Form 3.2-1 Administrative Topics Outline

REV. 0

Facility: Millstone 3 Date of Examination: 9/11/2023

Examination Level: RO ☒ SRO ☐ Operating Test Number: 2023 NRC

Administrative Topic (Step 1)	Activity and Associated K/A (Step 2)	Type Code (Step 3)
Conduct of Operations A.1.1	JPM: Calculate boron addition required to support EOP 3504, Cooldown Outside Control Room K/A: 2.1.37 Knowledge of procedures, guidelines, or limitations associated with reactivity management (RO rating: 4.3).	Location: R Source: N
Conduct of Operations A.1.2	JPM: Determine proper response to Reactor Coolant Pump Seal Alarms K/A: 2.1.19 Ability to use available indications to evaluate system or component status (RO rating: 3.9).	Location: S Source: N
Equipment Control A.2	JPM: Perform a manual Quadrant Power Tilt Ratio (QPTR) Surveillance. K/A: 2.2.12 Knowledge of surveillance procedures (RO rating: 3.7).	Location: R Source: P, D
Radiation Control A.3	JPM: Evaluate potential Steam Generator tube leak(s) using the N16 Monitor Displays K/A: Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms or personnel monitoring equipment (RO rating: 2.9).	Location: R Source: N

RO ADMIN JPM SUMMARY

A.1.1: Calculate boron addition required to support EOP 3504, *Cooldown Outside Control Room*
This is a new JPM. The crew has evacuated the control room and is carrying out EOP 3504 *Cooldown Outside Control Room*. The RO candidate is directed to use OP 3304C and calculate the required boron concentration for achieving Mode 5 conditions. In doing so, the RO must Attachment 2 "Determining Boron or Dilution Volume and Rate" of OP 3304C. The calculation will require proper input of several variables including proper application of a note and table to adjust for the boron correction factor changing during the cooldown.

A.1.2: Determine proper response to Reactor Coolant Pump Seal Alarms
This is a new JPM that will be administered in the simulator. The RO candidate will be brought into the simulator with multiple RCP seal alarms. The candidate will be asked to assess which seal is degraded and what the required actions are. In doing so, the candidate will need to use Annunciator Response Procedure (ARP), MB3B 2-10 "RCP Hi Range Leakage Flow Hi". The ARP will require interpretation of MB indications, alarms, and a plant computer screen to determine that the RCP requires removal from service. Once this determination is made, the candidate will be asked to identify which part of the three stage seal is degraded.

A.2: Perform a manual Quadrant Power Tilt Ratio (QPTR) Surveillance
This is a bank JPM. Following a control rod drop at 100% power, the RO candidate is asked to perform a manual QPTR calculation in accordance with surveillance procedure SP 31012, *Quadrant Power Tilt Ratio.* The candidate is given plant data to use in the calculation. After performing the surveillance, the candidate determines the QPTR is UNSAT and Technical Specification 3/4.2.4 must be entered. This JPM appeared on the 2021 Initial License Exam and was randomly selected for the 2023 Exam.

A.3: Evaluate potential Steam Generator tube leak(s) using the N16 Monitor Displays
This is a new JPM. With the plant at 100% power, the RO candidate will be given a set of plant conditions and a computer screen display for a simulated Steam Generator (SG) tube leak. Given the conditions that only the N16 monitors indicate a SG tube leak, the candidate will be asked to interpret the plant computer display and determine that the alarm panels are reading as expected and entry conditions for AOP 3576 *Steam Generator Tube Leak* are met.

Form 3.2-1 Administrative Topics Outline

REV. 0

Facility: Millstone 3 Date of Examination: 9/11/2023

Examination Level: RO ☐ SRO ☒ Operating Test Number: 2023 NRC

Administrative Topic (Step 1)	Activity and Associated K/A (Step 2)	Type Code (Step 3)
Conduct of Operations A.1.1	JPM: Respond to Degrading Intake Conditions KA: GEN. 2.1.20 Ability to interpret and execute procedure steps. (SRO rating: 4.6).	Location: R Source: P, D
Conduct of Operations A.1.2	JPM: Determine time to core boil for venting the RCS K/A: 2.1.25 Ability to interpret reference materials, such as graphs, curves, and tables (SRO rating: 4.2).	Location: R Source: M
Equipment Control A.2	JPM: Determine response for blocking open a Cable Spreading Room door K/A: 2.2.21 Knowledge of pre- and post-maintenance operability requirements (SRO rating: 4.1).	Location: R Source: M
Radiation Control A.3	JPM: Respond to a Radiation Monitoring System trouble alarm K/A: Knowledge of radiological safety principles and procedures pertaining to licensed operator duties, such as response to radiation monitor alarms… (SRO rating: 3.7).	Location: R Source: N
Emergency Plan A.4	JPM: Complete a Protective Action Recommendation (PAR) for a declared General Emergency K/A: 2.4.44 Knowledge of emergency plan implementing procedures protective action recommendations (SRO rating 4.4).	Location: R Source: N

Form 3.2-1 Administrative Topics Outline

REV. 0

SRO ADMIN JPM SUMMARY

A.1.1: Respond to Degrading Intake Conditions

This is a bank JPM. The SRO candidate is functioning as the Shift Manager and the unit is experiencing degraded intake conditions while at power. The Shift Technical Advisor is keeping SP 3665.2, *Intake Structure Condition Determination* current. The candidate is to review and accept the latest copy of this completed surveillance. There are embedded errors that need to be identified to properly identify the environmental factors as being upgraded to RED. With the new rating, additional surveillance procedure actions are required. This JPM appeared on the 2021 Initial License Exam and was randomly selected for the 2023 Exam.

A.1.2: Determine time to core boil for venting the RCS

This is a modified Bank JPM. The plant is in a refueling outage. The outage schedule has pulled up and the SRO candidate is asked to review a time to boil calculation for venting the RCS to Containment. The candidate must use OU-M3-201 Attachment 8 “Millstone Unit 3 RCS Heatup Calculations”. In doing so, the candidate must properly assess several notes and tables to properly determine that the previous calculation is in error. The candidate must re-perform using proper decay heat and mass multiplier terms that account for expected plant conditions.

A.2: Determine response for blocking open a Cable Spreading Room door

This is a modified Bank JPM. The plant is at 100% power and the SRO candidate is functioning as the Work Control SRO on shift. An emergent repair has required door C-24-3 (Stairwell to Cable Spreading Room) to be blocked open. The candidate is to determine any compensatory actions necessary before blocking open the door. The candidate will be expected to make necessary notifications in accordance with OP 3261 *Response to Door Inoperability*. Additionally, it’s expected that two TRM action statements are entered: (1) TRM 3.7.12.3.e “CO2 Systems” Action a and (2) TRM 3.7.13 “Fire Rated Assemblies” Action a.

A.3: Respond to a Radiation Monitoring System trouble alarm

This is a new JPM. The plant is at 100% power and the SRO candidate is functioning as the Unit Supervisor on shift. A Main Board Annunciator MB2B 2-9 RMS TROUBLE annunciates for 3CMS-RE22, Containment Atmosphere Radmonitor. The candidate is given a copy of the Radmonitor’s computer screen display and must determine that an equipment failure has occurred. With the equipment failure, the annunciator response procedure directs performing actions in OP 3362, *Radiation Monitor System Display and Control*. There are seven actions that must be performed, including entering two Tech Spec Action Statements: (1) T/S 3.3.3.1 “Radiation Monitoring for Plant Operations” Action b and (2) T/S 3.4.6.1.a “Reactor Coolant System Leakage Detection Systems” Action a.

A.4: Complete a Protective Action Recommendation (PAR) for a declared General Emergency

This is a new JPM. The SRO candidate will given a set of emergency conditions at Millstone Unit 3 and told that a General Emergency has been declared. The candidate will be directed to perform the PAR within 15 minutes. The candidate will be required to use the flowchart and determine that the event is classified as rapidly progressing and requires an evacuation in a 5-Mile radius and 10-Mile downstream. Using the included table and metrological data, the candidate selects the appropriate towns to evacuate. It’s expected that required the required PAR matches provided KEY.

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

Facility: Millstone 3 Date of Examination: 9/11/23

Exam Level: RO ☒ SRO-I ☐ SRO-U ☐ Operating Test Number: 2023 NRC

REV. 0

System / JPM Title	Type Code	Safety Function
Control Room Systems		
a. S.1 / Second control rod drops during rod recovery	D, A, S	1-001
b. S.2 / Perform E-0 Attachment B, Actuation Signal Verification	N, A, EN, S	2-013
c. S.3 / Perform RCS Bleed and Feed in FR-H.1	D, A, S	3-010
d. S.4 / Sweep air from RHR Train 'A'	N, A, L, S	4 PRI - 005
e. S.5 / Shift to Steam Generator Feedwater Flow Control Valves (K/A: 059-A4.03)	D, S	4 SEC - 059
f. S.6 / Respond to RMS-41/42 Alarm (K/A: 072-A3.01)	P, D, L, S	7-072
g. S.7 / Implement GA-30, Aligning RPCCW for RCS and SG Sampling (K/A: 008 CCWS A4.01)	P, D, EN, A, S	8-008
h. S.8 / Respond to smoke in the Control Room by operating the Control Room Emergency Ventilation System (K/A: 050-A2.02)	N, S	9-050
In-Plant Systems		
i. P.1 / Reset 3MSS*MSV5, Terry Turbine Trip Throttle Valve (K/A: W EPE-E05-EA 1.19)	P, D, R, E	4.2-061
j. P.2 / Establish alternate Charging Pump cooling (K/A: APE-062.AA1.08)	D, R, E, L	2-004
k. P.3 / Secondary side Plant Equipment Operator actions on a Control Room evacuation (K/A: APE-068 AA1.31)	M, A, E	6-064

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

* Type Codes	Criteria for RO
(A)lternate path	4-6 (6)
(C)ontrol room	
(D)irect from bank	≤ 9 (7)
(E)mergency or abnormal in-plant	≥ 1 (3)
(EN)gineered Safety Feature	≥ 1 (2) (Control Room System)
(L)ow-Power / Shutdown	≥ 1 (3)
(N)ew or (M)odified from bank including 1(A)	≥ 2 (4)
(P)revious 2 exams	≤ 3 (3) (Randomly Selected)
(R)CA	≥ 1 (2)
(S)imulator	

Simulator JPM's

S.1 Second control rod drops during rod recovery

This is a bank JPM. While operating at 100% power, one of the control rods dropped to core bottom due to a blown gripper coil fuse. I&C has replaced the fuse. The plant is stable. The license candidate is directed to recover dropped rod H-8 using AOP 3552, Attachment B "Dropped Rod". The candidate will perform system alignment and actions and start to recover the dropped rod. Upon successful completion of this, rod H-8 and another rod will drop to core bottom (**Alternate Path**). Based upon annunciator response procedure guidance, the candidate performs a manual reactor trip and completes immediate actions of E-0, Reactor Trip or Safety Injection.

S.2 Perform E-0 Attachment B, Actuation Signal Verification

This is a new JPM. The license candidate is told that a Reactor Trip has occurred and a Safety Injection has actuated. As the Reactor Operator, the candidate is directed to perform E-0 Attachment B "Actuation Signal Verification". As the candidate performs verifications, it's discovered that CDA should have actuated but didn't (**Alternate Path**). The manual CDA pushbuttons are defeated. The candidate has to realign equipment including starting Quench Spray pumps and aligning components per RNO direction "Align components for at least minimum safety function". In doing so, the candidate must realize that some equipment should not be started as the RWST volume hasn't depleted enough (ie suction head in CTMT is insufficient). Other re-alignment actions include stopping RPCCW Pumps and the RCP's.

S.3 Perform RCS Bleed and Feed in FR-H.1

This is bank JPM. With an emergency in progress and an active RED path on heat sink, the license candidate is directed to establish a RCS bleed and feed using FR-H.1 steps 12 thru 16. After performing verification steps for proper Safety Injection, the candidate attempts to open both Pressurizer PORV's. Only one PORV will open (**Alternate Path**). This requires RNO actions to align head vent letdown to the PRT.

S.4 Sweep air from RHR Train 'A'

This is a new JPM. The license candidate is directed to use OP 3310A section 4.15 "Sweeping Air from Residual Heat Removal (RHR) Train A". In doing so, the candidate re-aligns the RHR system (including pump, valve and controllers) and starts the 'A' RHR pump in recirculation. After pump start, pump cavitation occurs (**Alternate Path**). The candidate stops 'A' RHR pump in accordance with procedure direction.

S.5 Shift to Steam Generator Feedwater Flow Control Valves
This is a bank JPM. With a plant startup in progress and reactor power at 25%, the license candidate is directed to shift to from the feed bypass valves to the larger feed reg valves using use OP 3203. The candidate will successfully swap all four valves and ultimately place all four feed reg valve controllers in auto.

S.6 Respond to RMS-41/42 Alarm
This is a bank JPM. The Plant is in MODE 6 performing fuel movement when both radiation monitors RMS-41 and 42, Fuel Drop Monitors, come into ALARM. The license candidate is directed to take action in accordance with AOP 3573, Radiation Alarm Monitor Response. In doing so, the candidate stops the running Containment Purge fans and performs a manual damper re-alignment in accordance with OP 3313F, Containment Purge. All actions taken are on Ventilation Panel 1 in the Simulator and this JPM is a candidate to perform in parallel with another simulator JPM. This JPM appeared on the 2019 Initial License Exam and was randomly selected for the 2023 Exam.

S.7 Implement GA-30, Aligning RPCCW for RCS and SG Sampling
This is a bank JPM. The Plant is recovering from a faulted SG. The license candidate is directed to perform GA-30, Aligning RPCCW for RCS and SG Sampling. The candidate resets ESF actuation signals and discovers that the 'A' Instrument has failed and 'B' didn't auto start. The candidate takes RNO actions to establish instrument air (**Alternate Path**) and ultimately is successful in establishing a SG sample flowpath. This JPM appeared on the 2021 Initial License Exam and was randomly selected for the 2023 Exam.

S.8 Respond to smoke in the Control Room by operating the Control Room Emergency Ventilation System
This is a new JPM. The Control Room is experiencing light smoke and is implementing guidance in annunciator response procedure, OP 3353.VP1C 2-1A "CB Inlet Vent Smoke". The license candidate is directed to refer to OP 3314F, "Control Building Heating, Ventilation, Air Conditioning and Chill Water," and PLACE control room ventilation on full filtered recirculation. The candidate will align dampers and a filter fan to achieve the desired line-up. All actions taken are on Ventilation Panel 1 in the Simulator and this JPM is a candidate to perform in parallel with another simulator JPM.

In-Plant JPM's

P.1 Reset 3MSS*MSV5, Terry Turbine Trip Throttle Valve
This is a bank JPM and it's performed in the RCA. A Loss of Secondary Heat Sink event is in progress and the control room team is carrying out the actions of EOP 35 FR-H.1. AFW flow could not be established from the control room. The license candidate is directed to locally verify the position of 3MSS*MSV5, Terry Turbine Trip Throttle Valve using step 2 of GA-31. If 3MSS*MSV5 is out of position, the candidate is directed to reposition the valve per GA-31. The candidate discovers that 3MSS*MSV5 is tripped and they implement actions to reset and open the valve. This JPM appeared on the 2021 Initial License Exam and was randomly selected for the 2023 Exam.

P.2 Establish alternate Charging Pump cooling
This is a bank JPM and it's performed in the RCA. The plant is in Mode 5 when a loss of all AC power occurred. The control room team has progressed through EOP 3501 and restored power to an emergency bus. The license candidate is directed to perform EOP 3501 Attachment K "Establishing Alternate Charging Pump Cooling". The candidate aligns the fire water system to the 'A' CCE Heat Exchanger and successfully provides cooling to the 'A' Charging Pump. A recent plant modification (last two refueling outages) moved the CCE heat exchangers and this JPM ensures the candidates are cognizant of this modification.

P.3 Secondary side Plant Equipment Operator actions on a Control Room evacuation
This is a modified bank JPM. A Control Room fire has caused a Control Room evacuation in accordance with EOP 3509.1. A loss of offsite power has occurred. The license candidate is directed to perform secondary side PEO actions on a control room evacuation IAW EOP 3509.1, Attachment B. In the 'A' Emergency Diesel Generator (EDG) room, the candidate will electrically isolate the 'A' EDG, provide diesel Service Water cooling, and align room dampers. When verifying diesel volts, it's determined that volts are out of band (**Alternate Path**). The candidate utilizes RNO actions to manually control voltage. In the 'B' Emergency Diesel room, the candidate successfully stops the 'B' EDG.

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

Facility: Millstone 3 Date of Examination: 9/11/23

Exam Level: RO ☐ SRO-I ☒ SRO-U ☐ Operating Test Number: 2023 NRC

REV. 0

System / JPM Title	Type Code	Safety Function
Control Room Systems		
a. S.1 / Second control rod drops during rod recovery	D, A, S	1-001
b. S.2 / Perform E-0 Attachment B, Actuation Signal Verification	N, A, EN, S	2-013
c. S.3 / Perform RCS Bleed and Feed in FR-H.1	D, A, S	3-010
d. S.4 / Sweep air from RHR Train 'A'	N, A, L, S	4 PRI - 005
e. S.5 / Shift to Steam Generator Feedwater Flow Control Valves (K/A: 059-A4.03)	D, S	4 SEC - 059
f. S.7 / Implement GA-30, Aligning RPCCW for RCS and SG Sampling (K/A: 008 CCWS A4.01)	P, D, EN, A, S	8-008
g. S.8 / Respond to smoke in the Control Room by operating the Control Room Emergency Ventilation System (K/A: 050-A2.02)	N, S	9-050
In-Plant Systems		
h. P.1 / Reset 3MSS*MSV5, Terry Turbine Trip Throttle Valve (K/A: W EPE-E05-EA 1.19)	P, D, R, E	4.2-061
i. P.2 / Establish alternate Charging Pump cooling (K/A: APE-062.AA1.08)	D, R, E, L	2-004
j. P.3 / Secondary side Plant Equipment Operator actions on a Control Room evacuation (K/A: APE-068 AA1.31)	M, A, E	6-064

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

* Type Codes	Criteria for RO
(A)lternate path	4-6 (6)
(C)ontrol room	
(D)irect from bank	≤ 8 (6)
(E)mergency or abnormal in-plant	≥ 1 (3)
(EN)gineered Safety Feature	≥ 1 (2) (Control Room System)
(L)ow-Power / Shutdown	≥ 1 (2)
(N)ew or (M)odified from bank including 1(A)	≥ 2 (4)
(P)revious 2 exams	≤ 3 (2) (Randomly Selected)
(R)CA	≥ 1 (2)
(S)imulator	

Simulator JPM's

S.1 Second control rod drops during rod recovery

This is a bank JPM. While operating at 100% power, one of the control rods dropped to core bottom due to a blown gripper coil fuse. I&C has replaced the fuse. The plant is stable. The license candidate is directed to recover dropped rod H-8 using AOP 3552, Attachment B "Dropped Rod". The candidate will perform system alignment and actions and start to recover the dropped rod. Upon successful completion of this, rod H-8 and another rod will drop to core bottom (**Alternate Path**). Based upon annunciator response procedure guidance, the candidate performs a manual reactor trip and completes immediate actions of E-0, Reactor Trip or Safety Injection.

S.2 Perform E-0 Attachment B, Actuation Signal Verification

This is a new JPM. The license candidate is told that a Reactor Trip has occurred and a Safety Injection has actuated. As the Reactor Operator, the candidate is directed to perform E-0 Attachment B "Actuation Signal Verification". As the candidate performs verifications, it's discovered that CDA should have actuated but didn't (**Alternate Path**). The manual CDA pushbuttons are defeated. The candidate has to realign equipment including starting Quench Spray pumps and aligning components per RNO direction "Align components for at least minimum safety function". In doing so, the candidate must realize that some equipment should not be started as the RWST volume hasn't depleted enough (ie suction head in CTMT is insufficient). Other re-alignment actions include stopping RPCCW Pumps and the RCP's.

S.3 Perform RCS Bleed and Feed in FR-H.1

This is bank JPM. With an emergency in progress and an active RED path on heat sink, the license candidate is directed to establish a RCS bleed and feed using FR-H.1 steps 12 thru 16. After performing verification steps for proper Safety Injection, the candidate attempts to open both Pressurizer PORV's. Only one PORV will open (**Alternate Path**). This requires RNO actions to align head vent letdown to the PRT.

S.4 Sweep air from RHR Train 'A'

This is a new JPM. The license candidate is directed to use OP 3310A section 4.15 "Sweeping Air from Residual Heat Removal (RHR) Train A". In doing so, the candidate re-aligns the RHR system (including pump, valve and controllers) and starts the 'A' RHR pump in recirculation. After pump start, pump cavitation occurs (**Alternate Path**). The candidate stops 'A' RHR pump in accordance with procedure direction.

S.5 Shift to Steam Generator Feedwater Flow Control Valves
This is a bank JPM. With a plant startup in progress and reactor power at 25%, the license candidate is directed to shift to from the feed bypass valves to the larger feed reg valves using use OP 3203. The candidate will successfully swap all four valves and ultimately place all four feed reg valve controllers in auto.

S.7 Implement GA-30, Aligning RPCCW for RCS and SG Sampling
This is a bank JPM. The Plant is recovering from a faulted SG. The license candidate is directed to perform GA-30, Aligning RPCCW for RCS and SG Sampling. The candidate resets ESF actuation signals and discovers that the 'A' Instrument has failed and 'B' didn't auto start. The candidate takes RNO actions to establish instrument air (**Alternate Path**) and ultimately is successful in establishing a SG sample flowpath. This JPM appeared on the 2021 Initial License Exam and was randomly selected for the 2023 Exam.

S.8 Respond to smoke in the Control Room by operating the Control Room Emergency Ventilation System
This is a new JPM. The Control Room is experiencing light smoke and is implementing guidance in annunciator response procedure, OP 3353.VP1C 2-1A "CB Inlet Vent Smoke". The license candidate is directed to refer to OP 3314F, "Control Building Heating, Ventilation, Air Conditioning and Chill Water," and PLACE control room ventilation on full filtered recirculation. The candidate will align dampers and a filter fan to achieve the desired line-up. All actions taken are on Ventilation Panel 1 in the Simulator and this JPM is a candidate to perform in parallel with another simulator JPM.

In-Plant JPM's

P.1 Reset 3MSS*MSV5, Terry Turbine Trip Throttle Valve
This is a bank JPM and it's performed in the RCA. A Loss of Secondary Heat Sink event is in progress and the control room team is carrying out the actions of EOP 35 FR-H.1. AFW flow could not be established from the control room. The license candidate is directed to locally verify the position of 3MSS*MSV5, Terry Turbine Trip Throttle Valve using step 2 of GA-31. If 3MSS*MSV5 is out of position, the candidate is directed to reposition the valve per GA-31. The candidate discovers that 3MSS*MSV5 is tripped and they implement actions to reset and open the valve. This JPM appeared on the 2021 Initial License Exam and was randomly selected for the 2023 Exam.

P.2 Establish alternate Charging Pump cooling
This is a bank JPM and it's performed in the RCA. The plant is in Mode 5 when a loss of all AC power occurred. The control room team has progressed through EOP 3501 and restored power to an emergency bus. The license candidate is directed to perform EOP 3501 Attachment K "Establishing Alternate Charging Pump Cooling". The candidate aligns the fire water system to the 'A' CCE Heat Exchanger and successfully provides cooling to the 'A' Charging Pump. A recent plant modification (last two refueling outages) moved the CCE heat exchangers and this JPM ensures the candidates are cognizant of this modification.

P.3 Secondary side Plant Equipment Operator actions on a Control Room evacuation
This is a modified bank JPM. A Control Room fire has caused a Control Room evacuation in accordance with EOP 3509.1. A loss of offsite power has occurred. The license candidate is directed to perform secondary side PEO actions on a control room evacuation IAW EOP 3509.1, Attachment B. In the 'A' Emergency Diesel Generator (EDG) room, the candidate will electrically isolate the 'A' EDG, provide diesel Service Water cooling, and align room dampers. When verifying diesel volts, it's determined that volts are out of band (**Alternate Path**). The candidate utilizes RNO actions to manually control voltage. In the 'B' Emergency Diesel room, the candidate successfully stops the 'B' EDG.

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

Facility: Millstone 3 Date of Examination: 9/11/23

Exam Level: RO ☐ SRO-I ☐ SRO-U ☒ Operating Test Number: 2023 NRC

REV. 0

System / JPM Title	Type Code	Safety Function
Control Room Systems		
a. S.4 / Sweep air from RHR Train 'A'	N, A, L, S	4 PRI - 005
b. S.7 / Implement GA-30, Aligning RPCCW for RCS and SG Sampling (K/A: 008 CCWS A4.01)	P, D, EN, A, S	8-008
c. S.8 / Respond to smoke in the Control Room by operating the Control Room Emergency Ventilation System (K/A: 050-A2.02)	N, S	9-050
In-Plant Systems		
d. P.2 / Establish alternate Charging Pump cooling (K/A: APE-062.AA1.08)	D, R, E, L	2-004
e. P.3 / Secondary side Plant Equipment Operator actions on a Control Room evacuation (K/A: APE-068 AA1.31)	M, A, E	6-064

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

* Type Codes	Criteria for RO
(A)lternate path	2-3 (3)
(C)ontrol room	
(D)irect from bank	≤ 4 (2)
(E)mergency or abnormal in-plant	≥ 1 (2)
(EN)gineered Safety Feature	≥ 1 (1) (Control Room System)
(L)ow-Power / Shutdown	≥ 1 (2)
(N)ew or (M)odified from bank including 1(A)	≥ 1 (3)
(P)revious 2 exams	≤ 2 (1) (Randomly Selected)
(R)CA	≥ 1 (1)
(S)imulator	

Simulator JPM's

S.4 Sweep air from RHR Train 'A'
This is a new JPM. The license candidate is directed to use OP 3310A section 4.15 "Sweeping Air from Residual Heat Removal (RHR) Train A". In doing so, the candidate re-aligns the RHR system (including pump, valve and controllers) and starts the 'A' RHR pump in recirculation. After pump start, pump cavitation occurs (**Alternate Path**). The candidate stops 'A' RHR pump in accordance with procedure direction.

S.7 Implement GA-30, Aligning RPCCW for RCS and SG Sampling
This is a bank JPM. The Plant is recovering from a faulted SG. The license candidate is directed to perform GA-30, Aligning RPCCW for RCS and SG Sampling. The candidate resets ESF actuation signals and discovers that the 'A' Instrument has failed and 'B' didn't auto start. The candidate takes RNO actions to establish instrument air (**Alternate Path**) and ultimately is successful in establishing a SG sample flowpath. This JPM appeared on the 2021 Initial License Exam and was randomly selected for the 2023 Exam.

S.8 Respond to smoke in the Control Room by operating the Control Room Emergency Ventilation System
This is a new JPM. The Control Room is experiencing light smoke and is implementing guidance in annunciator response procedure, OP 3353.VP1C 2-1A "CB Inlet Vent Smoke". The license candidate is directed to refer to OP 3314F, "Control Building Heating, Ventilation, Air Conditioning and Chill Water," and PLACE control room ventilation on full filtered recirculation. The candidate will align dampers and a filter fan to achieve the desired line-up. All actions taken are on Ventilation Panel 1 in the Simulator and this JPM is a candidate to perform in parallel with another simulator JPM.

In-Plant JPM's

P.2 Establish alternate Charging Pump cooling
This is a bank JPM and it's performed in the RCA. The plant is in Mode 5 when a loss of all AC power occurred. The control room team has progressed through EOP 3501 and restored power to an emergency bus. The license candidate is directed to perform EOP 3501 Attachment K "Establishing Alternate Charging Pump Cooling". The candidate aligns the fire water system to the 'A' CCE Heat Exchanger and successfully provides cooling to the 'A' Charging Pump. A recent plant modification (last two refueling outages) moved the CCE heat exchangers and this JPM ensures the candidates are cognizant of this modification.

P.3 Secondary side Plant Equipment Operator actions on a Control Room evacuation
This is a modified bank JPM. A Control Room fire has caused a Control Room evacuation in accordance with EOP 3509.1. A loss of offsite power has occurred. The license candidate is directed to perform secondary side PEO actions on a control room evacuation IAW EOP 3509.1, Attachment B. In the 'A' Emergency Diesel Generator (EDG) room, the candidate will electrically isolate the 'A' EDG, provide diesel Service Water cooling, and align room dampers. When verifying diesel volts, it's determined that volts are out of band (**Alternate Path**). The candidate utilizes RNO actions to manually control voltage. In the 'B' Emergency Diesel room, the candidate successfully stops the 'B' EDG.

Facility: Millstone 3 Scenario #.: 1

Scenario Source.: New Op. Test # 2K23 NRC-01

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: The plant is 88% power (BOL) with the plant being returned to full power following a refueling outage. Xenon is slowly building in.

Turnover: The following equipment is Out-Of-Service: The 'B' Emergency Diesel Generator is OOS to repair an oil leak on the pre-lube pump. The 'B' Stator Cooling Pump is out of service for a bearing replacement.

Critical Tasks: 1.) Manually trip the Reactor from the Control Room before transition out of E-0 (CT-1). 2.) Isolate faulted SG before transition out of E-2 (CT-17).

Event No.	Malf. No	Event Type*	Event Description
1	-	R – RO N – BOP N- SRO	Raise power to 92% iaw OP 3204 "At Power Operation"
2	RC23A	C, MC – RO C, TS - SRO	Pressurizer Spray Valve Fails Open
3	TC07D	C – BOP C - SRO	No. 4 Turbine Control Valve Fails Closed
4	-	TS - SRO	Turbine Driven AFW Pump becomes inoperable with the 'B' EDG OOS
5	RP04B	C – RO C– BOP C- SRO	Inadvertent 'B' Train Containment Depressurization Actuation (CDA)
6	TC01 RP10A RP10B	C, MC – BOP C - SRO	Turbine Trips w/ the Reactor failing to Auto Trip
7	MS07A MS02D	M – RO M – BOP M - SRO	2 SG's become faulted on the transient
8	RP11L	C, MC – RO C - SRO	FWI Components fail to isolate automatically

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC) Manual Control

Millstone 2023 NRC Scenario 1

The plant is 88% power (BOL) with the plant being returned to full power following a refueling outage. Xenon is slowly building in.

The following equipment is Out-Of-Service: The 'B' Emergency Diesel Generator is OOS to repair an oil leak on the pre-lube pump. Additionally, the 'B' Stator Cooling Pump is out of service for a bearing replacement.

The crew takes the watch and raises power in accordance with step 4.1.31 of OP 3204, "*At Power Operation*". After power is raised to 92%, a pressurizer spray valve fails open lowering RCS pressure. The RO implements AOP 3581, "Immediate Actions" and is able to close the spray valve using RNO actions. The US will enter TS 3.2.5.b "DNB Parameters".

Following this, the No. 4 Turbine Control Valve fails closed causing a loss of Main Turbine load. The US enters AOP 3579, "Response to Turbine Runback / Loss of Turbine Load" and diagnoses the cause and addresses RIL.

Subsequently, the Turbine Driven AFW Pump becomes inoperable with the 'B' EDG OOS. The US enters TS 3.7.1.2 "Auxiliary Feedwater System" and TS 3.8.1.1 "AC Sources".

Then, an inadvertent 'B' Train Containment Depressurization Actuation (CDA) is generated. The US enters AOP 3583, "Inadvertent Containment Depressurization Actuation" and mitigates the event by stopping the containment spray pumps, restoring plant systems to normal, and addressing Tech Specs. The US enters TS 3.3.2 "ESFAS Instrumentation" and TS 3.4.6.1 "RCS Leak Detection". Depending on plant response & crew timeliness, the US may enter up to four additional Tech Specs.

Following this, the Main Turbine trips with the Reactor failing to auto trip. Auto Reactor trip and both MB Reactor trip switches are not functional requiring the BOP to isolate 480 Volt Load Centers 32B and 32N (**Critical Task**). The crew enters E-0, "Reactor Trip or Safety Injection". On the turbine trip, two SG's become faulted ('A' SG low set safety valve sticks open & a 'D' SG safety valve inlet bellows is breached). Initially, a Safety Injection signal is generated on low pressurizer pressure. The auto Main Steam Line Isolation (MSI) signal will not be generated for several minutes (due to fault size). Once the crew diagnoses the faulted SG's, the BOP will isolate AFW flow. While performing E-0 Attachment B, the RO observes Feedwater Isolation Components on MB5 did not close. The RO closes the associated FWI valves.

After meeting transition criteria for faulted SG's, the crew enters E-2, "Faulted SG Isolation". While in E-2, the crew isolates the two faulted SG's (**Critical Task**). Once this is done, the scenario will end.

CRITICAL TASK(s)			
TASK DESCRIPTION (INCLUDING PERFORMANCE STANDARD)	**TASK #**	**K/A**	**BASIS OF SELECTION**
Manually trip the Reactor from the Control Room before transition out of E-0.	CT-1	EPE 029-EA2.09 (4.1 / 4.1)	Source: Westinghouse PWROG-14043-NP "ERG Rev. 3 Based Critical Tasks" "The first of the E-0 verifications ensures that automatic reactor trip occurs. This highest priority verification ensures that the core heat production does not exceed the design capability of the safeguards heat removal systems…".
Isolate faulted SG before transition out of E-2.	CT-17	APE 040-AA1-02 (4.0)	Source: Westinghouse PWROG-14043-NP "ERG Rev. 3 Based Critical Tasks" "Failure to isolate a faulted SG that can be isolated causes challenges to CSFs beyond those irreparably introduced by the postulated conditions."

Facility: Millstone 3 Scenario #.: 2

Scenario Source.: New Op. Test # 2K23 NRC-02

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: The plant is 100% power (EOL). ISO NE has issued a capacity deficiency alert.

Turnover: The following equipment is Out-Of-Service: 3RHS*P1B, 'B' RHR Pump, is tagged out to repair a pump seal leak. 'B' TPCCW pump is tagged out for motor repair.

Critical Tasks: 1.) Manually close an open PORV during Station Blackout (CT-22)
2.) Following a loss of all AC power, isolate RCP Seal Injection before a Charging Pump is started (CT-27)

Event No.	Malf. No	Event Type*	Event Description
1	SW01C	C, MC – RO C, TS - SRO	'C' Service Water Pump (SWP) trips
2	FW14A	C – BOP C - SRO	First Point Feedwater Heater (FWH) develops a tube leak
3	-	R – RO N – BOP N - SRO	Rapid downpower to 87% power at 3% / min
4	-	TS - SRO	Diesel Driven Fire Pump is inoperable
5	CV12	C – RO C - SRO	Isolable RCS leak inside Containment
6	ED01 ED04D EG07A	M – RO M – BOP M - SRO	Loss of ALL AC Power. 'A' EDG trips. Bus differential on 'B' train 4kv Bus. Recovery with Station Blackout Diesel.
7	RC07B EGLO36	C, MC – RO C - SRO	'B' PORV opens 20 seconds after the Rx Trip

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC) Manual Control

Millstone 2023 NRC Scenario 2

The plant is 100% power (EOL). ISO NE has issued a capacity deficiency alert.

The following equipment is Out-Of-Service: 3RHS*P1B, 'B' RHR Pump, is tagged out to repair a pump seal leak. 'B' TPCCW pump is tagged out for motor repair.

Shortly after taking the watch, the 'C' Service Water Pump (SWP) trips. The standby 'A' SWP auto starts; however, the Service Water supply MOV's to the Turbine Plant Cooling Water (TPCCW) HX's (3SWP*MOV71A & B) auto close in the transient. The RO implements annunciator response procedure actions to restore TPCCW and avoid an auto turbine runback. With the failure of the 'C' SWP, the US enters two TRM action statements: (1) TRM 3.7.4 "Service Water System" and (2) TRM 7.4.1a "Fire Related Safe Shutdown Components".

Following this, tube leakage on the 1A high pressure Feedwater heater causes heater level to increase and reactor power to rise. The crew enters AOP 3567, "Operation with One Feedwater Heater String Isolated". The crew mitigates the event by down powering the unit to 87% power and isolating / bypassing the effected feedwater heater string.

Subsequently, the diesel driven fire pump becomes inoperable. The US makes notifications and enters TRM 3.7.12.1.a "Fire Depression Systems".

Then, an isolable leak develops on the Charging System line inside Containment. The crew enters AOP 3555, RCS Leak, and successfully isolates the ~40 gpm leak using Attachment F "Isolating Letdown While Supplying Seal Injection At Normal Operating Pressure". The RO stabilizes Pressurizer level by performing GA-14, *Establish Head Vent Letdown.*

Following this, a loss of offsite power occurs and the reactor is shutdown. The 'A' EDG starts but experiences a mechanical failure. The 'B' EDG initially re-powers the remaining 4kv emergency bus and then a bus differential lockout occurs causing a station blackout. The crew transitions to ECA-0.0 *Loss of all AC Power.* While in ECA-0.0, the RO recognizes the 'B' PORV has failed open and closes the 'B' PORV (**Critical Task**). The crew chooses 4kv emergency bus 34C to re-power from the Station Blackout (SBO) diesel. After the crew takes action to isolate and align bus 34C, the BOP energizes the bus from the SBO diesel and the US transitions to ECA-0.3, *Loss of All AC Power – Recovery with the SBO Diesel.* In ECA-0.3, the crew stabilizes the plant and It is a **Critical Task** to isolate RCP Seal Injection before a Charging Pump is started. Once this is done, the scenario will end.

CRITICAL TASK(s)			
TASK DESCRIPTION (INCLUDING PERFORMANCE STANDARD)	**TASK #**	**K/A**	**BASIS OF SELECTION**
Manually close the open PZR PORV (before exiting step 3 of ECA-0.0).	CT-22	EPE 009-EA1.15 (3.6)	Source: Westinghouse PWROG-14043-NP "ERG Rev. 3 Based Critical Tasks" "Closing the PORV under the postulated plant conditions constitutes a task that is essential to safety."
Following a loss of all AC power, isolate RCP Seal Injection before a Charging Pump is started.	CT-27	CVCS 004-A.4.11 (3.9)	Source: Westinghouse PWROG-14043-NP "ERG Rev. 3 Based Critical Tasks" "Failure to isolate RCP seal injection before starting a charging pump, can result in unnecessary and avoidable degradation of the RCS fission-product barrier…".

Facility: Millstone 3 Scenario #.: 3

Scenario Source.: New Op. Test # 2K23 NRC-03

Examiners: Operators:

Initial Conditions: The plant is 100% power (EOL). The 'B' Heater Drain Pump has elevated motor temperatures. The oncoming shift is scheduled to conduct a OP 3204 downpower to 92% and remove the pump from service.

Turnover: The following equipment is Out-Of-Service: The 'A' Quench Spray Pump is out of service to repair an oil leak. The SBO diesel is tagged out to for a computer repair.

Critical Tasks:

1.) Manually actuate containment cooling before transitioning out of FR-Z.1. (CT-3)

2.) Manually start at least one Charging Pump (CT-6).

3.) Energize at least one AC Emergency Bus before placing safeguards equipment hand switches in the pull-to-lock position. (CT-24).

Event No.	Malf. No	Event Type*	Event Description
1	-	N - RO TS - SRO	Energize all Pressurizer heaters to support upcoming downpower
2	MSDI 0160	C - BOP C - SRO	Steam Trap Bypass fails open to main condenser
3	RX05_1A	I, MC – RO I – BOP I, TS - SRO	RCS temperature (CH. 1), fails high causing Control Rods to auto insert.
4	-	R - RO N - BOP N - SRO	'B' Heater Drain Pump motor condition worsens, rapid downpower required at 1% / min
5	ED01 RC03A	M - RO M - BOP M - SRO	Loss of offsite Power / Rx Trip followed by a SBLOCA
6	RP11M	C, MC- BOP C - SRO	Manual actions needed to restore a 4KV Emergency Bus
7		C, MC - RO C - SRO	No Charging Pump is running in E-0, manual actions to start 'A' CHS Pp
8	RC03A	M - RO M - BOP M - SRO	LBLOCA - Transition to Functional Recovery Procedures (includes establishing CTMT Spray using an alternate alignment in FR-Z.1)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC) Manual Control

Millstone 2023 NRC Scenario 3

The plant is 100% power (EOL). The 'B' Heater Drain Pump has elevated motor temperatures. The oncoming shift is scheduled to conduct an OP 3204 downpower to 92% and remove the pump from service. The crew turnover (to support the upcoming downpower) is to energize all pressurizer heaters in accordance with OP 3301G, section 4.5 *Induce Pressurizer Spray to Equalize Boron Concentration.*

The following equipment is Out-Of-Service: The 'A' Quench Spray Pump is out of service to repair an oil leak. The SBO diesel is tagged out to for a computer repair.

After taking the watch, the crew performs OP 3301G, section 4.5 *Induce Pressurizer Spray to Equalize Boron Concentration.* When the RO energizes the 'B' Pressurizer Heater, the breaker trips. The US enters T/S 3.4.3.1a.

Following this, a Main Turbine steam trap bypass valve fails open causing reactor power to rise ~35 Mwth, exceeding license power level. The crew responds by entering AOP 3582, Excessive Steam Demand, and lowering turbine load. Upon identification of the failed component, a PEO is dispatched to islolate the trap.

Subsequently, the Control Rods automatically insert. The RO implements AOP 3581, *Immediate Actions*, and places the Control Rods in manual. The US transitions to AOP 3571, *Instrument Failure Response*, to restore Rod Control to auto and address the failed instrument. The US enters TS 3.3.1 (for both FU7 and FU8) and TS 3.3.2 for FU 5.d.

Then, the OMOC directs a 1% / min downpower to 92% power based on degrading motor conditions for the 'B' Heater Drain Pump.

Following the downpower, a loss of offsite power occurs causing a reactor trip. The crew performs immediate actions of E-0, *Reactor Trip and Safety Injection.* On the reactor trip, there is a station blackout caused from the failure of the 'A' EDG Output Breaker to auto close and a catastrophic failure of the 'B' EDG. In order to recover power to an emergency bus, the BOP must close the 'A' Emergency Diesel output breaker **[Critical Task]**. Once power is restored to a single 4kv emergency bus, transition is made to ES-0.1. After taking actions to control RCS Temperature and Aux Feedwater, a SBLOCA occurs. The crew exercises foldout page criteria for manual Safety Injection and transitions back to E-0.

In E-0, the RO must manually start the 'A' Charging Pump **[Critical Task]**. From E-0, the crew transitions to E-1, *Loss of Reactor or Secondary Coolant*. While in E-1, the LOCA worsens and becomes a LBLOCA. When this happens, the crew recognizes two STATUS trees that must be addressed. First, the crew transitions to FR-P.1 to address RCS Integrity. After this, the crew implements FR-Z.1 to address no CTMT Spray with elevated CTMT Pressures. While in FR-Z.1, the crew establishes containment spray using an alternate line-up and the Recirc Spray Pumps **[Critical Task]**.

CRITICAL TASK(s)			
TASK DESCRIPTION (INCLUDING PERFORMANCE STANDARD)	**TASK #**	**K/A**	**BASIS OF SELECTION**
Manually actuate containment cooling before transitioning out of FR-Z.1.	CT-3	W EPE E14-EA2.01 (3.7 / 4.1)	Source: Westinghouse PWROG-14043-NP "ERG Rev. 3 Based Critical Tasks" "…failure to manually actuate containment cooling results in a failure to prevent a significant reduction of safety margin…"
Manually start at least one Charging Pump (by either – whichever condition occurs later) (1) Transition out of E-0 OR (2) Completion of E-0 Attachment B, Actuation Signal Verification	CT-6	ECCS 006-A4.01 (4.3)	Source: Westinghouse PWROG-14043-NP "ERG Rev. 3 Based Critical Tasks" "Failure to manually start at least one Charging (SI) pump under the postulated conditions (SBLOCA) constitutes misoperation or incorrect crew performance in which the crew does not prevent degraded ECCS capacity."
Energize at least one AC Emergency Bus before placing safeguards equipment handswitches in the pull-to-lock position.	CT-24	EPE 055-EA1.06 (4.3)	Source: Westinghouse PWROG-14043-NP "ERG Rev. 3 Based Critical Tasks" "Failure to energize an ac emergency bus constitutes misoperation or incorrect crew performance in which the crew does not prevent degraded emergency power capacity."

Facility: Millstone 3 Scenario #.: 4
Scenario Source.: New Op. Test # 2K23 NRC-04
Examiners: Operators:

Initial Conditions: The plant is 26% power (BOL) with the plant being returned to full power following a forced shutdown. Xenon is slowly building in.

Turnover: The following equipment is Out-Of-Service: The 'B' Condensate Pump is out of service for a thrust bearing replacement. The 'C' CCP heat exchanger is out of service to repair a tube leak.

Critical Tasks: 1.) Isolate AFW flow to ruptured SG (SFRM 2.17.2.6.3) 2.) Control initial RCS cooldown (CT-19)

Event No.	Malf. No	Event Type*	Event Description
1	-	R - RO N - BOP N - SRO	Restore rod control and steam dumps systems iaw OP 3203, "Plant Startup". Raise reactor power to 30%.
2	CV04B	I, MC – RO I - SRO	Letdown heat exchanger outlet temperature instrument, 3CHS-TE130, fails low
3	-	TS–SRO	3CCI*P1A, SI PP 'A' COOLING PP, becomes inoperable
4	RX12K	I, MC - BOP I, TS - SRO	'D' SG level instrument drifts low and fails as-is
5	SG01A	C – RO C - SRO	'A' SG develops a 30 gpm tube leak
6	SG01A	M – RO M – BOP M - SRO	'A' SG tube leak becomes a 300 gpm rupture
7	SI07B	C – RO C - SRO	'B' SIH Pump fails to auto start (Man start available)
8	MS12A	C – BOP C - SRO	'A' MSIV stuck open, requires alternate isolation of 'A' SG

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC) Manual Control

Millstone 2023 NRC Scenario 4

The plant is 26% power (BOL) with the plant being returned to full power following a refueling outage. Xenon is slowly building in.

The following equipment is Out-Of-Service: The 'B' Condensate Pump is out of service for a thrust bearing replacement. The 'C' CCP heat exchanger is out of service to repair a tube leak.

The crew will take the watch and perform actions of OP 3203, "*Plant Startup*". Actions include placing rod control in automatic and placing the steam dump controllers in Tavg mode. Following this, the crew will begin a planned power increase to 30% power.

Following this, a letdown temperature instrument fails low causing CCP flow to the Letdown HX to modulate closed. This raises actual letdown temperature. The crew responds using ARP (MB3A 5-5, Letdown HX Out Temp Hi) to control letdown temperature manually using diverse indications. If letdown temperature reaches 134 F, letdown flow will automatically bypass the letdown demins and this would need to be re-aligned.

Subsequently, a Plant Equipment Operator reports an oil leak on 3CCI*P1A, Safety Injection Pp 'A' Cooling Pump. On the field report, the US should determine that oil leak renders 3SIH*P1A, 'A' Safety Injection Pump inoperable. The crew should place 'A' Safety Injection Pump in Pull to Lock (3CCI*P1A does not have a pull to lock position available). US should enter TS 3.5.2, "ECCS Subsystems" and TRM 7.4, "Fire Related Safe Shutdown Components".

Then a controlling SG level instrument channel drifts low and fails as –is. This failure causes the 'D' Feedwater Regulating Valve (FRV) to modulate open, resulting in a SG overfeed event. The RO implements AOP 3581, "*Immediate Actions"*, and places 'D' FRV in manual. The US transitions to AOP 3571, "*Instrument Failure Response"*, to restore feed water control to auto and address the failed instrument. The Unit Supervisor will enter TS 3.3.1, "Reactor Trip Instrumentation" and TS 3.3.2.b, "ESFAS Instrumentation".

Following this, a 30 gpm tube leak develops on the 'A' Steam Generator. Because of the low power, the N16 radmonitors are not operational. The crew will not be able to determine the affected SG but they will implement actions of AOP 3576, *SG Tube Leak*, to determine the leak rate and minimize contamination. After these actions are complete, the tube ruptures creating a 300 gpm RCS leak. The crew will need to trip the Reactor and initiate Safety Injection and enter E-0, "Reactor Trip or Safety Injection".

From E-0, the crew will transition to E-3, *SG Tube Rupture*. During event response, 'B' SIH Pump fails to automatically start. Because 'A' SIH pump is in PTL (from earlier cooling pump oil leak), the RO needs to manually start the 'B' SIH pump. Additionally, 'A' MSIV fails to close complicating the recovery and requiring use of Attachment 'A' to complete isolation. The crew will stop feeding the 'A' SG with NR levels between 8% - 30% (**Critical Task**), isolate the ruptured SG, and establish and maintain the necessary subcooling (**Critical Task**).

The scenario will terminate following completion of Step 20, *Stop ECCS Pumps*, of E-3.

CRITICAL TASK(s)			
TASK DESCRIPTION (INCLUDING PERFORMANCE STANDARD)	**TASK #**	**K/A**	**BASIS OF SELECTION**
Isolate AFW flow to the affected SG between greater than 8% to less than or equal to 30% Narrow Range Level.	SFRM 2.17.2.6.3	EPE 038 EA 1.01 (3.8)	Source: C OP 200.18 / SFRM 2.17.2.6.3 Avoid SG overfill during a Design Basis SGTR.
Establish / maintain an RCS temperature so that transition from E-3 does not occur because the RCS temperature is EITHER: 1. Too high to maintain minimum required subcooling OR 2. Too low requiring transition to FR-P.1	CT-19	EPE 038 EA 1.36 (3.8)	Source: Westinghouse PWROG-14043-NP “ERG Rev. 3 Based Critical Tasks” Failure to achieve the required RCS subcooling results in a condition that forces the crew to transition to contingency procedure, ECA-3.1. While terminating the cooldown too late challenges either the subcriticality CSF or the integrity CSF. Failure to establish or maintain subcooling would require the crew to take consensating action that would complicate the event mitigation strategy.

Form 4.1-PWR Pressurized-Water Reactor Examination Outline

Facility: Millstone 3	**K/A Catalog Rev. 3**	**Rev.** 0	**Date of Exam:** 09/11/2023

Tier	Group	RO K/A Category Points												**SRO-Only Points**		
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	**A2**	**G***	**Total**
1. Emergency and Abnormal Plant Evolutions	1	3	3	3				3	3			3	18	**3**	**3**	**6**
	2	1	1	1				1	2			2	8	**2**	**2**	**4**
	Tier Totals	4	4	4				4	5			5	26	**5**	**5**	**10**
2. Plant Systems	1	2	2	2	2	4	2	2	3	4	2	3	28	**2**	**3**	**5**
	2	1	1	1	1	1	1	0	1	0	1	1	9	**0** **2**	**1**	**3**
	Tier Totals	3	3	3	3	5	3	2	4	4	3	4	37	**4**	**4**	**8**

3. Generic Knowledge and Abilities Categories	CO	EC	RC	EM	6	**CO**	**EC**	**RC**	**EM**	**7**
	2	2	1	1		**2**	**2**	**1**	**2**	

4. Theory	Reactor Theory	Thermodynamics	6
	3	3	

Notes: CO = Conduct of Operations; EC = Equipment Control; RC = Radiation Control;
EM = Emergency Procedures/Plan

* These systems/evolutions may be eliminated from the sample when Revision 2 of the K/A catalog is used to develop the sample plan.

** These systems/evolutions are only included as part of the sample (as applicable to the facility) when Revision 2 of the K/A catalog is used to develop the sample plan.

ES-4.1-PWR PWR Examination Outline (Millstone 3)

Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/**SRO**)

Item #	E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	Q#

1	(000007) (EPE 7; BW E02 & E10; CE E02) Reactor Trip, Stabilization, Recovery					X		EA2.05 - Ability to determine and/or interpret the following as they apply to a Reactor Trip: Lights and alarms. (CFR: 41.7 / 45.5 / 45.6)	3.7	1
2	(000011) (EPE 11) Large-Break LOCA			X				EK3.12 - Knowledge of the reasons for the following responses and/or actions as they apply to a Large-Break LOCA: Actions contained in an EOP for large-break LOCA. (CFR: 41.5 / 41.10 / 45.6 / 45.13)	4.2	2
3	(000015) (APE 15) Reactor Coolant Pump Malfunctions					X		AA2.09 - Ability to determine and/or interpret the following as they apply to Reactor Coolant Pump Malfunctions: RCP high stator temperature. (CFR: 43.5 / 45.13)	3.3	3
4	(000022) (APE 22) Loss of Reactor Coolant Makeup					X		AA2.01 - Ability to determine and/or interpret the following as they apply to Loss of Reactor Coolant Makeup: Whether charging line leak exists. (CFR: 43.5 / 45.13)l	3.3	4
5	(000025) (APE 25) Loss of Residual Heat Removal System				X			AA1.20 - Ability to operate and/or monitor the following as they apply to the Loss of the Residual Heat Removal System: ECCS. (CFR: 41.7 / 45.5 / 45.6)	3.7	5
6	(000026) (APE 26) Loss of Component Cooling Water	X						AK1.02 - Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to Loss of Component Cooling Water: Loss of cooling to the CCWS. (CFR: 41.5 / 41.7 / 45.7 / 45.8)	3.8	6
7	(000029) (EPE 29) Anticipated Transient Without Scram						X	G2.4.20 – Knowledge of the operational implications of emergency and abnormal operating procedures warnings, cautions, and notes (CFR: 41.10 / 43.5 / 45.13)	3.8	7
8	(000038) (EPE 38) Steam Generator Tube Rupture		X					EK2.12 - Knowledge of the relationship between a Steam Generator Tube Rupture and the following systems or components: MFW system. (CFR: 41.7 / 41.8 / 45.4 / 45.7 / 45.8)	3.3	8
9	(000040) (APE 40; BW E05; CE E05; W E12) Steam Line Rupture – Excessive Heat Transfer						X	G2.1.19 – Ability to use available indications to evaluate system or component status. (CFR: 41.10 / 45.12)	3.9	9
10	(000054) (APE 54; CE E06) Loss of Main Feedwater	X						AK1.04 - Knowledge of the operational implications and/or cause and effect relationships of the following as they apply to Loss of Main Feedwater: RCS parameters on a complete loss of feedwater (all SGs dried out). (CFR: 41.8 / 41.10 / 45.3)	3.9	10
11	(000055) (EPE 55) Station Blackout			X				EK3.01 - Knowledge of the reasons for the following responses and/or actions as they apply to a Station Blackout: Length of time for which battery capacity is designed. (CFR: 41.5 / 41.10 / 45.6 / 45.13)	4.1	11
12	(000057) (APE 57) Loss of Vital AC Instrument Bus		X					AK2.08 - Knowledge of the relationship between Loss of Vital AC Electrical Instrument Bus and the following systems or components: NI. (CFR: 41.7 / 45.7)	4.1	12
13	(000058) (APE 58) Loss of DC Power			X				AK3.02 - Knowledge of the reasons for the following responses and/or actions as they apply to Loss of DC Power: Actions contained in AOPs or EOPs for loss of DC power. (CFR: 41.5 / 41.10 / 45.6 / 45.13)	4.1	13
14	(000065) (APE 65) Loss of Instrument Air				X			AA1.03 - Ability to operate and/or monitor the following as they apply to Loss of Instrument Air: Restoration of systems served by instrument air when pressure is regained. (CFR: 41.7 / 45.5 / 45.6)	3.1	14

15	(000077) (APE 77) Generator Voltage and Electric Grid Disturbances	X						AK1.04 - Knowledge of the operational implications and/or cause and effect relationships of the following as they apply to Generator Voltage and Electric Grid Disturbances: Declining grid frequency or voltage. (CFR: 41.4 / 41.5 / 41.7 / 41.10 / 45.8)	3.6	15
16	(W E04) LOCA Outside Containment		X					EK2.05 - Knowledge of the relationship between LOCA Outside Containment and the following systems or components: RCS leakage paths to outside containment. (CFR: 41.7 / 41.8 / 45.2 / 45.4)	4.0	16
17	(W E11) Loss of Emergency Coolant Recirculation				X			EA1.15 - Ability to operate and/or monitor the following as they apply to Loss of Emergency Coolant Recirculation: CSS. (CFR: 41.5 to 41.8 / 45.5 to 45.8)	3.8	17
18	(BW E04; W E05) Inadequate Heat Transfer – Loss of Secondary Heat Sink						X	G2.4.31 - Knowledge of annunciator alarms, indications, or response procedures. (CFR: 41.10 / 45.3)	4.2	18
19	**(000008) (APE 8) Pressurizer Vapor Space Accident**					**X**		**AA2.20 - Ability to determine and/or interpret the following as they apply to a Pressurizer Vapor Space Accident: The effect of an open PORV or code safety based on observation of plant parameters. (CFR: 43.5 / 45.13)**	**4.0**	**76**
20	**(000009) (EPE 9) Small Break LOCA**						**X**	**G2.4.18 - Knowledge of the specific bases for emergency and abnormal operating procedures. (CFR: 41.10 / 43.1 / 45.13)**	**4.0**	**77**
21	**(000027) (APE 27) Pressurizer Pressure Control System Malfunction**					**X**		**AA2.03 - Ability to determine and/or interpret the following as they apply to a Pressurizer Pressure Control System Malfunction: Effects of RCS pressure changes on key components in the plant. (CFR: 43.5 / 45.13)**	**3.4**	**78**
22	**(000056) (APE 56) Loss of Offsite Power**						**X**	**G2.2.36 - Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operation. (CFR: 41.10 / 43.2 / 45.13)**	**4.2**	**79**
23	**(000062) (APE 62) Loss of Nuclear Service Water**					**X**		**AA2.07 - Ability to determine and/or interpret the following as they apply to Loss of Service Water: Implementation of TS requirements for loss of service water. (CFR: 43.5 / 45.13)**	**4.0**	**80**
24	**(W E04) LOCA Outside Containment**						**X**	**G2.1.20 - Ability to interpret and execute procedure steps. (CFR: 41.10 / 43.5 / 45.12)**	**4.6**	**81**
K/A Category Totals:		3	3	3	3	6	6	Group Point Total:		24

ES-4.1-PWR	PWR Examination Outline (Millstone 3) Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/**SRO**)									
Item #	E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	Q#
25	(000001) (APE 1) Continuous Rod Withdrawal		X					AK2.14 - Knowledge of the relationship between Continuous Rod Withdrawal and the following systems or components: CRDS. (CFR: 41.7 / 45.7)	3.7	19
26	(000028) (APE 28) Pressurizer (PZR) Level Control Malfunction			X				AK3.03 - Knowledge of the reasons for the following responses and/or actions as they apply to a Pressurizer Level Control Malfunction: False indication of PZR level when PORV or spray valve is open and RCS is saturated. (CFR: 41.5 / 41.10 / 45.6 / 45.13)	3.8	20

27	(000033) (APE 33) Loss of Intermediate Range Nuclear Instrumentation					X		AA2.09 - Ability to determine and/or interpret the following as they apply to Loss of Intermediate Range Nuclear Instrumentation: Conditions that allow the bypass of an intermediate range level trip switch. (CFR: 43.5 / 45.13)	3.5	21
28	(000036) (APE 36; BW/A08) Fuel-Handling Incidents						X	G2.1.44 - Knowledge of RO duties in the control room during fuel handling, such as responding to alarms from the fuel handling area, communicating with fuel-handling personnel, operating systems from the control room to support fueling operations, or supporting instrumentation. (CFR: 41.10 / 43.7 / 45.12)	3.9	22
29	(000051) (APE 51) Loss of Condenser Vacuum						X	G2.1.7 – Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior, and instrument interpretation. (CFR: 41.5 / 43.5 / 45.12 / 45.13)	4.4	23
30	(000059) (APE 59) Accidental Liquid Radwaste Release	X						AK1.06 - Knowledge of the operational implications and/or cause and effect relationships of the following as they apply to an Accidental Liquid Radwaste Release: Loss of the CWS during discharge. (CFR: 41.8 / 41.10 / 45.3)	3.2	24
31	(000067) (APE 67) Plant Fire On Site				X			AA1.09 - Ability to operate and/or monitor the following as they apply to a Plant Fire On Site: Plant fire zone panel (including detector location). (CFR: 41.7 / 45.5 / 45.7)	3.2	25
32	(000069) (APE 69; W E14) Loss of Containment Integrity					X		(WE14) EA2.01 - Ability to determine and/or interpret the following as they apply to High Containment Pressure: Facility conditions and selection of appropriate procedures during abnormal and emergency operations. (CFR: 41.10 / 43.5 / 45.13)	3.7	26
33	**(000068) (APE 68; BW A06) Control Room Evacuation**					**X**		**AA2.09 - Ability to determine and/or interpret the following as they apply to Control Room Evacuation: Saturation margin. (CFR: 41.10 / 43.5 / 45.13)**	**3.8**	**82**
34	**(BW E09; CE A13**; W E09 & E10) Natural Circulation/4**						**X**	**(WE09) G2.4.51 – Knowledge of emergency operating procedure exit conditions (e.g., emergency condition no longer exists or severe accident entry is required). (CFR: 41.10 / 43.5 / 45.13)**	**4.0**	**83**
35	**(W E01 & E02) Rediagnosis & SI Termination**					**X**		**(WE01) EA2.09 - Ability to determine and/or interpret the following as they apply to Rediagnosis: Which procedure or procedure set should be transitioned to. (CFR: 41.10 / 43.5 / 45.13)**	**4.0**	**84**
36	**000074 (EPE 74; W E06 & E07) Inadequate Core Cooling / 4**						**X**	**(WE06) G2.2.44 - Ability to interpret control room indications to verify the status and operation of a system and understand how operator actions and directives affect plant and system conditions. (CFR: 41.5 / 43.5 / 45.12)**	**4.7**	**85**
	000003 (APE 3) Dropped Control Rod / 1									
	000005 (APE 5) Inoperable/Stuck Control Rod / 1									
	000024 (APE 24) Emergency Boration / 1									
	000032 (APE 32) Loss of Source Range Nuclear Instrumentation / 7									
	000037 (APE 37) Steam Generator Tube Leak / 3									

	000060 (APE 60) Accidental Gaseous Radwaste Release / 9									
	000061 (APE 61) Area Radiation Monitoring System Alarms / 7									
	(000076) (APE 76) High Reactor Coolant Activity									
	000078 (APE 78*) RCS Leak / 3									
	(W E13) Steam Generator Overpressure									
	(W E15) Containment Flooding / 5									
	(W E16) High Containment Radiation /9									
	(BW A01) Plant Runback / 1									
	(BW A02 & A03) Loss of NNI-X/Y/7									
	(BW A04) Turbine Trip / 4									
	(BW A05) Emergency Diesel Actuation / 6									
	(BW A07) Flooding / 8									
	(BW E03) Inadequate Subcooling Margin / 4									
	(BW E08; W E03) LOCA Cooldown – Depressurization / 4									
	(BW E13 & E14) EOP Rules and Enclosures									
	(CE A11**; W E08) RCS Overcooling – Pressurized Thermal Shock / 4									
	(CE A16) Excess RCS Leakage / 2									
	(CE E09) Functional Recovery									
	(CE E13*) Loss of Forced Circulation / LOOP / Blackout / 4									
K/A Category Totals:		1	1	1	1	4	4	Group Point Total:		12

Item #	System / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	Q#
37	(003) (SF4P RCP) Reactor Coolant Pump		X										K2.04 - Knowledge of electrical power supplies to the following: Containment isolation valves for RCP cooling water. (CFR: 41.7)	3.4	27
38	(003) (SF4P RCP) Reactor Coolant Pump					X							K5.07 - Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the Reactor Coolant Pump System: Staring one or more RCPs under various plant conditions. (CFR: 41.5 / 45.7)	3.5	28
39	(004) (SF1; SF2 CVCS) Chemical and Volume Control									X			A3.09 - Ability to monitor automatic operation of the Chemical and Volume Control System, including: VCT level. (CFR: 41.7 / 45.5)	3.7	29
40	(004) (SF1; SF2 CVCS) Chemical and Volume Control											X	G2.1.32 – Ability to explain and apply system precautions, limitations, notes, or cautions. (CFR: 41.10 / 43.2 / 45.12)	3.8	30
41	(005) (SF4P RHR) Residual Heat Removal										X		A4.02 - Ability to manually operate and/or monitor in the control room: RHR heat exchanger temperature/bypass control valves. (CFR: 41.7 / 45.5 to 45.8)	3.9	31
42	(006) (SF2; SF3 ECCS) Emergency Core Cooling								X				A2.08 - Ability to (a) predict the impacts of the following on the Emergency Core Cooling System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: ECCS valve failure mode. (CFR: 41.5 / 45.3 / 45.4 / 45.5)	3.2	32
43	(006) (SF2; SF3 ECCS) Emergency Core Cooling							X					A1.06 – Ability to predict and/or monitor changes in parameters associated with operation of the Emergency Core Cooling System, including: SCM. (CFR: 41.5 / 45.3 / 45.4 / 45.5)	3.9	33
44	(007) (SF5 PRTS) Pressurizer Relief/Quench Tank					X							K5.02 - Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the Pressurizer Relief Tank/Quench Tank System: Method of forming a steam bubble in the PZR. (CFR: 41.5 / 45.7)	3.4	34

45	(008) (SF8 CCW) Component Cooling Water									X			A3.08 - Ability to monitor automatic features of the Component Cooling Water System, including: Automatic actions associated with the CCWS that occur as a result of an ESFAS signal. (CFR: 41.7 / 45.5)	4.1	35
46	(010) (SF3 PZR PCS) Pressurizer Pressure Control	X											K1.06 - Knowledge of the physical connections and/or cause and effect relationships between the Pressurizer Pressure Control System and the following systems: CVCS. (CFR: 41.2 to 41.9 / 45.7 / 45.8)	3.7	36
47	(012) (SF7 RPS) Reactor Protection							X					A1.04 – Ability to predict and/or monitor changes in parameters associated with operation of the Reactor Protection System, including: Single and multiple channel trip indicators. (CFR: 41.5 / 45.5)	3.8	37
48	(012) (SF7 RPS) Reactor Protection											X	G2.4.45 – Ability to prioritize and interpret the significance of each annunciator or alarm. (CFR: 41.10 / 43.5 / 45.3 / 45.12)	4.1	38
49	(013) (SF2 ESFAS) Engineered Safety Features Actuation	X											K1.13 - Knowledge of the physical connections and/or cause and effect relationships between the Engineered Safety Features Actuation System and the following systems: HVAC for ESF equipment. (CFR: 41.2 to 41.9 / 45.7 / 45.8)	3.2	39
50	(022) (SF5 CCS) Containment Cooling											**X**	**COMPONENT (Breakers, Relays, and Disconnects): 191008 K1.06 – Interpreting a one-line diagram of control circuitry. (CFR: 41.7)**	**3.6**	40
51	(026) (SF5 CSS) Containment Spray										X		A4.01 - Ability to manually operate and/or monitor in the control room: CSS controls. (CFR: 41.7 / 45.5 to 45.8)	3.9	41
52	(039) (SF4S MSS) Main and Reheat Steam									X			A3.03 - Ability to monitor automatic operation of the Main and Reheat Steam System, including: Atmospheric relief valves. (CFR: 41.5 / 45.5)	3.7	42

53	(059) (SF4S MFW) Main Feedwater			X									K3.01 - Knowledge of the effect that a loss or malfunction of the Main Feedwater System will have on the following systems or system parameters: CDS. (CFR: 41.7 / 45.6)	3.2	43
54	(061) (SF4S AFW) Auxiliary/Emergency Feedwater								X				A2.07 - Ability to (a) predict the impacts of the following on the Auxiliary/Emergency Feedwater System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Air-operated valve, solenoid-operated valve, or motor-operated valve failure. (CFR: 41.5 / 45.6)	4.0	44
55	(061) (SF4S AFW) Auxiliary/Emergency Feedwater									X			A3.01 - Ability to monitor automatic features of the Auxiliary/Emergency Feedwater System, including: AFW system automatic start. (CFR: 41.7 / 45.7)	4.2	45
56	(062) (SF6 ED AC) AC Electrical Distribution						X						K6.11 - Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the AC Electrical Distribution System: Grounds. (CFR: 41.7 / 45.7)	3.1	46
57	(063) (SF6 ED DC) DC Electrical Distribution				X								K4.02 - Knowledge of DC Electrical Distribution System design features and/or interlocks that provide for the following: Breaker interlocks, permissives, bypasses, and cross-ties. (CFR: 41.7)	3.5	47
58	(064) (SF6 EDG) Emergency Diesel Generator		X										K2.02 - Knowledge of electrical power supplies to the following: Fuel oil pumps. (CFR: 41.7)	3.2	48
59	(064) (SF6 EDG) Emergency Diesel Generator			X									K3.01 - Knowledge of the effect that a loss or malfunction of the Emergency Diesel Generators will have on the following systems or system parameters: Systems controlled by automatic loader/sequencer. (CFR: 41.7 / 45.6)	4.2	49
60	(073) (SF7 PRM) Process Radiation Monitoring						X						K6.01 - Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Process Radiation Monitoring System: PRM component malfunctions (CFR: 41.7 / 41.8 / 41.9)	3.2	50

61	(076) (SF4S SW) Service Water								X				A2.06 - Ability to (a) predict the impacts of the following on the Service Water System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Controller and positioner failure. (CFR: 41.5 / 43.5 / 45.3 / 45.6 / 45.13)	3.3	51
62	(078) (SF8 IAS) Instrument Air				X								K4.02 - Knowledge of the Instrument Air System design features and/or interlocks that provide for the following: Crossover to other pneumatic systems. (CFR: 41.7)	3.1	52
63	(078) (SF8 IAS) Instrument Air					X							K5.03 - Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the Instrument Air System: Loss of instrument air. (CFR: 41.5 / 45.7)	3.9	53
64	(103) (SF5 CNT) Containment					X							K5.02 - Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the Containment System: Hydrogen concentration inside containment. (CFR: 41.5 / 45.7)	3.5	54
65	**(005) (SF4P RHR) Residual Heat Removal**											**X**	**G2.1.23 - Ability to perform general and/or normal operating procedures during any plant condition. (CFR: 41.10 / 43.5 / 45.2 / 45.6)**	**4.4**	**86**
66	**(008) (SF8 CCW) Component Cooling Water**											**X**	**G2.2.37 - Ability to determine operability or availability of safety-related equipment (SRO Only). (CFR: 43.2 / 43.5 / 45.12)**	**4.6**	**87**

67	**(013) (SF2 ESFAS) Engineered Safety Features Actuation**								**X**				**A2.05 - Ability to (a) predict the impacts of the following on the Engineered Safety Features Actuation System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Loss of DC control power. (CFR: 41.5 / 41.7 / 41.10 / 43.5 / 45.3 / 45.13)**	**3.8**	**88**
68	**(062) (SF6 ED AC) AC Electrical Distribution**								**X**				**A2.21 - Ability to (a) predict the impacts of the following on the AC Electrical Distribution System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Loss of vital AC electrical instrument buses. (CFR: 41.5 / 43.5 / 45.3 / 45.13)**	**4.3**	**89**
69	**(103) (SF5 CNT) Containment**											**X**	**G2.2.12 – Knowledge of surveillance procedures. (CFR: 41.10 / 43.2 / 45.13)**	**4.1**	**90**
	025 (SF5 ICE) Ice Condenser														
	053 (SF1; SF4P ICS*) Integrated Control														
K/A Category Totals:		2	2	2	2	4	2	2	5	4	2	6	Group Point Total:		33

ES-4.1-PWR	PWR Examination Outline (Millstone 3) Plant Systems—Tier 2/Group 2 (RO/**SRO**)														
Item #	System / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	Q#
70	(001) (SF1 CRDS) Control Rod Drive				X								K4.24 - Knowledge of Control Rod Drive System design features and/or interlocks that provide for the following: Control bank sequence and overlap. (CFR: 41.6)	3.7	55
71	(011) (SF2 PZR LCS) Pressurizer Level Control		X										K2.03 - Knowledge of electrical power supplies to the following: Level channels and controllers. (CFR: 41.7)	3.3	56

72	015 (SF7 NI) Nuclear Instrumentation					X							K5.20 - Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the Nuclear Instrumentation System: Maximum disagreement allowed between channels. (CFR: 41.5 / 45.7)	3.5	57
73	(029) (SF8 CPS) Containment Purge			X									K3.01 Knowledge of the effect that a loss or malfunction of the Containment Purge System will have on the following systems or system parameters: CNT. (CFR: 41.7 / 45.6 / 45.8)	3.1	58
74	041 (SF4S SDS) Steam Dump/Turbine Bypass Control						X						K6.10 - Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Steam Dump System and Turbine Bypass Control: RCS. (CFR: 41.7 / 45.7)	3.5	59
75	035 (SF4P SG) Steam Generator								X				A2.03 - Ability to (a) predict the impacts of the following on the Steam Generator System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Pressure/level transmitter failure. (CFR: 41.5 / 43.5 / 45.3 / 45.5)	3.8	60
76	050 (SF9 CRV*) Control Room Ventilation										X		A4.01 - Ability to manually operate and/or monitor the control room: Initiate/reset system. (CFR: 41.7 / 45.5 to 45.8)	3.8	61
77	(068) (SF9 LRS) Liquid Radwaste	X											K1.07 - Knowledge of the physical connections and/or cause and effect relationships between the Liquid Radwaste System and the following systems: Sources of liquid wastes for LRS. (CFR: 41.7 to 41.9 / 45.8 / 45.9)	2.8	62
78	(072) (SF7 ARM) Area Radiation Monitoring											X	**COMPONENT (Sensors and Detectors): 191002 K1.22 (Radiation Detection) - Theory and operation of ion chambers, Geiger-Muller tubes, and scintillation detectors. (CFR: 41.7)**	**2.8**	63
79	**(016) (SF7 NNI) Nonnuclear Instrumentation**								**X**				**A2.02 - Ability to (a) predict the impacts of the following on the Nonnuclear Instrumentation System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Loss of power supply. (CFR: 41.5 / 43.5 / 45.3 / 45.5)**	**3.3**	**91**

80	**(071) (SF9 WGS) Waste Gas Disposal**								**X**				**A2.05 - Ability to (a) predict the impacts of the following on the Waste Gas Disposal System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: RMS alarms and/or malfunctions. (CFR: 41.5 / 43.5 / 45.3 / 45.8 / 45.9 / 45.13)**	**3.1**	**92**
81	**(086) (SF8 FPS) Fire Protection**											**X**	**G2.2.38 – Knowledge of conditions and limitations in the facility license. (CFR: 41.7 / 41.10 / 43.1 / 45.13)**	**4.5**	**93**
	002 (SF2; SF4P RCS) Reactor Coolant														
	014 (SF1 RPI) Rod Position Indication														
	017 (SF7 ITM) In Core Temperature Monitor														
	(027) (SF5 CIRS) Containment Iodine Removal														
	(028) (SF5 HRPS) Hydrogen Recombiner and Purge Control														
	033 (SF8 SFPCS) Spent Fuel Pool Cooling														
	(034) (SF8 FHS) Fuel Handling Equipment														
	045 (SF4S MTG) Main Turbine Generator														
	055 (SF4S CARS) Condenser Air Removal														
	056 (SF4S CDS) Condensate														
	(075) (SF8 CW) Circulating Water														

	079 (SF8 SAS**) Station Air														
K/A Category Totals:		1	1	1	1	1	1	0	3	0	1	2	Group Point Total:		12

Form 4.1-COMMON Common Examination Outline

ES-4.1-COMMON	COMMON Examination Outline (Millstone 3)	
Facility: Millstone 3		Date of Exam: 09/11/2023

Generic Knowledge and Abilities Outline (Tier 3) (RO/SRO)

Category	K/A #	Topic	Item #	RO IR	RO Q#	SRO-Only IR	SRO-Only Q#
1. Conduct of Operations	G2.1.3	Knowledge of shift or short-term relief turnover practices. (CFR: 41.10 / 45.13)	82	3.7	64		
	G2.1.39	Knowledge of conservative decision-making practices. (CFR: 41.10 / 43.5 / 45.12)	83	3.6	65		
	G2.1.1	**Knowledge of conduct of operations requirements. (CFR: 41.10 / 43.10 / 45.13)**	**84**			**4.2**	**94**
	G2.1.35	**Knowledge of the fuel handling responsibilities of SROs (SRO Only). (CFR: 43.7)**	**85**			**3.9**	**95**
	Subtotal			N/A	2	N/A	**2**
2. Equipment Control	G2.2.13	Knowledge of tagging and clearance procedures. (CFR: 41.10 / 43.1 / 45.13)	86	4.1	66		
	G2.2.14	Knowledge of the process for controlling equipment configuration or status. (CFR: 41.10 / 43.3 / 45.13)	87	3.9	67		
	G2.2.5	**Knowledge of the process for making design or operating changes to the facility, such as 10 CFR 50.59, "Changes, Tests and Experiments," screening and evaluation processes, administrative processes for temporary modifications, disabling annunciators, or installation of temporary equipment. (CFR: 41.10 / 43.3 / 45.13)**	**88**			**3.2**	**96**
	G2.2.19	**Knowledge of maintenance work order requirements. (CFR: 41.10 / 43.5 / 45.13)**	**89**			**3.4**	**97**
	Subtotal			N/A	2	N/A	**2**
3. Radiation Control	G2.3.11	Ability to control radiation releases. (CFR: 41.11 / 43.4 / 45.10)	90	3.8	68		
	G2.3.14	**Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities, such as analysis and interpretation of radiation and activity readings as they pertain to administrative, normal, abnormal, and emergency procedures or to analysis and interpretation of coolant activity, including comparison to emergency plan or regulatory limits (SRO Only). (CFR: 43.4 / 45.10)**	**91**			**3.8**	**98**
	Subtotal			N/A	1	N/A	**1**
4. Emergency Procedures / Plan	G2.4.26	Knowledge of facility protection requirements, including fire brigade and portable firefighting equipment usage. (CFR: 41.10 / 43.5 / 45.12)	92	3.1	69		
	G2.4.22	**Knowledge of the bases for prioritizing safety functions during abnormal and emergency operations. (CFR: 41.7 / 41.10 / 43.5 / 45.12)**	**93**			**4.4**	**99**

	G2.4.40	**Knowledge of SRO responsibilities in emergency plan implementing procedures (SRO Only). (CFR: 43.5 / 45.11)**	94			4.5	100
	Subtotal			N/A	1	N/A	2
Tier 3 Point Total				N/A	6	N/A	7

Form 4.1-COMMON Common Examination Outline

ES-4.1-COMMON	COMMON Examination Outline (Millstone 3)	
Facility: Millstone 3		Date of Exam: 09/11/2023

Theory (Tier 4) (RO)

Category	K/A #	Topic	Item #	RO IR	RO Q#
Reactor Theory	192003 (K1.01)	REACTOR KINETICS AND NEUTRON SOURCES - Explain the concept of subcritical multiplication. (CFR: 41.1)	95	2.8	70
	192005 (K1.06)	CONTROL RODS - Explain the shape of the curves for differential and integral rod worth versus position. (CFR: 41.1)	96	2.9	71
	192006 (K1.08)	FISSION PRODUCT POISONS - Describe the effects of xenon concentration on flux shape and control rod patterns. (CFR: 41.1)	97	3.4	72
	Subtotal			N/A	3
Thermodynamics	193004 (K1.15)	THERMODYNAMIC PROCESS: Throttling and the Throttling Process - Determine the exit conditions for a throttling process based on the use of steam and/or water. (CFR: 41.14)	98	2.8	73
	193007 (K1.08)	HEAT TRANSFER: Core Thermal Power - Calculate core thermal power using a simplified heat balance. (CFR: 41.14)	99	3.4	74
	193008 (K1.22)	THERMAL HYDRAULICS: Natural Circulation – Describe means to determine whether natural circulation flow exists. (CFR: 41.14)	100	4.2	75
	Subtotal			N/A	3
Tier 4 Point Total				N/A	6