – greater than or equal to 43% - At least one Steam Generator is available for RCS heat removal <u>AND</u> Steam Generator level meets one of the following conditions: - SG level - 40 to 70% <u>OR</u> - SG level is being restored 14c. Throttle HPSI flow <u>OR</u> Stop one HPSI pump at a time
	ATC	15. HPSI Pump Restart Criteria 15a. Check SIAS – Actuated 15b. Check HPSI throttle criteria in step 14b being maintained
When the event has been addressed to the lead examiner's satisfaction, the scenario is complete.		