Facility: BFN Scenario Number: NRC- 1 Op-Test Number: 21-04

Examiners: _____ Operators: SRO: _____

_____ ATC: _____

_____ BOP: _____

Initial Conditions: 80% Reactor Power.

Turnover: Reactor Shutdown in progress. SRV 1-22 is INOPERABLE (ADS Valve). EHPM tagged for motor bearing inspection.

Critical Tasks:

1. With the Reactor at power and with a Primary System discharging into the Secondary Containment, manually SCRAM the Reactor before any area exceeds the Maximum Safe Temperature operating value by entering EOI-1, RPV Control.
2. With a Primary System discharging into the Secondary Containment, when two or more areas are greater than their Maximum Safe operating values for the same parameter, the Unit Operator initiates Emergency Depressurization as directed by the Nuclear Unit Senior Operator (NUSO).

Event Number	Malfunction Number	Event Type*	Event Description
1.	N/A	N-BOP N-NUSO	Return Reactor Water Cleanup (RWCU) to Operation
2.	N/A	R-OATC R-NUSO	Reduce Reactor Power to 75% using Core Flow
3.#S	XA-55-4C_13	C-BOP C-NUSO	Reactor Building Closed Cooling Water (RBCCW) Surge Tank Low Level
4.	SCHED RWCU	C-OATC TS-NUSO	Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close
5.	N/A	TS-NUSO	Core Spray Loop I Room Cooler EECW Leak
6.	ED08C	C-OATC C-NUSO	2C 4KV Unit Board Trip
7.	RC09 FCV-71-2 FCV-71-3	M-ALL	Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak
8.#	TH23	M-ALL	Fuel Damage
9.	FCV-73-16	C-BOP C-NUSO	Reactor Feedwater Pumps (RFPTs) Trip / HPCI Fails to Automatically Start and Inject

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor (TS)Technical Specification
# Event on previous two NRC Exams
#S Event on previous two NRC Exams Spare Scenario

Events

1. The crew will return Reactor Water Cleanup (RWCU) to service in accordance with 2-OI-69, Reactor Water Cleanup System.

2. The crew will continue the Reactor shutdown and reduce Reactor Power using Core Flow to 75% in accordance with 2-OI-68, Reactor Recirculation System, and 2-GOI-100-12A, Unit Shutdown from Power Operation to Cold Shutdown and Reductions in Power During Power Operations.

3. The Reactor Building Closed Cooling Water (RBCCW) Surge Tank Low Level alarm will be received, requiring the crew to take action to fill the RBCCW Surge Tank in accordance with Alarm Response Procedure 2-ARP-9-4C, Window 13, RBCCW SURGE TANK LEVEL LOW.

4. A leak will develop in the Reactor Water Cleanup System (RWCU), requiring the crew to respond in accordance with 2-AOI-64-2A, Group 3 Reactor Water Cleanup Isolation. 2-FCV-69-1, RWCU INBOARD SUCTION ISOLATION VALVE, will fail to automatically close on an isolation signal, requiring manual action by the crew to isolate the RWCU System. The Nuclear Unit Senior Operator (NUSO) will address Technical Specification 3.6.1.3, Primary Containment Isolation Valves (PCIVs), Condition A.

5. The Reactor Building AUO will report that an Emergency Equipment Cooling Water (EECW) leak was found in the Loop I Core Spray Room Cooler and that the leak has been isolated, requiring the NUSO to address Technical Requirements Manual 3.5.3, Equipment Area Coolers, Condition A and Technical Specification 3.5.1, Emergency Core Cooling Systems – Operating, Condition F.

6. 4KV Unit Board 2C will trip, resulting in a loss of the following electrical loads: 2C Condensate Pump, 2C Condensate Booster Pump, 2C Raw Cooling Water (RCW) Pump, 2C Condenser Cooling Water (CCW) Pump, and 2A Control Rod Drive (CRD) Pump. Action will be required to restore CRD Flow in accordance with 2-AOI-85-3, CRD System Failure.

7. Reactor Core Isolation Cooling (RCIC) will develop an un-isolable leak, causing high temperatures and radiation levels in the Reactor Building. The SRO will respond in accordance with 2-EOI-3, Secondary Containment Control.

8. Fuel damage will occur when the Reactor SCRAMs, requiring the crew to Emergency Depressurize the Reactor due to two Area Radiation Levels exceeding their Maximum Safe Values in Secondary Containment.

9. Reactor Feedwater Pumps (RFPTs) will trip when the Reactor MODE SWITCH is placed in SHUTDOWN. When Reactor Water Level lowers to the initiation setpoint, the High Pressure Coolant Injection (HPCI) System will not automatically start, requiring the crew to take action to manually start HPCI for Reactor Water Level control.

The Scenario ends when the crew has Emergency Depressurized the Reactor and has control of Reactor Water level above the Top of Active Fuel ((-) 162 inches) using low pressure systems.

Critical Tasks 2

1. With the Reactor at power and with a Primary System discharging into the Secondary Containment, manually SCRAM the Reactor before any area exceeds the Maximum Safe Temperature operating value by entering EOI-1, RPV Control.

a. **Safety Significance**

SCRAM reduces to decay heat the energy that the RPV may be discharging into the Secondary Containment.

b. **Cues**

Procedural Compliance.
Secondary Containment Area Temperature, Level and/or radiation indication.

c. **Measured by**

Observation - With a Primary System discharging into Secondary Containment a Reactor SCRAM is initiated before a Maximum Safe condition is reached.

d. **Feedback**

Control Rod positions
Reactor Power reduction

e. **Critical Task Failure Criteria**

The operating crew fails to proceed without delay and in a controlled manner to initiate a Reactor SCRAM from the time it is announced that one Area Temperature is approaching the Maximum Safe value.

2. With a Primary System discharging into the Secondary Containment, when two or more areas are greater than their Maximum Safe operating values for the same parameter, the Unit Operator initiates Emergency Depressurization as directed by the Nuclear Unit Senior Operator.

a. **Safety Significance**

Places the Primary System in the lowest possible energy state, rejects heat to the Suppression Pool in preference to outside the Primary Containment, and reduces driving head and flow of system discharging into the Secondary Containment.

b. **Cues**

Procedural Compliance.
Secondary Containment Area Temperature, Level, or Radiation indication.

c. **Measured by**

Observation - NUSO transitions to 2-EOI-C2, Emergency RPV Depressurization, and directs opening at least 6 MSRVs when two or more areas are greater than their Maximum Safe operating values for the same parameter.

d. **Feedback**

Reactor Pressure Trend.
MSRV status indications.

e. **Critical Task Failure Criteria**

The operating crew fails to proceed with without delay and in a controlled manner to initiate Emergency Depressurization when two Area Radiation Levels exceed Maximum Safe value.

Facility: BFN Scenario Number: NRC-1 Op-Test Number:21-04

Examiners: _____ Operators: SRO: _____

_____ ATC: _____

_____ BOP: _____

Initial Conditions: 80% Reactor Power.

Turnover: Reactor Shutdown in progress. SRV 1-22 is INOPERABLE (ADS Valve). EHPM tagged for motor bearing inspection.

Critical Tasks:

1. With the Reactor at power and with a Primary System discharging into the Secondary Containment, manually SCRAM the Reactor before any area exceeds the Maximum Safe Temperature operating value by entering EOI-1, RPV Control.
2. With a Primary System discharging into the Secondary Containment, when two or more areas are greater than their Maximum Safe operating values for the same parameter, the Unit Operator initiates Emergency Depressurization as directed by the Nuclear Unit Senior Operator (NUSO).

Event Number	Malfunction Number	Event Type*	Event Description
1.	N/A	N-BOP N-NUSO	Return Reactor Water Cleanup (RWCU) to Operation
2.	N/A	R-OATC R-NUSO	Reduce Reactor Power to 75% using Core Flow
3.#S	XA-55-4C_13	C-BOP C-NUSO	Reactor Building Closed Cooling Water (RBCCW) Surge Tank Low Level
4.	SCHED RWCU	C-OATC TS-NUSO	Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close
5.	N/A	TS-NUSO	Core Spray Loop I Room Cooler EECW Leak
6.	ED08C	C-OATC C-NUSO	3C 4KV Unit Board Trip
7.	RC09 FCV-71-2 FCV-71-3	M-ALL	Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak
8.#	TH23	M-ALL	Fuel Damage
9.	FCV-73-16	C-BOP C-NUSO	Reactor Feedwater Pumps (RFPTs) Trip / HPCI Fails to Automatically Start and Inject

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

Event on previous two NRC Exams

#S Event on previous two NRC Exams Spare Scenario

Events

1. The crew will return Reactor Water Cleanup (RWCU) to service in accordance with 3-OI-69, Reactor Water Cleanup System.

2. The crew will continue the Reactor shutdown and reduce Reactor Power using Core Flow to 75% in accordance with 3-OI-68, Reactor Recirculation System, and 3-GOI-100-12A, Unit Shutdown from Power Operation to Cold Shutdown and Reductions in Power During Power Operations.

3. The Reactor Building Closed Cooling Water (RBCCW) Surge Tank Low Level alarm will be received, requiring the crew to take action to fill the RBCCW Surge Tank in accordance with Alarm Response Procedure 3-ARP-9-4C, Window 13, RBCCW SURGE TANK LEVEL LOW.

4. A leak will develop in the Reactor Water Cleanup System (RWCU), requiring the crew to respond in accordance with 3-AOI-64-2A, Group 3 Reactor Water Cleanup Isolation. 3-FCV-69-1, RWCU INBOARD SUCTION ISOLATION VALVE, will fail to automatically close on an isolation signal, requiring manual action by the crew to isolate the RWCU System. The Nuclear Unit Senior Operator (NUSO) will address Technical Specification 3.6.1.3, Primary Containment Isolation Valves (PCIVs), Condition A.

5. The Reactor Building AUO will report that an Emergency Equipment Cooling Water (EECW) leak was found in the Loop I Core Spray Room Cooler and that the leak has been isolated, requiring the NUSO to address Technical Requirements Manual 3.5.3, Equipment Area Coolers, Condition A and Technical Specification 3.5.1, Emergency Core Cooling Systems – Operating, Condition F.

6. 4KV Unit Board 3C will trip, resulting in a loss of the following electrical loads: 3C Condensate Pump, 3C Condensate Booster Pump, 3C Raw Cooling Water (RCW) Pump, 3C Condenser Cooling Water (CCW) Pump, and 3A Control Rod Drive (CRD) Pump. Manual action will be required to restore CRD Flow in accordance with 3-AOI-85-3, CRD System Failure.

7. Reactor Core Isolation Cooling (RCIC) will develop an un-isolable leak, causing high temperatures and radiation levels in the Reactor Building. The SRO will respond in accordance with 3-EOI-3, Secondary Containment Control.

8. Fuel damage will occur when the Reactor SCRAMs, requiring the crew to Emergency Depressurize the Reactor due to two Area Radiation Levels exceeding their Maximum Safe Values in Secondary Containment.

9. Reactor Feedwater Pumps (RFPTs) will trip when the Reactor MODE SWITCH is placed in SHUTDOWN. When Reactor Water Level lowers to the initiation setpoint, the High Pressure Coolant Injection (HPCI) System will not automatically start, requiring the crew to take action to manually start HPCI for Reactor Water Level control.

The Scenario ends when the crew has Emergency Depressurized the Reactor and has control of Reactor Water level above the Top of Active Fuel ((-) 162 inches) using low pressure systems.

Critical Tasks 2

1. With the Reactor at power and with a Primary System discharging into the Secondary Containment, manually SCRAM the Reactor before any area exceeds the Maximum Safe Temperature operating value by entering EOI-1, RPV Control.

a. **Safety Significance**

SCRAM reduces to decay heat the energy that the RPV may be discharging into the Secondary Containment.

b. **Cues**

Procedural Compliance.
Secondary Containment Area Temperature, Level and/or radiation indication.

c. **Measured by**

Observation - With a Primary System discharging into Secondary Containment a Reactor SCRAM is initiated before a Maximum Safe condition is reached.

d. **Feedback**

Control Rod positions
Reactor Power reduction

e. **Critical Task Failure Criteria**

The operating crew fails to proceed without delay and in a controlled manner to initiate a Reactor SCRAM from the time it is announced that one Area Temperature is approaching the Maximum Safe value.

2. With a Primary System discharging into the Secondary Containment, when two or more areas are greater than their Maximum Safe operating values for the same parameter, the Unit Operator initiates Emergency Depressurization as directed by the Nuclear Unit Senior Operator.

a. **Safety Significance**

Places the Primary System in the lowest possible energy state, rejects heat to the Suppression Pool in preference to outside the Primary Containment, and reduces driving head and flow of system discharging into the Secondary Containment.

b. **Cues**

Procedural Compliance.
Secondary Containment Area Temperature, Level, or Radiation indication.

c. **Measured by**

Observation - NUSO transitions to 3-EOI-C2, Emergency RPV Depressurization, and directs opening at least 6 MSRVs when two or more areas are greater than their Maximum Safe operating values for the same parameter.

d. **Feedback**

Reactor Pressure Trend.
MSRV status indications.

e. **Critical Task Failure Criteria**

The operating crew fails to proceed with without delay and in a controlled manner to initiate Emergency Depressurization when two Area Radiation Levels exceed Maximum Safe value.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 1 of 9

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	Driver	**PRIOR to placing the simulator in RUN, start CPERF to record critical parameters.**
	NRC	**If the crew does not start Event 1, Return Reactor Water Cleanup (RWCU) to Operation, request that the Driver contact the Nuclear Unit Senior Operator (NUSO) as the Shift Manager and direct the crew to return RWCU to operation.**
	Driver	**If requested by the Chief Examiner, contact the NUSO as the Shift Manager and direct the crew to return RWCU to operation.** **If contacted by the crew as the Reactor Building Assistant Unit Operator (AUO) acknowledge any direction given.**
	NRC	**If Panel 2-9-4B, Window 17, RWCU NON-REGENERATIVE HX DISCH TEMP HIGH, is received, see page 9 of 57 for Alarm Response Procedure actions.**
	NUSO	Directs the Balance of Plant Operator (BOP) to return RWCU to service.
	BOP	2-OI-69, Reactor Water Cleanup System Section 5.1 RWCU Pump Startup **NOTES** 1) All controls and indications are located on Panel 2-9-4 unless noted otherwise. 2) RWCU is required to be operated within the following restrictions with Reactor Pressure ≤50 psig (MODES 2 or 3), or any time the unit is in MODE 4, MODE 5, or de-fueled: • One pump in operation, pump can be operated to its maximum flow capacity • Two pumps in operation, maximum flow limited to ≤100 gpm per pump (200 gpm total) [4] **ENSURE RESET** the RWCU Group 3 Isolation using 2-HS-64-16A-S32, PCIS DIVISION I RESET and 2-HS-64-16A-S33 PCIS DIVISION II RESET, at Panel 2-9-4.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 2 of 9

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	BOP	[5] **CHECK** the following on Panel 2-LPNL-925-0003, Unit 2 Reactor Building Elevation 621': [5.1] Demin 2A and/or 2B Holding Pumps are running (2-HS-069-6015 and 2-HS-069-6005). [5.2] Demin 2A and/or 2B Outlet Valves are closed (2-HS-069-0035 and/or 2-HS-069-0060).
	Driver	**If contacted as the Reactor Building AUO to perform Step [5], acknowledge the direction and report that the Holding Pumps are running with the Demineralizer Outlet Valves closed.**
	BOP	[6] N/A [7] **ENSURE** 2-TIC-069-0010A, RWCU HEAT EXCHANGERS RBCCW FLOW CONTROL, is in MANUAL, and FULL OPEN demand is on 2-TCV-70-49, RWCU NON-REGENERATIVE HEAT EXCHANGER OUTLET TCV.
	Driver	**When directed to place 2-TIC-069-0010A in manual, insert Event 11. Inform the crew that 2-TIC-069-0010A is in manual and is fully open.**
	BOP	[8] **ENSURE CLOSED** the following: • 2-HC-69-15, RWCU BLOWDOWN PRESSURE CONTROL VALVE • 2-HS-69-16, RWCU BLOWDOWN TO MAIN CONDENSER • 2-HS-69-17, RWCU BLOWDOWN TO RADWASTE [9] **ENSURE** the DEFEAT/OPERATE SWITCH FOR 2-HC-069-0015 in the DEFEAT position, using 2-HS-069-0015A. [10] N/A [11] **NOTIFY** Chemistry that RWCU is being placed in service and to check the durability monitor.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 3 of 9

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	Driver	**When contacted as Chemistry acknowledge the direction to check the durability monitor.**
	BOP	[12] **ENSURE OPEN** the following: [12.1] 2-FCV-69-1, RWCU INBD SUCT ISOLATION VALVE. [12.2] 2-FCV-69-2, RWCU OUTBD SUCT ISOLATION VALVE. [12.3] 2-FCV-69-8, RWCU DEMIN BYPASS VALVE. [13] **OPEN** 2-FCV-069-0012, RWCU RETURN ISOLATION VALVE by one of the two methods described below. • **THROTTLE OPEN** 2-FCV-069-0012, RWCU RETURN ISOLATION VALVE as follows: **PLACE** 2-HS-69-12A in the OPEN position, **THEN WHEN** intermediate position (red and green light) is indicated, **THEN RETURN** 2-HS-69-12A to the NORM position • **FULLY OPEN** RWCU RETURN ISOLATION VALVE, 2-FCV-069-0012 as follows: **ENSURE** 2-FCV-069-0012 is OPEN **NOTES** 1) Too high a flow on startup after isolation could cause 2-TIS-69-11 to actuate due to a high Non-Regenerative Heat Exchanger Outlet Temperature (2-XS-69-6, RWCU TEMP SELECT, Position 3, WATER TO RWCU DEMINS). 2) The RWCU Pump trips on low flow at 56 gpm, after a 30 second time delay. Failure to immediately raise flow to greater than 56 gpm in the following steps results in a pump trip. [14] **PLACE** seal purge in operation to pump(s) to be placed in service. (REFER TO Section 8.2)

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 4 of 9

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	Driver	**When directed to place seal purge in service, acknowledge the direction and inform the crew that seal purge has been placed in service in accordance with 2-OI-69, Section 8.2**
	BOP	[15] **START** RWCU PUMP 2A(2B) using 2-HS-69-4A(B)-A, **AND RAISE** flow, using 2-HS-69-12A, RWCU RETURN ISOLATION VALVE, to prevent low flow trip. [16] **IF** two pump operation is desired, **THEN START** the second RWCU PUMP 2B(2A) using 2-HS-69-4B(A)-A, **AND RAISE** flow using RWCU RETURN ISOLATION VALVE, 2-HS-69-12A, to prevent low flow trip. [17] **WHEN** desired, **THEN PLACE** RWCU filter-demineralizers in service. (REFER TO Section 6.2)
	BOP	2-OI-69, Reactor Water Cleanup System Section 6.2, Placing Filter-Demineralizers in Service **NOTES** 1) To prevent resin intrusion into the Reactor Vessel, the resin trap (Filter Effluent Strainer) on a vessel that was removed from service due to high D/P should be backwashed prior to returning the demin vessel to service. 2) The flow rate in the mechanical seal areas can be to a maximum of 8.0 gpm for a 24 to 36 hour period. Based on the layout design showing the flush coming in over the retainer at the back of the mechanical seal, the rise in flush gpm should NOT cause any operational problems with the mechanical seal when conditions are returned to normal.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 5 of 9

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	BOP	**CAUTION** When initially placing a filter-demineralizer into service, it is desirable that most RWCU Discharge Flow be returned to the Main Condenser. If the Reactor is pressurized, however, failure to follow temperature restrictions could result in thermal shocking the Regenerative Heat Exchanger. [1] **REVIEW** Precautions and Limitations in Section 3.0. [2] – [10] Performed in the Field by an AUO.
	Driver	**When contacted as the Reactor Building AUO to prepare to roll in RWCU Demineralizer, acknowledge the direction and report that you are standing by with Steps complete Steps [2] through [10] of 2-OI-69, Reactor Water Cleanup System, Section 6.2 are complete.** **When directed to place filter-demineralizers in service, insert Event 1 to perform AUO actions to place demineralizers in service, and inform the crew that Demin Flow is rising.** **Demineralizers will roll in over a 1-minute time frame – when complete inform the crew that RWCU filter-demineralizers have been placed in service.** **If requested, Demineralizer flows are rising and are normal.**
	BOP	**NOTE** RWCU is required to be operated within the following restrictions with Reactor Pressure ≤ 50 psig (Modes 2 or 3), or any time the unit is in Mode 4, Mode 5, or defueled: • One pump in operation, pump can be operated to its maximum flow capacity • Two pumps in operation, maximum flow limited to ≤ 100 gpm per pump (200 gpm total)

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 6 of 9

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	BOP	[11] **PERFORM** the following simultaneously: • **CLOSE** 2-HS-69-8, RWCU DEMIN BYPASS VALVE on Panel 2-9-4
	Driver	**Verify that the crew is able to clear RWCU Demineralizer Alarm (Panel 2-9-4B, Window 24) – it will automatically reset on Event 1 after 15 seconds. If the crew cannot get the alarm to reset, insert remote function AN01E to RESET again).**
	BOP	[12] **RAISE** flow through the Demin until the desired flow has been established. [13] **ENSURE** 2-HS-069-6015(6005), DEMIN 2A(2B) HOLDING PUMP, in the AUTO position. [14] **CHECK** that Holding Pump 2A(2B), on the Demin being placed in service, has STOPPED. [15] **CHECK** 2-FCV-069-0035B(0060B), DEMIN 2A(2B) HOLDING PUMP DISCH VLV H, has CLOSED.
	Driver	**When directed to perform Steps [12], [13], and [14] acknowledge the direction and inform the crew that Steps [12], [13], and [14] are complete.**
	BOP	[16] **NOTIFY** Chemistry that the filter-demineralizer is in service **AND REQUEST** a sample for conductivity and silica of the effluent. [17] **CHECK** that the results of the filter-demineralizer effluent sample taken by Chemistry are within the limits of CI-13.1, Chemistry Manual, for return to the Reactor Vessel. [17.1] **CHECK** RWCU Flows on ICS per Section 8.16.
	Driver	**When contacted as Chemistry, acknowledge any information or direction given.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 7 of 9

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	BOP	Continuing 2-OI-69, Reactor Water Cleanup System Section 5.1 RWCU Pump Startup [18] **ADJUST** 2-HS-69-12A, RWCU RETURN ISOLATION VALVE, using as required to maintain system parameters within limits specified in this procedure. **CAUTION** Failure to maintain RWCU Non-Regenerative Heat Exchanger tube side outlet temperature below 130 ºF will reduce resin efficiency and may result in resin damage. [19] **THROTTLE** blowdown flow as required to maintain the following parameters (REFER TO Section 6.5): • Desired Reactor Water Level • Non-regenerative Heat Exchanger Tube Outlet Temperature less than 130 ºF
	BOP	[20] **IF** at Operations Management discretion it is desired to place 2-TIC-069-0010A, RWCU HEAT EXCHANGERS RBCCW FLOW CONTROL in AUTO, **THEN PERFORM** the following: [20.1] **PLACE** 2-TIC-069-0010A, RWCU HEAT EXCHANGERS RBCCW FLOW CONTROL, in AUTO (REFER TO Section 8.14).
	Driver	**If contacted by the crew to place 2-TIC-069-0010A in automatic acknowledge the direction and inform the crew that 2-TIC-069-0010A has been placed in automatic.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 8 of 9

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	BOP	**NOTES** • Seal water to the RWCU Pumps has been observed to slightly lower after pump(s) are placed in service • When the Reactor Vessel is at atmospheric pressure and RWCU Pump seal water is being supplied by CS&S system, RWCU Pump seal water flow may decrease to 0 gpm after the RWCU Pump has started. See PRECAUTION P&L 3.6E [21] **ENSURE** SEAL WATER TO RWCU PUMPS, at Panel 2-25-314, is within 1.8 to 2.0 gpm (REFER TO Section 8.2). • 2-FI-085-0075, RWCU PUMP 2A PURGE WATER FLOW INDICATOR • 2-FI-085-0077, RWCU PUMP 2B SEAL WATER
	Driver	**When contacted as the Reactor Building AUO to perform Step [21], inform the crew that seal water flow is 1.9 gpm.**
	NRC	**The restoration of RWCU ICS point to the heat balance is not required if automatically bypassed.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 9 of 9

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	BOP	2-9-ARP-4B, Alarm Response Procedure RWCU NON-REGENERATIVE HX DISCHARGE TEMPERATURE HIGH, Window 17 Operator Action: A. **CHECK** 2-XS-69-6, RWCU NRHX Discharge Temperature, on Panel 2-9-4. B. **CHECK** RBCCW System Temperature indication normal, Panel 2-9-4. C. **IF** temperature continues to rise, **THEN PERFORM** the following, otherwise, **MARK** steps N/A: • **REDUCE** system flow or reject flow as necessary to control temperature. • **REFER** TO 2-OI-69, Reactor Water Cleanup System D. **DISPATCH** personnel to check the following: • RWCU Heat Exchangers RBCCW Flow Controller (normally in auto with setpoint at approximately 110 ºF), located on Panel 25-2 Rx Bldg 593' • 2-TCV-70-49, RWCU NON-REGENERATIVE HEAT EXCHANGER OUTLET TCV operating properly (RBCCW to NRHX), located in RWCU HX room E. N/A
	Driver	**If contacted by the crew to check equipment in Step D (see above), acknowledge the direction and report the following as required:** • **RWCU Heat Exchangers RBCCW Flow Controller is set at 110 ºF and is in automatic** • **2-TCV-70-49 is operating properly**
	NRC	**End of Event 1. Proceed to Event 2, Reduce Reactor Power to 75% using Core Flow.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 2 Page 1 of 4

Event Description: Reduce Reactor Power to 75% using Core Flow

Time	Position	Applicant's Actions or Behavior
	NRC	**If the crew does not proceed to Event 2, Reduce Reactor Power to 75% using Core Flow, request that the Driver contact the NUSO as the Shift Manager and direct the crew to reduce Reactor Power to 75%.**
	Driver	**If requested by the Chief Examiner, contact the crew as the Shift Manager and direct the crew to continue with Step [2] of the Reactivity Control Plan (RCP) for the Reactor Shutdown and reduce Reactor Power to 75% using Core Flow.**
	NRC	**The crew may elect to conduct a re-focus reactivity brief prior to lowering Reactor Power.**
	NUSO	Directs the Operator at the Controls (OATC) to lower Reactor Power to 75% in accordance with Step [2] of RCP U2-2104NRC1 and in accordance with 2-OI-68, Reactor Recirculation System, 2-GOI-100-12A, Unit Shutdown from Power Operation to Cold Shutdown and Reductions in Power During Power Operations and 2-GOI-100-12, Power Maneuvering.
	OATC	2-GOI-100-12A, Unit Shutdown from Power Operation to Cold Shutdown and Reductions in Power During Power Operations Section 5.3, Power Reduction 5.3.1 Reducing Reactor Power to 40% [1] **ENSURE** the operators are using Attachment 9, Operations Down Power Monitoring. [2] **REDUCE** Reactor Power by combination of Control Rod insertions and Core Flow changes, as recommended by Reactor Engineer.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 2 Page 2 of 4

Event Description: Reduce Reactor Power to 75% using Core Flow

Time	Position	Applicant's Actions or Behavior
	OATC	2-GOI-100-12, Power Maneuvering Section 5.0, Instruction Steps [7] **REDUCE** Reactor Power by combination of Control Rod insertions and Core Flow changes, as recommended by Reactor Engineer. **REFER TO** 2-SR-3.1.3.5(A), Control Rod Coupling Integrity Check and 2-OI-68, Reactor Recirculation System.
	NRC	**2-OI-68, Reactor Recirculation System** **3.0 Precautions and Limitations** **Section 3.5.3, Dual Pump Operation** **E. When raising (lowering) Reactor Power per the Reactivity Plan, the following guideline should be used to establish the 60 rpm mismatch between the Recirc Pumps.** **1. When the first Recirc Pump reaches 1200 rpm (1300 rpm) or both Recirc Pumps are at 1200 rpm (1300 rpm) then individual controls will be used.** **2. While following the Reactivity Plan establish the 60 rpm mismatch using the individual controls for the leading Recirc Pump.** **3. While maintaining the 60 rpm mismatch and using the Reactivity Plan, raise (lower) the Recirc Pump speeds using either the Master Controllers or Individual Controllers.** **4. Once a Recirc Pump reaches 1300 rpm (1200 rpm) the 60 rpm mismatch is no longer required. While following the Reactivity Plan raise (lower) the lagging Recirc Pump using the individual controller match Recirc Pump speeds.** **5. Once the Recirc Pumps are matched, then the speeds may be adjusted as required using the Master Controller or Individual Controllers while maintaining the requirements of Attachment 1.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 2 Page 3 of 4

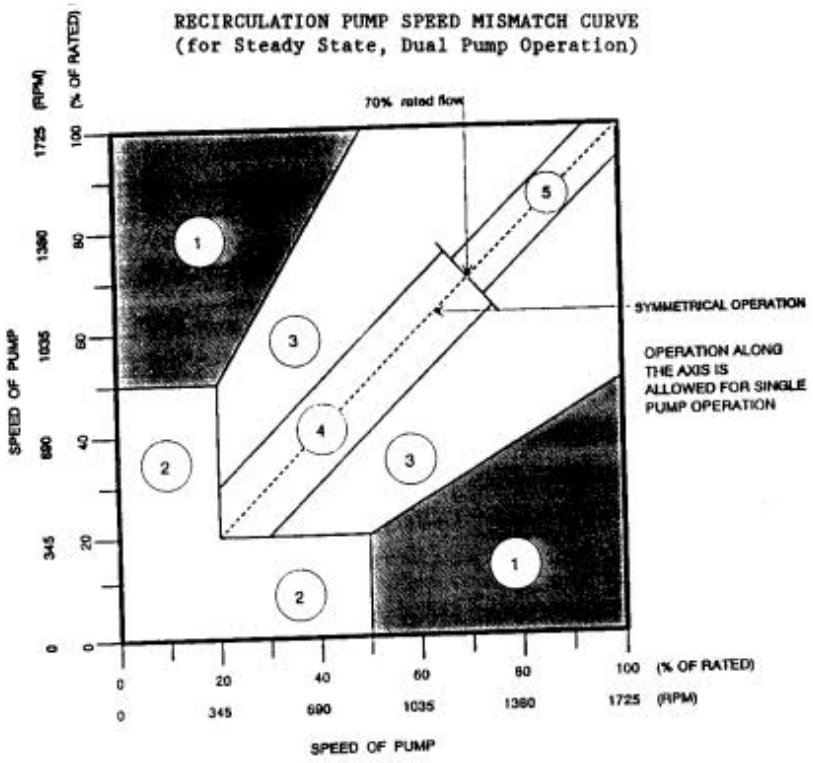
Event Description: Reduce Reactor Power to 75% using Core Flow

Time	Position	Applicant's Actions or Behavior
	NRC	

BFN Unit 2	Reactor Recirculation System	2-OI-68 Rev. 0159 Page 181 of 209

Attachment 1
(Page 1 of 1)

Recirculation Pump Speed Mismatch Curve



1. Avoid Region To Prevent Excessive Jet Pump Vibration.
2. Below Recirc Drive Minimum speed.
3. Operation allowed if reactor subcritical or during transient periods.
4. Limited Operation for Core flow ≤ 70% rated (mismatch ≤ 10% rated speed).
5. Limited operation for Core flow > 70% rated (mismatch ≤ 5% rated speed).

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 2 Page 4 of 4

Event Description: Reduce Reactor Power to 75% using Core Flow

Time	Position	Applicant's Actions or Behavior
	OATC	2-OI-68, Reactor Recirculation System Section 6.2, Adjusting Recirc Flow **NOTES** 1) Thermal Limits are shown in 0-TI-248, Station Reactor Engineer and 2-SR-2, Instrument Checks and Observations. 2) Recirc Flow changes made during the later part of the operating cycle (Coastdown) could cause Core Flow values to approach or exceed the allowable values of the Increased Core Flow (ICF) Region of the power to flow map. Instruments used to monitor pump speed and Core Flow should be identified in the Reactivity Control Plan. These values should be recorded prior to reducing Core Flow and used as a benchmark to reestablish the previous conditions when returning to power. Increased caution should be used when changes in Recirc Flow are made in this area. [1] **IF** desired to control Recirc Pumps 2A and/or 2B speed with Recirc Individual Control, **THEN PERFORM** the following: • **LOWER** Recirc Pump 2A using 2-HS-96-17A(17B)(17C), SLOW(MEDIUM)(FAST), (Otherwise N/A) AND/OR • **LOWER** Recirc Pump 2B using 2-HS-96-18A(18B)(18C), SLOW(MEDIUM)(FAST). (Otherwise N/A) [2] **WHEN** desired to control Recirc Pumps 2A and/or 2B speed with the RECIRC MASTER CONTROL, **THEN ADJUST** Recirc Pump Speed 2A & 2B using the following pushbuttons as required. 2-HS-96-33, LOWER SLOW 2-HS-96-34, LOWER MEDIUM 2-HS-96-35, LOWER FAST
	NRC	**When satisfied with power reduction, end of Event 2. Request that the Driver insert Event 3, Reactor Building Closed Cooling Water (RBCCW) Surge Tank Low Level.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 3 Page 1 of 1

Event Description: Reactor Building Closed Cooling Water (RBCCW) Surge Tank Low Level

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 3, Reactor Building Closed Cooling Water (RBCCW) Surge Tank Low Level**
	BOP	Acknowledges and reports the following alarm to the NUSO: • RBCCW SURGE TANK LEVEL LOW, 2-9-4C, Window 13
	NUSO	Directs the Balance of Plant Operator (BOP) to respond in accordance with the appropriate Alarm Response Procedure.
	BOP	Alarm Response Procedure, 2-ARP-9-4C RBCCW SURGE TANK LEVEL LOW, Window 13 A. **ADD** water to the RBCCW Surge Tank for approximately one minute or until low level alarm resets using the following: • 2-FCV-70-1, RBCCW SYS SURGE TANK FILL VALVE (Panel 2-9-4) OR • 2-HCV-2-1369, FCV-70-1 BYPASS VALVE (locally) B. **IF** alarm does NOT reset, **THEN CHECK** the tank locally. C. **IF** unable to maintain RBCCW Surge Tank level, **THEN REFER TO** 2-AOI-70-1, Loss of Reactor Building Closed Cooling Water. D. **IF** necessary to add water more than once per shift, **THEN CHECK** Drywell floor drain system for excessive operation AND **INSPECT** system outside the Drywell for leakage.
	NRC	**The RBCCW Surge Tank Low Level alarm can be cleared 15 seconds after the fill valve is opened.**
	BOP	Opens 2-FCV-70-1, RBCCW SYS SURGE TANK FILL VALVE for approximately one minute and checks that RBCCW SURGE TANK LEVEL LOW 2-9-4C, Window 13 clears.
	Driver	**If contacted as the Reactor Building AUO to check for leaks or check RBCCW Surge Tank Level locally, acknowledge the direction. Wait 2 minutes and report that Surge Tank Level is normal and there are no leaks.**
	NRC	**End of Event 3. Request that the Driver insert Event 4, Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 1 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 4, Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close.**
	NRC	**2-FCV-69-2, RWCU OUTBOARD SUCTION ISOLATION VALVE, will not automatically close on the Primary Containment System Isolation (PCIS) signal, but can be closed manually.**
	OATC/ BOP	Acknowledges and reports the following alarms: • RWCU LEAK DETECTION TEMP HIGH, 2-9-3D, Window 17 • RWCU ISOL LOGIC CHANNEL A TEMP HIGH, 2-9-5B, Window 32 • RWCU ISOL LOGIC CHANNEL B TEMP HIGH, 2-9-5B, Window 33
	NUSO	Directs the BOP to respond in accordance with applicable Alarm Response Procedures.
	BOP	2-ARP-9-3D, Alarm Response Procedure RWCU LEAK DETECTION TEMP HIGH, Window 17 Operator Action: A. **IF** this alarm is received in conjunction with RWCU ISOL LOGIC CHANNEL A TEMP HIGH [2-XA-55-5B, Window 32] and RWCU ISOL LOGIC CHANNEL B TEMP HIGH [2-XA-55-5B, Window 33], **THEN EXIT** this procedure and **GO TO** 2-ARP-9-5B. Otherwise, **CONTINUE** in this procedure.
	BOP	Exits 2-ARP-9-3D, Alarm Response Procedure, and enters 2-ARP-9-5B, Alarm Response Procedure.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 2 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	BOP	2-ARP-9-5B, Alarm Response Procedure RWCU ISOL LOGIC CHANNEL A TEMP HIGH, Window 32 Operator Action: A. **CHECK** alarm by checking: 1. Analog Trip Units (ATUs) on Panel 2-9-83 and 2-9-85. 2. RWCU LEAK DETECTION TEMP HIGH annunciator in alarm (2-XA-55-3D, Window 17). 3. Area temperature indications on 2-TR-69-29, LEAK DETECTION SYSTEM TEMPERATURE, on Panel 2-9-22. 4. Area Radiation Monitors (ARMs) 2-RR-90-1, 2-RR-90-50B on Panel 2-9-2 and 2-RR-90-250 on Panel 1-9-44. 5. ICS 'HPTURB' & 'RWCU' mimics for the 834 and 835 temperature loops. B. **IF** leak is suspected, **THEN MANUALLY ISOLATE** RWCU.
	Driver	**If contacted as Unit 1 Operator to check Area Radiation Monitors or Radiation Recorders, acknowledge the request.**
	BOP	Determines that 2-FCV-69-2, RWCU OUTBOARD SUCTION ISOLATION VALVE, failed to automatically close and manually closes 2-FCV-69-2. Informs the NUSO.
	BOP	C. **IF** RWCU automatically isolates, **THEN REFER TO** 2-AOI-64-2A, Group 3 Reactor Water Cleanup Isolation. D. **IF** TIS-69-835A(C) indicates greater than 131 ºF, **THEN ENTER** 2-EOI-3, Secondary Containment Control.
	NUSO	E. **REFER TO** Tech Spec Table 3.3.6.1-1, Primary Containment Isolation Instrumentation. F. **EVALUATE** equipment associated with this alarm to determine compensatory actions required to maintain REP function. **REFER TO** NPG-SPP-18.3.5, Equipment Important to Emergency Response.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 3 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	NUSO	As required by 2-ARP-9-5B, Window 32 and 2-ARP-9-5B, Window 33, references NPG-SPP-18.3.5, Equipment Important to Emergency Response. No actions are required in accordance with this procedure.
	NRC	**Technical Specifications are covered starting on page 21 of 57.**
	BOP	2-ARP-9-5B, Alarm Response Procedure RWCU ISOL LOGIC CHANNEL B TEMP HIGH, Window 33 Operator Action: A. **CHECK** alarm by checking: 1. ATUs on Panel 2-9-84 and 2-9-86. 2. RWCU LEAK DETECTION TEMP HIGH annunciator in ALARM (2-XA-55-3D, Window 17). 3. Area temperature indications on 2-TR-69-29, LEAK DETECTION SYSTEM TEMPERATURE, on Panel 2-9-22. 4. ARMs 2-RR-90-1, 2-RR-90-50B on Panel 2-9-2 and 2-RR-90-250 on Panel 1-9-44. 5. ICS 'HPTURB' & 'RWCU' mimics for the 834 and 835 temperature loops. B. **IF** a leak is suspected, **THEN MANUALLY ISOLATE** RWCU**.** C. **IF** RWCU automatically isolates, **THEN REFER TO** 2-AOI-64-2A, Group 3 Reactor Water Cleanup Isolation. D. **IF** TIS-69-835B(D) indicates greater than 131 ºF, **THEN ENTER** 2-EOI-3, Secondary Containment Control. E. **REFER TO** Technical Specification Table 3.3.6.1-1, Primary Containment Isolation Instrumentation.
	NRC	**No actions are required in accordance with Technical Specification 3.3.6.1.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 4 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	BOP	2-AOI-64-2A, Group 3 Reactor Water Cleanup Isolation Immediate Actions [1] **PERFORM** the following: • **ENSURE CLOSED** 2-FCV-69-1, RWCU INBD SUCTION ISOLATION VALVE • **ENSURE CLOSED** 2-FCV-69-2, RWCU OUTBD SUCTION ISOLATION VALVE • **ENSURE CLOSED** 2-FCV-69-12, RWCU RETURN ISOLATION VALVE • **ENSURE TRIPPED** Reactor Water Cleanup Recirc Pumps 2A and 2B Subsequent Actions [1] **IF** any EOI entry condition is met, **THEN ENTER** appropriate EOI(s).
	NRC	**The NUSO may enter 2-EOI-3, Secondary Containment Control, if Area Temperature or Radiation exceeds the Maximum Normal value. See page 23 of 57 for 2-EOI-3 actions.**
	Driver	**If contacted as an AUO to check ATUs, acknowledge the direction. Wait 3 minutes and report that ATUs 2-TIS-69-835A-D indicate 160 degrees and lowering.** **If contacted as Work Control or Maintenance, acknowledge any direction or reports given.**
	BOP	[2] **CHECK** the following to confirm high area temperature condition exists: • 2-TR-69-29, LEAK DETECTION SYSTEM TEMPERATURE, (Panel 2-9-22) • ATUs in Auxiliary Instrument Room

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 5 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	BOP	[3] **IF** isolation is caused by high area temperature, **THEN DETERMINE** if a line break exists by: • RWCU ARMs 2-RI-90-9A, 13A, and 14A • Visual Observation • Rx Zone Exhaust Rad Monitors 2-RE-90-142A, 142B, 143A, and 143B [4] **PERFORM** necessary Heat Balance adjustments. **REFER TO** 2-OI-69, Reactor Water Cleanup System. [5] **CHECK** the following monitors for a rise in activity: A. 2-RR-90-1, AREA RADIATION, Points 9, 13, and 14 (Panel 2-9-2). B. AIR PARTICULATE MONITOR CONSOLE, 2-MON-90-50, 2-RM-90-55 and 57 (Panel 2-9-2). C. Reactor Building, Turbine Building, and Refuel Zone Exh Rad on 0-MON-90-361, CHEMISTRY CAM MONITOR CONTROLLER (Panel 1-9-2). [6] **IF** it has been determined that leakage is the cause of the isolation, **THEN NOTIFY** RADCON of RWCU status. [7] **NOTIFY** Chemistry that RWCU has been removed from service and to perform the following evaluations. • The need to begin sampling Reactor Water • The need to remove the Durability Monitor from service [8] **IF** the isolation cannot be reset, **THEN PERFORM** the following: [8.1] **ISOLATE** seal water from the CRD System by closing 2-69-592(A) and 2-69-614(B) (R-12T, El. 593, Unit 2 Reactor Building). [8.2] **REFER TO** 2-OI-68, Recirculation System, for Recirc System operating restrictions while RWCU is isolated.
	Driver	**If contacted as Radiation Protection or Chemistry acknowledge any directions or reports given.** **If contacted as Unit 1 to check Reactor Building, Turbine Building, and Refuel Zone Exhaust Radiation on 0-MON-90-361, CHEMISTRY CAM MONITOR CONTROLLER (Panel 1-9-2), acknowledge the direction.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 6 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior	
	NUSO	[9] **EVALUATE** Technical Requirements Manual 3.4.1, Coolant Chemistry, for limiting conditions for operation (Required Action).	
	NUSO	Technical Requirements Manual 3.4.1, Coolant Chemistry. TSR 3.4.1.1 is applicable	
	NUSO	**SURVEILLANCE:** Monitor Reactor Coolant conductivity	**FREQUENCY:** 4 hours when the continuous conductivity monitor is INOPERABLE and the Reactor is not in MODE 4 or 5
	Driver	**If contacted as Chemistry stating that Reactor Coolant sampling is required every 4 hours in accordance with TSR 3.4.1.1, acknowledge report.**	

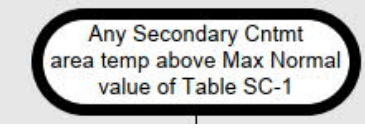
Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 7 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	NUSO	Technical Specification 3.6.1.3, Primary Containment Isolation Valves (PCIVs) LCO 3.6.1.3 Each PCIV, except Reactor Building-to-Suppression Chamber Vacuum Breakers, shall be OPERABLE APPLICABILITY: MODES 1, 2, and 3 When associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation." NOTES 1. Penetration flow paths except for 18 and 20 inch purge valve penetration flow paths may be un-isolated intermittently under administrative controls. 2. Separate Condition entry is allowed for each penetration flow path. 3. Enter applicable Conditions and Required Actions for systems made inoperable by PCIVs. 4. Enter applicable Conditions and Required Actions of LCO 3.6.1.1, "Primary Containment," when PCIV leakage results in exceeding overall containment leakage rate acceptance criteria in MODES 1, 2, and 3. **CONDITION:** NOTE: Only applicable to penetration flow paths with two PCIVs. A. – One or more penetration flow paths with one PCIV inoperable except due to MSIV leakage not within limits.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 8 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior	
	NUSO	**REQUIRED ACTION:** A.1 – Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured AND NOTE: Isolation devices in High Radiation Areas may be verified by use of administrative means. A.2 – Verify the affected penetration flow path is isolated	**COMPLETION TIME:** A.1 – 4 hours except for Main Steam Line A.2 – Once per 31 days for isolation devices outside Primary Containment AND Prior to entering MODE 2 or 3 from MODE 4, if Primary Containment was de-inerted while in MODE 4, if not performed within the previous 92 days, for isolation devices inside Primary Containment
	NUSO	If RWCU Room Temperature exceeds the Maximum Normal 2-EOI-3, Secondary Containment Control 	

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 9 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

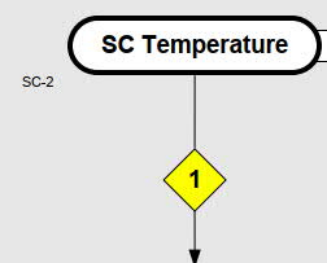
<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>NUSO</td><td>2-EOI-3, Secondary Containment Control

SC-1
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Reactor Zone Ventilation Exhaust Radiation level is above 72 mR/hr</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Refuel Zone Ventilation Exhaust Radiation level is above 72 mR/hr</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Reactor Zone Ventilation is isolated
AND
Reactor Zone Ventilation Exhaust Radiation level is below 72 mR/hr</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Refuel Zone Ventilation is isolated
AND
Refuel Zone Ventilation Exhaust Radiation level is below 72 mR/hr</td><td>NO ACTION REQUIRED</td></tr>
</table></td></tr>
</table>

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 10 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	NUSO	



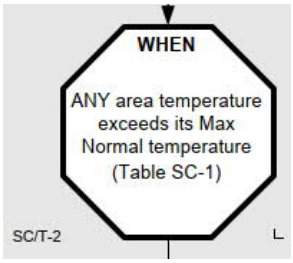
1

- An RPV water lvl instrument may be used to determine or trend lvl only when it reads above the Minimum Indicated Lvl associated with the highest max DW or SC run temp
- If DW temps or SC area temps (Table 6), as applicable, are outside the safe region of Curve 8, the associated instrument may be unreliable due to boiling in the run

INSTRUMENT	RANGE	MINIMUM INDICATED LVL	MAX DW RUN TEMP (FROM XR-64-50 OR TI-64-52AB)	MAX SC RUN TEMP (FROM TABLE 6)
LI-3-58A/B	Emergency -155 to +60	on scale	N/A	below 100
		-150	N/A	101 to 150
		-145	N/A	151 to 200
		-140	N/A	201 to 250
		-130	N/A	251 to 300
		-120	N/A	301 to 350
LI-3-53 LI-3-60 LI-3-206 LI-3-253 LI-3-208A, B, C, D	Normal 0 to +60	on scale	N/A	below 150
		+5	N/A	151 to 200
		+15	N/A	201 to 250
		+20	N/A	251 to 300
		+30	N/A	301 to 350
LI-3-52 LI-3-62A	Post Accident -268 to +32	on scale	N/A	N/A
LI-3-55	Shutdown Floodup 0 to +500	+10	Below 100	N/A
		+15	100 to 150	N/A
		+20	151 to 200	N/A
		+30	201 to 250	N/A
		+40	251 to 300	N/A
		+50	301 to 350	N/A
		+65	351 to 400	N/A

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 11 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	NUSO	SC/T-1 **IF** Reactor Zone or Refuel Zone Ventilation Exhaust Radiation Level is below 72 mr/hr **THEN** operate available Reactor Zone or Refuel Zone Ventilation  SC-3 ③ ISOLATE all systems that are discharging into the area EXCEPT systems required: • For damage control OR • To be operated by EOIs NOTE ③ Tables SC-1 and SC-2 contain information that may be used to determine if a primary system is discharging into Secondary Containment (Emergency Depressurization will reduce discharge).
	NRC	**When the RWCU Leak has been isolated and Area Temperature and Radiation is below the Maximum Safe value, the NUSO may contact the Shift Manager and recommend exiting 2-EOI-3, Secondary Containment Control, as an emergency no longer exists.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 12 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	Driver	**If contacted as the Shift Manager by the NUSO to discuss exiting 2-EOI-3, Secondary Containment Control, agree with any recommendation given.**
	NRC	**End of Event 4. Request that the Driver insert Event 5, Core Spray Loop I Room Cooler EECW Leak.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 5 Page 1 of 2

Event Description: Core Spray Loop I Room Cooler EECW Leak

Time	Position	Applicant's Actions or Behavior	
	Driver	**When requested by the Chief Examiner, insert Event 5, Core Spray Loop I Room Cooler EECW Leak. Contact the NUSO as the Reactor Building Assistant Unit Operator (AUO) and report that you discovered and isolated a water leak in the Core Spray Loop 1 Room Cooler. Report that the following valves were closed to isolate the leak:** • **2-SHV-67-550, NW Core Spray Room Cooler Supply Shutoff** • **2-SHV-67-553, NW Core Spray Room Cooler Outlet** **If asked, the water appears to have stopped leaking.**	
	Driver	**If contacted as Work Control or Mechanical Maintenance, acknowledge any direction concerning the Core Spray Loop I Room Cooler.**	
	NUSO	Technical Requirements Manual 3.5.3, Equipment Area Coolers LCO 3.5.3 The Equipment Area Cooler associated with each RHR Pump and the Equipment Area Cooler associated with each set of Core Spray Pumps (A and C or B and D) must be OPERABLE at all times when the pump or pumps served by that specific cooler is considered to be OPERABLE. APPLICABILITY: Whenever the associated subsystem is required to be OPERABLE **CONDITION:** A. – One or more Equipment Area Cooler inoperable	
	NUSO	**REQUIRED ACTION:** A.1 – Declare the pump(s) served by that cooler INOPERABLE (Refer to applicable Tech Spec and TRM LCOs)	**COMPLETION TIME:** A.1 – Immediately

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 5 Page 2 of 2

Event Description: Core Spray Loop I Room Cooler EECW Leak

Time	Position	Applicant's Actions or Behavior	
	NUSO	Technical Specification 3.5.1, ECCS – Operating LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of six safety/relief valves shall be OPERABLE APPLICABILITY: MODE 1, MODES 2 and 3, except High Pressure Coolant Injection (HPCI) and ADS valves are not required to be OPERABLE with Reactor Steam Dome Pressure ≤150 psig **CONDITION:** A. – One low pressure ECCS injection/spray subsystem inoperable. OR One low pressure coolant injection (LPCI) pump in both LPCI subsystems inoperable.	
	NUSO	**REQUIRED ACTION:** See Condition F	**COMPLETION TIME:** See Condition F
	NUSO	**CONDITION:** F. – One ADS Valve inoperable AND Condition A entered	
	NUSO	**REQUIRED ACTION:** F.1 – Restore ADS Valve to OPERABLE status OR F.2 – Restore Low Pressure ECCS Injection / Spray subsystem to OPERABLE status	**COMPLETION TIME:** F.1 – 72 hours F.2 – 72 hours
	NRC	**End of Event 5. Request that the Driver insert Event 6, 2C 4KV Unit Board Trip.**	

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 6 Page 1 of 3

Event Description: 2C 4KV Unit Board Trip

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 6, 2C 4KV Unit Board Trip.**
	BOP	Acknowledges and reports the following alarms: • 4KV UNIT BOARD 2C UNDERVOLTAGE, 2-9-8B, Window 14 • CONDENSATE BOOSTER PUMP C AUX OIL PRESS LOW, 2-9-6A, Window 14 • MOTOR TRIPOUT, 2-9-8C, Window 33
	CREW	Monitors Reactor Water Level.
	OATC	Reports a loss of Control Rod Drive (CRD) System Flow due to 2A CRD Pump being de-energized.
	NUSO	Directs the BOP to respond in accordance with applicable Alarm Response Procedures and direct the OATC to respond in accordance with 2-AOI-85-3, CRD System Failure.
	OATC	2-AOI-85-3, CRD System Failure Immediate Actions [1] **IF** operating CRD pump has failed AND standby CRD pump is available, **THEN PERFORM** the following at Panel 2-9-5: (Otherwise N/A) [1.1] **PLACE** 2-FIC-85-11, CRD SYSTEM FLOW CONTROL, in MAN at minimum setting. [1.2] **START** associated standby CRD Pump using 2-HS-85-2A, CRD Pump 1B.
	Driver	**If contacted as Unit 1 concerning 1B CRD Pump being started for Unit 2, acknowledge any report given. If the crew requests to use 1B CRD Pump for Unit 2, inform the crew that 1B CRD Pump is not needed for Unit 1.**
	OATC	[1.3] **IF** CRD Pump 1B was started, **THEN OPEN** 2-HS-85-8A, CRD PUMP 1B DISCH TO U2.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 6 Page 2 of 3

Event Description: 2C 4KV Unit Board Trip

Time	Position	Applicant's Actions or Behavior
	OATC	[1.4] **ADJUST** 2-FIC-85-11, CRD SYSTEM FLOW CONTROL, to establish the following conditions: • 2-PDI-85-18A, CRD COOLING WATER HEADER DP, between 10 psid and 20 psid • 2-FIC-85-11, CRD SYSTEM FLOW CONTROL, between 40 and 65 gpm [1.5] **BALANCE** 2-FIC-85-11, CRD SYSTEM FLOW CONTROL, AND **PLACE** in AUTO or BALANCE.
	BOP	2-ARP-9-8B, Alarm Response Procedure 4KV UNIT BOARD 2C UNDERVOLTAGE, Window 14 Operator Action: A. **CHECK** Unit in stable condition by checking: • Condensate Pump C • Condensate Booster Pump C • RCW Pump C • CCW Pump C • CRD Pump 2A B. **IF** undervoltage has occurred, **THEN** 1. **CLEAR** disagreement lights on breakers. 2. **REDUCE** load as necessary to maintain stable operating conditions. 3. Condenser discharge may need to be throttled for two CCW Pump operation. **REFER TO** 2-OI-27, Condenser Circulating Water System. C. **CHECK** Unit Bd C for abnormal conditions: relay targets, smoke, burned paint, etc. D. **REFER TO** 0-OI-57A, Switchyard and 4160V AC Electrical System, to re-energize board. E. **REFER TO** appropriate OI for recovery or realignment of equipment.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 6 Page 3 of 3

Event Description: 2C 4KV Unit Board Trip

Time	Position	Applicant's Actions or Behavior
	Driver	**If contacted as an AUO, Work Control, or Electrical Maintenance to investigate, acknowledge the direction. If directed to prepare protected equipment tags acknowledge the direction.** **Wait 2 minutes and report that 2C 4KV Unit Board has an overcurrent trip flag.**
	BOP	2-ARP-9-8C, Alarm Response Procedure MOTOR TRIPOUT, Window 33 Operator Action: A. **CHECK** Control Room for white disagreement light illuminated for affected equipment. B. **CLEAR** disagreement light. C. **DISPATCH** personnel to check: • Relays at associated electrical board • Equipment for abnormal conditions • Safe-stop locally reset, if necessary D. **REFER** TO 0-GOI-300-2, Electrical, if relay targets are present or for motor starting limits. E. **REFER** TO appropriate OI for recovery or realignment of equipment
	BOP	2-ARP-9-6A, Alarm Response Procedure CONDENSATE BOOSTER PUMP C AUX OIL PUMP PRESS LOW, Window 14 Operator Action: A. **DISPATCH** personnel to check Booster Pump Lube Oil system: 1. **ENSURE** running or start Aux Oil Pump. 2. **CHECK** for leaks. 3. **CHECK** oil level and temperature at reservoir.
	Driver	**If contacted as the Turbine Building AUO to start 2C Condensate Booster Pump Aux Oil Pump, insert Event 16 and report that the Aux Oil Pump is running.**
	NRC	**End of Event 6. Request that the Driver insert Event 7 Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 1 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 7, Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak.**
	NRC	**Event 8, Fuel Damage, and Event 9, Reactor Feedwater Pumps Trip / HPCI Fails to Automatically Start and Inject, are automatically entered by the simulator setup. No action is required by the Driver to Insert Event 8 or Event 9. See page 43 of 57 for Event 8 actions and page 50 of 57 for Event 9 actions.**
	BOP	Acknowledges and reports the following alarms as they are received: • REACTOR BUILDING RADIATION HIGH, 2-9-3A, Window 22 • REACTOR BUILDING, TURBINE BUILDING, REFUEL ZONE EXHAUST RADIATION HIGH, 2-9-3A, Window 4 • RCIC STEAM LINE LEAK DETECTION TEMPERATURE HIGH, 2-9-3D, Window 10
	NRC	**See Event 8 (page 43 of 57) for actions for Radiation Alarms.**
	NUSO	Directs the BOP to respond in accordance with the applicable Alarm Response Procedure.
	BOP	2-9-ARP-3D, Alarm Response Procedure RCIC STEAM LINE LEAK DETECTION TEMPERATURE HIGH, Window 10 A. **CHECK** RCIC Temperature elements on 2-TR-69-29, LEAK DETECTION SYSTEM TEMPERATURE recorder (points 9-12) on Panel 2-9-22.
	BOP	Checks Area Temperatures on Panel 2-9-22.
	BOP	B. **IF** RCIC is **NOT** in service AND 2-FI-71-1A(B), RCIC STEAM FLOW indicates flow, **THEN ISOLATE** RCIC AND **VERIFY** temperatures lowering.
	BOP	Determines that RCIC failed to automatically isolate, and attempts to manually isolate RCIC. Informs the NUSO that RCIC will not isolate.
	BOP	C. **IF** high temperature is confirmed, **THEN ENTER** 2-EOI-3, Secondary Containment Control.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 2 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

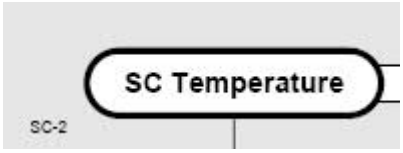
Time	Position	Applicant's Actions or Behavior
	BOP	Confirms that Area Temperatures are rising and informs the NUSO.
	NUSO	Enters 2-EOI-3, Secondary Containment Control. Directs the BOP to monitor Secondary Containment parameters.
	BOP	D. **CHECK** 2-RI-90-26A, CS/RCIC ROOM EL 519 RX BLDG radiation indicator on Panel 2-9-11 and **NOTIFY RADCON** if rising radiation levels are observed. E. **DISPATCH** personnel to investigate.
	Driver	**If contacted as Radiation Protection that radiation levels are rising, acknowledge the report.** **If contacted as the Reactor Building AUO to investigate, acknowledge the direction.**
	NUSO	F. **REFER TO** Tech Specs 3.3.6.1, Primary Containment Isolation Instrumentation and 3.5.3, RCIC System.
	NRC	**Technical Specification evaluation for this event is not required and should not be used to evaluate the candidate's Technical Specification competency.**
		G. **EVALUATE** equipment associated with this alarm to determine compensatory actions required to maintain REP function. **REFER TO** NPG-SPP-18.3.5, Equipment Important to Emergency Response.
	NRC	**It is not expected that the SRO reference NPG-SPP-18.3.5, Equipment Important to Emergency Response, during this event.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 3 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	NUSO	2-EOI-3, Secondary Containment Control SC-1

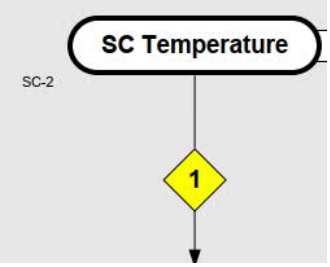
IF	THEN
Reactor Zone Ventilation Exhaust Radiation level is above 72 mR/hr	**NO ACTION REQUIRED**
Refuel Zone Ventilation Exhaust Radiation level is above 72 mR/hr	**NO ACTION REQUIRED**
Reactor Zone Ventilation is isolated AND Reactor Zone Ventilation Exhaust Radiation level is below 72 mR/hr	**NO ACTION REQUIRED**
Refuel Zone Ventilation is isolated AND Refuel Zone Ventilation Exhaust Radiation level is below 72 mR/hr	**NO ACTION REQUIRED**



Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 4 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	NUSO	



1

- An RPV water lvl instrument may be used to determine or trend lvl only when it reads above the Minimum Indicated Lvl associated with the highest max DW or SC run temp
- If DW temps or SC area temps (Table 6), as applicable, are outside the safe region of Curve 8, the associated instrument may be unreliable due to boiling in the run

INSTRUMENT	RANGE	MINIMUM INDICATED LVL	MAX DW RUN TEMP (FROM XR-64-50 OR TI-64-52AB)	MAX SC RUN TEMP (FROM TABLE 6)
LI-3-58A/B	Emergency -155 to +60	on scale	N/A	below 100
		-150	N/A	101 to 150
		-145	N/A	151 to 200
		-140	N/A	201 to 250
		-130	N/A	251 to 300
		-120	N/A	301 to 350
LI-3-53 LI-3-60 LI-3-206 LI-3-253 LI-3-208A, B, C, D	Normal 0 to +60	on scale	N/A	below 150
		+5	N/A	151 to 200
		+15	N/A	201 to 250
		+20	N/A	251 to 300
		+30	N/A	301 to 350
LI-3-52 LI-3-62A	Post Accident -268 to +32	on scale	N/A	N/A
LI-3-55	Shutdown Floodup 0 to +500	+10	Below 100	N/A
		+15	100 to 150	N/A
		+20	151 to 200	N/A
		+30	201 to 250	N/A
		+40	251 to 300	N/A
		+50	301 to 350	N/A
		+65	351 to 400	N/A

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 5 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	NUSO	SC/T-1

IF	Reactor Zone or Refuel Zone Ventilation Exhaust Radiation level is below 72 mR/hr
THEN	Operate available Reactor Zone or Refuel Zone Ventilation

SC/T-2

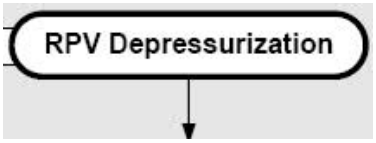
WHEN
ANY Area Temperature exceeds its Max Normal Temperature (Table SC-1)

Table SC-1
Secondary Cntmt Area Temp

Area	Panel 9-3 Alarm Window (unless noted)	Panel 9-22 Temp Element (unless noted)	Max Normal Value °F	Max Safe Value °F	Potential Isolation Sources
RHR sys I pumps	XA-55-3E-4	74-95A	Alarmed	150	FCV-74-47, 48
RHR sys II pumps	XA-55-3E-4	74-95B	Alarmed	210	FCV-74-47, 48
HPCI room	XA-55-3F-10	73-55A	Alarmed	270	FCV-73-2, 3, 44, 81
CS sys I pumps RCIC room	XA-55-3D-10	71-41A	Alarmed	190	FCV-71-2, 3, 39
Top of torus	XA-55-3D-10 XA-55-3F-10 XA-55-3E-4	71-41B, C, D 73-55B, C, D 74-95G, H	Alarmed Alarmed Alarmed	200 240 240	FCV-71, 2, 3 FCV-73-2, 3, 81 FCV-74-47, 48
Steam tunnel (RB)	XA-55-3D-24	1-60A (Panel 9-3)	Alarmed	315	MSIVs FCV-71-2, 3, FCV-69-1, 2, 12
DW access	XA-55-3E-4	74-95E	Alarmed	170	FCV-74-47, 48
RB el 565 W (RWCU pipe trench)	XA-55-5B-32 (Panel 9-5) XA-55-5B-33 (Panel 9-5)	69-835A, B, C, D (Aux Inst room)	Alarmed	170	FCV-69-1, 2, 12
RWCU hx room	XA-55-3D-17	69-29F, G, H	Alarmed	220	FCV-69-1, 2, 12
RWCU pump A	XA-55-3D-17	69-29D	Alarmed	215	FCV-69-1, 2, 12
RWCU pump B	XA-55-3D-17	69-29E	Alarmed	215	FCV-69-1, 2, 12
RB el 593	XA-55-3E-4	74-95C, D	Alarmed	195	FCV-74-47, 48
RB el 621	XA-55-3E-4	74-95F	Alarmed	155	FCV-43-13, 14

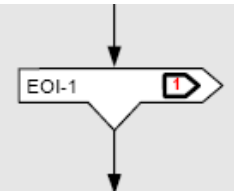
Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 6 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	NUSO	SC-3 (3) ISOLATE all systems that are discharging into the area EXCEPT systems required: • For damage control OR • To be operated by EOIs NOTE (3) Tables SC-1 and SC-2 contain information that may be used to determine if a primary system is discharging into Secondary Containment (Emergency Depressurization will reduce discharge). SC-4  SC-7 (3) **WHEN** A Primary System is discharging into Secondary Containment

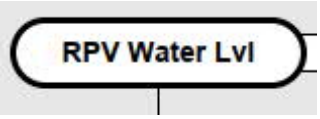
Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 7 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	NUSO	SC-8 **BEFORE** ANY Secondary Containment parameter reaches its Max Safe Value (Tables SC-1, SC-2, and SC-3) 
	CREW	**Critical Task:** **With the Reactor at power and with a Primary System discharging into the Secondary Containment, manually SCRAM the Reactor before any area exceeds the Maximum Safe Temperature operating value by entering EOI-1, RPV Control.** **Critical Task Failure Criteria:** **The operating crew fails to proceed without delay and in a controlled manner to initiate a Reactor SCRAM from the time it is announced that one Area Temperature is approaching the Maximum Safe value.**
	NUSO	Enters 2-EOI-1, RPV Control. Directs the crew to enter 2-AOI-100-1, Reactor SCRAM, and directs the OATC to insert a manual Reactor SCRAM.
	NRC	**Event 8, Fuel Damage, and Event 9, Reactor Feedwater Pumps Trip / HPCI Fails to Automatically Initiate, are inserted when the Reactor MODE SWITCH is placed in SHUTDOWN.**
	OATC	Inserts a manual Reactor SCRAM.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 8 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	OATC	2-AOI-100-1, Reactor SCRAM Immediate Actions [1] **DEPRESS** 2-HS-99-5A/S3A, REACTOR SCRAM A and 2-HS-99-5A/S3B, REACTOR SCRAM B, on Panel 2-9-5. [2] **PLACE** 2-HS-99-5A/S1, REACTOR MODE SWITCH, in SHUTDOWN. [3] N/A [4] **IF** Reactor Power is 5% or BELOW, **THEN**: (otherwise **MARK** N/A) **REPORT** the following to the US: • Reactor Scram • Mode Switch is in Shutdown • "All rods in" or "rods out " • Reactor Water Level and trend (recovering or lowering) • Reactor Pressure and trend • MSIV position (Open or Closed) • Power level [5] N/A
	OATC	Determines that all Reactor Feedwater Pumps (RFPTs) have tripped and informs the NUSO (See Event 9).
	NUSO	2-EOI-1, RPV Control  RC/L-1 **ENSURE** each as required: • PCIS isolations (Groups 1, 2, and 3) • ECCS • RCIC

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 9 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>NUSO</td><td>
RC/L-2
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>RPV Water Level can be restored and maintained above (-)162 in.
AND
The ADS timer has initiated</td><td>INHIBIT ADS</td></tr>
<tr><td>Loss of available injection systems is anticipated
OR
Raising RPV Water Level above (+)51 in. will facilitate use of shutdown cooling, steam-driven injection systems, or Alternate Injection Subsystems (Table L-2)</td><td>NO ACTION REQUIRED</td></tr>
</table>
RC/L-3
<table>
<tr><td colspan="2">RESTORE and MAINTAIN RPV Water Level between (+)2 in. and (+)51 in. with ANY Preferred Injection Systems (Table L-1)</td></tr>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>RPV Water Level cannot be restored and maintained between (+)2 in. and (+)51 in.</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>RPV Water Level cannot be restored and maintained above (-)162 in.</td><td>NO ACTION REQUIRED</td></tr>
</table>
</td></tr>
</table>

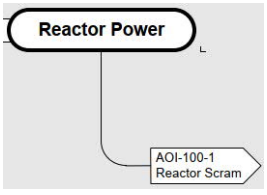
Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 10 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	NUSO	Directs the OATC/BOP to maintain Reactor Water Level using HPCI in accordance with 2-EOI-Appendix-5D, Injection System Lineup HPCI.
	NRC	**2-EOI-Appendix-5D, Injection System Lineup HPCI actions are covered in Event 9. See page 50 of 57.**
	NUSO	Table L-1 Preferred Injection Systems SOURCES / APPX / INJ PRESS CNDS and FW / 5A / 1210 psig CRD / 5B / 1640 psig RCIC with CST suction if available (2, 3, 6) / 5C, 20M / 1200 psig HPCI with CST suction if available (2, 6, 7) / 5D, 20N / 1200 psig CNDS / 6A / 480 psig CS (2) / 6D, 6E / 330 psig LPCI (2) / 6B, 6C / 320 psig
	NUSO	RPV Press RC/P-1 IF: A high Drywell Pressure ECCS signal exists (2.45 psig) — THEN: NO ACTION REQUIRED IF: EMERGENCY RPV DEPRESSURIZATION is REQUIRED or has been required — THEN: (2) C2 Emergency RPV Depressurization IF: Emergency RPV Depressurization is anticipated — THEN: NO ACTION REQUIRED RC-P/2 **IF** ANY MSRV is cycling **THEN** NO ACTION REQUIRED

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 11 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>NUSO</td><td>
RC/P-3
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Suppression Pool Temperature and Level CANNOT be maintained in a safe area of Curve 3 at the existing RPV Pressure</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Suppression Pool Level CANNOT be maintained in the safe area of Curve 4</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>STEAM COOLING IS REQUIRED</td><td>NO ACTION REQUIRED</td></tr>
</table>
RC/P-4
<table>
<tr><td colspan="2">STABILIZE RPV Pressure below 1073 psig using the Main Turbine Bypass Valves (APPX 8B)
➢ OK to use ANY Alternate RPV Pressure Control Systems (Table P-1)
➢ Crosstie CAD or MSRV carts to DW Control Air (APPX 8G, 20H) if necessary</td></tr>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>DW Control Air is or becomes unavailable</td><td>NO ACTION REQUIRED</td></tr>
</table>
</td></tr>
<tr><td></td><td>NUSO</td><td>Directs the BOP to maintain Reactor Pressure using the Main Turbine Bypass Valves.</td></tr>
<tr><td></td><td>NUSO</td><td> 
</td></tr>
<tr><td></td><td>NRC</td><td>End of Event 7. Continue to Event 8.</td></tr>
</table>

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 1 of 7

Event Description: Fuel Damage

Time	Position	Applicant's Actions or Behavior
	NRC	**Event 8, Fuel Damage, is inserted when the Reactor MODE SWITCH is placed in SHUTDOWN. No action is required by the driver to insert Event 8.**
	BOP	Acknowledges and reports the following alarms to the NUSO as they are received: • REACTOR BUILDING RADIATION HIGH, 2-9-3A, Window 22 • REACTOR BUILDING, TURBINE BUILDING, REFUEL ZONE EXHAUST RADIATION HIGH, 2-9-3A, Window 4
	BOP	2-ARP-9-3A, Alarm Response Procedure REACTOR BUILDING RADIATION HIGH, Window 22 Operator Action: A. **DETERMINE** area with high radiation level on Panel 2-9-11. (Alarm on Panel 2-9-11 will automatically reset if radiation level lowers below setpoint.)
	BOP	Monitors Radiation Levels on Panel 2-9-11. Keeps the NUSO informed on instruments which are alarming and which are approaching Maximum Safe Values.
	BOP	B. N/A C. N/A D. **NOTIFY** Radiation Protection.
	Driver	**If contacted as Radiation Protection, acknowledge any reports or direction given.**
	BOP	E. **IF** the TSC is NOT manned and a "VALID" radiological condition exists, **THEN USE** public address system to evacuate area where high radiological conditions exist.
	BOP	Makes a plant announcement to evacuate the Reactor Building due to high radiation.

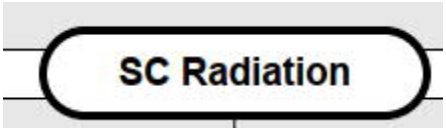
Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 2 of 7

Event Description: Fuel Damage

Time	Position	Applicant's Actions or Behavior
	BOP	F. N/A G. **MONITOR** other parameters providing input to this annunciator frequently as these parameters will be masked from alarming while this alarm is sealed in. H. **IF** a CREV initiation is received, **THEN** 1. **CHECK** CREV A(B) Flow is ≥ 2700 CFM, and ≤ 3300 CFM as indicated on 0-FI-031-7214(7213) within 5 hours of the CREV initiation. 2. **IF** CREV A(B) Flow is NOT ≥2700 CFM, and ≤ 3300 CFM as indicated on 0-FI-031-7214(7213), **THEN PERFORM** the following: (Otherwise N/A) a. **STOP** the operating CREV per 0-OI-31, Control Bay and Off-Gas Treatment Building Air Conditioning System. b. **START** the standby CREV per 0-OI-31, Control Bay and Off-Gas Treatment Building Air Conditioning System.
	Driver	**If contacted as an AUO to monitor CREV operation, acknowledge the direction.**
	BOP	I. N/A J. For all radiation indicators except FUEL STORAGE POOL radiation indicator, 2-RI-90-30, **ENTER** 2-EOI-3, Secondary Containment Control Flowchart.
	NUSO	Re-enters 2-EOI-3, Secondary Containment Control (if not already entered on Secondary Containment Radiation).
	BOP	K. N/A L. **EVALUATE** equipment associated with this alarm to determine compensatory actions required to maintain REP function. **REFER TO** NPG-SPP-18.3.5, Equipment Important to Emergency Response.
	NRC	**It is not expected that the SRO reference NPG-SPP-18.3.5, Equipment Important to Emergency Response, during this event.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 3 of 7

Event Description: Fuel Damage

Time	Position	Applicant's Actions or Behavior
	NUSO	

SC/R-1

WHEN

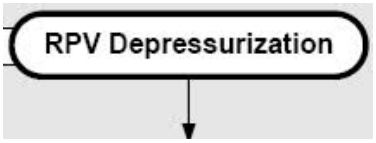
ANY Area Radiation Level exceeds its Max Normal Radiation Level (Table SC-2)

Table SC-2
Secondary Cntmt Area Radiation

Area	Applicable Radiation Indicators	Max Normal Value mR/hr	Max Safe Value mR/hr	Potential Isolation Sources
RHR sys I pumps	90-25A	Alarmed	1000	FCV-74-47, 48
RHR sys II pumps	90-28A	Alarmed	1000	FCV-74-47, 48
HPCI room	90-24A	Alarmed	1000	FCV-73-2, 3, 44, 81
CS sys I pumps RCIC room	90-26A	Alarmed	1000	FCV-71-2, 3, 39
CS sys II pumps	90-27A	Alarmed	1000	None
Top of torus General area	90-29A	Alarmed	1000	FCV-73-2, 3, 81 FCV-74-47, 48 FCV-71-2, 3
RB el 565 W	90-20A	Alarmed	1000	FCV-69-1, 2, 12 SDV vents & drains
RB el 565 E	90-21A	Alarmed	1000	SDV vents & drains
RB el 565 NE	90-23A	Alarmed	1000	None
TIP room	90-22A	Alarmed	100,000	TIP ball valve
RB el 593	90-13A, 14A	Alarmed	1000	FCV-74-47, 48
RB el 621	90-9A	Alarmed	1000	FCV-43-13, 14
Recirc MG sets	90-4A	Alarmed	1000	None
Refuel floor	90-1A, 2A 3A	Alarmed	1000	None

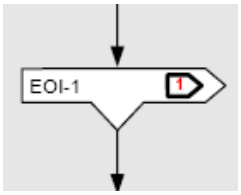
Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 4 of 7

Event Description: Fuel Damage

Time	Position	Applicant's Actions or Behavior
	NUSO	SC-3 (3) ISOLATE all systems that are discharging into the area EXCEPT systems required: • For damage control OR • To be operated by EOIs NOTE (3) Tables SC-1 and SC-2 contain information that may be used to determine if a primary system is discharging into Secondary Containment (Emergency Depressurization will reduce discharge). SC-4  SC-7 (3) **WHEN** A Primary System is discharging into Secondary Containment

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 5 of 7

Event Description: Fuel Damage

Time	Position	Applicant's Actions or Behavior
	NUSO	SC-8 **BEFORE** ANY Secondary Containment parameter reaches its Max Safe Value (Tables SC-1, SC-2, and SC-3) 
	BOP	Monitors Area Radiation levels and informs the NUSO when two areas are at Maximum Safe.
	NUSO	SC-9 **WHEN** Any Secondary Containment parameter exceeds its Max Safe value in two (2) or more areas for the same parameter (Tables SC-1, SC-2, SC-3) SC-10 **EMERGENCY DEPRESSURIZATION IS REQUIRED**
	NUSO	Updates the crew that Emergency Depressurization is required. Enters 2-C-2, Emergency RPV Depressurization.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 6 of 7

Event Description: Fuel Damage

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>Crew</td><td>Critical Task:
With a Primary System discharging into the Secondary Containment when two or more areas are greater than their maximum safe operating values for the same parameter, the Balance of Plant Operator initiates Emergency Depressurization as directed by the Nuclear Unit Senior Operator.

Critical Task Failure Criteria:
The operating crew fails to proceed with without delay and in a controlled manner to initiate Emergency Depressurization when two Area Radiation Levels exceed Maximum Safe value.</td></tr>
<tr><td></td><td>NUSO</td><td>2-C-2, Emergency RPV Depressurization
C2-1
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Reactor Water Level CANNOT be determined</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>It is anticipated that Reactor depressurization will result in loss of injection required for Adequate Core Cooling</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Containment Water Level CANNOT be maintained below 44 feet</td><td>NO ACTION REQUIRED</td></tr>
</table></td></tr>
<tr><td></td><td>NUSO</td><td>C2-2
<table>
<tr><td>IF Drywell Pressure is above 2.45 PSIG
THEN PREVENT injection from ONLY those Core Spray and LPCI pumps NOT required to assure Adequate Core Cooling (Appendix 4)</td></tr>
</table></td></tr>
</table>

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 7 of 7

Event Description: Fuel Damage

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>NUSO</td><td>C2-3
EMERGENCY DEPRESSURIZE the Reactor

IF Suppression Pool Water Level is above 5.5 feet
THEN OPEN 6 MSRVs (ADS Valves preferred)
➢ OK to exceed 100ºF/hr cooldown rate
<table><tr><th>IF</th><th>THEN</th></tr><tr><td>Drywell Control Air is or becomes unavailable</td><td>NO ACTION REQUIRED</td></tr><tr><td>Less than 4 MSRVs can be opened
AND
Reactor Pressure is 80 PSIG or more above Suppression Chamber Pressure</td><td>NO ACTION REQUIRED</td></tr></table></td></tr>
<tr><td></td><td>BOP</td><td>Opens 5 SRVs and one additional SRV (due to ADS Valve 1-22 being out of service).</td></tr>
<tr><td></td><td>NUSO</td><td>C2-4
WHEN
Shutdown Cooling RPV Pressure interlock clears AND further cooldown is required</td></tr>
<tr><td></td><td>NRC</td><td>End of Event 8. When the crew has Emergency Depressurized the Reactor and has control of Reactor Water Level above the Top of Active Fuel ((-) 162 inches) using low pressure systems, end of Scenario.</td></tr>
</table>

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 9 Page 1 of 3

Event Description: Reactor Feedwater Pumps (RFPTs) Trip / HPCI Fails to Automatically Start and Inject

Time	Position	Applicant's Actions or Behavior
	NRC	**Event 9, Reactor Feedwater Pumps Trip / HPCI Fails to Automatically Start and Inject, is inserted when the Reactor MODE SWITCH is placed in SHUTDOWN. No action is required by the Driver to insert Event 9.**
	OATC	Reports that all Reactor Feedwater Pumps (RFPTs) have tripped.
	BOP	When Reactor Water Level reaches the High Pressure Coolant Injection (HPCI) initiation setpoint (-45"), determines that HPCI did not automatically start and manually starts HPCI. Informs the NUSO of the actions required to start HPCI.
	NUSO	Directs the BOP to maintain Reactor Water Level using 2-EOI-Appendix-5D, Injection System Lineup HPCI.
	BOP	2-EOI-Appendix-5D, Injection System Lineup HPCI [1] **IF** Suppression Pool Level drops below 12.75 ft. during HPCI operation, **THEN TRIP** HPCI and **CONTROL** injection using other options. [2] **IF** Suppression Pool level CANNOT be maintained below 5.25 in, **THEN EXECUTE** EOI Appendix 16E, Bypassing HPCI High Suppression Pool Water Level Suction Transfer Interlock, concurrently with this procedure to bypass HPCI High Suppression Pool Water Level Suction Transfer Interlock. [3] **IF** BOTH of the following exist: • High temperature exists in the HPCI area, **AND** • SRO directs bypass of HPCI High Temperature Isolation Interlocks, **THEN PERFORM** the following: [3.1] **EXECUTE** EOI Appendix 16L, Bypassing HPCI High Temperature Isolation, concurrently with this procedure. [3.2] **RESET** auto isolation logic using HPCI AUTO-ISOL LOGIC A (B) RESET pushbuttons. [4] **VERIFY** at least one SGTS train in operation.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 9 Page 2 of 3

Event Description: Reactor Feedwater Pumps (RFPTs) Trip / HPCI Fails to Automatically Start and Inject

Time	Position	Applicant's Actions or Behavior
	BOP	**CAUTIONS** 1) Operating HPCI Turbine below 2400 rpm may result in unstable system operation and equipment damage. 2) Operating HPCI Turbine with Suction Temperatures above 140 ºF may result in equipment damage. [5] **VERIFY** 2-FIC-73-33, HPCI SYSTEM FLOW/CONTROL, is in one of the following configurations, as desired: • in AUTO and set for 5300 gpm for rapid injection • in AUTO and set for approximately 2500 gpm for slower injection • in MANUAL with output at approximately 50% for slower injection **NOTE** HPCI Auxiliary Oil Pump will NOT start UNTIL 2-FCV-73-16, HPCI TURBINE STEAM SUPPLY VLV, starts to open. [6] **IF** high Reactor Water Level trip logic is actuated, **THEN** [6.1] **DEPRESS** HPCI TURBINE TRIP RX LVL HIGH RESET pushbutton. [6.2] **CHECK** HPCI TURBINE TRIP LVL HIGH amber light has extinguished. [7] **PLACE** 2-HS-73-47A, HPCI AUXILIARY OIL PUMP handswitch in START. [8] **PLACE** 2-HS-73-10A, HPCI STEAM PACKING EXHAUSTER handswitch in START. [9] **OPEN** 2-FCV-73-30, HPCI PUMP MIN FLOW VALVE. [10] **OPEN** 2-FCV-73-44, HPCI PUMP INJECTION VALVE. [11] **OPEN** 2-FCV-73-16, HPCI TURBINE STEAM SUPPLY VALVE, to start the HPCI Turbine.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 9 Page 3 of 3

Event Description: Reactor Feedwater Pumps (RFPTs) Trip / HPCI Fails to Automatically Start and Inject

Time	Position	Applicant's Actions or Behavior
	BOP	[12] **CHECK** proper HPCI operation by observing the following: A. HPCI Turbine speed accelerates. B. 2-CKV-73-45, HPCI SYSTEM CHECK VLV, opens by observing 2-ZI-73-45A, DISC POSITION, red light illuminated. C. HPCI flow to RPV stabilizes and is controlled automatically at the setpoint. (N/A if controller in manual). D. 2-FCV-73-30, HPCI PUMP MIN FLOW VALVE, closes as flow exceeds approximately 1200 gpm. **CAUTION** HPCI PUMP MIN FLOW VALVE, 2-FCV-073-0030, automatically opens when system flow is at or below 900 gpm (lowering) only if a system initiation signal is present. Manually opening the Min Flow Valve may be required for pump min flow protection. [13] **ADJUST** 2-FIC-73-33, HPCI SYSTEM FLOW/CONTROL, controller as necessary to control injection. [14] **VERIFY** HPCI Auxiliary Oil Pump stops and the shaft-driven oil pump operates properly. [15] **WHEN** HPCI Auxiliary Oil Pump stops, **THEN PLACE** HPCI AUXILIARY OIL PUMP handswitch in AUTO. [16] N/A [17] N/A
	NRC	**End of Event 9. When the crew has Emergency Depressurized the Reactor and has control of Reactor Water Level above the Top of Active Fuel ((-) 162 inches) using low pressure systems, end of Scenario.**

Scenario Setup
UNIT 2

IC	54
Exam IC	276

Procedure	Revision	Procedure	Revision	Procedure	Revision
OI-68	159	EOI-3	17	ARP 6A	34
OI-69	139	2-C-2	11	ARP 8B	17
GOI-12	48	APPX 5D	10	ARP 8C	19
GOI-12A	118	ARP 3A	55	TRM 3.4.1	21
AOI-64-2A	27	ARP 3D	34	TS 3.5.1	A294
AOI-85-3	26	ARP 4B	51	TS 3.5.3	0
AOI-100-1	116	ARP 4C	35	TS 3.6.1.3	A253
EOI-1	18	ARP 5B	31		

Simulator Setup	• Verify camera system is powered down (admin password = abcd1234) • Start CPERF **PRIOR** to placing the Simulator in RUN • Ensure Danger Tags are placed on SRV 1-22 and the Emergency High Pressure Makeup Pump
Schedule Files(s):	2104 NRC Scenario 1 UNIT 2.sch RWCU.sch
Event Files(s):	2104 NRC Scenario 1 UNIT 2.evt

Schedule File – 2104 NRC Scenario 1 Unit 2.sch

Event	Action	Description
	2104 NRC Scenario 1 Unit 2.evt	Event File
1	Insert remote CU01 to 45.00000 in 60	RWCU DEMIN FILTER A FRC-69-35
1	Insert remote CU02 to 45.00000 in 60	RWCU DEMIN FILTER B FRC-69-60
1	Insert remote AN01E after 15 to RESET	CU LOCAL RESET (2-XA-55-4B W24)
11	Insert remote CU05 to MANUAL	RWCU HX RBCCW FLOW CONTROL TIC-69-10A
21	Insert remote CU05 to AUTO	RWCU HX RBCCW FLOW CONTROL TIC-69-10A

Schedule File

Event	Action	Description
3	Insert malfunction XA-55-4C_13 to ON	RBCCW SURGE TANK LEVEL LOW 2-LA-70-2B
13	Insert malfunction XA-55-4C_13 after 10 to NORMAL delete in 1	RBCCW SURGE TANK LEVEL LOW 2-LA-70-2B
4	Schedule F:\ Scenarios\Scenario 1\RWCU.sch	
6	Insert malfunction ED08C	4KV UNIT BOARD 2C FAILURE (RELAY 86-316 AND 86-532)
16	Insert remote FW06 to START	CONDENSATE BOOSTER PUMP C AUX OIL PUMP
16	Insert remote AN01D to RESET in 5	FW LOCAL RESET 121 (2-XA-55-6B W6)
7	Insert malfunction RC09 to 35.00000 in 1800	RCIC STEAM LEAK INTO RCIC ROOM
	Insert malfunction FCV-71-2 to FAIL_NOW	MOTOR_OPERATED_VALVE RCIC STEAM LINE INBD ISOL VLV
	Insert override ZLOHS712A_1 to Off	HS-71-2A-GREEN RCIC STEAM LINE INBD ISOLATION VLV
	Insert override ZLOHS712A_2 to On	HS-71-2A-Red* RCIC STEAM LINE INBD ISOLATION VLV
17	Delete override ZLOHS712A_2	HS-71-2A-Red* RCIC STEAM LINE INBD ISOLATION VLV
	Insert malfunction FCV-71-3 to FAIL_NOW	MOTOR_OPERATED_VALVE RCIC STEAM LINE OUTBD ISOL VLV
	Insert override ZLOHS713A_1 to Off	HS-71-3A-GREEN RCIC STEAM LINE OUTBD ISOLATION VLV
	Insert override ZLOHS713A_2 to On	HS-71-3A-Red* RCIC STEAM LINE OUTBD ISOLATION VLV
8	Insert malfunction TH23 to 10.00000 in 900	FUEL CLADDING DAMAGE
8	Insert malfunction FW14A	RFPT 2A TRIP ON RFPT 2A BEARING LOW OIL PRESSURE (PS-3-123B)

Schedule File – 2104 NRC Scenario 1 Unit 2.sch

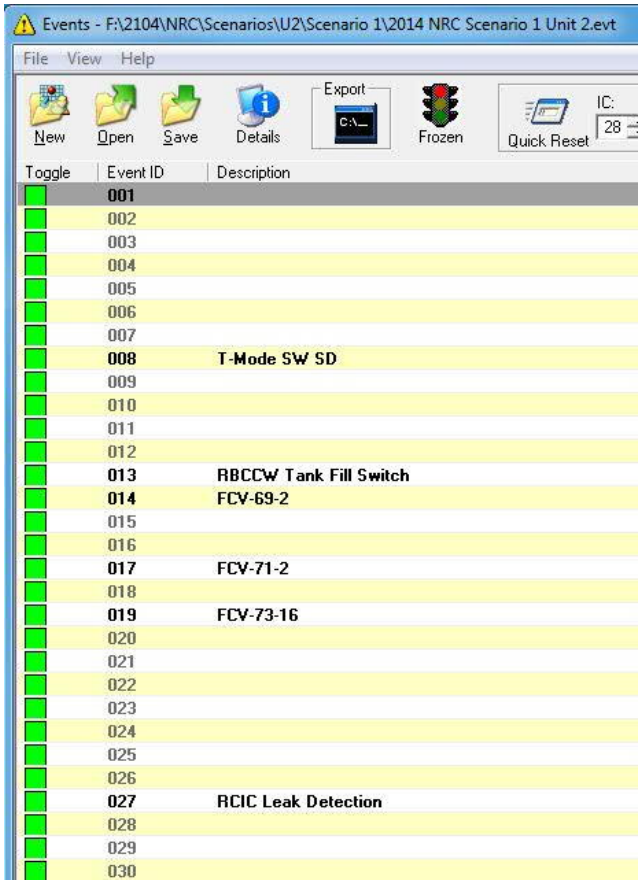
Event	Action	Description
8	Insert malfunction FW14B	RFPT 2B TRIP ON RFPT 2A BEARING LOW OIL PRESSURE (PS-3-149B)
8	Insert malfunction FW14C	RFPT 2C TRIP ON RFPT 2A BEARING LOW OIL PRESSURE (PS-3-174B)
	Insert malfunction FCV-73-16 to FAIL_NOW	MOTOR_OPERATED_VALVE HPCI TURBINE STEAM SUPPLY VLV
	Insert override ZLOHS7316A_1 to On	HS-73-16A-Green* HPCI TURBINE STEAM SUPPLY VLV
	Delete malfunction FCV-73-16	MOTOR_OPERATED_VALVE HPCI TURBINE STEAM SUPPLY VLV
	Delete override ZLOHS7316A_1	HS-73-16A-Green* HPCI TURBINE STEAM SUPPLY VLV
27	Insert malfunction RC09 to 18.00000 in 1800 on event 27	RCIC STEAM LEAK INTO RCIC ROOM
8	Insert malfunction RC09 to 100.00000 in 1800 on event 8	RCIC STEAM LEAK INTO RCIC ROOM

Schedule File – RWCU.sch

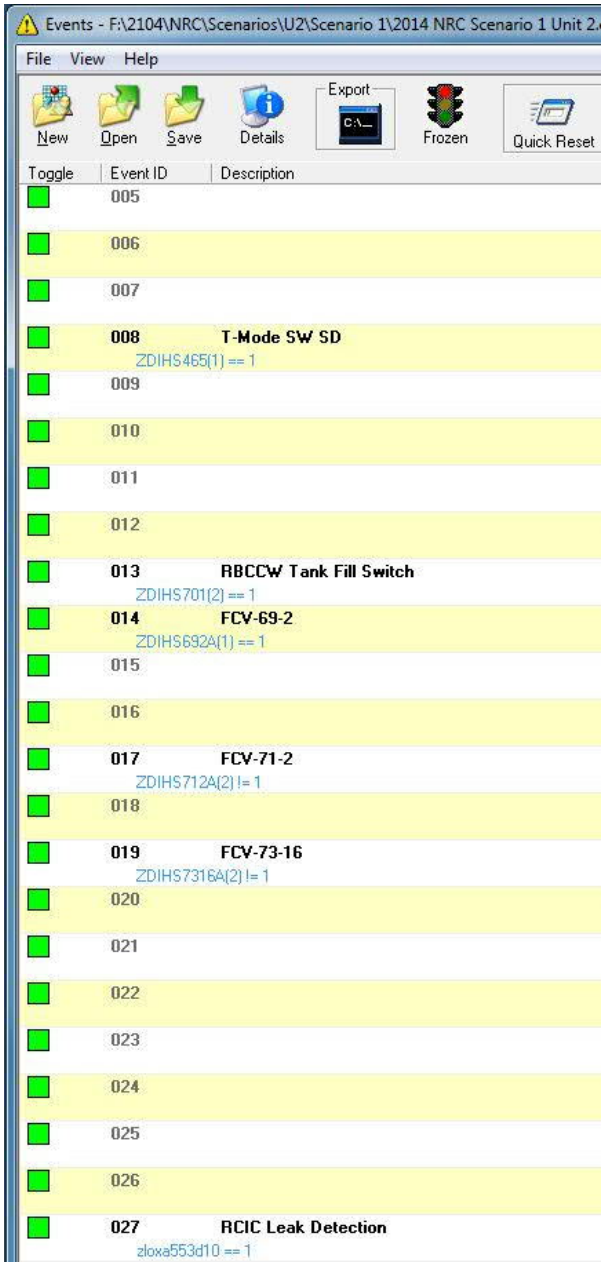
Event	Action	Description
	Insert malfunction CU04 to 25.00000	RWCU SYSTEM SUCTION BREAK
	Insert malfunction FCV-69-2 to FAIL_NOW	MOTOR_OPERATED_VALVE RWCU OUTBOARD ISOLATION VLV
	Insert override ZLOHS692A_1 to Off	HS-69-2A-GREEN RWCU OUTBD SUCT ISOLATION VALVE
	Insert override ZLOHS692A_2 to On	HS-69-2A-Red* RWCU OUTBD SUCT ISOLATION VALVE
14	Delete malfunction FCV-69-2	MOTOR_OPERATED_VALVE RWCU OUTBOARD ISOLATION VLV
14	Delete override ZLOHS692A_1	HS-69-2A-GREEN RWCU OUTBD SUCT ISOLATION VALVE
14	Delete override ZLOHS692A_2	HS-69-2A-Red* RWCU OUTBD SUCT ISOLATION VALVE

Event File

List



Details



UNIT 2 SHIFT TURNOVER MEETING			Today
MODE 1	**DAYS ON LINE** 208	**Total Drywell Leakage (gpm)**	**Protected Equipment**
	PRA (EOOS) -GREEN	1.55	None
Rx Power 80%	500Kv GRID - Qualified	**Floor Drain (gpm)**	
	161Kv Grid -Qualified	0.11	
MWe	**Last breaker closure**	**Equipment Drain (gpm)**	
	4/10/19 4:31	1.44	

☐ Review logs ☐Qualifications ☐Review RCP/Rx Brief ☐Review LCO/OWA Actions ☐Walkdown Panels/Verify EOOS
☐ CR Reviews Complete □ Leadership and Team Effectiveness

CHANGES IN LCOs

SRV 1-22 is INOPERABLE (ADS Valve). Tech Spec 3.5.1, Condition E (Day 4 of 14 Day LCO)

LCOs OF 72 HOURS OR LESS

SIGNIFICANT ITEMS DURING PREVIOUS SHIFT/RADIOLOGICAL CHANGES

Reactor Shutdown. Maintain RFPTs, Condensate, and Condensate Booster Pumps running until Reactor Power is <70%
EHPM tagged for motor bearing inspection
RWCU Non-Regenerative Heat Exchanger repairs completed, tags are clear, and RWCU has been filled and vented.

MAJOR EQUIPMENT CHANGES PLANNED FOR THIS SHIFT

Return RWCU to service in accordance with 2-OI-69, Section 5.1, beginning at Step [4]. RPHP is in effect.
Continue the Reactor Shutdown in accordance with 2-GOI-100-12A, Section 5.3.1, Step [4].
Reduce Reactor Power to 75% using Core Flow, then wait for further guidance from RE.

OPERATOR WORK AROUNDS **OWAs - 0 Burdens - 0 Challenges - 6**

ODMIs/ACMPs

ONEAs

FIRE RISK SIGNIFICANT ITEMS OOS/FPLCO Actions Due

FPRM Attachment A, FPLCO A.2.2.1, Unit 2 Emergency High Pressure Makeup Pump – Fire Watch established

SCHEDULED ITEMS NOT COMPLETED

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 1 of 8

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	Driver	**PRIOR to placing the simulator in RUN, start CPERF to record critical parameters.**
	NRC	**If the crew does not start Event 1, Return Reactor Water Cleanup (RWCU) to Operation, request that the Driver contact the Nuclear Unit Senior Operator (NUSO) as the Shift Manager and direct the crew to return RWCU to operation.**
	Driver	**If requested by the Chief Examiner, contact the NUSO as the Shift Manager and direct the crew to return RWCU to operation.** **If contacted by the crew as the Reactor Building Assistant Unit Operator (AUO) acknowledge any direction given.**
	NRC	**If Panel 3-9-4B, Window 17, RWCU NON-REGENERATIVE HX DISCH TEMP HIGH, is received, see page 8 of 57 for Alarm Response Procedure actions.**
	NUSO	Directs the Balance of Plant Operator (BOP) to return RWCU to service.
	BOP	3-OI-69, Reactor Water Cleanup System Section 5.1 RWCU Pump Startup **NOTES** 1) All controls and indications are located on Panel 3-9-4 unless noted otherwise. 2) RWCU is required to be operated with the following restrictions with Reactor Pressure ≤ 50 psig (MODES 2 or 3) or any time the unit is in MODE 4, MODE 5, or defueled: • One pump in operation, pump can be operated to its maximum flow capacity. • Two pumps operation, max flow limit of ≤ 100 gpm per pump (200 gpm total). [4] **ENSURE RESET** the RWCU Group 3 Isolation using 3-HS-64-16A-S32, PCIS DIV I RESET and 3-HS-64-16A-S33, PCIS DIV II RESET at Panel 3-9-4.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 2 of 8

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	BOP	[5] **CHECK** the following on Panel 3-LPNL-925-0003, Unit 3 Reactor Building, Elevation.621': [5.1] Demin 3A and/or 3B Holding Pumps are running (3-HS-069-6015 and 3-HS-069-6005). [5.2] Demin 3A and/or 3B Outlet Valves are closed (3-HS-069-0035 and/or 3-HS-069-0060).
	Driver	**If contacted as the Reactor Building AUO to perform Step [5], acknowledge the direction and report that the Holding Pumps are running with the Demineralizer Outlet Valves closed.**
	BOP	[6] N/A [7] **ENSURE** 3-TIC-069-0010A, RWCU HEAT EXCHANGERS RBCCW FLOW CONTROL is in MANUAL, and FULL OPEN demand is on 3-TCV-70-49, RWCU NON-REGENERATIVE HEAT EXCHANGER OUTLET TCV. (**REFER TO** Attachment 5)
	Driver	**When directed to place 3-TIC-069-0010A in manual, insert Event 11. Inform the crew that 3-TIC-069-0010A is in manual and is fully open.**
	BOP	[8] **ENSURE CLOSED** the following: • 3-HC-69-15, RWCU BLOWDOWN PRESSURE CONTROL VALVE • 3-HS-69-16A, RWCU BLOWDOWN TO MAIN CONDENSER • 3-HS-69-17A, RWCU BLOWDOWN TO RADWASTE [9] **ENSURE** 3-HS-69-15A, DEFEAT/OPERATE (FOR 3-HC-69-15) in the **DEFEAT** position. [10] N/A [11] **NOTIFY** Chemistry that RWCU is being placed in service and to check the durability monitor.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 3 of 8

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	Driver	**When contacted as Chemistry acknowledge the direction to check the durability monitor.**
	BOP	[12] **ENSURE OPEN** the following valves: • 3-FCV-69-1, RWCU INBD SUCT ISOLATION VALVE • 3-FCV-69-2, RWCU OUTBD SUCT ISOLATION VALVE • 3-FCV-69-8, RWCU DEMIN BYPASS VALVE [13] **OPEN** 3-FCV-069-0012, RWCU RETURN ISOLATION VALVE by one of the two methods described below. • **PLACE** 3-HS-69-12A in the OPEN position, **THEN** **RETURN** 3-HS-69-12A to the NORM position when intermediate position (red and green light) is indicated • **PLACE** 3-HS-69-12A in the OPEN position, **THEN** **RETURN** 3-HS-69-12A to the NORM position when **FULL OPEN** position (red light only) is indicated **NOTES** 1) Too high a flow on startup after isolation could cause 3-TIS-69-11 to actuate due to a high Non-Regenerative Heat Exchanger Outlet Temperature (3-XS-69-6, RWCU TEMP SELECT, Position 3, WATER TO RWCU DEMINS). 2) The RWCU Pump will trip on low flow at 56 gpm, after a 30 second time delay. Failure to immediately raise flow to greater than 56 gpm in the following steps will result in a pump trip. 14] **PLACE** seal purge in operation to pump(s) to be placed in service. **REFER TO** Section 8.3.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 4 of 8

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	Driver	**When directed to place seal purge in service, acknowledge the direction and inform the crew that seal purge has been placed in service in accordance with 3-OI-69, Section 8.3**
	BOP	[15] N/A [16] **START** RWCU RECIRC PUMP 3A(3B) using control switch 3-HS-69-4A(4B)-A, **AND RAISE** flow, using RWCU RETURN ISOLATION VALVE, 3-HS-69-12A, to prevent low flow trip. [17] **IF** two pump operation is desired, **THEN START** the second RWCU RECIRC PUMP 3B(3A) using control switch 3-HS-69-4B(4A)-A, AND RAISE flow using RWCU RETURN ISOLATION VALVE, 3-HS-69-12A, to prevent low flow trip. [18] **IF** the RWCU filter-demineralizers are to be placed in service, **THEN REFER TO** Section 6.2.
	BOP	3-OI-69, Reactor Water Cleanup System Section 6.2, Placing Filter-Demineralizers in Service **CAUTION** When initially placing a filter-demineralizer into service, it is desirable that most RWCU Discharge Flow be returned to the Main Condenser. If the Reactor is pressurized, however, failure to follow temperature restrictions could result in thermal shocking the Regenerative Heat Exchanger. [1] **REVIEW** Precautions and Limitations in Section 3.0. [2] – [10] Performed in the Field by an AUO.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 5 of 8

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	Driver	**When contacted as the Reactor Building AUO to prepare to roll in RWCU Demineralizer, acknowledge the direction and report that you are standing by with Steps complete Steps [2] through [10] of 3-OI-69, Reactor Water Cleanup System, Section 6.2 are complete.** **When directed to place filter-demineralizers in service, insert Event 1 to perform AUO actions to place demineralizers in service, and inform the crew that Demin Flow is rising.** **Demineralizers will roll in over a 1-minute time frame – when complete inform the crew that RWCU filter-demineralizers have been placed in service.** **If requested, Demineralizer flows are rising and are normal.**
	BOP	**NOTE** RWCU is required to be operated with the following restrictions with Reactor Pressure ≤ 50 psig (MODES 2 or 3) or any time the unit is in MODE 4, MODE 5, or defueled: • One pump in operation, pump can be operated to its maximum flow capacity. • Two pumps in operation, maximum flow limited to ≤ 100 gpm per pump (200 gpm total) [11] **PERFORM** the following simultaneously: • **CLOSE** 3-HS-69-8A, RWCU DEMIN BYPASS VALVE on Panel 3-9-4
	Driver	**Verify that the crew is able to clear RWCU Demineralizer Alarm (Panel 3-9-4B, Window 24) – it will automatically reset on Event 1 after 15 seconds. If the crew cannot get the alarm to reset, insert remote function AN01E to RESET again).**
	BOP	[12] **RAISE** flow through the Demin until the desired flow has been established. [13] **ENSURE** DEMIN 3A(3B) HOLDING PUMP, 3-HS-069-6015(6005), in the AUTO position.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 6 of 8

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	BOP	[14] **CHECK** that Holding Pump 3A(3B), on the Demin being placed in service, has STOPPED. [15] **CHECK** DEMIN 3A(3B) HOLDING PUMP DISCH VALVE H, 3-HS-069-0035B(0060B), has CLOSED.
	Driver	**When directed to perform Steps [12], [13], and [14] acknowledge the direction and inform the crew that Steps [12], [13], and [14] are complete.**
	BOP	[16] **NOTIFY** Chemistry that the filter-demineralizer has been placed in service and **REQUEST** a sample for conductivity and silica of the effluent.
	Driver	**When contacted as Chemistry, acknowledge any information or direction given.**
	BOP	Continuing 3-OI-69, Reactor Water Cleanup System Section 5.1 RWCU Pump Startup [19] **ADJUST** the RWCU RETURN ISOLATION VALVE, using 3-HS-69-12A, as required to obtain desired system flow. **CAUTIONS** 1) Failure to maintain RWCU Non-Regenerative Heat Exchanger Tube Side Outlet Temperature below 130 ºF will reduce resin efficiency and may result in resin damage. 2) Exercise care when making RWCU System Flow adjustments to values greater than 270 gpm to ensure temperature limits are not exceeded. [20] **THROTTLE** blowdown flow as required to maintain the following parameters. (REFER TO Section 6.5). • Desired Reactor Water Level • Non-Regenerative Heat Exchanger Tube Outlet Temperature less than 130 ºF

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 7 of 8

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	BOP	[21] **IF** at Operations Management discretion it is desired to place 3-TIC-069-0010A, RWCU HEAT EXCHANGERS RBCCW FLOW CONTROL in AUTO, **THEN** PERFORM the following: (Otherwise N/A) [21.1] **PLACE** 3-TIC-069-0010A, RWCU HEAT EXCHANGERS RBCCW FLOW CONTROL in AUTO. (REFER TO Section 8.15.)
	Driver	**If contacted by the crew to place 3-TIC-069-0010A in automatic acknowledge the direction and inform the crew that 3-TIC-069-0010A has been placed in automatic.**
	BOP	**NOTES** 1) Seal water to the RWCU Pumps has been observed to slightly lower after pump(s) are placed in service. 2) When the Reactor Vessel is at atmospheric pressure and RWCU Pump seal water is being supplied by CS&S system, RWCU Pump seal water flow may decrease to 0 gpm after the RWCU Pump has started. See PRECAUTION P&L 3.6E. [22] **ENSURE** PURGE (SEAL) WATER TO RWCU PUMPS at Panel 3-25-314 (1.8 to 2.0 gpm). (REFER TO Section 8.3.) • 3-FI-085-0075, RWCU PUMP 3A PURGE WATER FLOW INDICATOR • 3-FI-085-0077, RWCU PUMP 3B SEAL WATER
	Driver	**When contacted as the Reactor Building AUO to perform Step [22], inform the crew that seal water flow is 1.9 gpm.**
	NRC	**The restoration of RWCU ICS point to the heat balance is not required if automatically bypassed.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 1 Page 8 of 8

Event Description: Return Reactor Water Cleanup (RWCU) to Operation

Time	Position	Applicant's Actions or Behavior
	BOP	3-9-ARP-4B, Alarm Response Procedure RWCU NON-REGENERATIVE HX DISCHARGE TEMPERATURE HIGH, Window 17 Operator Action: A. **CHECK** RWCU NRHX Discharge Temperature, 3-XS-69-6, on Panel 3-9-4. B. **CHECK** RBCCW System Temperature indication normal, Panel 3-9-4. C. **IF** temperature continues to rise, **THEN PERFORM** the following, otherwise, **MARK** steps N/A: • **REDUCE** system flow or reject flow as necessary to control temperature • **REFER TO** 3-OI-69, Reactor Water Cleanup System D. **DISPATCH** personnel to CHECK the following: • RWCU Heat Exchangers RBCCW Flow Controller (normally in auto with setpoint at approx. 110 ºF), located on 3-LPNL-925-0002 Reactor Bldg 593' • 3-TCV-70-49 operating properly (RBCCW to NRHX), located in RWCU HX room
	Driver	**If contacted by the crew to check equipment in Step D (see above), acknowledge the direction and report the following as required:** • **RWCU Heat Exchangers RBCCW Flow Controller is set at 110 ºF and is in automatic** • **3-TCV-70-49 is operating properly**
	NRC	**End of Event 1. Proceed to Event 2, Reduce Reactor Power to 75% using Core Flow.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 2 Page 1 of 5

Event Description: Reduce Reactor Power to 75% using Core Flow

Time	Position	Applicant's Actions or Behavior
	NRC	**If the crew does not proceed to Event 2, Reduce Reactor Power to 75% using Core Flow, request that the Driver contact the NUSO as the Shift Manager and direct the crew to reduce Reactor Power to 75%.**
	Driver	**If requested by the Chief Examiner, contact the crew as the Shift Manager and direct the crew to continue with Step [2] of the Reactivity Control Plan (RCP) for the Reactor Shutdown and reduce Reactor Power to 75% using Core Flow.**
	NRC	**The crew may elect to conduct a re-focus reactivity brief prior to lowering Reactor Power.**
	NUSO	Directs the Operator at the Controls (OATC) to lower Reactor Power to 75% in accordance with Step [2] of RCP U3-2104NRC1 and in accordance with 3-OI-68, Reactor Recirculation System, 3-GOI-100-12A, Unit Shutdown from Power Operation to Cold Shutdown and Reductions in Power During Power Operations and 3-GOI-100-12, Power Maneuvering.
	OATC	3-GOI-100-12A, Unit Shutdown from Power Operation to Cold Shutdown and Reductions in Power During Power Operations Section 5.3, Power Reduction 5.3.1 Reducing Reactor Power to 40% [1] **ENSURE** the operators are using Attachment 9, Operations Down Power Monitoring. [2] **REDUCE** Reactor Power by a combination of Control Rod insertions and core flow changes, as recommended by Reactor Engineer.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 2 Page 2 of 5

Event Description: Reduce Reactor Power to 75% using Core Flow

Time	Position	Applicant's Actions or Behavior
	OATC	3-GOI-100-12, Power Maneuvering Section 5.0, Instruction Steps [7] **REDUCE** Reactor Power by a combination of Control Rod insertions and Core Flow changes, as recommended by Reactor Engineer. **REFER TO** 3-SR-3.1.3.5(A) and 3-OI-68. (N/A if entering 3-GOI-100-12, Power Maneuvering, to recover from Recirc Pump Trip).
	NRC	**3-OI-68, Reactor Recirculation System** **3.0 Precautions and Limitations** **Section 3.5.3, Dual Pump Operation** E. When raising (lowering) Reactor Power per the Reactivity Plan, the following guideline should be used to establish the 60 rpm mismatch between the Recirc Pumps. 1. When the first Recirc Pump reaches 1200 rpm (1300 rpm) or both Recirc Pumps are at 1200 rpm (1300 rpm) then individual controls will be used. 2. While following the Reactivity Plan establish the 60 rpm mismatch using the individual controls for the leading Recirc Pump. 3. While maintaining the 60 rpm mismatch and using the Reactivity Plan, raise (lower) the Recirc Pump speeds using either the Master Controllers or Individual Controllers. 4. Once a Recirc Pump reaches 1300 rpm (1200 rpm) the 60 rpm mismatch is no longer required. While following the Reactivity Plan raise (lower) the lagging Recirc Pump using the individual controller match Recirc Pump speeds. 5. Once the Recirc Pumps are matched, then the speeds may be adjusted as required using the Master Controller or Individual Controllers while maintaining the requirements of Attachment 1.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 2 Page 3 of 5

Event Description: Reduce Reactor Power to 75% using Core Flow

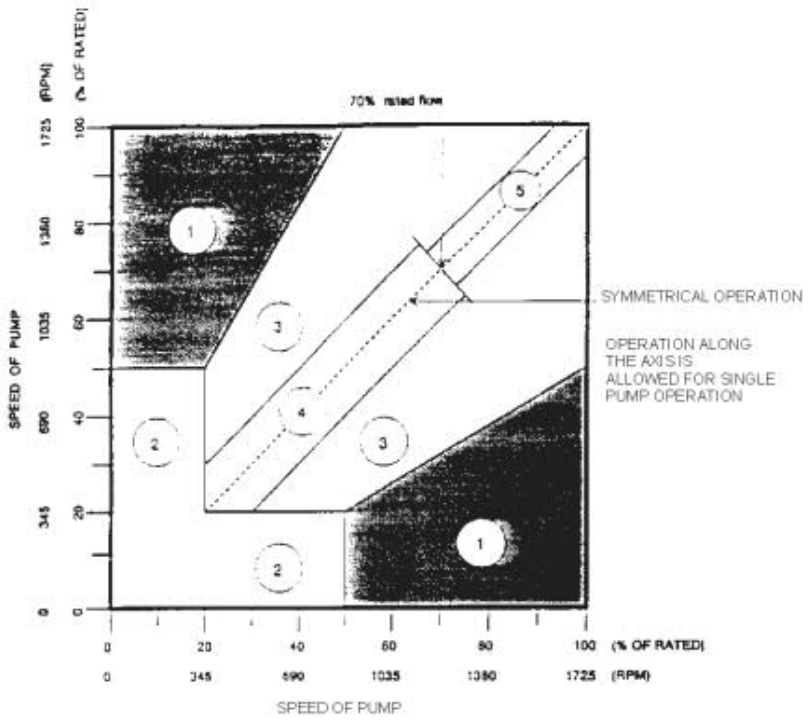
Time	Position	Applicant's Actions or Behavior
	NRC	

BFN Unit 3	Reactor Recirculation System	3-OI-68 Rev. 0099 Page 181 of 210

Attachment 1
(Page 1 of 1)

Recirculation Pump Speed Mismatch Curve

(for Steady State, Dual Pump Operation)



1. Avoid Region To Prevent Excessive Jet Pump Vibration.
2. Below Recirc Drive Minimum speed.
3. Operation allowed if reactor subcritical or during transient periods.
4. Limited Operation for Core flow ≤ 70% rated (mismatch ≤ 10% rated speed).
5. Limited operation for Core flow > 70% rated (mismatch ≤ 5% rated speed).

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 2 Page 4 of 5

Event Description: Reduce Reactor Power to 75% using Core Flow

Time	Position	Applicant's Actions or Behavior
		3-OI-68, Reactor Recirculation System Section 6.2, Adjusting Recirc Flow **NOTES** 1) Thermal Limits are shown on 0-TI-248, Station Reactor Engineer and 3-SR-2, Instrument Checks and Observations. 2) Recirc Flow changes made during the later part of the operating cycle (Coastdown) could cause Core Flow values to approach or exceed the allowable values of the Increased Core Flow (ICF) Region of the Power to Flow Map. Instruments used to monitor pump speed and Core Flow should be identified in the Reactivity Control Plan. These values should be recorded prior to reducing Core Flow and used as a benchmark to reestablish the previous conditions when returning to power. Increased caution should be used when changes in Recirc Flow are made in this area.
	OATC	[1] **IF** desired to control Recirc Pump 3A speed with Recirc Individual Control, **THEN PERFORM** the following; (Otherwise N/A) [1.1] N/A [1.2] Lower Recirc Pump 3A using 3-HS-96-17A(17B)(17C), SLOW (MEDIUM) (FAST). (Otherwise N/A) [2] **IF** desired to control Recirc Pump 3B speed with Recirc Individual Control, **THEN PERFORM** the following; (Otherwise N/A) [2.1] N/A [2.2] Lower Recirc Pump 3B using 3-HS-96-18A(18B)(18C), SLOW (MEDIUM) (FAST). (Otherwise N/A) [3] **WHEN** desired to control Recirc Pumps 3A and/or 3B speed with the RECIRC MASTER CONTROL, **THEN ADJUST** Recirc Pump speed 3A & 3B using the following push buttons as required: 3-HS-96-33, LOWER SLOW 3-HS-96-34, LOWER MEDIUM 3-HS-96-35, LOWER FAST

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 2 Page 5 of 5

Event Description: Reduce Reactor Power to 75% using Core Flow

Time	Position	Applicant's Actions or Behavior
	NRC	**When satisfied with power reduction, end of Event 2. Request that the Driver insert Event 3, Reactor Building Closed Cooling Water (RBCCW) Surge Tank Low Level.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 3 Page 1 of 1

Event Description: Reactor Building Closed Cooling Water (RBCCW) Surge Tank Low Level

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 3, Reactor Building Closed Cooling Water (RBCCW) Surge Tank Low Level**
	BOP	Acknowledges and reports the following alarm to the NUSO: • RBCCW SURGE TANK LEVEL LOW, 3-9-4C, Window 13
	NUSO	Directs the Balance of Plant Operator (BOP) to respond in accordance with the appropriate Alarm Response Procedure.
	BOP	Alarm Response Procedure, 3-ARP-9-4C RBCCW SURGE TANK LEVEL LOW, Window 13 A. **ADD** water to the RBCCW Surge Tank for approximately one minute or until low level alarm resets using the following: • 3-FCV-70-1, RBCCW SYS SURGE TANK FILL VALVE (Panel 3-9-4) OR • 3-BYV-002-1369, FCV-70-1 BYPASS VALVE (locally) B. **IF** alarm does **NOT** reset, **THEN CHECK** tank locally. C. **IF** unable to maintain RBCCW Surge Tank level, **THEN REFER TO** 3-AOI-70-1, Loss of Reactor Building Closed Cooling Water. D. **IF** necessary to add water more than once per shift, **THEN CHECK** Drywell floor drain system for excessive operation **AND INSPECT** system outside Drywell for leakage.
	NRC	**The RBCCW Surge Tank Low Level alarm can be cleared 15 seconds after the fill valve is opened.**
	BOP	Opens 3-FCV-70-1, RBCCW SYS SURGE TANK FILL VALVE for approximately one minute and checks that RBCCW SURGE TANK LEVEL LOW 3-9-4C, Window 13 clears.
	Driver	**If contacted as the Reactor Building AUO to check for leaks or check RBCCW Surge Tank Level locally, acknowledge the direction. Wait 2 minutes and report that Surge Tank Level is normal and there are no leaks.**
	NRC	**End of Event 3. Request that the Driver insert Event 4, Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 1 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 4, Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close.**
	NRC	**3-FCV-69-2, RWCU OUTBOARD SUCTION ISOLATION VALVE, will not automatically close on the Primary Containment System Isolation (PCIS) signal, but can be closed manually.**
	OATC/ BOP	Acknowledges and reports the following alarms: • RWCU LEAK DETECTION TEMP HIGH, 3-9-3D, Window 17 • RWCU ISOL LOGIC CHANNEL A TEMP HIGH, 3-9-5B, Window 32 • RWCU ISOL LOGIC CHANNEL B TEMP HIGH, 3-9-5B, Window 33
	NUSO	Directs the BOP to respond in accordance with applicable Alarm Response Procedures.
	BOP	3-ARP-9-3D, Alarm Response Procedure RWCU LEAK DETECTION TEMP HIGH, Window 17 Operator Action: A. **IF** this alarm is received in conjunction with RWCU ISOL LOGIC CHANNEL A TEMP HIGH [3-XA-55-5B, window 32] and RWCU ISOL LOGIC CHANNEL B TEMP HIGH [3-XA-55-5B, window 33], **THEN EXIT** this procedure and GO TO 3-ARP-9-5B. Otherwise, CONTINUE in this procedure.
	BOP	Exits 3-ARP-9-3D, Alarm Response Procedure, and enters 3-ARP-9-5B, Alarm Response Procedure.
	BOP	3-ARP-9-5B, Alarm Response Procedure RWCU ISOL LOGIC CHANNEL A TEMP HIGH, Window 32 Operator Action: A. **CHECK** alarm by checking: 1. ATUs on Panel 3-9-83 and 3-9-85.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 2 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	BOP	2. RWCU LEAK DETECTION TEMP HIGH annunciator in alarm (3-XA-55-3D, Window 17). 3. Area temperature indication on 3-TR-69-29, LEAK DETECTION SYSTEM TEMPERATURE, on Panel 3-9-21. 4. Area Radiation Monitors (ARMs) 3-RR-90-1, 3-CONS-90-50A on Panel 3-9-2 and 0-CONS-90-361 on Panel 1-9-2. 5. ICS 'HPTURB' & 'RWCU' mimics for the 834 and 835 temperature loops. B. **IF** leak is suspected, **THEN MANUALLY ISOLATE** RWCU or if RWCU automatically isolates, **REFER TO** 3-AOI-64-2A, Group 3 Reactor Water Cleanup Isolation.
	Driver	**If contacted as Unit 1 Operator to check Area Radiation Monitors or Radiation Recorders, acknowledge the request.**
	BOP	Determines that 3-FCV-69-2, RWCU OUTBOARD SUCTION ISOLATION VALVE, failed to automatically isolate and manually closes 3-FCV-69-2. Informs the NUSO.
	BOP	C. **IF** TIS-69-835A(C) indicates greater than 131 ºF, **THEN ENTER** 3-EOI-3, Secondary Containment Control. D. **REFER TO** Tech. Spec. Table 3.3.6.1-1, Primary Containment Isolation Instrumentation. E. **EVALUATE** equipment associated with this alarm to determine compensatory actions required to maintain REP function. **REFER TO** NPG-SPP-18.3.5, Equipment Important to Emergency Response.
	NUSO	As required by 3-ARP-9-5B, Window 32 and 3-ARP-9-5B, Window 33, references NPG-SPP-18.3.5, Equipment Important to Emergency Response. No actions are required in accordance with this procedure.
	NRC	**Technical Specifications are covered starting on page 21 of 57.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 3 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	BOP	3-ARP-9-5B, Alarm Response Procedure RWCU ISOL LOGIC CHANNEL B TEMP HIGH, Window 33 Operator Action: A. **CHECK** alarm by checking: 1. ATUs on Panel 3-9-84 and 3-9-86. 2. RWCU LEAK DETECTION TEMP HIGH annunciator in alarm (3-XA-55-3D, Window 17). 3. Area temperature indications on LEAK DETECTION SYSTEM TEMPERATURE, 3-TR-69-29, on Panel 3-9-21. 4. ARMs 3-RR-90-1, 3-CONS-90-50A on Panel 3-9-2 and 0-MON-90-361 on Panel 1-9-2. 5. ICS 'HPTURB' & 'RWCU' mimics for the 834 and 835 temperature loops. B. **IF** a leak is suspected, **THEN MANUALLY ISOLATE** RWCU or if RWCU automatically isolates, **REFER TO** 3-AOI-64-2A, Group 3 Reactor Water Cleanup Isolation. C. **IF** TIS-69-835B(D) indicates greater than 131 ºF, **THEN ENTER** 3-EOI-3, Secondary Containment Control. D. **REFER TO** Tech. Spec. Table 3.3.6.1-1, Primary Containment Isolation Instrumentation. E. **EVALUATE** equipment associated with this alarm to determine compensatory actions required to maintain REP function. **REFER TO** NPG-SPP-18.3.5, Equipment Important to Emergency Response.
	NRC	**No actions are required in accordance with Technical Specification 3.3.6.1.**
	BOP	3-AOI-64-2A, Group 3 Reactor Water Cleanup Isolation Immediate Actions [1] **ENSURE** automatic actions occur.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 4 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	BOP	Automatic Actions: • 3-FCV-69-1, RWCU INBD SUCTION ISOLATION VALVE CLOSES • 3-FCV-69-2, RWCU OUTBD SUCTION ISOLATION VALVE CLOSES • 3-FCV-69-12, RWCU RETURN ISOLATION VALVE CLOSES • Reactor Water Cleanup Recirc Pumps 3A and 3B TRIP Subsequent Actions: [1] **IF** any EOI entry condition is met, **THEN ENTER** appropriate EOI(s).
	NRC	**The NUSO may enter 3-EOI-3, Secondary Containment Control, if Area Temperature or Radiation exceeds the Maximum Normal value. See page 23 of 57 for 3-EOI-3 actions.**
	Driver	**If contacted as an AUO to check ATUs, acknowledge the direction. Wait 3 minutes and report that ATUs 3-TIS-69-835A-D indicate 160 degrees and lowering.** **If contacted as Work Control or Maintenance, acknowledge any direction or reports given.**
	BOP	[2] **CHECK** the following to confirm high area temperature condition exists: • 3-TR-69-29, LEAK DETECTION SYSTEM TEMPERATURE (Panel 3-9-21) • ATUs in Auxiliary Instrument Room [3] **IF** isolation is caused by high area temperature, **THEN DETERMINE** if a line break exists by: • RWCU ARMs 3-RI-90-9A, 13A, and 14A • Visual Observation • Rx Zone Exhaust Rad Monitors 3-RE-90-142A, 142B, 143A, and 143B [4] **PERFORM** necessary Heat Balance adjustments. **REFER TO** 3-OI-69, Reactor Water Cleanup System.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 5 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	BOP	[5] **CHECK** the following monitors for a rise in activity: • 3-RR-90-1, AREA RADIATION, Points 9, 13, and 14 (Panel 3-9-2) • 3-MON-90-50, AIR PARTICULATE MONITOR CONSOLE, 3-RM-90-55 and 57 (Panel 3-9-2) • RB, TB, and Refuel Zone Exhaust Rad on 0-MON-90-361, CHEMISTRY CAM, MONITOR CONTROLLER, (Panel 1-9-2) [6] **IF** it has been determined that leakage is the cause of the isolation, **THEN NOTIFY** RADCON of RWCU status. **NOTE** Based on recent On-Shift Analysis from the License Amendment, chemistry sampling may be delayed following plant events. In the case of a REP event, Chemistry will be required to assist with dose assessments. Dose assessments will have precedence over sampling actions in REP events. [7] **NOTIFY** Chemistry that RWCU has been removed from service for the following evaluations: • The need to begin sampling Reactor Water • The need to remove the Durability Monitor from service [8] **IF** the isolation cannot be reset, **THEN PERFORM** the following: [8.1] **ISOLATE** the CRD System by closing the following seal water valves in the Unit 3 Reactor Building Elevation 593: • 3-SHV-069-0592 (A pump) • 3-SHV-069-0614 (B pump) [8.2] **REFER TO** 3-OI-68, Reactor Recirculation System for Recirc System operating restrictions while RWCU is isolated.
	Driver	**If contacted as Radiation Protection or Chemistry acknowledge any directions or reports given.** **If contacted as Unit 1 to check Reactor Building, Turbine Building, and Refuel Zone Exhaust Radiation on 0-MON-90-361, CHEMISTRY CAM MONITOR CONTROLLER (Panel 1-9-2), acknowledge the direction.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 6 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior	
	NUSO	[9] **EVALUATE** Technical Requirements Manual Section 3.4.1, Coolant Chemistry, for limiting conditions for operation.	
	NUSO	Technical Requirements Manual 3.4.1, Coolant Chemistry. TSR 3.4.1.1 is applicable	
	NUSO	**SURVEILLANCE:** Monitor Reactor Coolant conductivity	**FREQUENCY:** 4 hours when the continuous conductivity monitor is INOPERABLE and the Reactor is not in MODE 4 or 5
	Driver	**If contacted as Chemistry stating that Reactor Coolant sampling is required every 4 hours in accordance with TSR 3.4.1.1, acknowledge report.**	

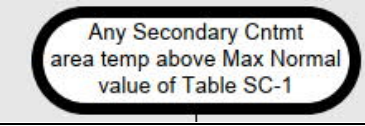
Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 7 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	NUSO	Technical Specification 3.6.1.3, Primary Containment Isolation Valves (PCIVs) LCO 3.6.1.3 Each PCIV, except Reactor Building-to-Suppression Chamber Vacuum Breakers, shall be OPERABLE APPLICABILITY: MODES 1, 2, and 3 When associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation." **NOTES** 1. Penetration flow paths except for 18 and 20 inch purge valve penetration flow paths may be un-isolated intermittently under administrative controls. 2. Separate Condition entry is allowed for each penetration flow path. 3. Enter applicable Conditions and Required Actions for systems made inoperable by PCIVs. 4. Enter applicable Conditions and Required Actions of LCO 3.6.1.1, "Primary Containment," when PCIV leakage results in exceeding overall containment leakage rate acceptance criteria in MODES 1, 2, and 3. **CONDITION:** NOTE: Only applicable to penetration flow paths with two PCIVs. A. – One or more penetration flow paths with one PCIV inoperable except due to MSIV leakage not within limits.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 8 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior	
	NUSO	**REQUIRED ACTION:** A.1 – Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured AND NOTE: Isolation devices in High Radiation Areas may be verified by use of administrative means. A.2 – Verify the affected penetration flow path is isolated	**COMPLETION TIME:** A.1 – 4 hours except for Main Steam Line A.2 – Once per 31 days for isolation devices outside Primary Containment AND Prior to entering MODE 2 or 3 from MODE 4, if Primary Containment was de-inerted while in MODE 4, if not performed within the previous 92 days, for isolation devices inside Primary Containment
	NUSO	If RWCU Room Temperature exceeds the Maximum Normal 3-EOI-3, Secondary Containment Control 	

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 9 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

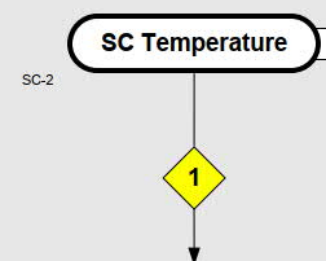
<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>NUSO</td><td>3-EOI-3, Secondary Containment Control

SC-1
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Reactor Zone Ventilation Exhaust Radiation level is above 72 mR/hr</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Refuel Zone Ventilation Exhaust Radiation level is above 72 mR/hr</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Reactor Zone Ventilation is isolated
AND
Reactor Zone Ventilation Exhaust Radiation level is below 72 mR/hr</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Refuel Zone Ventilation is isolated
AND
Refuel Zone Ventilation Exhaust Radiation level is below 72 mR/hr</td><td>NO ACTION REQUIRED</td></tr>
</table></td></tr>
</table>

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 10 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	NUSO	



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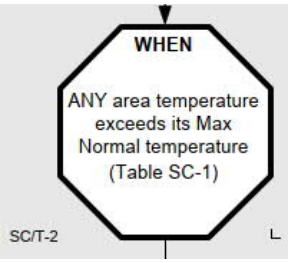
- An RPV water lvl instrument may be used to determine or trend lvl only when it reads above the Minimum Indicated Lvl associated with the highest max DW or SC run temp
- If DW temps or SC area temps (Table 6), as applicable, are outside the safe region of Curve 8, the associated instrument may be unreliable due to boiling in the run

INSTRUMENT	RANGE	MINIMUM INDICATED LVL	MAX DW RUN TEMP (FROM XR-64-50 OR TI-64-52AB)	MAX SC RUN TEMP (FROM TABLE 6)
LI-3-58A/B	Emergency -155 to +60	on scale	N/A	below 100
		-150	N/A	101 to 150
		-145	N/A	151 to 200
		-140	N/A	201 to 250
		-130	N/A	251 to 300
		-120	N/A	301 to 350
LI-3-53 LI-3-60 LI-3-206 LI-3-253 LI-3-208A, B, C, D	Normal 0 to +60	on scale	N/A	below 150
		+5	N/A	151 to 200
		+15	N/A	201 to 250
		+20	N/A	251 to 300
		+30	N/A	301 to 350
LI-3-52 LI-3-62A	Post Accident -268 to +32	on scale	N/A	N/A
LI-3-55	Shutdown Floodup 0 to +500	+10	Below 100	N/A
		+15	100 to 150	N/A
		+20	151 to 200	N/A
		+30	201 to 250	N/A
		+40	251 to 300	N/A
		+50	301 to 350	N/A
		+65	351 to 400	N/A

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 11 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	NUSO	SC/T-1 **IF** Reactor Zone or Refuel Zone Ventilation Exhaust Radiation Level is below 72 mr/hr **THEN** operate available Reactor Zone or Refuel Zone Ventilation  SC-3 (3) ISOLATE all systems that are discharging into the area EXCEPT systems required: • For damage control OR • To be operated by EOIs NOTE (3) Tables SC-1 and SC-2 contain information that may be used to determine if a primary system is discharging into Secondary Containment (Emergency Depressurization will reduce discharge).
	NRC	**When the RWCU Leak has been isolated and Area Temperature and Radiation is below the Maximum Safe value, the NUSO may contact the Shift Manager and recommend exiting 3-EOI-3, Secondary Containment Control, as an emergency no longer exists.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 4 Page 12 of 12

Event Description: Reactor Water Cleanup (RWCU) Leak / One PCIV Fails to Close

Time	Position	Applicant's Actions or Behavior
	Driver	**If contacted as the Shift Manager by the NUSO to discuss exiting 3-EOI-3, Secondary Containment Control, agree with any recommendation given.**
	NRC	**End of Event 4. Request that the Driver insert Event 5, Core Spray Loop I Room Cooler EECW Leak.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 5 Page 1 of 2

Event Description: Core Spray Loop I Room Cooler EECW Leak

Time	Position	Applicant's Actions or Behavior	
	Driver	**When requested by the Chief Examiner, insert Event 5, Core Spray Loop I Room Cooler EECW Leak. Contact the NUSO as the Reactor Building Assistant Unit Operator (AUO) and report that you discovered and isolated a water leak in the Core Spray Loop 1 Room Cooler. Report that the following valves were closed to isolate the leak:** • **3-SHV-67-550, NW Core Spray Room Cooler Supply Shutoff** • **3-SHV-67-553, NW Core Spray Room Cooler Outlet** **If asked, the water appears to have stopped leaking.**	
	Driver	**If contacted as Work Control or Mechanical Maintenance, acknowledge any direction concerning the Core Spray Loop I Room Cooler.**	
	NUSO	Technical Requirements Manual 3.5.3, Equipment Area Coolers LCO 3.5.3 The Equipment Area Cooler associated with each RHR Pump and the Equipment Area Cooler associated with each set of Core Spray Pumps (A and C or B and D) must be OPERABLE at all times when the pump or pumps served by that specific cooler is considered to be OPERABLE. APPLICABILITY: Whenever the associated subsystem is required to be OPERABLE **CONDITION:** A. – One or more Equipment Area Cooler inoperable	
	NUSO	**REQUIRED ACTION:** A.1 – Declare the pump(s) served by that cooler INOPERABLE (Refer to applicable Tech Spec and TRM LCOs)	**COMPLETION TIME:** A.1 – Immediately

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 5 Page 2 of 2

Event Description: Core Spray Loop I Room Cooler EECW Leak

Time	Position	Applicant's Actions or Behavior	
	NUSO	Technical Specification 3.5.1, ECCS – Operating LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of six safety/relief valves shall be OPERABLE APPLICABILITY: MODE 1, MODES 2 and 3, except High Pressure Coolant Injection (HPCI) and ADS valves are not required to be OPERABLE with Reactor Steam Dome Pressure ≤150 psig **CONDITION:** A. – One low pressure ECCS injection/spray subsystem inoperable. OR One low pressure coolant injection (LPCI) pump in both LPCI subsystems inoperable.	
	NUSO	**REQUIRED ACTION:** See Condition F	**COMPLETION TIME:** See Condition F
	NUSO	**CONDITION:** F. – One ADS Valve inoperable AND Condition A entered	
	NUSO	**REQUIRED ACTION:** F.1 – Restore ADS Valve to OPERABLE status OR F.2 – Restore Low Pressure ECCS Injection / Spray subsystem to OPERABLE status	**COMPLETION TIME:** F.1 – 72 hours F.2 – 72 hours
	NRC	**End of Event 5. Request that the Driver insert Event 6, 3C 4KV Unit Board Trip.**	

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 6 Page 1 of 3

Event Description: 3C 4KV Unit Board Trip

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 6, 3C 4KV Unit Board Trip.**
	BOP	Acknowledges and reports the following alarms: • 4KV UNIT BOARD 3C UNDERVOLTAGE, 3-9-8B, Window 14 • CONDENSATE BOOSTER PUMP C AUX OIL PRESSURE LOW, 3-9-6A, Window 14 • MOTOR TRIPOUT, 3-9-8C, Window 33
	CREW	Monitors Reactor Water Level.
	OATC	Reports a loss of Control Rod Drive (CRD) System Flow due to 3A CRD Pump being de-energized.
	NUSO	Directs the BOP to respond in accordance with applicable Alarm Response Procedures and direct the OATC to respond in accordance with 3-AOI-85-3, CRD System Failure.
	OATC	3-AOI-85-3, CRD System Failure Immediate Actions [1] **IF** operating CRD PUMP has failed **AND** the standby CRD Pump is available, **THEN PERFORM** the following at Panel 3-9-5: (Otherwise N/A) [1.1] **PLACE** 3-FIC-85-11, CRD SYSTEM FLOW CONTROL in MAN at minimum setting. [1.2] **START** associated standby CRD Pump using the following: • 3-HS-85-2A, CRD PUMP 3B [1.3] **ADJUST** 3-FIC-85-11, CRD SYSTEM FLOW CONTROL, to establish the following conditions: • 3-PDI-85-18A, CRD COOLING WATER HEADER DP, between 10 psid and 20 psid • 3-FIC-85-11, CRD SYSTEM FLOW CONTROL, between 40 and 65 gpm [1.4] **BALANCE** CRD SYSTEM FLOW CONTROL, 3-FIC-85-11, and **PLACE** in AUTO or BALANCE.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 6 Page 2 of 3

Event Description: 3C 4KV Unit Board Trip

Time	Position	Applicant's Actions or Behavior
	BOP	3-ARP-9-8B, Alarm Response Procedure 4KV UNIT BOARD 3C UNDERVOLTAGE, Window 14 Operator Action: A. **CHECK** Unit in stable condition by checking: • Condensate Pump 3C • Condensate Booster Pump 3C • RCW Pump 3C • CCW Pump 3C • CRD Pump 3A B. **IF** undervoltage has occurred, **THEN** 1. **CLEAR** disagreement lights on breakers. 2. **REDUCE** load as necessary to maintain stable operating conditions. 3. Condenser discharge may need to be throttled for two CCW pump operation. **REFER TO** 3-OI-27, Condenser Circulating Water System. C. **CHECK** Unit Bd 3C for abnormal conditions: relay targets, smoke, burned paint, etc. D. **REFER TO** 0-OI-57A, Switchyard and 4160V AC Electrical System, to re-energize board. E. **REFER TO** appropriate OI for recovery or realignment of equipment.
	Driver	**If contacted as an AUO, Work Control, or Electrical Maintenance to investigate, acknowledge the direction. If directed to prepare protected equipment tags acknowledge the direction.** **Wait 2 minutes and report that 3C 4KV Unit Board has an overcurrent trip flag.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 6 Page 3 of 3

Event Description: 3C 4KV Unit Board Trip

Time	Position	Applicant's Actions or Behavior
	BOP	3-ARP-9-8C, Alarm Response Procedure MOTOR TRIPOUT, Window 33 Operator Action: A. **CHECK** Control Room for white disagreement light illuminated for affected equipment. B. **CLEAR** disagreement light. C. **DISPATCH** personnel to CHECK: 1. Relays at associated electrical board. 2. Equipment for abnormal conditions. 3. Safe-stop locally reset, if necessary. D. **REFER TO** 0-GOI-300-2, Electrical, if relay targets are present or for motor starting limits. E. **REFER TO** appropriate OI for recovery or realignment of equipment.
	BOP	3-ARP-9-6A, Alarm Response Procedure CONDENSATE BOOSTER PUMP C AUX OIL PUMP PRESS LOW, Window 14 Operator Action: A. **DISPATCH** personnel to check booster pump lube oil system: 1. **ENSURE** running or start Aux Oil Pump. 2. **CHECK** for leaks. 3. **CHECK** oil level and temperature at reservoir. 4. **ROTATE** Cuno Filter.
	Driver	**If contacted as the Turbine Building AUO to start 3C Condensate Booster Pump Aux Oil Pump, insert Event 16 and report that the Aux Oil Pump is running.**
	NRC	**End of Event 6. Request that the Driver insert Event 7 Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 1 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 7, Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak.**
	NRC	**Event 8, Fuel Damage, and Event 9, Reactor Feedwater Pumps Trip / HPCI Fails to Automatically Start and Inject, are automatically entered by the simulator setup. No action is required by the Driver to Insert Event 8 or Event 9. See page 43 of 57 for Event 8 actions and page 50 of 57 for Event 9 actions.**
	BOP	Acknowledges and reports the following alarms as they are received: • REACTOR BUILDING RADIATION HIGH, 3-9-3A, Window 22 • REACTOR BUILDING, TURBINE BUILDING, REFUEL ZONE EXHAUST RADIATION HIGH, 3-9-3A, Window 4 • RCIC STEAM LINE LEAK DETECTION TEMPERATURE HIGH, 3-9-3D, Window 10
	NRC	**See Event 8 (page 43 of 57) for actions for Radiation Alarms.**
	NUSO	Directs the BOP to respond in accordance with the applicable Alarm Response Procedure.
	BOP	3-9-ARP-3D, Alarm Response Procedure RCIC STEAM LINE LEAK DETECTION TEMPERATURE HIGH, Window 10 Operator Action: A. **CHECK** RCIC temperature elements on LEAK DETECTION SYSTEM TEMPERATURE recorder, 3-TR-69-29 on Panel 3-9-21.
	BOP	Checks Area Temperatures on Panel 3-9-22.
	BOP	B. **IF** RCIC is **NOT** in service **AND** 3-FI-71-1A(B), RCIC STEAM FLOW indicates flow, **THEN ISOLATE** RCIC and **CHECK** temperatures lowering.
	BOP	Determines that RCIC failed to automatically isolate, and attempts to manually isolate RCIC. Informs the NUSO that RCIC will not isolate.
	BOP	C. **IF** high temperature is confirmed, **THEN ENTER** 3-EOI-3, Secondary Containment Control.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 2 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

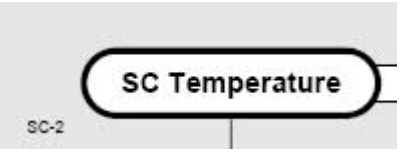
Time	Position	Applicant's Actions or Behavior
	BOP	Confirms that Area Temperatures are rising and informs the NUSO.
	NUSO	Enters 3-EOI-3, Secondary Containment Control. Directs the BOP to monitor Secondary Containment parameters.
	BOP	D. **CHECK** CS/RCIC ROOM El 519 RX BLDG radiation indicator, 3-RI-90-26A on Panel 3-9-11 and NOTIFY RADCON if rising radiation levels are observed. E. **DISPATCH** personnel to investigate.
	Driver	**If contacted as Radiation Protection that radiation levels are rising, acknowledge the report.** **If contacted as the Reactor Building AUO to investigate, acknowledge the direction.**
	NUSO	F. **REFER TO** Tech Specs 3.3.6.1, Primary Containment Isolation Instrumentation and 3.5.3, RCIC System.
	NRC	**Technical Specification evaluation for this event is not required and should not be used to evaluate the candidate's Technical Specification competency.**
		G. **EVALUATE** equipment associated with this alarm to determine compensatory actions required to maintain REP function. **REFER TO** NPG-SPP-18.3.5, Equipment Important to Emergency Response.
	NRC	**It is not expected that the SRO reference NPG-SPP-18.3.5, Equipment Important to Emergency Response, during this event.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 3 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	NUSO	3-EOI-3, Secondary Containment Control SC-1

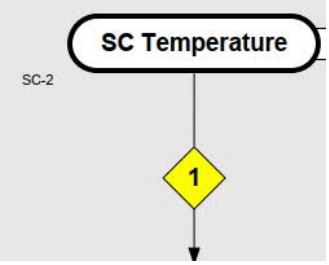
IF	THEN
Reactor Zone Ventilation Exhaust Radiation level is above 72 mR/hr	**NO ACTION REQUIRED**
Refuel Zone Ventilation Exhaust Radiation level is above 72 mR/hr	**NO ACTION REQUIRED**
Reactor Zone Ventilation is isolated AND Reactor Zone Ventilation Exhaust Radiation level is below 72 mR/hr	**NO ACTION REQUIRED**
Refuel Zone Ventilation is isolated AND Refuel Zone Ventilation Exhaust Radiation level is below 72 mR/hr	**NO ACTION REQUIRED**



Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 4 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	NUSO	



1

- An RPV water lvl instrument may be used to determine or trend lvl only when it reads above the Minimum Indicated Lvl associated with the highest max DW or SC run temp
- If DW temps or SC area temps (Table 6), as applicable, are outside the safe region of Curve 8, the associated instrument may be unreliable due to boiling in the run

INSTRUMENT	RANGE	MINIMUM INDICATED LVL	MAX DW RUN TEMP (FROM XR-64-50 OR TI-64-52AB)	MAX SC RUN TEMP (FROM TABLE 6)
LI-3-58A/B	Emergency -155 to +60	on scale	N/A	below 100
		-150	N/A	101 to 150
		-145	N/A	151 to 200
		-140	N/A	201 to 250
		-130	N/A	251 to 300
		-120	N/A	301 to 350
LI-3-53 LI-3-60 LI-3-206 LI-3-253 LI-3-208A, B, C, D	Normal 0 to +60	on scale	N/A	below 150
		+5	N/A	151 to 200
		+15	N/A	201 to 250
		+20	N/A	251 to 300
		+30	N/A	301 to 350
LI-3-52 LI-3-62A	Post Accident -268 to +32	on scale	N/A	N/A
LI-3-55	Shutdown Floodup 0 to +500	+10	Below 100	N/A
		+15	100 to 150	N/A
		+20	151 to 200	N/A
		+30	201 to 250	N/A
		+40	251 to 300	N/A
		+50	301 to 350	N/A
		+65	351 to 400	N/A

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 5 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	NUSO	SC/T-1

IF	Reactor Zone or Refuel Zone Ventilation Exhaust Radiation level is below 72 mR/hr
THEN	Operate available Reactor Zone or Refuel Zone Ventilation

SC/T-2

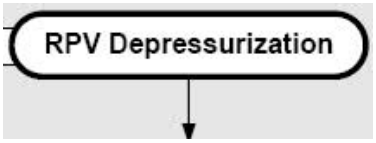
WHEN
ANY Area Temperature exceeds its Max Normal Temperature (Table SC-1)

Table SC-1
Secondary Cntmt Area Temp

Area	Panel 9-3 Alarm Window (unless noted)	Panel 9-22 Temp Element (unless noted)	Max Normal Value °F	Max Safe Value °F	Potential Isolation Sources
RHR sys I pumps	XA-55-3E-4	74-95A	Alarmed	150	FCV-74-47, 48
RHR sys II pumps	XA-55-3E-4	74-95B	Alarmed	210	FCV-74-47, 48
HPCI room	XA-55-3F-10	73-55A	Alarmed	270	FCV-73-2, 3, 44, 81
CS sys I pumps RCIC room	XA-55-3D-10	71-41A	Alarmed	190	FCV-71-2, 3, 39
Top of torus	XA-55-3D-10 XA-55-3F-10 XA-55-3E-4	71-41B, C, D 73-55B, C, D 74-95G, H	Alarmed Alarmed Alarmed	200 240 240	FCV-71, 2, 3 FCV-73-2, 3, 81 FCV-74-47, 48
Steam tunnel (RB)	XA-55-3D-24	1-60A (Panel 9-3)	Alarmed	315	MSIVs FCV-71-2, 3, FCV-69-1, 2, 12
DW access	XA-55-3E-4	74-95E	Alarmed	170	FCV-74-47, 48
RB el 565 W (RWCU pipe trench)	XA-55-5B-32 (Panel 9-5) XA-55-5B-33 (Panel 9-5)	69-835A, B, C, D (Aux Inst room)	Alarmed	170	FCV-69-1, 2, 12
RWCU hx room	XA-55-3D-17	69-29F, G, H	Alarmed	220	FCV-69-1, 2, 12
RWCU pump A	XA-55-3D-17	69-29D	Alarmed	215	FCV-69-1, 2, 12
RWCU pump B	XA-55-3D-17	69-29E	Alarmed	215	FCV-69-1, 2, 12
RB el 593	XA-55-3E-4	74-95C, D	Alarmed	195	FCV-74-47, 48
RB el 621	XA-55-3E-4	74-95F	Alarmed	155	FCV-43-13, 14

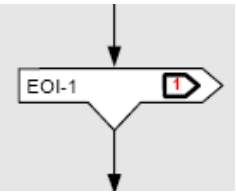
Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 6 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	NUSO	SC-3 ③ ISOLATE all systems that are discharging into the area EXCEPT systems required: • For damage control OR • To be operated by EOIs NOTE ③ Tables SC-1 and SC-2 contain information that may be used to determine if a primary system is discharging into Secondary Containment (Emergency Depressurization will reduce discharge). SC-4  SC-7 ③ **WHEN** A Primary System is discharging into Secondary Containment

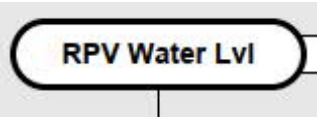
Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 7 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	NUSO	SC-8 **BEFORE** ANY Secondary Containment parameter reaches its Max Safe Value (Tables SC-1, SC-2, and SC-3) 
	CREW	**Critical Task:** **With the Reactor at power and with a Primary System discharging into the Secondary Containment, manually SCRAM the Reactor before any area exceeds the Maximum Safe Temperature operating value by entering EOI-1, RPV Control.** **Critical Task Failure Criteria:** **The operating crew fails to proceed without delay and in a controlled manner to initiate a Reactor SCRAM from the time it is announced that one Area Temperature is approaching the Maximum Safe value.**
	NUSO	Enters 3-EOI-1, RPV Control. Directs the crew to enter 3-AOI-100-1, Reactor SCRAM, and directs the OATC to insert a manual Reactor SCRAM.
	NRC	**Event 8, Fuel Damage, and Event 9, Reactor Feedwater Pumps Trip / HPCI Fails to Automatically Initiate, are inserted when the Reactor MODE SWITCH is placed in SHUTDOWN.**
	OATC	Inserts a manual Reactor SCRAM.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 8 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	OATC	3-AOI-100-1, Reactor SCRAM Immediate Actions [1] **DEPRESS** 3-HS-99-5A/S3A, REACTOR SCRAM A and 3-HS-99-5A/S3B, REACTOR SCRAM B, on Panel 3-9-5. [2] **PLACE** 3-HS-99-5A/S1, REACTOR MODE SWITCH, in SHUTDOWN. [3] **IF** all Control Rods can NOT be verified fully inserted, **THEN INITIATE** ARI. (Otherwise MARK N/A). [4] **IF** Reactor Power is 5% or BELOW, **THEN**: (Otherwise **MARK** N/A) **REPORT** the following to the UNIT SRO: • Reactor Scram • Mode Switch is in Shutdown • "All rods in" or "rods out " • Reactor Water Level and trend (recovering or lowering) • Reactor Pressure and trend • MSIV position (Open or Closed) • Power level [5] N/A
	OATC	Determines that all Reactor Feedwater Pumps (RFPTs) have tripped and informs the NUSO (See Event 9).
	NUSO	3-EOI-1, RPV Control  RC/L-1 **ENSURE** each as required: • PCIS isolations (Groups 1, 2, and 3) • ECCS • RCIC

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 9 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>NUSO</td><td>
RC/L-2
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>RPV Water Level can be restored and maintained above (-)162 in.
AND
The ADS timer has initiated</td><td>INHIBIT ADS</td></tr>
<tr><td>Loss of available injection systems is anticipated
OR
Raising RPV Water Level above (+)51 in. will facilitate use of shutdown cooling, steam-driven injection systems, or Alternate Injection Subsystems (Table L-2)</td><td>NO ACTION REQUIRED</td></tr>
</table>
RC/L-3
<table>
<tr><td colspan="2">RESTORE and MAINTAIN RPV Water Level between (+)2 in. and (+)51 in. with ANY Preferred Injection Systems (Table L-1)</td></tr>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>RPV Water Level cannot be restored and maintained between (+)2 in. and (+)51 in.</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>RPV Water Level cannot be restored and maintained above (-)162 in.</td><td>NO ACTION REQUIRED</td></tr>
</table>
</td></tr>
</table>

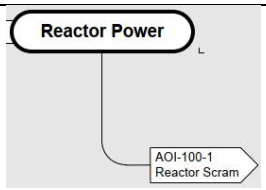
Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 10 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

Time	Position	Applicant's Actions or Behavior
	NUSO	Directs the OATC/BOP to maintain Reactor Water Level using HPCI in accordance with 3-EOI-Appendix-5D, Injection System Lineup HPCI.
	NRC	**3- EOI-Appendix-5D, Injection System Lineup HPCI actions are covered in Event 9. See page 50 of 57.**
	NUSO	Table L-1 Preferred Injection Systems SOURCES / APPX / INJ PRESS CNDS and FW — 5A — 1210 psig CRD — 5B — 1640 psig RCIC with CST suction if available (2)(3)(6) — 5C, 20M — 1200 psig HPCI with CST suction if available (2)(6)(7) — 5D, 20N — 1200 psig CNDS — 6A — 480 psig CS (2) — 6D, 6E — 330 psig LPCI (2) — 6B, 6C — 320 psig
	NUSO	RPV Press RC/P-1 IF: A high Drywell Pressure ECCS signal exists (2.45 psig) — THEN: NO ACTION REQUIRED IF: EMERGENCY RPV DEPRESSURIZATION is REQUIRED or has been required — THEN: (2) C2 Emergency RPV Depressurization IF: Emergency RPV Depressurization is anticipated — THEN: NO ACTION REQUIRED RC-P/2 **IF** ANY MSRV is cycling **THEN** NO ACTION REQUIRED

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 7 Page 11 of 11

Event Description: Un-isolable Reactor Core Isolation Cooling (RCIC) Steam Leak

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>NUSO</td><td>
RC/P-3
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Suppression Pool Temperature and Level CANNOT be maintained in a safe area of Curve 3 at the existing RPV Pressure</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Suppression Pool Level CANNOT be maintained in the safe area of Curve 4</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>STEAM COOLING IS REQUIRED</td><td>NO ACTION REQUIRED</td></tr>
</table>
RC/P-4
<table>
<tr><td colspan="2">STABILIZE RPV Pressure below 1073 psig using the Main Turbine Bypass Valves (APPX 8B)
➢ OK to use ANY Alternate RPV Pressure Control Systems (Table P-1)
➢ Crosstie CAD or MSRV carts to DW Control Air (APPX 8G, 20H) if necessary</td></tr>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>DW Control Air is or becomes unavailable</td><td>NO ACTION REQUIRED</td></tr>
</table>
</td></tr>
<tr><td></td><td>NUSO</td><td>Directs the BOP to maintain Reactor Pressure using the Main Turbine Bypass Valves.</td></tr>
<tr><td></td><td>NUSO</td><td> 
</td></tr>
<tr><td></td><td>NRC</td><td>End of Event 7. Continue to Event 8.</td></tr>
</table>

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 1 of 7

Event Description: Fuel Damage

Time	Position	Applicant's Actions or Behavior
	NRC	**Event 8, Fuel Damage, is inserted when the Reactor MODE SWITCH is placed in SHUTDOWN. No action is required by the driver to insert Event 8.**
	BOP	Acknowledges and reports the following alarms to the NUSO as they are received: • REACTOR BUILDING RADIATION HIGH, 3-9-3A, Window 22 • REACTOR BUILDING, TURBINE BUILDING, REFUEL ZONE EXHAUST RADIATION HIGH, 3-9-3A, Window 4
	BOP	3-ARP-9-3A, Alarm Response Procedure REACTOR BUILDING RADIATION HIGH, Window 22 Operator Action: A. **DETERMINE** area with high radiation level on Panel 3-9-11. (Alarm on Panel 3-9-11 will automatically reset if radiation level lowers below setpoint.)
	BOP	Monitors Radiation Levels on Panel 3-9-11. Keeps the NUSO informed on instruments which are alarming and which are approaching Maximum Safe Values.
	BOP	B. N/A C. **NOTIFY** Radiation Protection.
	Driver	**If contacted as Radiation Protection, acknowledge any reports or direction given.**
	BOP	D. **IF** the TSC is **NOT** manned and a "VALID" radiological condition exists., **THEN USE** public address system to evacuate area where high radiological conditions exist E. N/A
	BOP	Makes a plant announcement to evacuate the Reactor Building due to high radiation.
	BOP	F. **MONITOR** other parameters providing input to this annunciator frequently as these parameters will be masked from alarming while this alarm is sealed in.

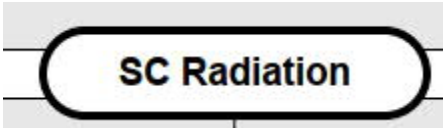
Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 2 of 7

Event Description: Fuel Damage

Time	Position	Applicant's Actions or Behavior
	BOP	G. **IF** a CREV initiation is received, **THEN** 1. **CHECK** CREV A(B) Flow is ≥ 2700 CFM, and ≤ 3300 CFM as indicated on 0-FI-031-7214(7213) within 5 hours of the CREV initiation. 2. **IF** CREV A(B) Flow is NOT ≥2700 CFM, and ≤ 3300 CFM as indicated on 0-FI-031-7214(7213), **THEN PERFORM** the following: (Otherwise N/A) a. **STOP** the operating CREV per 0-OI-31, Control Bay and Off-Gas Treatment Building Air Conditioning System. b. **START** the standby CREV per 0-OI-31, Control Bay and Off-Gas Treatment Building Air Conditioning System.
	Driver	**If contacted as an AUO to monitor CREV operation, acknowledge the direction.**
	BOP	H. N/A I. **ENTER** 3-EOI-3, Secondary Containment Control.
	NUSO	Re-enters 3-EOI-3, Secondary Containment Control (if not already entered on Secondary Containment Radiation).
	BOP	K. **EVALUATE** equipment associated with this alarm to determine compensatory actions required to maintain REP function. **REFER TO** NPG-SPP-18.3.5, Equipment Important to Emergency Response.
	NRC	**It is not expected that the SRO reference NPG-SPP-18.3.5, Equipment Important to Emergency Response, during this event.**

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 3 of 7

Event Description: Fuel Damage

Time	Position	Applicant's Actions or Behavior
	NUSO	

SC/R-1

WHEN

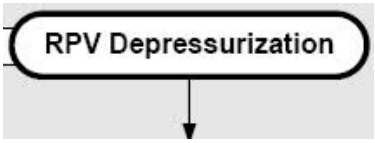
ANY Area Radiation Level exceeds its Max Normal Radiation Level (Table SC-2)

Table SC-2
Secondary Cntmt Area Radiation

Area	Applicable Radiation Indicators	Max Normal Value mR/hr	Max Safe Value mR/hr	Potential Isolation Sources
RHR sys I pumps	90-25A	Alarmed	1000	FCV-74-47, 48
RHR sys II pumps	90-28A	Alarmed	1000	FCV-74-47, 48
HPCI room	90-24A	Alarmed	1000	FCV-73-2, 3, 44, 81
CS sys I pumps RCIC room	90-26A	Alarmed	1000	FCV-71-2, 3, 39
CS sys II pumps	90-27A	Alarmed	1000	None
Top of torus General area	90-29A	Alarmed	1000	FCV-73-2, 3, 81 FCV-74-47, 48 FCV-71-2, 3
RB el 565 W	90-20A	Alarmed	1000	FCV-69-1, 2, 12 SDV vents & drains
RB el 565 E	90-21A	Alarmed	1000	SDV vents & drains
RB el 565 NE	90-23A	Alarmed	1000	None
TIP room	90-22A	Alarmed	100,000	TIP ball valve
RB el 593	90-13A, 14A	Alarmed	1000	FCV-74-47, 48
RB el 621	90-9A	Alarmed	1000	FCV-43-13, 14
Recirc MG sets	90-4A	Alarmed	1000	None
Refuel floor	90-1A, 2A 3A	Alarmed	1000	None

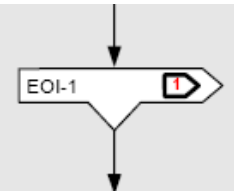
Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 4 of 7

Event Description: Fuel Damage

Time	Position	Applicant's Actions or Behavior
	NUSO	SC-3 (3) ISOLATE all systems that are discharging into the area EXCEPT systems required: • For damage control OR • To be operated by EOIs NOTE (3) Tables SC-1 and SC-2 contain information that may be used to determine if a primary system is discharging into Secondary Containment (Emergency Depressurization will reduce discharge). SC-4  SC-7 (3) **WHEN** A Primary System is discharging into Secondary Containment

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 5 of 7

Event Description: Fuel Damage

Time	Position	Applicant's Actions or Behavior
	NUSO	SC-8 **BEFORE** ANY Secondary Containment parameter reaches its Max Safe Value (Tables SC-1, SC-2, and SC-3) 
	BOP	Monitors Area Radiation levels and informs the NUSO when two areas are at Maximum Safe.
	NUSO	SC-9 **WHEN** Any Secondary Containment parameter exceeds its Max Safe value in two (2) or more areas for the same parameter (Tables SC-1, SC-2, SC-3) SC-10 **EMERGENCY DEPRESSURIZATION IS REQUIRED**
	NUSO	Updates the crew that Emergency Depressurization is required. Enters 3-C-2, Emergency RPV Depressurization.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 6 of 7

Event Description: Fuel Damage

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>Crew</td><td>Critical Task:
With a Primary System discharging into the Secondary Containment when two or more areas are greater than their maximum safe operating values for the same parameter, the Balance of Plant Operator initiates Emergency Depressurization as directed by the Nuclear Unit Senior Operator.

Critical Task Failure Criteria:
The operating crew fails to proceed with without delay and in a controlled manner to initiate Emergency Depressurization when two Area Radiation Levels exceed Maximum Safe value.</td></tr>
<tr><td></td><td>NUSO</td><td>3-C-2, Emergency RPV Depressurization
C2-1
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Reactor Water Level CANNOT be determined</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>It is anticipated that Reactor depressurization will result in loss of injection required for Adequate Core Cooling</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Containment Water Level CANNOT be maintained below 44 feet</td><td>NO ACTION REQUIRED</td></tr>
</table></td></tr>
<tr><td></td><td>NUSO</td><td>C2-2
<table>
<tr><td>IF Drywell Pressure is above 2.45 PSIG
THEN PREVENT injection from ONLY those Core Spray and LPCI pumps NOT required to assure Adequate Core Cooling (Appendix 4)</td></tr>
</table></td></tr>
</table>

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 8 Page 7 of 7

Event Description: Fuel Damage

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>NUSO</td><td>C2-3
EMERGENCY DEPRESSURIZE the Reactor

IF Suppression Pool Water Level is above 5.5 feet
THEN OPEN 6 MSRVs (ADS Valves preferred)
➢ OK to exceed 100ºF/hr cooldown rate
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Drywell Control Air is or becomes unavailable</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Less than 4 MSRVs can be opened
AND
Reactor Pressure is 80 PSIG or more above Suppression Chamber Pressure</td><td>NO ACTION REQUIRED</td></tr>
</table></td></tr>
<tr><td></td><td>BOP</td><td>Opens 5 SRVs and one additional SRV (due to ADS Valve 1-22 being out of service).</td></tr>
<tr><td></td><td>NUSO</td><td>C2-4
WHEN
Shutdown Cooling RPV Pressure interlock clears AND further cooldown is required</td></tr>
<tr><td></td><td>NRC</td><td>End of Event 8. When the crew has Emergency Depressurized the Reactor and has control of Reactor Water Level above the Top of Active Fuel ((-) 162 inches) using low pressure systems, end of Scenario.</td></tr>
</table>

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 9 Page 1 of 3

Event Description: Reactor Feedwater Pumps (RFPTs) Trip / HPCI Fails to Automatically Start and Inject

Time	Position	Applicant's Actions or Behavior
	NRC	**Event 9, Reactor Feedwater Pumps Trip / HPCI Fails to Automatically Start and Inject, is inserted when the Reactor MODE SWITCH is placed in SHUTDOWN. No action is required by the Driver to insert Event 9.**
	OATC	Reports that all Reactor Feedwater Pumps (RFPTs) have tripped.
	BOP	When Reactor Water Level reaches the High Pressure Coolant Injection (HPCI) initiation setpoint (-45"), determines that HPCI did not automatically start and manually starts HPCI. Informs the NUSO of the actions required to start HPCI.
	NUSO	Directs the OATC/BOP to maintain Reactor Water Level using 3-EOI-Appendix-5D, Injection System Lineup HPCI.
	BOP	3-EOI-Appendix-5D, Injection System Lineup HPCI [1] **IF** Suppression Pool level drops below 12.75 ft. during HPCI operation, **THEN** TRIP HPCI and CONTROL injection using other options. [2] **IF** Suppression Pool level CANNOT be maintained below 5.25 in, **THEN EXECUTE** EOI Appendix 16E concurrently with this procedure to bypass HPCI High Suppression Pool Water Level Suction Transfer Interlock. [3] **IF** BOTH of the following exist: • High temperature exists in the HPCI area, AND • SRO directs bypass of HPCI High Temperature Isolation Interlocks, **THEN PERFORM** the following: [3.1] **EXECUTE** EOI Appendix 16L, Bypassing HPCI High Temperature Isolation concurrently with this procedure. [3.2] **RESET** auto isolation logic using HPCI AUTO-ISOL LOGIC A (B) RESET pushbuttons. [4] **VERIFY** at least one SGTS train in operation.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 9 Page 2 of 3

Event Description: Reactor Feedwater Pumps (RFPTs) Trip / HPCI Fails to Automatically Start and Inject

Time	Position	Applicant's Actions or Behavior
	BOP	**CAUTIONS** 1) Operating HPCI Turbine below 2400 rpm may result in unstable system operation and equipment damage. 2) Operating HPCI Turbine with suction temperatures above 140□F may result in equipment damage. [5] **VERIFY** 3-FIC-73-33, HPCI SYSTEM FLOW/CONTROL, controller is in one of the following configurations, as desired: • in AUTO and set for 5300 gpm for rapid injection • in AUTO and set for approximately 2500 gpm for slower injection • in MANUAL with output at approximately 50% for slower injection **NOTE** HPCI Auxiliary Oil Pump will NOT start UNTIL 3-FCV-73-16, HPCI TURBINE STEAM SUPPLY VALVE, starts to open. [6] **IF** high Reactor Water Level Trip logic is actuated, THEN [6.1] **DEPRESS** HPCI TURBINE TRIP RX LVL HIGH RESET pushbutton. [6.2] **CHECK** HPCI TURBINE TRIP LVL HIGH amber light has extinguished. [7] **PLACE** HPCI AUXILIARY OIL PUMP handswitch in START. [8] **PLACE** HPCI STEAM PACKING EXHAUSTER handswitch in START. [9] **OPEN** 3-FCV-73-30, HPCI PUMP MIN FLOW VALVE. [10] **OPEN** 3-FCV-73-44, HPCI PUMP INJECTION VALVE. [11] **OPEN** 3-FCV-73-16, HPCI TURBINE STEAM SUPPLY VALVE, to start HPCI Turbine.

Op Test No.: 21-04 Scenario No. NRC-1 Event No.: 9 Page 3 of 3

Event Description: Reactor Feedwater Pumps (RFPTs) Trip / HPCI Fails to Automatically Start and Inject

Time	Position	Applicant's Actions or Behavior
	BOP	[12] **CHECK** proper HPCI operation by observing the following: A. HPCI Turbine speed accelerates. B. 3-CKV-73-45, HPCI SYSTEM CHECK VALVE, opens by observing 3-ZI-73-45A, DISC POSITION, red light illuminated. C. HPCI flow to RPV stabilizes and is controlled automatically at the setpoint. (N/A if controller in manual). D. 3-FCV-73-30, HPCI PUMP MIN FLOW VALVE, closes as flow exceeds approximately 1200 gpm. **CAUTION** 3-FCV-073-0030, HPCI PUMP MIN FLOW VALVE, automatically opens when system flow is at or below 900 gpm (lowering) only if a system initiation signal is present. Manually opening the min flow valve may be required for pump min flow protection. [13] **ADJUST** 3-FIC-73-33, HPCI SYSTEM FLOW/CONTROL, controller as necessary to control injection. [14] **VERIFY** HPCI Auxiliary Oil Pump stops and the shaft-driven oil pump operates properly. [15] **WHEN** HPCI Auxiliary Oil Pump stops, **THEN PLACE** HPCI AUXILIARY OIL PUMP handswitch in AUTO. [16] N/A [17] N/A
	NRC	**End of Event 9. When the crew has Emergency Depressurized the Reactor and has control of Reactor Water Level above the Top of Active Fuel ((-) 162 inches) using low pressure systems, end of Scenario.**

Scenario Setup
UNIT 3

IC	54
Exam IC	251

Procedure	Revision	Procedure	Revision	Procedure	Revision
OI-68	99	EOI-3	12	ARP 6A	27
OI-69	109	3-C-2	13	ARP 8B	24
GOI-12	49	APPX 5D	8	ARP 8C	20
GOI-12A	72	ARP 3A	57	TRM 3.4.1	21
AOI-64-2A	12	ARP 3D	32	TS 3.5.1	229
AOI-85-3	13	ARP 4B	53	TS 3.5.3	244
AOI-100-1	74	ARP 4C	42	TS 3.6.1.3	212
EOI-1	13	ARP 5B	32		

Simulator Setup	• Verify camera system is powered down (admin password = abcd1234) • Start CPERF **PRIOR** to placing the Simulator in RUN • Ensure Danger Tags are placed on SRV 1-22 and the Emergency High Pressure Makeup Pump
Schedule Files(s):	2104 NRC Scenario 1 UNIT 3.sch RWCU.sch
Event Files(s):	2104 NRC Scenario 1 UNIT 3.evt

Schedule File: 2104 NRC Scenario 1 UNIT 3.sch

Event	Action	Description
	2104 NRC Scenario 1 Unit 3.evt	Event File
1	Insert remote CU01 to 45.00000 in 60	RWCU DEMIN FILTER A FRC-69-35
1	Insert remote CU02 to 45.00000 in 60	RWCU DEMIN FILTER B FRC-69-60
1	Insert remote AN01E after 15 to RESET	CU LOCAL RESET (3-XA-55-4B W24)
11	Insert remote CU05 to MANUAL	RWCU HX RBCCW FLOW CONTROL TIC-69-10A
21	Insert remote CU05 to AUTO	RWCU HX RBCCW FLOW CONTROL TIC-69-10A

Schedule File: 2104 NRC Scenario 1 UNIT 3.sch

Event	Action	Description
3	Insert malfunction XA-55-4C_13 to ON	RBCCW SURGE TANK LEVEL LOW 3-LA-70-2B
13	Insert malfunction XA-55-4C_13 after 10 to NORMAL delete in 1	RBCCW SURGE TANK LEVEL LOW 3-LA-70-2B
4	Schedule F:\Scenarios\Scenario 1\RWCU.sch	RWCU Leak
6	Insert malfunction ED08C	4KV UNIT BOARD 3C FAILURE (RELAY 86-316 AND 86-532)
16	Insert remote FW06 to START	CONDENSATE BOOSTER PUMP C AUX OIL PUMP
16	Insert remote AN01D to RESET in 5 on	FW LOCAL RESET 121 (3-XA-55-6B W6)
7	Insert malfunction RC09 to 35.00000 in 1800	RCIC STEAM LEAK INTO RCIC ROOM
	Insert malfunction FCV-71-2 to FAIL_NOW	MOTOR_OPERATED_VALVE RCIC STEAM LINE INBD ISOL VALVE
	Insert override ZLOHS712A_1 to Off	HS-71-2A RCIC STEAM LINE INBD ISOL VALVE
	Insert override ZLOHS712A_2 to On	HS-71-2A RCIC STEAM LINE INBD ISOL VALVE
17	Delete override ZLOHS712A_2	HS-71-2A RCIC STEAM LINE INBD ISOL VALVE
	Insert malfunction FCV-71-3 to FAIL_NOW	MOTOR_OPERATED_VALVE RCIC STEAM LINE OUTBD ISOL VALVE
	Insert override ZLOHS713A_1 to Off	HS-71-3A RCIC STEAM LINE OUTBD ISOL VALVE
	Insert override ZLOHS713A_2 to On	HS-71-3A RCIC STEAM LINE OUTBD ISOL VALVE
8	Insert malfunction TH23 to 10.00000 in 900	FUEL CLADDING DAMAGE

Schedule File: 2104 NRC Scenario 1 UNIT 3.sch

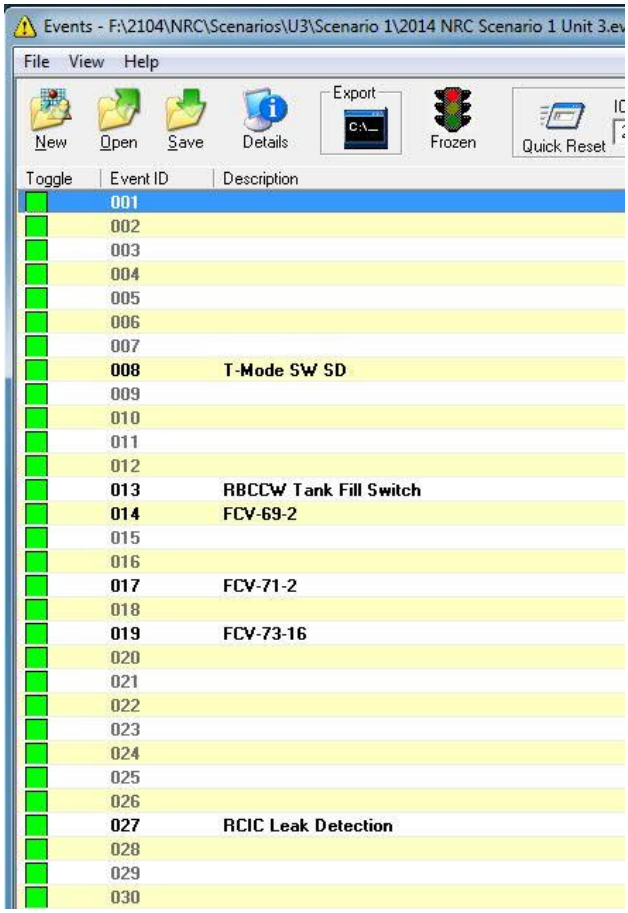
Event	Action	Description
8	Insert malfunction FW14A	RFPT 3A TRIP ON RFPT 3A BEARING LOW OIL PRESSURE (PS-3-123B)
8	Insert malfunction FW14B	RFPT 3B TRIP ON RFPT 3B BEARING LOW OIL PRESSURE (PS-3-149B)
8	Insert malfunction FW14C	RFPT 3C TRIP ON RFPT 3C BEARING LOW OIL PRESSURE (PS-3-174B)
	Insert malfunction FCV-73-16 to FAIL_NOW	MOTOR_OPERATED_VALVE HPCI TURBINE STEAM SUPPLY VALVE
	Insert override ZLOHS7316A_1 to On	HS-73-16A HPCI TURBINE STEAM SUPPLY VALVE
19	Delete malfunction FCV-73-16	MOTOR_OPERATED_VALVE HPCI TURBINE STEAM SUPPLY VALVE
19	Delete override ZLOHS7316A_1	HS-73-16A HPCI TURBINE STEAM SUPPLY VALVE
27	Insert malfunction RC09 to 18.00000 in 1800 on event 27	RCIC STEAM LEAK INTO RCIC ROOM
28	Insert malfunction RC09 to 100.00000 in 1800 on event 8	RCIC STEAM LEAK INTO RCIC ROOM

Schedule File: RWCU.sch

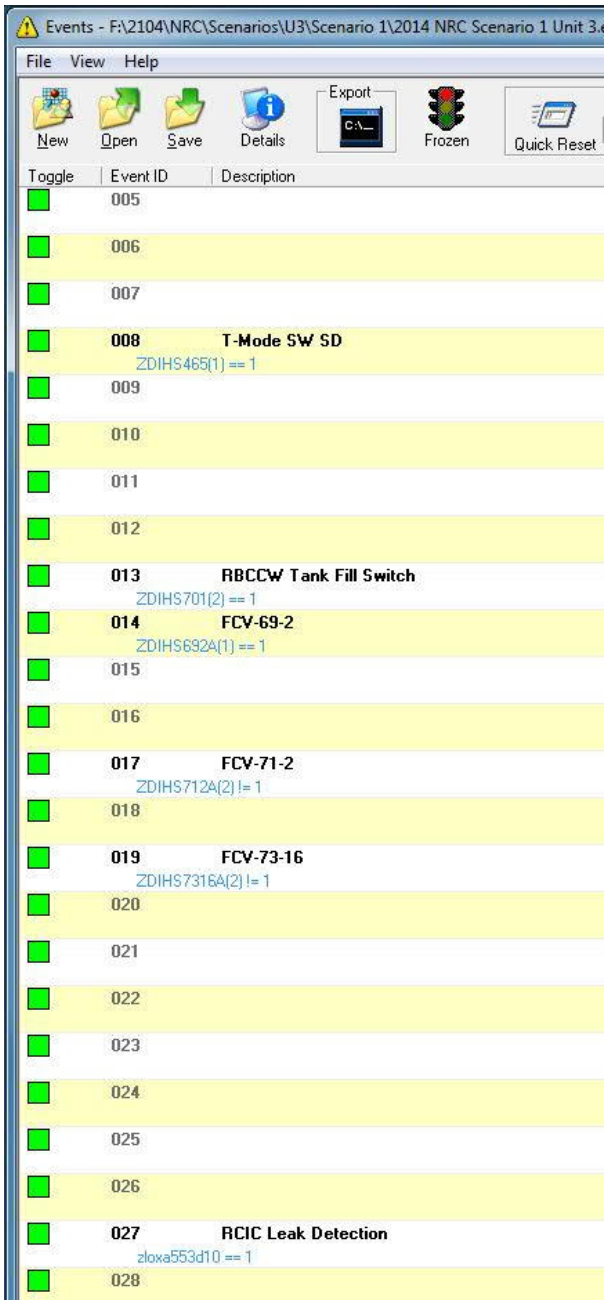
Event	Action	Description
	Insert malfunction CU04 to 25.00000	RWCU SYSTEM SUCTION BREAK
	Insert malfunction FCV-69-2 to FAIL_NOW	MOTOR_OPERATED_VALVE RWCU OUTBOARD ISOLATION VLV
	Insert override ZLOHS692A_1 to Off	HS-69-2A RWCU OUTBD SUCT ISOLATION VALVE
	Insert override ZLOHS692A_2 to On	HS-69-2A RWCU OUTBD SUCT ISOLATION VALVE
14	Delete malfunction FCV-69-2	MOTOR_OPERATED_VALVE RWCU OUTBOARD ISOLATION VALVE
14	Delete override ZLOHS692A_1	HS-69-2A RWCU OUTBD SUCT ISOLATION VALVE
14	Delete override ZLOHS692A_2	HS-69-2A RWCU OUTBD SUCT ISOLATION VALVE

Event File

List



Details



UNIT 3 SHIFT TURNOVER MEETING			Today
MODE 1	**DAYS ON LINE** **234**	**Drywell Leakage (GPM)** **1.81**	**Protected Equipment** **None**
	PRA (EOOS) -Green 500Kv GRID - Qualified 161Kv Grid -Qualified		
Rx Power **80.0%**		**Floor Drain (GPM)** **0.27**	
MWe **1012**	**Last breaker closure** **3/15/19 5:41**	**Equipment Drain (GPM)** **1.54**	

☐Review logs ☐Qualifications ☐Review RCP/Rx Brief ☐Review LCO/OWA Actions ☐Walkdown Panels/Verify EOOS
☐CR Reviews Complete ☐Leadership and Team Effectiveness

CHANGES IN LCOs

SRV 1-22 is INOPERABLE – ADS Valve. Tech Spec 3.5.1.E, Condition E (Day 4 of 14 day LCO)

LCOs OF 72 HOURS OR LESS

SIGNIFICANT ITEMS DURING PREVIOUS SHIFT/RADIOLOGICAL CHANGES

Reactor Shutdown. Maintain RFPTs, Condensate, and Condensate Booster Pumps running until Reactor Power is <70%

EHPM tagged for bearing inspection.

RWCU Non-Regenerative Heat Exchanger repairs completed, tags are clear, and RWCU has been filled and vented.

MAJOR EQUIPMENT CHANGES PLANNED FOR THIS SHIFT

Return RWCU to service in accordance with 3-OI-69, Section 5.1, beginning at Step [4]. RPHP is in effect.

Continue the Reactor Shutdown in accordance with 3-GOI-100-12A, Section 5.3.1, Step [4].

Reduce Reactor Power to 75% using Core Flow, then wait for further guidance from RE.

OPERATOR WORK AROUNDS **OWAs - 0** **Burdens - 0** **Challenges - 6**

ODMIs/ACMPs

ONEAs

FIRE RISK SIGNIFICANT ITEMS OOS/FPLCO Actions Due

SCHEDULED ITEMS NOT COMPLETED

Facility: BFN Scenario Number: NRC-2 Op-Test Number: 21-04

Examiners: _____ Operators: SRO: _____

_____ ATC: _____

_____ BOP: _____

Initial Conditions: 100% Reactor Power.

Turnover: 100% Reactor Power. A3 EECW Pump is tagged for oil change. 2B EHC Pump is tagged for maintenance. 2A CCW Pump ready for restart.

Critical Tasks:

1. With a Reactor SCRAM required and the Reactor not shutdown, to prevent an uncontrolled Reactor depressurization and subsequent power excursion inhibit ADS or control Reactor Water Level such that no automatic ADS actuation occurs.
2. When Reactor Power is greater than 5% or unknown during an ATWS, STOP and PREVENT all injection into the Reactor except for RCIC, CRD, and SLC within 130 seconds of the loss of forced recirculation to prevent possible fuel damage.

Event Number	Malfunction Number	Event Type*	Event Description
1.	N/A	N-BOP N-NUSO	Swap Recirc Drive Cooling Water Pumps
2.	SW03F	C-BOP TS-NUSO	EECW Pump Trip
3.	NMAPRMGAIN(1)	C-OATC C-NUSO	APRM 1 Fails Downscale
4.#	RD04R3023	C-OATC TS-NUSO	Control Rod Drifts Out
5.	OG04A	C-BOP C-NUSO	2A Steam Jet Air Ejector (SJAE) Trip
6.#	MC05	R-OATC R-NUSO	Clogged Traveling Screens / Lowering Condenser Vacuum
7.#	RD09A RD09B RD17A RD17B	M-ALL	Hydraulic Anticipated Transient Without SCRAM (ATWS)
8.	HS-47-1A	C-BOP C-NUSO	2A EHC Pump Trip
9.	SL01A	C-BOP C-NUSO	SLC Pump Trip

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

Event on previous two NRC Exams

#S Event on previous two NRC Exams Spare Scenario

Events

1. The crew will swap Recirc Drive Cooling Water Pumps in accordance with 2-OI-68, Reactor Recirculation System, Section 6.3.

2. D3 Emergency Equipment Cooling Water (EECW) Pump will trip. The crew will start another pump to support the South EECW Header in accordance with 0-OI-67, Emergency Equipment Cooling Water, Section 5.3. Depending on the course of action taken to restore EECW Flow, the Nuclear Unit Senior Operator (NUSO) will reference either Technical Specification 3.7.1, Residual Heat Removal Service Water (RHRSW) System, Condition A or Technical Specification 3.7.2, Emergency equipment Cooling Water (EECW) System and Ultimate Heat Sink (UHS), Condition A.

3. APRM 1 will fail downscale. The crew will respond in accordance with Alarm Response Procedures and 2-OI-92B, Average Power Range Monitoring to bypass the faulty instrument. The NUSO will review Technical Specification 3.3.1.1, RPS Instrumentation, Table 3.3.1.1.

4. A Control Rod will drift out. The crew will take actions to insert the Control Rod in accordance with 2-AOI-85-6, Rod Drift Out. The drifting Control Rod will latch into position “00” and the NUSO will address Technical Specification 3.1.3, Control Rod OPERABILITY, Condition C.

5. Steam Jet Air Ejector 2A will trip, requiring the crew to respond in accordance with Alarm Response Procedures and 2-OI-66, Off-Gas System to place the standby Steam Jet Air Ejector in service.

6. Due to eel grass intrusion, the intake traveling screens will become clogged, resulting in lowering Condenser Vacuum. The crew will respond to lowering Condenser Vacuum in accordance with 2-AOI-47-3, Loss of Condenser Vacuum. The crew will reduce Reactor Power in response to lowering Condenser Vacuum prior to inserting a manual Reactor SCRAM.

7. When a manual Reactor SCRAM is attempted, Control Rods will not insert due to a Hydraulic Anticipated Transient Without SCRAM (ATWS). The crew will respond in accordance with 2-EOI-1A, ATWS RPV Control.

8. When a Manual Reactor SCRAM is inserted, 2A EHC Pump will trip, resulting in Main Turbine Bypass Valves failing CLOSED, requiring the crew to take action to control Reactor Pressure.

9. When the crew attempts to inject SLC for Reactor Power Control, the first SLC Pump will trip, requiring the Balance of Plant Operator (BOP) to start the alternate SLC Pump in accordance with 2-EOI Appendix-3A, SLC Injection.

The Scenario ends when the crew has inserted all Control Rods and has control of Reactor Water Level above the Top of Active Fuel ((-) 162 inches) using high pressure systems.

Critical Tasks 2

1. **With a Reactor SCRAM required and the Reactor not shutdown, to prevent an uncontrolled Reactor depressurization and subsequent power excursion inhibit ADS or control Reactor Water Level such that no automatic ADS actuation occurs.**

   a. **Safety Significance**
   Precludes core damage due to an uncontrolled reactivity addition.

   b. **Cues**
   Procedural Compliance.

   c. **Measured by**
   ADS Logic inhibited prior to an automatic initiation.

   d. **Feedback**
   Reactor Pressure trend.
   Reactor Water Level trend.
   ADS LOGIC BUS A/B INHIBITED (2-9-3C, Window 18/31) annunciator status.

   e. **Critical Task Failure Criteria**
   ADS automatic initiation with Control Rods out.

2. **When Reactor Power is greater than 5% or unknown during an ATWS, STOP and PREVENT all injection into the Reactor except for RCIC, CRD, and SLC within 130 seconds of the loss of forced recirculation to prevent possible fuel damage.**

   a. **Safety Significance**
   With thermal power being produced in the Reactor and actions to lower Reactor Power have not brought power out of the heating range, power oscillations and subsequent fuel damage may be generated.

   b. **Cues**
   The Reactor is SCRAMMED and ATWS actions are taken by the OATC and Reactor Power is greater than 5% or unknown.

   c. **Measured by:**
   Reactor Power on APRM displays.

   d. **Feedback**
   Lowering Reactor Water Level.
   Lowering Reactor Power.

   e. **Critical Task Failure Criteria:**
   The operating crew fails to STOP and PREVENT injection and lower Reactor Water Level for Reactor Power control during an ATWS within 130 seconds after Recirculation Flow is stopped.

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 1 Page 1 of 2

Event Description: Swap Recirc Drive Cooling Water Pumps

Time	Position	Applicant's Actions or Behavior
	Driver	**Prior to placing the simulator in RUN, start CPERF to record critical parameters.**
	NRC	**If the crew does not start Event 1, Swap Recirc Drive Cooling Water Pumps, after assuming the shift, request that the Driver contact the Nuclear Unit Senior Operator (NUSO) as the Shift Manager and direct the crew to swap Recirc Drive Cooling Water Pumps.**
	Driver	**If requested by the Chief Examiner, contact the NUSO as the Shift Manager and direct the crew to swap Recirc Drive Cooling Water Pumps.** **If contacted as an Assistant Unit Operator (AUO), report that you are standing by, and are ready to support.**
	NUSO	Directs the Balance of Plant Operator (BOP) to swap Recirc Drive Cooling Water Pumps in accordance with 2-OI-68, Reactor Recirculation System.
	BOP	2-OI-68, Reactor Recirculation System Section 6.3, Swapping Recirc Drive Cooling Water Pumps **NOTES** 1) Perform these steps, as required, to swap the Recirc Drive Cooling Water Pumps. 2) Placing the standby pump in RUN will cause the running pump to shut down after ~2 seconds if the running pump is in AUTO. 3) The red light indication above the MCR handswitch only indicates that the motor starter has been energized. A successful pump start should be verified locally or by ICS flow indication. 4) ICS screen VFDPMPA(VFDPMPB) may be referred to observe Recirc Drive Cooling Water System parameters. 5) The time both Cooling Water Pumps are running should be minimized. The pump being placed in standby should be placed in AUTO as soon as possible after placing the lead pump in RUN.

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Event Description: Swap Recirc Drive Cooling Water Pumps

Time	Position	Applicant's Actions or Behavior
	BOP	[1] **IF** it is desired to place Recirc Drive Cooling Water Pump 2A2 in service, and place 2A1 pump in standby, **THEN PERFORM** the following: (Otherwise N/A): [1.1] **DEPRESS** 2-HS-96-13, FAULT RESET, on Panel 2-9-4. [1.2] **PLACE** in RUN 2-HS-68-2A2/A, RECIRC DRIVE 2A COOLING PUMP 2A2. [1.3] **CHECK** RECIRC DRIVE 2A COOLING PUMP 2A2, STARTS. [1.4] **PLACE** in AUTO 2-HS-68-2A1/A, RECIRC DRIVE 2A COOLING PUMP 2A1. [1.5] **CHECK** RECIRC DRIVE 2A COOLING PUMP 2A1 STOPS. [2] N/A [3] **IF** it is desired to place Recirc Drive Cooling Water Pump 2B2 in service, and place the B1 pump in standby, **THEN PERFORM** the following: (Otherwise N/A) [3.1] **DEPRESS** 2-HS-96-14, FAULT RESET, on Panel 2-9-4. [3.2] **PLACE** in RUN 2-HS-68-2B2/A, RECIRC DRIVE 2B COOLING PUMP 2B2. [3.3] **CHECK** RECIRC DRIVE 2B COOLING PUMP 2B2 STARTS. [3.4] **PLACE** in AUTO 2-HS-68-2B1/A, RECIRC DRIVE 2B COOLING PUMP 2B1. [3.5] **CHECK** RECIRC DRIVE 2B COOLING PUMP 2B1 STOPS. [4] N/A
	Driver	**If contacted as an AUO to report the status, report that 2B1 and 2B2 Recirc Drive Cooling Water Pumps are running normally.**
	BOP	Informs the Nuclear Unit Senior Operator (NUSO) that Recirc Drive Cooling Water Pumps have been swapped.
	NRC	**End of Event 1. Request that the driver insert Event 2, D3 EECW Pump Trip.**

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Event Description: EECW Pump Trip

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 2, EECW Pump Trip to trip D3 EECW Pump.**
	BOP	Acknowledges and reports the following alarms if received to the NUSO: • MOTOR TRIPOUT, 2-9-8C, Window 33 • EECW NORTH HEADER DG SECTION PRESSURE LOW, 2-9-20A, Window 21 Informs the NUSO that D3 EECW Pump has tripped.
	NUSO	Directs the BOP to respond in accordance with the appropriate Alarm Response Procedure.
	BOP	Alarm Response Procedure, 2-ARP-9-8C MOTOR TRIPOUT, Window 33 Operator Action: A. **CHECK** Control Room for white disagreement light illuminated for affected equipment. B. **CLEAR** disagreement light. C. **DISPATCH** personnel to check: • Relays at associated electrical board • Equipment for abnormal conditions • Safe-stop locally reset, if necessary
	Driver	**If contacted as the Outside NUSO, AUO, or Electrical Maintenance to investigate the trip of D3 EECW Pump, acknowledge any direction given.**
	BOP	D. **REFER TO** 0-GOI-300-2, Electrical, if relay targets are present or for motor starting limits. E. **REFER TO** appropriate Operating Instruction for recovery or realignment of equipment.

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Event Description: EECW Pump Trip

Time	Position	Applicant's Actions or Behavior
	BOP	Alarm Response Procedure, 2-ARP-9-20A EECW NORTH HEADER DG SECTION PRESSURE LOW, Window 21 Operator Action: A. **CHECK** indications on Panel 2-9-20. 1. 0-PI-67-19/2, Unit 1-2 NORTH HEADER PRESSURE. 2. 0-FI-67-3A/2, EECW NORTH HEADER PUMP A FLOW. 3. 0-FI-67-9A/2, EECW NORTH HEADER PUMP C FLOW. B. **CHECK** Panel 2-9-3 for status of North Header Pump(s) breaker lights and Pump Motor Amps normal. C. **NOTIFY** UNIT SUPERVISOR, Unit 1 and Unit 3.
	Driver	**If contacted as the Unit 1 and/or Unit 3 NUSO, acknowledge any information given.**
	BOP	D. **START** standby pump for affected header. **REFER TO** 0-OI-67, Emergency Equipment Cooling Water System. E. **DISPATCH** personnel to check affected pump room and header for abnormal conditions. F. N/A G. N/A H. **IF** pump failure is cause of alarm, **THEN REFER TO** Technical Specification 3.7.2, Emergency Equipment Cooling Water (EECW) System and Ultimate Heat Sink (UHS).
	NUSO	Directs the BOP to start B3 EECW Pump.
	BOP	0-OI-67, Emergency Equipment Cooling Water System Precautions and Limitations C. The EECW System is aligned as follows: 1. At least one RHRSW Pump, assigned to the EECW System, should be running on each header to maintain the header charged at all times. If no pumps are running on a header and header pressure lowers to ≤ 0 psig, the header shall be declared inoperable and appropriate actions taken, as required by Technical Specifications.

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Event Description: EECW Pump Trip

Time	Position	Applicant's Actions or Behavior	
	BOP	Starts B3 EECW Pump.	
	NUSO	References Technical Specification 3.7.2, Emergency Equipment Cooling Water (EECW) System and Ultimate Heat Sink (UHS). LCO 3.7.2: The EECW System with three pumps and UHS shall be OPERABLE. APPLICABILITY: MODES 1, 2, and 3. **CONDITION:** A. One required EECW Pump INOPERABLE.	
	NUSO	**REQUIRED ACTION:** A.1 Restore the required EECW Pump to OPERABLE status.	**COMPLETION TIME:** A.1 – 7 days
	NRC	**End of Event 2. Request that the Driver insert Event 3, APRM 1 Fails Downscale.**	

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Event Description: APRM 1 Fails Downscale

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 3, APRM 1 Fails Downscale.**
	OATC	Acknowledges and reports the following alarms: • APRM DOWNSCALE / OPRM INOPERABLE, 2-9-5A, Window 4 • CONTROL ROD WITHDRAWAL BLOCK, 2-9-5A, Window 7
	NUSO	Directs the Operator at the Controls (OATC) to respond in accordance with the appropriate Alarm Response Procedures.
	OATC	Alarm Response Procedure, 2-ARP-9-5A APRM DOWNSCALE / OPRM INOP, Window 4 Operator Action: A. **DETERMINE** which APRM/OPRM channel is downscale/inoperable. B. **IF** APRM failed downscale, **THEN BYPASS** channel. **REFER** TO 2-OI-92B, Average Power Range Monitoring. C. N/A D. N/A E. **REFER TO** Technical Specification (Tech Spec) Tables 3.3.1.1-1, Reactor Protection System Instrumentation, and Technical Requirements Manual (TRM) Table 3.3.4-1, Control Rod Block Instrumentation.
	OATC	Recommends to the NUSO that APRM 1 be bypassed.
	NRC	**EXAMINER NOTE: The NUSO may reference Tech Specs and the TRM. There are no required Tech Spec or TRM actions, but the NUSO may enter an Information Only LCO.**
	NUSO	Directs the OATC to bypass APRM 1 in accordance with the appropriate Operating Instruction.

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Event Description: APRM 1 Fails Downscale

Time	Position	Applicant's Actions or Behavior
	OATC	2-OI-92B, Average Power Range Monitoring Section 6.0, System Operations **NOTES** 1) Only one APRM/OPRM can be bypassed at a time. 2) All operations are performed on Panel 2-9-5 unless specifically stated otherwise. 3) In order to prevent inadvertent Rod Withdrawal Block or Reactor SCRAM while operating APRM BYPASS Selector Switch, always ensure the previously bypassed channel returns to normal status by observing the BLUE bypassed lights on Panel 2-9-14 Voters are extinguished prior to selecting any other channel to be bypassed. After bypassing a channel, the applicable BLUE BYPASSED status lights on Panel 2-9-14 Voters should be illuminated prior to testing, operating, or working on that channel.
	OATC	Section 6.1, Bypassing APRM / OPRM Channel **CAUTION** NPG-SPP-10.4, Reactivity Management Program, requires approval of the Plant Manager or his designee prior to any planned operation with APRMs bypassed unless bypassing is specifically allowed within approved procedures. [1] **REVIEW** all Precautions and Limitations. **REFER** TO Section 3.0. [2] **PLACE** 2-HS-92-7B/S3, APRM BYPASS, to desired channel to be bypassed. [3] **CHECK** BLUE BYPASSED lights illuminated on Panel 2-9-14 Voters. [4] **CHECK** white bypass light on Panel 2-9-5 is illuminated.

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Event Description: APRM 1 Fails Downscale

Time	Position	Applicant's Actions or Behavior
	OATC	Alarm Response Procedure, 2-ARP-9-5A CONTROL ROD WITHDRAWAL BLOCK, Window 7 Operator Action: A. **DETERMINE** initiating condition from corresponding rod withdrawal block alarm(s) and **REFER TO** Operator Action for alarm(s). B. N/A C. N/A D. N/A E. N/A
	NRC	**End of Event 3. Request that the driver insert Event 4, Control Rod Drifts Out.**

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Event Description: Control Rod Drifts Out

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 4, Control Rod Drift Out.**
	NRC	**Control Rod 30-11 will drift out.**
	OATC	Acknowledges and reports the following alarm to the NUSO: • CONTROL ROD DRIFT, 2-9-5A, Window 28 • CONTROL ROD WITHDRAWL BLOCK, 2-9-5A, Window 7 • RBM DOWNSCALE, 2-9-5A, Window 31
	NUSO	Directs the OATC to respond in accordance with the appropriate Alarm Response and Abnormal Operating Procedures.
	OATC	Alarm Response Procedure, 2-ARP-9-5A CONTROL ROD DRIFT, Window 28 Operator Action: A. **DETERMINE** which rod is drifting from Full Core Display. B. **IF** no Control Rod motion is observed, **THEN RESET** rod drift as follows. 1. **PLACE** 2-HS-85-3A-S7, ROD DRIFT ALARM TEST switch, in RESET and **RELEASE**. 2. **RESET** annunciator. C. N/A D. **IF** rod drifting out, **THEN REFER** TO 2-AOI-85-6, Rod Drift Out and 2-AOI-85-7, Mispositioned Control Rod. E. **REFER TO** Tech Spec 3.1.3, Control Rod Operability and 3.10.8, Shutdown Margin (SDM) Test – Refueling.
	NRC	**The Control Rod Drift condition will clear when the Control Rod is driven to Position 0.**
	OATC	2-AOI-85-6, Rod Drift Out Immediate Actions: [1] N/A

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Event Description: Control Rod Drifts Out

Time	Position	Applicant's Actions or Behavior
	OATC	Subsequent Actions: [1] N/A [2] **IF** a Control Rod is moving from its intended position without operator actions, **THEN SELECT** the drifting Control Rod and **INSERT** to the FULL IN (00) position. [3] **IF** a Control Rod Block occurs during rod insertion due to Rod Worth Minimizer, **THEN BYPASS** the RWM per step 4.2[1]. (Otherwise N/A) [4] N/A [5] **NOTIFY** the Reactor Engineer to Evaluate Core Thermal Limits and Preconditioning Limits for the current Control Rod pattern.
	Driver	**When contacted as the Reactor Engineer or an AUO acknowledge any direction given.**
	OATC	[6] **IF** another Control Rod Drift occurs before Reactor Engineering completes the evaluation, **THEN MANUALLY SCRAM** Reactor and enter 2-AOI-100-1, Reactor SCRAM. [7] N/A [8] **IF** the Control Rod is latched into position "00", **THEN REMOVE** associated Hydraulic Control Unit (HCU) from service per 2-OI-85, Control Rod Drive System. (N/A if Control will not latch at "00") [9] **EVALUATE** Tech Spec 3.1.3, Control Rod OPERABILITY. [10] **INITIATE** Service Request/Work Order. [11] **NOTIFY** Reactor Engineer to perform the following: • **EVALUATE** condition of the Core to assure no resultant fuel damage has occurred, and • **EVALUATION** of impact on Thermal Limits and PCIOMOR restraints. (N/A if SCRAM was initiated.) • **DETERMINE** if other Control Rods need to be repositioned in order to safely restore Core symmetry to prevent local fuel damage. (N/A if scram was initiated.) [12] **NOTIFY** System Engineering to **PERFORM** 0-TI-20, Control Rod Drive System Testing and Troubleshooting, to determine problem with faulty Control Rod.

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Event Description: Control Rod Drifts Out

Time	Position	Applicant's Actions or Behavior
	OATC	[13] **IF** a manual SCRAM was not inserted and Reactor Startup or Shutdown is not in progress, **THEN ENSURE** 2-GOI-100-12, Power Maneuvering, has been entered if a power change occurred. (Otherwise N/A) [14] – [15] N/A [16] **NOTIFY** the Reactor Engineer to **EVALUATE** impact on preconditioning envelope, prior to returning to normal power operation.
	OATC	2-AOI-85-7, Mispositioned Control Rod (if entered) Immediate Actions: None Subsequent Actions: [1] N/A [2] **IF** Control Rod is determined to be mispositioned, **THEN NOTIFY** the following: • Reactor Engineer (RE) • Shift Technical Advisor (STA) • Unit Supervisor • Shift Manager (SM) • Operations Superintendent [3] N/A [4] N/A [5] **CHECK** the following radiation recorders for rise in radiation activity to determine if fuel damage occurred: • MAIN STEAM LINE RADIATION, 2-RR-90-135 (Panel 2-9-2) • OFFGAS RADIATION, 2-RR-90-266 (Panel 2-9-2) • OG PRETREATMENT RAD MON RTMR, 2-RM-90-157, on Panel 2-9-10 • OFFGAS RAD MON RTMR, 2-RM-90-160, on Panel 2-9-10 [6] N/A

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Event Description: Control Rod Drifts Out

Time	Position	Applicant's Actions or Behavior	
	OATC	[7] **INTIATE** a Service Request/PER for Control Rod error or mispositioned Control Rod. [8] N/A [9] **NOTIFY** Reactor Engineer to perform the following when time permits: • **EVALUATE** possible consequences • **DOCUMENT** in Reactor Engineer log [10] N/A	
	NUSO	Technical Specification 3.1.3, Control Rod OPERABILITY LCO 3.1.3 Each Control Rod shall be OPERABLE Applicability: Modes 1 and 2 ---------- NOTE: Separate Condition entry is allowed for each Control Rod. ---------- **CONDITION:** C. One or more Control Rods INOPERABLE for reasons other than Condition A or B.	
	NUSO	**REQUIRED ACTION:** C.1 ----------NOTE---------- RWM may be bypassed as allowed by LCO 3.3.2.1, if required, to allow insertion of INOPERABLE Control Rod and continued operation. ---------- Fully insert INOPERABLE Control Rod <u>AND</u> C.2 Disarm the associated CRD.	**COMPLETION TIME:** C.1 – 3 hours C.2 – 4 hours

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Event Description: Control Rod Drifts Out

Time	Position	Applicant's Actions or Behavior
	NRC	**Tech Spec 3.10.8, Shutdown Margin (SDM) Test – Refueling is not applicable to current plant conditions.**
	NRC	**End of Event 4. Request that the Driver insert Event 5, 2A Steam Jet Air Ejector (SJAE) Trip.**

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Event Description: 2A Steam Jet Air Ejector (SJAE) Trip

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 5, Steam Jet Air Ejector (SJAE) Trip.**
	BOP	Acknowledges and reports the following alarms to the NUSO: • OFFGAS HOLDUP LINE INLET FLOW LOW, 2-9-53, Window 4 • H2 WATER CHEMISTRY ABNORMAL, 2-9-53, Window 10 • H2 WATER CHEMISTRY SHUTDOWN, 2-9-53, Window 20
	BOP	Alarm Response Procedure, 2-9-53 OFFGAS HOLDUP LINE INLET FLOW LOW, Window 4 A. **CHECK** holdup line flow on: 1. OFFGAS H2 CONTROL/OFFGAS TO 6 HR FLOW/ANALYZER, 2-XR-66-103 (CH 3-Narrow Range), Panel 2-9-53. 2. OFFGAS FLOW TO HOLDUP VOLUME, 2-FR-66-20, Panel 2-9-8. 3. Integrated Computer System, computer point 66-111A (D419). B. **ENSURE OPEN** in-service Recombiner Inlet and Outlet Valves at Panel 2-9-53. C. **ENSURE OPEN**, OFF-GAS SYSTEM ISOLATION VALVE, 2-FCV-66-28. D. **ENSURE** that SJAE auto isolation has **NOT** occurred. E. **DISPATCH** personnel to Panel 25-95 to verify the alarm, 2-FI-66-111A. F. N/A
	BOP	Determines that the cause for the above alarms is the trip of 2A SJAE. Informs the NUSO.
	NUSO	Directs the BOP to place the Standby (3B) SJAE in service using the 2-OI-66, Off-Gas System, Attachment 6, Standby SJAE System Lineup Hard Card.
	OATC	Monitors Condenser Vacuum.

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Event Description: 2A Steam Jet Air Ejector (SJAE) Trip

Time	Position	Applicant's Actions or Behavior
	Driver	**If contacted as an AUO, acknowledge any direction given.**
	BOP	2-OI-66, Off-Gas System Attachment 6, Standby SJAE System Lineup Hard Card Operator Actions for SJAE 2B **NOTES** Radiation Protection should be notified prior to placing a SJAE in service. If time does not permit this due to plant conditions then notification should be made when possible. 2-HS-001-0375, SJAE TRAIN PERMISSIVE (located on 2-LPNL-925-0105, U2 TB, EL 586') should normally be in the position of the standby SJAE. If problems are encountered while placing a SJAE in service and time permits, operate this switch as required during the performance of this section. [1] **ENSURE RESET** Off-Gas isolation using 2-HS-90-155, OFFGAS OUTLET/DRAIN ISOLATION VALVES. [2] **ENSURE OPEN** the following valves: • 2-HS-66-15, SJAE 2B INLET VALVE • 2-HS-1-156A, STEAM TO SJAE 2B [3] **ENSURE** in AUTO/OPEN SJAE 2B OFFGAS OUTLET VALVE, 2-HS-66-18. [4] **PLACE** 2-HS-1-152, SJAE 2B PRESS CONTROLLER, in CLOSE and then in OPEN. [5] **ENSURE** OPEN the following valves (red light illuminated): • STEAM TO SJAE 2B STAGES 1,2, AND 3, 2-PCV-1-153/167 • SJAE 2B INTERMEDIATE CONDENSER DRAIN,2-FCV-1-152 [6] **MONITOR** Hotwell Pressure as indicated on recorder CONDENSATE, 2-XR-002-0026 (Point 3), on Panel 2-9-6.
	Driver	**If notified as Radiation Protection that 2B SJAE is being placed (or is) in service, acknowledge the report.**

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Event Description: 2A Steam Jet Air Ejector (SJAE) Trip

Time	Position	Applicant's Actions or Behavior
	BOP	[7] **FOR** the SJAE not being placed in service, **ENSURE CLOSED** the following valves: • SJAE 2A OG OUTLET VALVE, 2-HS-66-14 • SJAE 2A PRESSURE CONTROLLER, 2-HS-1-150 • STEAM TO SJAE 2A, 2-HS-1-155A [8] **WHEN** Condenser Vacuum has stabilized, **THEN PROCEED** to step 8.4[4] **AND PERFORM** the applicable steps to establish acceptable SJAE parameters to obtain stable and live pressure indications.
	BOP	Informs the NUSO that 2B SJAE is in service. Monitors Condenser Vacuum.
	Driver	**If contacted as the Work Control NUSO, Maintenance, or an AUO to investigate the trip of 2A SJAE, acknowledge any direction given.**
	NRC	**End of Event 5. Request that the driver insert Event 6, Clogged Traveling Screens / Lowering Condenser Vacuum.**

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Event Description: Clogged Traveling Screens / Lowering Condenser Vacuum

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 6, Clogged Traveling Screens / Lowering Condenser Vacuum.**
	BOP	Acknowledges and reports the following alarm to the NUSO: • TRAVELING SCEEN DP HIGH, 2-9-20A, Window 18
	NUSO	Directs the Balance of Plant Operator (BOP) to respond in accordance with the appropriate Alarm Response Procedure.
	BOP	Alarm Response Procedure, 2-ARP-9-20A TRAVELING SCEEN DP HIGH, Window 18 Operator Action: A. **CHECK** alarm on 2-PDI-27-1A, TRAVELING SCREEN DIFFERENTIAL WATER LEVEL, on Panel 2-9-20. B. **DISPATCH** personnel to VERIFY the traveling screens are in service. Refer to 2-OI-27A, Screen Wash System. C. **MONITOR** Traveling Screens for carryover. D. **MONITOR** Turbine Backpressure. E. **IF** debris is being carried over, **THEN** • **MONITOR** 0-PDIS-067-0001(0005)(0008)(0011), EECW SUPPLY STRAINER DIFF PRESS, locally in RHRSW Pump Rooms • **MONITOR** Waterbox D/P for indications of fouling (<160" H2O (does not apply to 2C2 waterbox) with 3 CCW pumps in service) F. **IF** TRAVELING SCREEN DIFF WTR LVL, 2-PDI-27-1A, does NOT lower, **THEN** • **REFER** TO 2-OI-27A, Screen Wash System • **REFER** TO 0-AOI-27-1, Component Biofouling • **NOTIFY** Mechanical Maintenance to SCRAPE the trash racks and/or operate Milfoil Harvester as needed

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Event Description: Clogged Traveling Screens / Lowering Condenser Vacuum

Time	Position	Applicant's Actions or Behavior
	BOP	G. **IF** Divers are required to clear the trash racks, **THEN REMOVE** the Amertap system from service per 2-OI-27B, Amertap Condenser Tube Cleaning System.
	BOP	0-AOI-27-1, Component Biofouling Immediate Actions: NONE Subsequent Actions: **NOTES** 1) Procedure is written in a logical order but due to changing plant conditions and operator experience, steps may be performed in parallel or out of sequence as required. 2) The most common cause of degraded cooling water system performance is the fouling of intake screens for the CCW Pumps. When intake screens begin to foul they are required to be placed in service as soon as possible using 1(2,3)-OI-27A, Screen Wash System. The timely response to this condition will keep screens from becoming over burdened with foreign material and collapsing. 3) If CCW Intake Screens cannot be cleaned with associated CCW Pump running, the pump may have to be removed from service in order to clean screens. After screens are cleaned the affected CCW Pump may be returned to service (1(2,3)-OI-27, Condenser Circulating Water System) if desired. 4) Entry into this procedure requires evaluation of situation per EOOS Management NPG-SPP-09.11.1, Equipment Out of Service Management. CAUTION Debris Filter may cycle repeatedly when total CCW flow is throttled excessively or due to heavy debris carryover from the intake. Debris Filter Flush Valve Motor is not rated for heavy repeated cycling. CCW flow should be maximized by throttling open available waterboxes until pump head is as low as possible (>20" H2O), Debris Filter should be run in manual and checked often. Expedite returning CCW System to normal three pump alignment with Debris Filter in AUTO.

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Event Description: Clogged Traveling Screens / Lowering Condenser Vacuum

Time	Position	Applicant's Actions or Behavior
	BOP	[1] **CONTACT** Maintenance to **PERFORM** attachment 7.
	Driver	**When contacted as Maintenance to perform Attachment 7, acknowledge the direction.**
	BOP	[2] **CHECK** CCW Intake Screens for fouling. [3] **IF** CCW Intake Screens are fouled, **THEN ENSURE** in service per 2-OI-27A, Screen Wash System. (Otherwise N/A).
	Driver	**If contacted as the Outside NUSO, Maintenance, or an AUO to check intake screens for fouling, acknowledge the direction. Wait 2 minutes and report that the intake screens are becoming fouled by Eel Grass.** **Is asked if Eel Gras is coming over the intake screens, state that it is.**
	BOP	[3] **IF** CCW Intake Screens are fouled, **THEN ENSURE** in service per 2-OI-27A, Screen Wash System. (Otherwise N/A). [4] **INITIATE** Attachment 1, Continuous Action Summary.
	NUSO / BOP	0-AOI-27-1, Component Biofouling Attachment 1, Continuous Action Summary Action Summary [1] **IF** at any time any of the following condition occurs: • Unexpected fouling indication of more than one river water supplied heat exchanger. **THEN** Action II is applicable, GO TO Step 4.2[9]. (Otherwise N/A) [2] **IF** at any time any of the following conditions occur: • Any indications of abnormal operation of the Circulating Water System OR • Any removal of two or more Circulating Water Pumps from service **THEN GO TO** 1(2)(3)-OI-27, Circulating Water System (Otherwise N/A)

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Event Description: Clogged Traveling Screens / Lowering Condenser Vacuum

Time	Position	Applicant's Actions or Behavior
	BOP	[3] **IF** at any time a low reservoir level (<550') OR High Traveling Screen DP occur **THEN**: (Otherwise N/A) • **MONITOR** CCW Pumps for loss of suction/cavitation. [4] **IF** at any time the CCW Pumps indicate a loss of suction or cavitation **THEN**: (Otherwise N/A) • **SHUTDOWN** the CCW Pumps. **REFER TO** 2-OI-27, Circulating Water System.
	NRC	**As the malfunction ramps in, Condenser Vacuum will continue to lower. The crew may enter 2-AOI-47-3, Loss of Condenser Vacuum before an alarm is received.**
	BOP	2-AOI-47-3, Loss of Condenser Vacuum Immediate Actions: NONE Subsequent Actions: [1] **IF** ANY EOI entry condition is met, **THEN ENTER** the appropriate EOI(s). **CAUTION** Operations outside of the allowable regions shown on the Recirculation System Operating Map could result in thermal-hydraulic power oscillations and subsequent fuel damage. **REFER TO** 2-GOI-100-12A, Unit Shutdown from Power Operation to Cold Shutdown and Reductions in Power During Power Operations, for required actions and monitoring to be performed during a power reduction. [2] **MONITOR** Condenser Vacuum (Turb Exhaust) Margin to Trip using 2-XR-002-0026, CONDENSATE, Channel 7. [3] **IF** Condenser Vacuum (Turb Exhaust) Margin to Trip as indicated on 2-XR-002-0026, CONDENSATE, approaches 0 inches Hg, with Reactor Power less than 26%, **THEN TRIP** the Main Turbine.

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Event Description: Clogged Traveling Screens / Lowering Condenser Vacuum

Time	Position	Applicant's Actions or Behavior
	BOP	[4] **IF** Condenser Vacuum is lost, **THEN OPEN** 2-DRV-043-1019, HOTWELL SAMPLE TO FLOOR DRAIN, (557'@ T-10 C-Line) and 2-DRV-043-1020, CONDENSATE DEMIN SAMPLE TO FLOOR DRAIN, (557'@ T-6 G-Line), to establish flow through the sample lines.
	Driver	**If contacted as an AUO to perform any outside steps of this procedure, acknowledge any direction given.**
	BOP	[5] **REDUCE** Reactor Power in an attempt to maintain Condenser Vacuum.
	NRC	**See Event 6, Attachment 1 (page 23), Reactor Power Reduction for Lowering Condenser Vacuum for Reactor Power reduction actions.**
	BOP	[6] **ENSURE** automatic actions. [7] **CHECK** CCW Pumps for proper operation. **IF** available, **THEN START** additional CCW Pumps. [8] – [15] N/A
	NRC	**The crew may elect to NOT start 2A CCW Pump.**
	NUSO	Directs the crew to monitor Condenser Vacuum and sets a trigger value of 1.0" to Trip Condenser Vacuum for a Reactor SCRAM.
	NRC	**In accordance with the ILT Simulator Expectations, the NUSO will set target values for Condenser Vacuum as follows:** • **Low Condenser Vacuum alarm (Panel 2-9-7B, Window 17) – Core Flow Runback** • **1" Margin to Trip Condenser Vacuum – Reactor SCRAM** **However, the NUSO may conservatively direct these actions based on the rate of vacuum degradation and information from the field.**
	BOP	Acknowledges and reports the following alarm when received: • CONDENSER A, B, OR C VACUUM LOW, 2-9-7B, Window 17

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 6 Page 6 of 11

Event Description: Clogged Traveling Screens / Lowering Condenser Vacuum

Time	Position	Applicant's Actions or Behavior
	BOP	Alarm Response Procedure, 2-ARP-9-7B CONDENSER A, B, OR C VACUUM LOW, 2-9-7B, Window 17 Operator Action: A. **CHECK** alarm by checking Condenser Vacuum lowering, MWe lowering, and Exhaust Hood Temperature rise. B. **IF** alarm is valid, **THEN REFER** TO 2-AOI-47-3, Loss of Condenser Vacuum.
	NUSO	Provides a Condenser Vacuum trigger value for the OATC to insert a manual Reactor SCRAM.
	OATC	When the trigger value for Condenser Vacuum is reached or when directed by the NUSO, inserts a manual Reactor SCRAM.
	NRC	**Condenser Vacuum will continue to lower, requiring the crew to insert a manual Reactor SCRAM.** **Two minutes after the crew inserts a manual SCRAM, the clogged Traveling Screen malfunction will be set to 50% to provide cooling water for the crew to place Suppression Pool Cooling in service if necessary.**
	Driver	**Two minutes after the Reactor SCRAM report to the crew that there has been some success in clearing Traveling Screens to allow some water flow.**
	NRC	**When the crew inserts a manual Reactor SCRAM due to lowering Condenser Vacuum, the following Events are automatically inserted by Simulator Setup:** • **Event 7, Hydraulic Anticipated Transient Without SCRAM (ATWS)** • **Event 8, 2A EHC Pump Trip** • **Event 9, SLC Pump Trip** **No action is required by the Driver to insert Events 7, 8, or 9.** **End of Event 6, proceed to Event 7.**

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 6 Page 7 of 11

Event 6, ATTACHMENT 1
Reactor Power Reduction for Lowering Condenser Vacuum for Reactor Power

Time	Position	Applicant's Actions or Behavior
	NRC	**The crew may elect to reduce power by any method or combination of runbacks in an attempt to maintain Condenser Vacuum.**
	NUSO	Directs the OATC to reduce Reactor Power by using any one or any combination of the following: • Manually using Recirc Master Control pushbuttons on Panel 2-9-5 • Upper Power Runback • Mid Power Runback • Core Flow Runback
	NRC	**2-OI-68, Reactor Recirculation System** **3.0 Precautions and Limitations** **Section 3.5.3, Dual Pump Operation** **E. When raising (lowering) Reactor Power per the Reactivity Plan, the following guideline should be used to establish the 60 rpm mismatch between the Recirc Pumps.** **1. When the first Recirc Pump reaches 1200 rpm (1300 rpm) or both Recirc Pumps are at 1200 rpm (1300 rpm) then individual controls will be used.** **2. While following the Reactivity Plan establish the 60 rpm mismatch using the individual controls for the leading Recirc Pump.** **3. While maintaining the 60 rpm mismatch and using the Reactivity Plan, raise (lower) the Recirc Pump speeds using either the Master Controllers or Individual Controllers.** **4. Once a Recirc Pump reaches 1300 rpm (1200 rpm) the 60 rpm mismatch is no longer required. While following the Reactivity Plan raise (lower) the lagging Recirc Pump using the individual controller match Recirc Pump speeds.** **5. Once the Recirc Pumps are matched, then the speeds may be adjusted as required using the Master Controller or Individual Controllers while maintaining the requirements of Attachment 1.**

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 6 Page 8 of 11

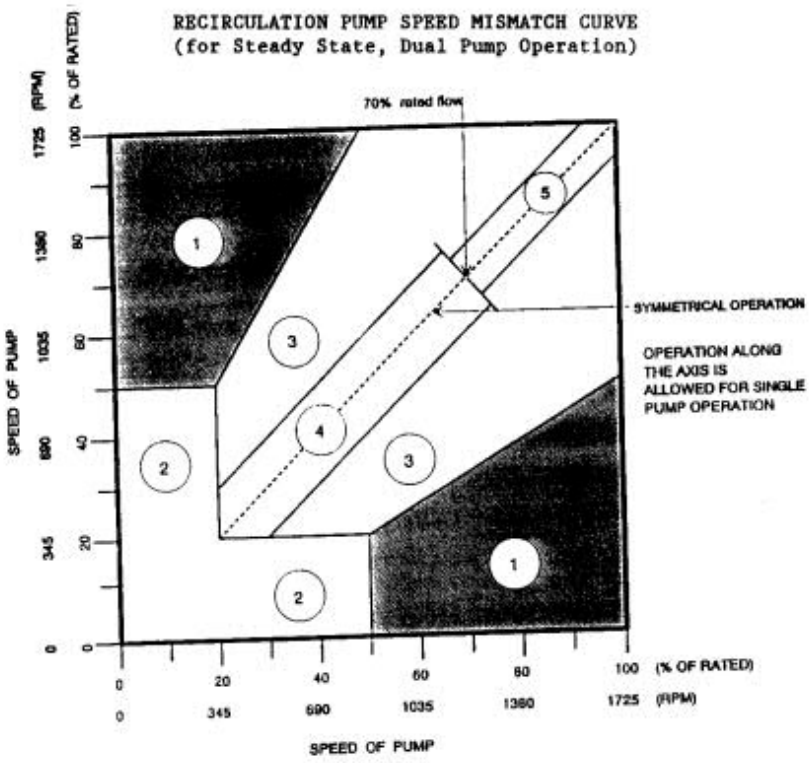
Event 6, ATTACHMENT 1
Reactor Power Reduction for Lowering Condenser Vacuum for Reactor Power

Time	Position	Applicant's Actions or Behavior
	NRC	

BFN Unit 2	Reactor Recirculation System	2-OI-68 Rev. 0159 Page 181 of 209

Attachment 1
(Page 1 of 1)

Recirculation Pump Speed Mismatch Curve



1. Avoid Region To Prevent Excessive Jet Pump Vibration.
2. Below Recirc Drive Minimum speed.
3. Operation allowed if reactor subcritical or during transient periods.
4. Limited Operation for Core flow ≤ 70% rated (mismatch ≤ 10% rated speed).
5. Limited operation for Core flow > 70% rated (mismatch ≤ 5% rated speed).

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 6 Page 9 of 11

Event 6, ATTACHMENT 1
Reactor Power Reduction for Lowering Condenser Vacuum for Reactor Power

Time	Position	Applicant's Actions or Behavior
	OATC	2-OI-68, Reactor Recirculation System Section 6.2, Adjusting Recirc Flow **NOTES** 1) Thermal Limits are shown in 0-TI-248 and 2-SR-2, Instrument Checks and Observations. 2) Recirc Flow changes made during the later part of the operating cycle (Coastdown) could cause Core Flow values to approach or exceed the allowable values of the Increased Core Flow (ICF) Region of the Power to Flow Map. Instruments used to monitor pump speed and Core Flow should be identified in the Reactivity Control Plan. These values should be recorded prior to reducing Core Flow and used as a benchmark to reestablish the previous conditions when returning to power. Increased caution should be used when changes in Recirc Flow are made in this area. [1] **IF** desired to control Recirc Pumps 2A and/or 2B speed with Recirc Individual Control, **THEN PERFORM** the following: • **LOWER** Recirc Pump 2A using 2-HS-96-17A(17B)(17C), SLOW(MEDIUM)(FAST), (Otherwise N/A) AND/OR • **LOWER** Recirc Pump 2B using 2-HS-96-18A(18B)(18C), SLOW(MEDIUM)(FAST). (Otherwise N/A) [2] **WHEN** desired to control Recirc Pumps 2A and/or 2B speed with the RECIRC MASTER CONTROL, **THEN ADJUST** Recirc Pump Speed 2A & 2B using the following pushbuttons as required. 2-HS-96-33, LOWER SLOW 2-HS-96-34, LOWER MEDIUM 2-HS-96-35, LOWER FAST

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 6 Page 10 of 11

Event 6, ATTACHMENT 1
Reactor Power Reduction for Lowering Condenser Vacuum for Reactor Power

Time	Position	Applicant's Actions or Behavior
	OATC	2-OI-68, Reactor Recirculation System Section 8.12, Initiating Manual Runbacks **NOTES** 1) Manual runback controls are utilized when it becomes necessary to reduce Reactor Power and Core Flow during abnormal plant conditions. 2) This section is performed at Panel 2-9-5. 3) Depressing a manual runback pushbutton initiates a runback of both Recirc Pumps until the setpoint is reached. Depressing the pushbutton a second time stops the manual runback. The pushbutton can be depressed a third and fourth time to reinitiate and stop the manual runback. This pattern can be repeated until the applicable setpoint is reached. 4) Attachment 2 can be referred to for additional information on manual runback controls. 5) When initiating manual runbacks, the appropriate manual pushbutton must be depressed until the backlight is blinking, then the pushbutton can be released. 6) If ≥ 25 rpm mismatch in the lower direction exists between Speed Demand and Calculated Speed, the Manual Runback pushbuttons are disabled. 7) RECIRC PUMPS MID POWER RUNBACK is to be used any time a Condensate Pump trips and Reactor Power is greater than or equal to 90%. [1] **IF** time permits, **THEN REVIEW** Precautions and Limitations. (REFER TO Section 3.0).

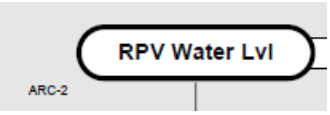
Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 6 Page 11 of 11

Event 6, ATTACHMENT 1
Reactor Power Reduction for Lowering Condenser Vacuum for Reactor Power

Time	Position	Applicant's Actions or Behavior
	OATC	[2] **IF** desired to reduce Reactor Power to approximately 90%, **THEN** (Otherwise N/A): [2.1] **DEPRESS** 2-HS-68-42, RECIRC PUMPS UPPER POWER RUNBACK Pushbutton. [2.2] **CHECK** the following: • Pushbutton backlight blinks until setpoint is reached • Reactor Power lowers to approximately 90% [3] **IF** desired to reduce Reactor Power to 66.3%, **THEN** (Otherwise N/A): [3.1] **DEPRESS** 2-HS-68-43, RECIRC PUMPS MID POWER RUNBACK pushbutton. [3.2] **CHECK** the following: • Pushbutton backlight blinks until setpoint is reached • Reactor Power lowers to 66.3% [4] **IF** desired to reduce Core Flow to approximately 60%, **THEN** (Otherwise N/A): [4.1] **DEPRESS** 2-HS-68-44, RECIRC PUMPS CORE FLOW RUNBACK Pushbutton. [4.2] **CHECK** the following: • Pushbutton backlight blinks until setpoint is reached • Core Flow lowers to approximately 60%
	NRC	**End of Reactor Power Reduction Actions. Continue with Event 6 actions until the Reactor SCRAM is inserted.**

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 1 of 13

Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

Time	Position	Applicant's Actions or Behavior
	NRC	**Event 7, Hydraulic Anticipated Transient Without SCRAM (ATWS) is inserted on Simulator Setup. No action is required by the Driver to insert Event 7.**
	Driver	**During Event 7, when contacted as the Outside NUSO acknowledge direction to perform EOI Appendices and enter events as necessary:** • **Event 17 – 2-EOI-Appendix-1D, Insert Control Rods Using Reactor Manual Control System (Close 2-FCV-85-586, CHARGING WATER ISOLATION)** • **Event 18 – Open 2-FCV-85-586, CHARGING WATER ISOLATION** • **Event 19 – 2-EOI-Appendix-1F, Manual SCRAM** • **Event 20 – 2-EOI-Appendix-2, Defeating ARI Logic Trips** • **Event 21 – 2-EOI-Appendix-8A, Bypassing Group RPV Low Low Low Level Isolation Interlocks** • **Event 22 – 2-EOI-Appendix-8E, Bypassing Group 6 RPV Low Level and High Drywell Pressure Isolation Interlocks** **Once the event(s) requested have finished their time delay, report completion of the various EOI Appendices to the Control Room.**
	NUSO	Enters 2-EOI-1A, ATWS RPV Control, and updates the crew.
	NUSO	 ARC/L-1 **ENSURE** each as required: • PCIS isolations (Groups 1, 2, and 3) • ECCS • RCIC ARC/L-2 **INHIBIT** ADS

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 2 of 13

Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

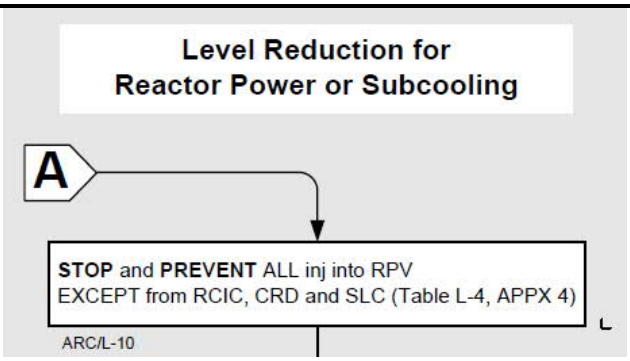
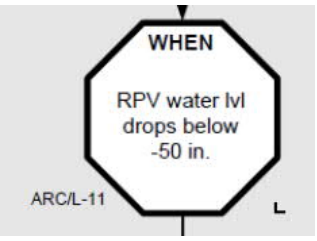
Time	Position	Applicant's Actions or Behavior
	CREW	**Critical Task:** **With a Reactor SCRAM required and the Reactor not shutdown, to prevent an uncontrolled Reactor depressurization and subsequent power excursion inhibit ADS or control Reactor Water Level such that no automatic ADS actuation occurs.** **Critical Task Failure Criteria:** **ADS automatic initiation with Control Rods out.**
	NUSO	ARC/L-3 **IF** ANY Main Steam Line is open **THEN START** defeating the following isolations: • MSIV Low Low Low RPV Water Level (2- EOI-Appendix 8A) • Reactor Building Ventilation Low RPV Water Level (2-EOI-Appendix-8E)
	NUSO	ARC/L-4

IF	THEN
Reactor Power is above 5% or unknown AND Reactor Water Level is above (-) 50 inches	A
ALL Level/Power conditions exist (Table Q-1)	A

NUSO	Table Q-1 Level/Power Conditions • Suppression Pool Temperature is above 110°F ☐ • Reactor Power above 5% OR unknown ☐ • RPV Level above -162 in. ☐ • MSRV open/cycling OR DW pressure above 2.4 psig ☐

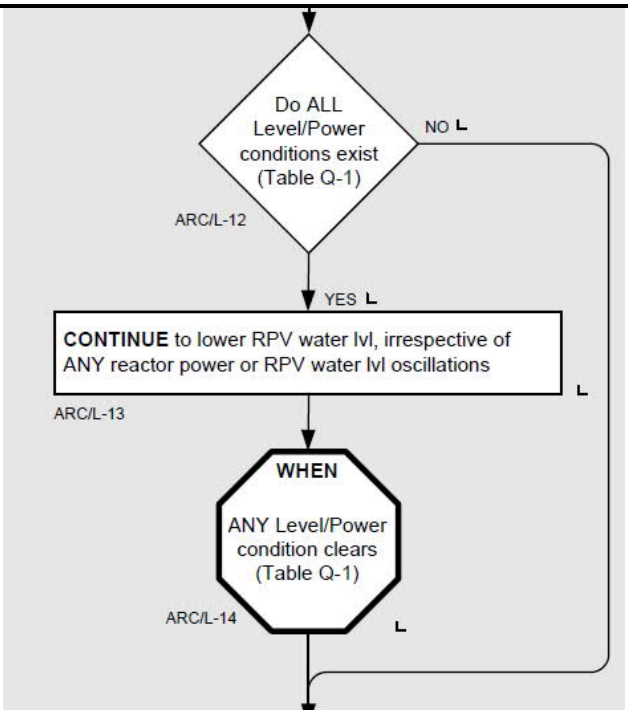
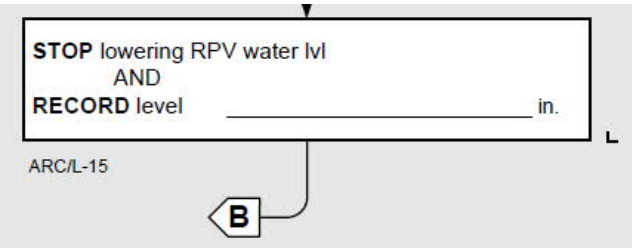
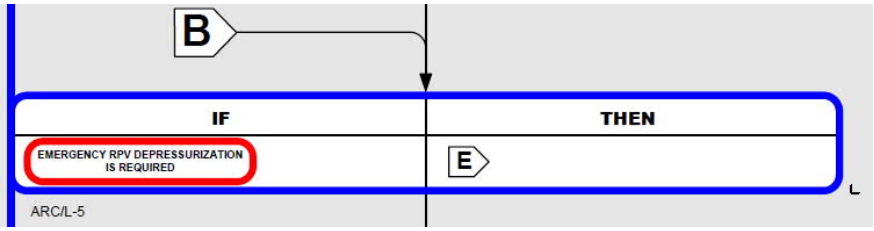
Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 3 of 13

Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

Time	Position	Applicant's Actions or Behavior
	NUSO	
	NRC	**NOTE: The start time for the Critical Task below begins when Recirc Pump Speeds are equal to zero.**
	Crew	**Critical Task:** **When Reactor Power is greater than 5% or unknown during an ATWS, STOP and PREVENT all injection into the Reactor except for RCIC, CRD, and SLC within 130 seconds of the loss of forced recirculation to prevent possible fuel damage.** **Critical Task Failure Criteria:** **The operating crew fails to STOP and PREVENT injection and lower Reactor Water Level for Reactor Power control during an ATWS within 130 seconds after Recirculation Flow is stopped.**
	NUSO	

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 4 of 13

Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

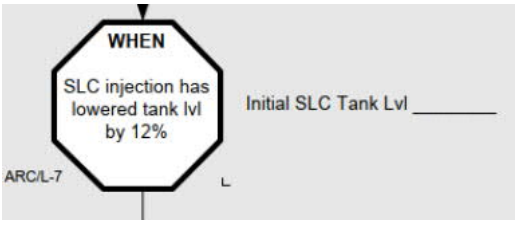
Time	Position	Applicant's Actions or Behavior
	NUSO	
	NUSO	
	NUSO	

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 5 of 13

Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

Time	Position	Applicant's Actions or Behavior
	NUSO	ARC/L-6 **USE** ANY Preferred ATWS Injection System (Table L-3) to maintain RPV Water Level between (-) 180 inches and: Lowered level (if level was deliberately lowered in flowpath A) OR +51 inches (if level was NOT deliberately lowered) ➢ Ok to use Core Spray (2-EOI-Appendix-6D or 6E) or Alternate Injection Subsystems (Table L-2) if previously required by flowpath E or C4A

IF	THEN
Reactor Water Level CANNOT be restored and maintained above (-) 180 inches AND Core Steam Flow remains below MCSF (Table L-5)	**NO ACTION REQUIRED**

	NUSO	
	NUSO	Table L-3 Preferred ATWS Injection Systems

SOURCES	APPX	INJ PRESS
CNDS and FW	5A	1210 psig
CRD	5B	1640 psig
RCIC with CST suction if available ◇2 ◇3 ◇6	5C, 20M	1200 psig
HPCI with CST suction if available ◇2 ◇6 ◇7	5D, 20N	1200 psig
CNDS	6A	480 psig
LPCI ◇2	6B, 6C	320 psig
SLC (boron tank)	7B	1450 psig
Table L-2 systems or CS ONLY IF Step ARC/L-19 has been previously performed	----	----

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 6 of 13

Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

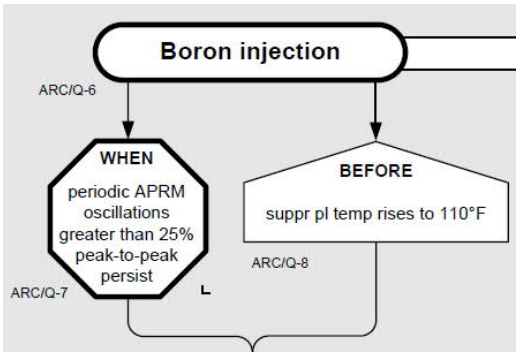
Time	Position	Applicant's Actions or Behavior
	NUSO	Table L-2 Alternate Injection Subsystems

SOURCE	APPX	INJ PRESS
EHPM Pump	7L	1210 psig
SLC (test tank)	7B	1450 psig
SLC (boron tank)	7B	1450 psig
CNDS transfer pumps to RHR and CS	7A	110 psig
RHR crosstie to other units	7C	320 psig
Stby coolant	7D	160 psig
RHR drain pumps	7E, 7F	50 psig
PSC head tank pumps	7G	30 psig
RCIC (aux boiler steam) with CST suction if available ◇2◇3◇6	7H	1200 psig
RCIC manual start	20A	1200 psig
HPCI (aux boiler steam) with CST suction if available ◇2◇6◇7	7J	780 psig
Fire Protection system	7K	150 psig
FLEX Pump Sys (CILRT/CS)	20D	150 psig
FLEX Pump Sys (Standby Coolant)	20B	150 psig
FLEX Pump Sys (CILRT/CRD)	20C	150 psig

	NUSO	Table L-5 Minimum Core Steam Flow MCSF is 1,100,000 lbm/hr and indicated by ANY: • MSCP (Table P-3) • Open TBPVs and RPV pressure above the following: TBPV — RPV Pressure (psig) 2.1 — 1,100 2.3 — 1,000 2.6 — 900 2.8 — 800 3.2 — 700 • RPV injection flow greater than 2200 gpm • Reactor power above 9.1%
	NUSO	Reactor Power L

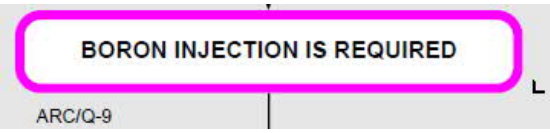
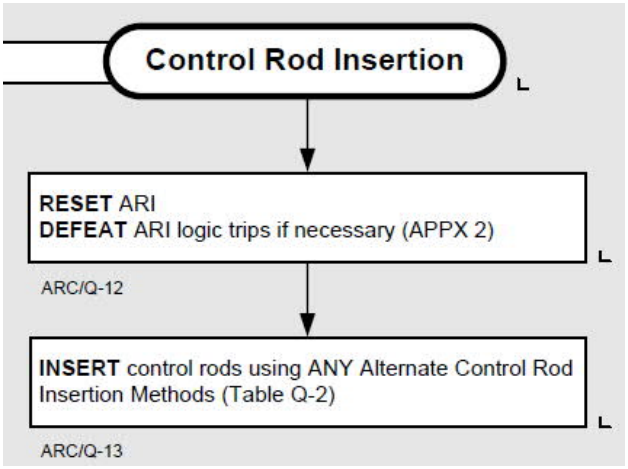
Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 7 of 13

Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

Time	Position	Applicant's Actions or Behavior
	NUSO	ARC/Q-1 **IF**: The Reactor is subcritical AND NO boron has been injected **THEN**: AOI-100-1 Reactor Scram ARC/Q-2 **ENSURE** Reactor Mode Switch in SHUTDOWN ARC/Q-3 **INITIATE** ARI ARC/Q-4 **IF** tripping Recirc Pumps will cause loss of Main Turbine, RFPT, HPCI, or RCIC **THEN ENSURE** Recirc Runback (pump speed 480 RPM or less)
	NUSO	ARC/Q-5 **IF** Reactor Power is above 5% or unknown **THEN TRIP** Recirc Pumps 
	NUSO	In accordance with BFN-ODM-4.20, Strategies for Successful Transient Mitigation, Section 4.8.4.C, when EOI-1A, ATWS RPV Control, Step ARC/Q-8 is reached, **IF** Reactor Power is greater than APRM downscale, **THEN INITIATE** SLC.

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 8 of 13

Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>NUSO</td><td> 
</td></tr>
<tr><td></td><td>NRC</td><td>See Event 9 on page 48 of 55.</td></tr>
<tr><td></td><td>NUSO</td><td>ARC/Q-10
<table>
<tr><td colspan="2">1. INITIATE SLC (2-EOI-Appendix-3A)
2. INHIBIT ADS</td></tr>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Boron CANNOT be injected using SLC</td><td>INJECT boron into RPV using CRD (2-EOI-Appendix-3B)</td></tr>
<tr><td>SLC Tank Water Level drops to 0%</td><td>NO ACTION REQUIRED</td></tr>
</table></td></tr>
<tr><td></td><td>NUSO</td><td>ARC/Q-11
<table>
<tr><td>ENSURE RWCU System Isolation</td></tr>
</table></td></tr>
<tr><td></td><td>NUSO</td><td> 
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Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 9 of 13

Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

Time	Position	Applicant's Actions or Behavior
	NUSO	Table Q-2 Alternate Control Rod Insertion Methods CONDITIONS / METHODS / APPX Scram valves failed to open — **DEENERGIZE** scram solenoids — 1A Scram valves failed to open — **VENT** scram air header — 1B Scram valves opened but SDV is full — 1. **RESET** scram **DEFEAT** RPS logic if necessary; 2. **DRAIN** SDV; 3. **RECHARGE** accumulators; 4. **INITIATE** scram — 1F Manual control rod insertion methods — **DRIVE** control rods **BYPASS** RWM and **RAISE** CRD drive water differential pressure if necessary — 1D Manual control rod insertion methods — **RAISE** CRD cooling water header dp — 1G Manual control rod insertion methods — **SCRAM** individual control rods — 1C Manual control rod insertion methods — **VENT** control rod over piston volumes — 1E
	NUSO	RPV Press
	NUSO	ARC/P-1 **IF**: A high Drywell Pressure ECCS signal exists (2.45 PSIG) — **THEN**: **NO ACTION REQUIRED** **IF**: EMERGENCY DEPRESSURIZATION is required or has been required — **THEN**: **NO ACTION REQUIRED**

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 10 of 13

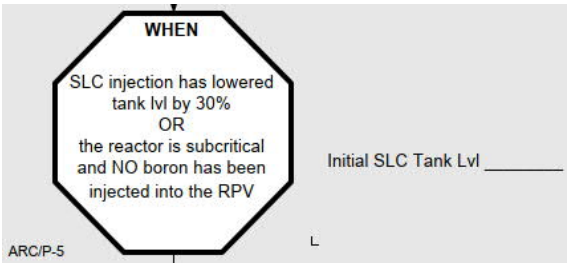
Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>NUSO</td><td>ARC/P-2

IF ANY MSRV is cycling
THEN MANUALLY OPEN MSRVs UNTIL RPV press drops to the pressure at which all Main Turbine Bypass Valves are fully open (APPX 11A)</td></tr>
<tr><td></td><td>NUSO</td><td>ARC/P-3
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Suppression Pool Temperature and Water Level CANNOT be maintained in the safe area of Curve 3 at the existing RPV Pressure</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Suppression Pool Water Level CANNOT be maintained in the safe area of Curve 4</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>BORON INJECTION IS REQUIRED
AND
The Main Condenser is available
AND
There has been no indication of a steam line break</td><td>NO ACTION REQUIRED</td></tr>
</table></td></tr>
</table>

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 11 of 13

Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>NUSO</td><td>ARC/P-4
STABILIZE RPV Pressure below 1073 psig using the Main Turbine Bypass Valves (2-EOI-Appendix-8B)
➢ Use Alternate RPV Pressure Control Systems (Table P-1), if necessary
➢ Crosstie CAD or MSRV carts to DW Control Air (APPX 8G, 20H) if necessary
<table><tr><th>IF</th><th>THEN</th></tr><tr><td>Drywell Control Air is or becomes unavailable</td><td>NO ACTION REQUIRED</td></tr></table></td></tr>
<tr><td></td><td>NUSO</td><td> 
</td></tr>
<tr><td></td><td>OATC</td><td>2-EOI-Appendix-1F, Manual SCRAM

[1] VERIFY Reactor SCRAM and ARI reset.
[1.1] IF ARI CANNOT be reset, THEN EXECUTE EOI Appendix 2, Defeating ARI Logic Trips, concurrently with Step 1.0[1.2] of this procedure.
[1.2] IF Reactor SCRAM CANNOT be reset, THEN DISPATCH personnel to Unit 2 Auxiliary Instrument Room to defeat ALL RPS Logic trips.
[2] WHEN RPS Logic has been defeated, THEN RESET Reactor SCRAM.
[3] VERIFY OPEN SCRAM Discharge Volume Vent and Drain Valves.</td></tr>
<tr><td></td><td>OATC</td><td>Dispatches personnel to perform outside portions of 2-EOI-Appendix-1F, Manual SCRAM.</td></tr>
</table>

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 12 of 13

Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

Time	Position	Applicant's Actions or Behavior
	OATC	[4] **DRAIN** SCRAM Discharge Volume (SDV) UNTIL the following annunciators clear: • WEST CRD DISCHARGE VOLUME WATER LEVEL HIGH HALF SCRAM (Panel 2-9-4, 2-XA-55-4A, Window 1). • EAST CRD DISCHARGE VOLUME WATER LEVEL HIGH HALF SCRAM (Panel 2-9-4, 2-XA-55-4A, Window 29).
	NRC	**The accumulators will drain in approximately 7 minutes, and the alarms at Panel 2-9-4, Windows 1 and 29, will clear. The OATC may then attempt a Reactor SCRAM.**
	OATC	[5] **DISPATCH** personnel to **VERIFY OPEN** 2-SHV-085-0586, CHARGING WATER ISOLATION. **NOTES** 1) If EOI Appendix 2 has been executed, ARI initiation or reset will NOT be possible or necessary in Step 1.0[6]. 2) If Reactor Pressure is greater than 600 PSIG, NUSO may direct performance of step 1.0[6] prior to accumulators being fully recharged. [6] **WHEN** CRD Accumulators are recharged, **THEN INITIATE** manual Reactor SCRAM and ARI.
	NRC	**Control Rods will insert the first time the OATC attempts a Reactor SCRAM after the ATWS.**
	OATC	[7] **CONTINUE** to perform Steps 1.0[1] through 1.0[6] UNTIL ANY of the following exists: • ALL Control Rods are fully inserted, **OR** • NO inward movement of Control Rods is observed, **OR** • NUSO directs otherwise. END OF EOI APPENDIX 1F

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 7 Page 13 of 13

Event Description: Hydraulic Anticipated Transient Without SCRAM (ATWS)

Time	Position	Applicant's Actions or Behavior
	OATC	2--EOI-8A, Bypassing Group 1 RPV Low Low Low Level Isolation Interlocks [1] **BYPASS** Group 1 RPV Low-Low-Low Level Isolation Interlocks as follows (Unit 2 Control Room, Panel 9-4): [1.1] **PLACE** keylock switch 2-HS-064-0056A, GROUP 1 RPV LOW LEVEL BYPASS (SYS A1), in BYPASS. [1.2] **PLACE** keylock switch 2-HS-064-0056B, GROUP 1 RPV LOW LEVEL BYPASS (SYS B1), in BYPASS. [1.3] **PLACE** keylock switch 2-HS-064-0056C, GROUP 1 RPV LOW LEVEL BYPASS (SYS A2), in BYPASS. [1.4] **PLACE** keylock switch 2-HS-064-0056D, GROUP 1 RPV LOW LEVEL BYPASS (SYS B2), in BYPASS. [1.5] **ENSURE** closed the following valves (Unit 2 Control Room, Panel 9-3): • 2-FCV-43-13, RX RECIRC SAMPLE INBOARD ISOLATION VALVE • 2-FCV-43-14, RX RECIRC SAMPLE OUTBOARD ISOLATION VALVE [2] N/A [3] **NOTIFY** Unit Operator to ensure closed the following valves (Unit 2 Control Room, Panel 9-3): • 2-FCV-43-13, RX RECIRC SAMPLE INBOARD ISOLATION VALVE • 2-FCV-43-14, RX RECIRC SAMPLE OUTBOARD ISOLATION VALVE END OF EOI APPENDIX 8A
	NRC	**End of Event 7. When the crew has inserted all Control Rods and has control of Reactor Water Level above the Top of Active Fuel ((-) 162 inches) using high pressure systems, end of Scenario.**

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 8 Page 1 of 7

Event Description: 2A EHC Pump Trip

Time	Position	Applicant's Actions or Behavior
	NRC	**Event 8, EHC Pump Trip, is inserted on Simulator Setup. No action is required by the Driver to insert this event.** **Thirty (30) seconds after the MODE SWITCH is placed in RUN, 2A EHC pump will be stopped.**
	BOP	Acknowledges and reports the following alarms when received: • STANDBY EHC PUMP FAILED, 2-9-7B, Window 15 • EHC HYDRAULIC FLUID HEADER PRESSURE LOW, 2-9-7B, Window 1
	NUSO	Directs the BOP to respond in accordance with the appropriate Alarm Response Procedure(s).
	BOP	Alarm Response Procedure, 2-ARP-9-7B STANDBY EHC PUMP FAILED, Window 15 Operator Action: A. **PERFORM** the following on Panel 2-9-7: 1. **CHECK** alarm by checking 2-PI-47-7, EHC HEADER PRESSURE. 2. **CHECK** 2-HS-47-2A, EHC PUMP 2B and/or 2-HS-47-1A, EHC PUMP 2A running. 3. **CHECK** 2-EI-47-2, EHC PUMP 2B PUMP MTR CURRENT and/or 2-EI-47-1, EHC PUMP 2A PUMP MTR CURRENT. **NOTE** Lights extinguish at 1300 psig lowering and illuminate at 1500 psig rising. 4. **CHECK** lights above 2-HS-47-4A, EHC PUMP 2A TEST pushbutton and 2-HS-47-5A, EHC PUMP 2B TEST pushbutton. B. **DISPATCH** personnel to pumping unit to check for abnormal conditions.

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 8 Page 2 of 7

Event Description: 2A EHC Pump Trip

Time	Position	Applicant's Actions or Behavior
	Driver	**If contacted as the outside NUSO, Work Control, Maintenance, or an AUO to investigate the cause for 2A EHC Pump Trip or to check for abnormal conditions, acknowledge the direction.**
	BOP	**NOTE** On EHC Hydraulic System failure accumulator and check valve arrangement will provide approximately one minute Bypass Valve operation. C. **IF** EHC Hydraulic System fails, **THEN ENSURE** Turbine trips at or below 1100 psig.
	BOP	Alarm Response Procedure, 2-ARP-9-7B EHC HYDRAULIC FLUID HEADER PRESSURE LOW, Window 1 Operator Action: A. N/A. B. **CHECK** EHC HEADER PRESSURE indicator, 2-PI-47-7 between 1550 and 1650 psig. C. **DISPATCH** personnel to inspect EHC Pump unit. **NOTE** On EHC Hydraulic System failure, accumulator and check valve arrangement will provide approximately one minute Bypass Valve operation. D. **IF** EHC Hydraulic system fails, **THEN ENSURE** Turbine trips at or below 1100 psig.
	NUSO	Directs the BOP to maintain Reactor Pressure with Main Steam Relief Valves (MSRVs) using 2-EOI-Appendix-11A, Alternate RPV Pressure Control Systems MSRVs.

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 8 Page 3 of 7

Event Description: 2A EHC Pump Trip

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>BOP</td><td>2-EOI-Appendix-11A, Alternate RPV Pressure Control Systems MSRVs.

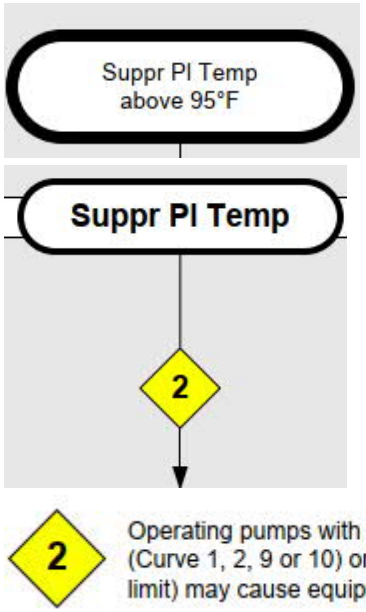
[1] N/A
[2] N/A
[3] OPEN MSRVs using the following sequence to control RPV pressure as directed by the SRO:

<table>
<tr><td>1</td><td>2-PCV-1-179</td><td>MN STM LINE A RELIEF VALVE</td></tr>
<tr><td>2</td><td>2-PCV-1-180</td><td>MN STM LINE D RELIEF VALVE</td></tr>
<tr><td>3</td><td>2-PCV-1-4</td><td>MN STM LINE A RELIEF VALVE</td></tr>
<tr><td>4</td><td>2-PCV-1-31</td><td>MN STM LINE C RELIEF VALVE</td></tr>
<tr><td>5</td><td>2-PCV-1-23</td><td>MN STM LINE B RELIEF VALVE</td></tr>
<tr><td>6</td><td>2-PCV-1-42</td><td>MN STM LINE D RELIEF VALVE</td></tr>
<tr><td>7</td><td>2-PCV-1-30</td><td>MN STM LINE C RELIEF VALVE</td></tr>
<tr><td>8</td><td>2-PCV-1-19</td><td>MN STM LINE B RELIEF VALVE</td></tr>
<tr><td>9</td><td>2-PCV-1-5</td><td>MN STM LINE A RELIEF VALVE</td></tr>
<tr><td>10</td><td>2-PCV-1-41</td><td>MN STM LINE D RELIEF VALVE</td></tr>
<tr><td>11</td><td>2-PCV-1-22</td><td>MN STM LINE B RELIEF VALVE</td></tr>
<tr><td>12</td><td>2-PCV-1-18</td><td>MN STM LINE B RELIEF VALVE</td></tr>
<tr><td>13</td><td>2-PCV-1-34</td><td>MN STM LINE C RELIEF VALVE</td></tr>
</table>
[4] N/A
[5] N/A
[6] N/A

END OF EOI APPENDIX 11A</td></tr>
<tr><td></td><td>BOP</td><td>Acknowledges and reports the following alarm when received:
• SUPPRESSION POOL AVERAGE TEMPERATURE HIGH, 2-9-3E, Window 12</td></tr>
</table>

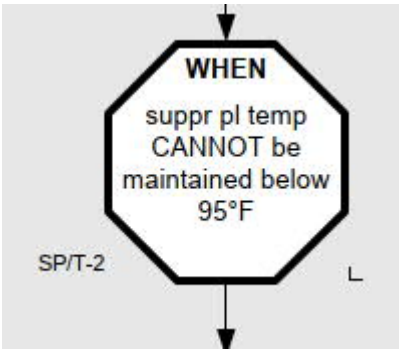
Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 8 Page 4 of 7

Event Description: 2A EHC Pump Trip

Time	Position	Applicant's Actions or Behavior
	NUSO	Directs the BOP to respond in accordance with the appropriate Alarm Response Procedure.
	BOP	(If received) Alarm Response Procedure, 2-ARP-9-3E SUPPRESSION POOL AVERAGE TEMPERATURE HIGH, Window 12 Operator Action: A. **IF** alarm is valid, **THEN ENTER** 2-EOI-2, Primary Containment Control.
	NUSO	Enters 2-EOI-2, Primary Containment Control.
	NUSO	

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 8 Page 5 of 7

Event Description: 2A EHC Pump Trip

Time	Position	Applicant's Actions or Behavior
	NUSO	SP/T-1 **MONITOR** and **CONTROL** Suppr Pool Temperature below 95°F using available Suppr Pool Cooling (APPX 17A) SP/T-2  SP/T-3 **OPERATE** all available Suppression Pool Cooling using only RHR Pumps NOT required to assure adequate Core Cooling by continuous injection (APPX 17A)
	NUSO	Directs the BOP to place Suppression Pool Cooling in service in accordance with 2-EOI-Appendix-17A, RHR System Operation Suppression Pool Cooling.
	BOP	2-EOI-Appendix-17A, RHR System Operation Suppression Pool Cooling **NOTE** Placing a BYPASS SEL switch in BYPASS in Step 1.0[1] below prevents automatic opening of the affected RHR loop's Outboard Injection Valve. This makes LPCI Mode of that RHR Loop inoperable.

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 8 Page 6 of 7

Event Description: 2A EHC Pump Trip

Time	Position	Applicant's Actions or Behavior
	BOP	[1] **IF** Adequate Core Cooling is assured OR directed to cool the Suppression Pool irrespective of Adequate Core Cooling, **THEN BYPASS** LPCI Injection Valve open interlock AS NECESSARY: • PLACE 2-HS-74-155A, LPCI SYSTEM I OUTBOARD INJECTION VALVE BYPASS SELECT in BYPASS • PLACE 2-HS-74-155B, LPCI SYSTEM II OUTBOARD INJECTION VALVE BYPASS SELECT in BYPASS [2] **PLACE** RHR SYSTEM I(II) in Suppression Pool Cooling as follows: [2.1] **ENSURE** at least one RHRSW Pump supplying each EECW Header. [2.2] **ENSURE** RHRSW Pump supplying desired RHR Heat Exchanger(s). [2.3] **THROTTLE** the following in service RHRSW Outlet Valves to obtain required RHRSW Flow: • 2-FCV-23-34, RHR HX 2A RHRSW OUTLET VALVE (Required flow is 1700 to 4500 gpm) • 2-FCV-23-46, RHR HX 2B RHRSW OUTLET VALVE (Required flow is 1350 to 4500 gpm for B1 pump) (Required flow is 1700 to 4500 gpm for B2 pump) • 2-FCV-23-40, RHR HX 2C RHRSW OUTLET VALVE (Required flow is 1700 to 4500 gpm) • 2-FCV-23-52, RHR HX 2D RHRSW OUTLET VALVE (Required flow is 1700 to 4500 gpm) [2.4] **IF** Directed by SRO, **THEN PLACE** 2-XS-74-122(130), RHR SYS I(II) LPCI 2/3 CORE HEIGHT OVERRIDE, in MANUAL OVERRIDE. [2.5] **IF** LPCI Initiation signal exists, **THEN MOMENTARILY PLACE** 2-XS-74-121(129), RHR SYS I (II) CONTAINMENT SPRAY/COOLING VALVE SELECT, in SELECT. [2.6] **IF** 2-FCV-74-53(67), RHR SYS I(II) LPCI INBOARD INJECTION VALVE, is OPEN, **THEN ENSURE CLOSED** 2-FCV-74-52(66), RHR SYSTEM I(II) LPCI OUTBOARD INJECTION VALVE.

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 8 Page 7 of 7

Event Description: 2A EHC Pump Trip

Time	Position	Applicant's Actions or Behavior
	BOP	[2.7] **OPEN** 2-FCV-74-57(71), RHR SYS I(II) SUPPRESSION CHAMBER/POOL ISOLATION VALVE. [2.8] **ENSURE** desired RHR Pump(s) for Suppression Pool Cooling are operating. **CAUTION** RHR System Flows below 7,000 gpm or above 10,000 gpm for one pump operation may result in excessive vibration and equipment damage. [2.9] **THROTTLE OPEN** 2-FCV-74-59(73), RHR SYS I(II) SUPPRESSION POOL COOLING/TEST VALVE, to maintain EITHER of the following as indicated on 2-FI-74-50(64), RHR SYS I(II) FLOW: • Between 7,000 and 10,000 gpm for one pump operation **OR** • At or below 13,000 gpm for two pump operation [2.10] **ENSURE** CLOSED 2-FCV-74-7(30), RHR SYS I(II) MIN FLOW VALVE. [2.11] **MONITOR** RHR Pump NPSH using Attachment 1. [2.12] **NOTIFY** Chemistry that RHRSW is aligned to in service RHR Heat Exchangers.
	Driver	**When contacted as Chemistry, acknowledge any information given.**
	BOP	[2.13] **IF** Additional Suppression Pool Cooling Flow is necessary, **THEN PLACE** additional RHR and RHRSW Pumps in service using Steps 1.0[2.2] through 1.0[2.12]. [3] N/A END OF EOI APPENDIX 17A
	NRC	**End of Event 8. Once the crew has inserted all Control Rods and has control of Reactor Water Level above the Top of Active Fuel ((-) 162 inches) using high pressure systems, end of Scenario.**

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 9 Page 1 of 2

Event Description: SLC Pump Trip

Time	Position	Applicant's Actions or Behavior
	NRC	**Event 9, SLC Pump Trip, is inserted on Simulator Setup. No action is required by the Driver to insert this event.** **NOTE: The first SLC Pump that is started will trip.**
	BOP	2-EOI-Appendix-3A, SLC Injection [1] **UNLOCK** and **PLACE** 2-HS-63-6A, SLC PUMP 2A/2B, control switch in START-A or START-B position. [2] **CHECK** SLC System for injection by observing the following: • Selected pump starts, as indicated by red light illuminated above pump control switch • Squib valves fire, as indicated by SQUIB VALVE A and B CONTINUITY blue lights extinguished • SLC SQUIB VALVE CONTINUITY LOST Annunciator in alarm on Panel 9-5 (2-XA-55-5B, Window 20) • 2-PI-63-7A, SLC PUMP DISCH PRESS, indicates above RPV Pressure • System flow, as indicated by 2-IL-63-11, SLC FLOW, red light illuminated on Panel 9-5 • SLC INJECTION FLOW TO REACTOR Annunciator in alarm on Panel 9-5 (2-XA-55-5B, Window 14). [3] **IF** proper system operation CANNOT be verified, **THEN RETURN** to Step 1.0[1] and **START** other SLC pump.
	BOP	Determines that the first SLC Pump that was started trips, and starts the alternate SLC Pump.
	BOP	[4] **VERIFY** RWCU isolation by observing the following: • RWCU Pumps 2A and 2B tripped • 2-FCV-69-1, RWCU INBOARD SUCT ISOLATION VALVE closed • 2-FCV-69-2, RWCU OUTBOARD SUCT ISOLATION VALVE closed • 2-FCV-69-12, RWCU RETURN ISOLATION VALVE closed

Op Test No.: 21-04 Scenario No. NRC-2 Event No.: 9 Page 2 of 2

Event Description: SLC Pump Trip

Time	Position	Applicant's Actions or Behavior
	BOP	[5] **VERIFY** ADS inhibited. [6] **MONITOR** Reactor Power for downward trend. [7] **MONITOR** 2-LI-63-1A, SLC STORAGE TANK LEVEL, and **CHECK** that level is dropping approximately 1% per minute. [8] **WHEN** EITHER of the following exists: • SLC Tank Level drops to 0%, **OR** • As directed by SRO, **THEN** **STOP** SLC Pump 2A or 2B. [9] **NOTIFY** Chemistry to mix additional solution to compensate for dilution as directed by the SRO. [10] **WHEN** directed by the SRO to perform system flush, **THEN REFER** to OI-63, Standby Liquid Control System, Section 8.1, for system flush. END OF 2-EOI-APPENDIX-3A
	Driver	**If contacted as Chemistry, acknowledge any direction given.**
	NRC	**End of Event 9. Once the crew has inserted all Control Rods and has control of Reactor Water Level above the Top of Active Fuel ((-) 162 inches) using high pressure systems, end of Scenario.**

Scenario Setup
UNIT 2

IC	28
Exam IC	277

Procedure	Revision	Procedure	Revision	Procedure	Revision
OI-68	161	ARP-3E	31	APPX-17A	18
OI-67	126	ARP-5A	60	APPX-1F	6
OI-92B	43	ARP-7B	36	APPX-8A	5
GOI-100-12A	118	ARP-8C	19		
0-AOI-27-1	12	ARP-20A	30		
AOI-47-3	22	EOI-1A	2		
AOI-85-6	21	EOI-2	16		
ODM 4.20	7	EOI-3	6		

Simulator Setup	Verify camera system is powered down (admin password = abcd1234) Start CPERF **PRIOR** to placing the Simulator in RUN Verify EECW Pump Alarm borders are properly arranged on Panels 2-9-23A / B / C / D. Hang Danger Tags on A3 EECW Pump and 2B EHC Pump. Hang Protected Equipment Tag on 2A EHC Pump.
Schedule Files(s):	2104 NRC Scenario 2 UNIT 2.sch
Event Files(s):	2104 NRC Scenario 2 UNIT 2.evt

Schedule File: 2104 NRC Scenario 2 UNIT 2.sch

Event	Action	Description
	2104 NRC Scenario 2 UNIT 2.evt	
2	Insert malfunction SW03M	RHRSW PUMP D3 TRIP
3	set nmaprmgain(1)=0.000005	Fails APRM 1 Low
4	Insert malfunction RD04R3011	DRIFT ANY CONTROL ROD OUT 30-11
14	Delete malfunction RD04R3011	DRIFT ANY CONTROL ROD OUT 30-11
5	Insert malfunction OG04A	OFFGAS SJAE ISOLATION (RELAY R5A)
6	Insert malfunction MC05 to 100.00000 in 600	INTAKE PUMPING STATION TRAVELING SCREENS CLOG

Schedule File: 2104 NRC Scenario 2 UNIT 2.sch

Event	Action	Description
7	Insert malfunction MC05 to 50.00000 in 120	INTAKE PUMPING STATION TRAVELING SCREENS CLOG
26	Insert malfunction MC02A after 60	CCW PUMP 2A MOTOR TRIP
	Insert malfunction RD09A after 2 to 55.00000	ATWS (HYDRAULIC LOCK) EAST
	Insert malfunction RD09B after 2 to 55.00000	ATWS (HYDRAULIC LOCK) WEST
	Insert malfunction RD06ALLSTICK	STICK ALL CONTROL RODS
	Insert malfunction RD17A	EAST SDV LEVEL SWITCH FAILS LOW (LS-85-45E,F,G,H,K,M)
	Insert malfunction RD17B	WEST SDV LEVEL SWITCH FAILS LOW (LS-85-45A,B,C,D,J,L)
7	Insert override HS-47-1A after 30 to STOP	EHC HYD FLUID PUMP 2A
	Insert malfunction PMP-47-1 to FAIL_CCOIL	52_BREAKER EHC HYD FLUID PUMP A
	Insert malfunction SL01A	SLC PUMP 2A TRIP
	Insert malfunction SL01B	SLC PUMP 2B TRIP
9	Delete malfunction SL01A	SLC PUMP 2A TRIP
10	Delete malfunction SL01B	SLC PUMP 2B TRIP
17	Insert remote RD06 to CLOSE	CRD CHARGING WATER VALVE FCV-2-85-586
18	Insert remote RD06 to OPEN	CRD CHARGING WATER VALVE FCV-2-85-586
19	Schedule F:\Scenarios\ Scenario 2\App. 1F.sch	
20	Schedule F:\2104\NRC\Scenarios\U2\Scenario 2\App. 2.sch	
21	Schedule F:\Scenarios\ Scenario 2\App. 8A.sch	
22	Schedule F:\Scenarios\ Scenario 2\App. 8E.sch	

Schedule File: 2104 NRC Scenario 2 UNIT 2.sch

Event	Action	Description
7	Delete malfunction RD17A	EAST SDV LEVEL SWITCH FAILS LOW (LS-85-45E,F,G,H,K,M)
7	Delete malfunction RD17B	WEST SDV LEVEL SWITCH FAILS LOW (LS-85-45A,B,C,D,J,L)
27	Delete malfunction RD09A	ATWS (HYDRAULIC LOCK) EAST
27	Delete malfunction RD09B	ATWS (HYDRAULIC LOCK) WEST
27	Delete malfunction RD06ALLSTICK	STICK ALL CONTROL RODS

Schedule File: App. 1F.sch

Event	Action	Description
	Insert remote RP13A to BYP after 300	DEFEAT CHANNEL A1 AUTO SCRAM
	Insert remote RP13B to BYP after 300	DEFEAT CHANNEL B1 AUTO SCRAM
	Insert remote RP13C to BYP after 300	DEFEAT CHANNEL A2 AUTO SCRAM
	Insert remote RP13D to BYP after 300	DEFEAT CHANNEL B2 AUTO SCRAM

Schedule File: App. 2.sch

Event	Action	Description
	Insert remote RP12A to TEST after 300	OPERATE LOCAL ATWS MODE SWITCH 2-HS-68-118A
	Insert remote RP12B to TEST after 300	OPERATE LOCAL ATWS MODE SWITCH 2-HS-68-118B

Schedule File: App. 8A.sch

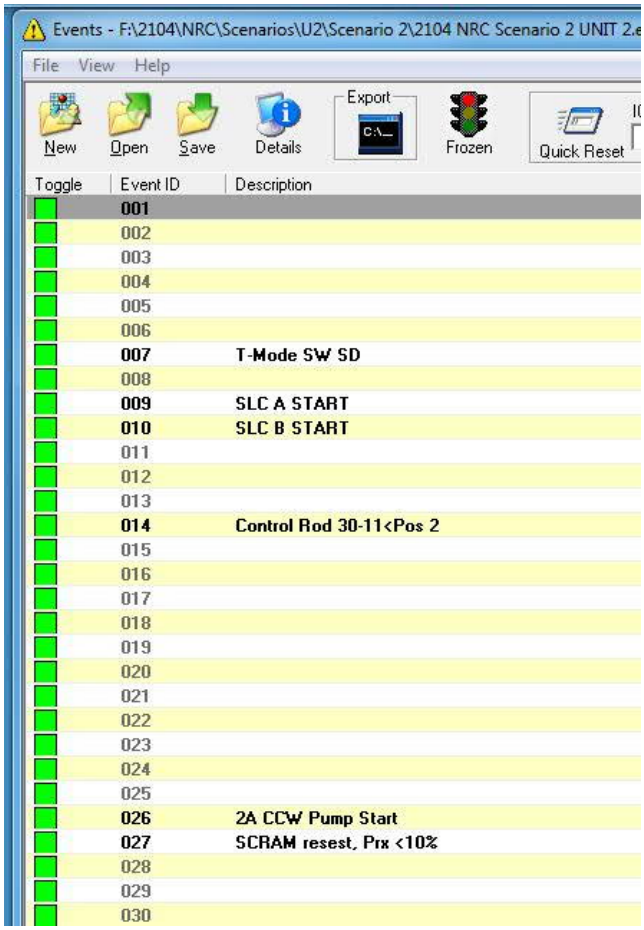
Event	Action	Description
	Insert remote RP06A to BYP after 300	BYP MSIV GP 1 LO LVL -APPNDX 8A-16A-K1A
	Insert remote RP06B to BYP after 300	BYP MSIV GP 1 LO LVL -APPNDX 8A-16A-K1B
	Insert remote RP06C to BYP after 300	BYP MSIV GP 1 LO LVL -APPNDX 8A-16A-K1
	Insert remote RP06D to BYP after 300	BYP MSIV GP 1 LO LVL -APPNDX 8A-16A-K1D

Schedule File: App. 8E.sch

Event	Action	Description
	Insert remote RP14A to BYP after 300	BYPASS GROUP 6 INBOARD LOW LVL/HI DW PRESS INTLKS
	Insert remote RP14B to BYP after 300	BYPASS GROUP 6 OUTBOARD LOW LVL/HI DW PRESS INTLKS

Event File: 2104 NRC Scenario 2 UNIT 2.evt

List



Details

UNIT 2 SHIFT TURNOVER MEETING			Today
MODE 1	**DAYS ON LINE** 227	**Total Drywell Leakage (gpm)**	**Protected Equipment**
	PRA (EOOS) -GREEN	1.55	2A EHC Pump
Rx Power 100%	500Kv GRID - Qualified	**Floor Drain (gpm)**	
	161Kv Grid -Qualified	0.11	
MWe 1295	**Last breaker closure** 10/01/20 4:31	**Equipment Drain (gpm)** 1.44	

☐Review logs ☐Qualifications ☐Review RCP/Rx Brief ☐Review LCO/OWA Actions ☐Walkdown Panels/Verify EOOS ☐CR Reviews Complete ☐Leadership and Team Effectiveness

CHANGES IN LCOs

A3 EECW Pump is tagged for oil change (information only LCO).

LCOs OF 72 HOURS OR LESS

SIGNIFICANT ITEMS DURING PREVIOUS SHIFT/RADIOLOGICAL CHANGES

A3 EECW Pump is tagged for oil change

2B EHC Pump tagged for discharge filter replacement.

2A CCW Pump repairs are complete, tags are cleared. Ready to re-start when Maintenance is ready.

MAJOR EQUIPMENT CHANGES PLANNED FOR THIS SHIFT

Continue to support A3 EECW and 2B EHC Pump maintenance.

Alternate both Recirc Drive Cooling Water Pumps.

OPERATOR WORK AROUNDS **OWAs - 1*** **Burdens - 0** **Challenges - 7**

ODMIs/ACMPs

ONEAs

FIRE RISK SIGNIFICANT ITEMS OOS/FPLCO Actions Due

SCHEDULED ITEMS NOT COMPLETED

Facility: BFN Scenario Number: NRC-3 Op-Test Number:21-04

Examiners: _____ Operators: SRO: _____

_____ ATC: _____

_____ BOP: _____

Initial Conditions: ~2.2 % Reactor Power.

Turnover: Reactor Startup in progress. Raise Reactor Power and place the Reactor MODE SWITCH in RUN. A thunderstorm watch has just been issued for Limestone County, AL. 'H' IRM is bypassed due to noise.

Critical Tasks:

1. When Suppression Pool Water Level cannot be maintained within the safe area of Curve 4, SRV Tail Pipe Level Limit, the crew will insert a manual Reactor SCRAM as directed by the Nuclear Unit Senior Operator (NUSO).
2. When Suppression Pool Water Level and RPV Pressure cannot be restored and maintained within the safe area of Curve 4, the NUSO determines that Emergency Depressurization is required. The Operator initiates Emergency Depressurization as directed by the NUSO.

Event Number	Malfunction Number	Event Type*	Event Description
1.	N/A	N-BOP N-NUSO	Transfer Seal Steam to Main Steam
2.	N/A	R-OATC R-NUSO	Raise Reactor Power using Control Rods
3.	XS-92-7/42G	C-OATC C-NUSO	IRM Failure
4.	RD08R2227	TS-NUSO	Control Rod Accumulator INOPERABLE
5.	SCHEDULE STACK	C-BOP C-NUSO	Failure of 3A Stack Dilution Fan, Standby Fan Fails to Automatically Start
6.	DG01B	TS-NUSO	3EA Emergency Diesel Generator (EDG) Logic Breaker Tripped
7.	SCHEDULE TORUS	M-ALL	High Suppression Pool Water Level / Emergency Depressurization
8.	RD06R3019 RD06R2615	C-OATC C-NUSO	Two Control Rods Fail to Insert
9.#	ED10A ED10B	C-BOP C-NUSO	480V Shutdown Board Trip

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

Event on previous two NRC Exams

#S Event on previous two NRC Exams Scenario (Spare)

Events

1. The crew will transfer Seal Steam from Auxiliary Steam to Main Steam in accordance with 3-OI-47C, Seal Steam System.

2. The crew will continue the Reactor startup by withdrawing Control Rods in accordance with 3-OI-85, Control Rod Drive System, and 3-GOI-100-1A, Unit Startup and Power Operation.

3. During Control Rod withdrawal, the IRM 'G' Range Switch will fail in position 8, requiring the crew to bypass IRM 'G' in accordance with 3-OI-92A, Intermediate Range Monitors. The Nuclear Unit Senior Operator (NUSO) will reference Technical Specification 3.3.1.1, RPS Instrumentation, Table 3.3.1.1.

4. Control Rod 22-27 Accumulator Pressure will lower below 940 psig, requiring the NUSO to address Technical Specification 3.1.5, Control Rod SCRAM Accumulators, Condition A.

5. Stack Dilution Fan 3A will fail and the standby Stack Dilution Fan will fail to automatically start. The crew will take action to manually restore Stack Dilution Flow by starting 3B Stack Dilution Fan in accordance with 3-OI-66, Off-Gas System, Section 5.1.

6. The 3EA Emergency Diesel Generator (EDG) Logic Breaker will trip, causing an annunciation in the Control Room and disabling 3EA EDG. The NUSO will address Technical Specification 3.8.1, AC Sources – Operating, Condition B.

7. The crew will respond to a rising Suppression Pool Water Level in accordance with Emergency Operating Instruction 3-EOI-2, Primary Containment Control. Suppression Pool Water Level will not be able to be maintained in the safe area of Curve 4, SRV Tail Pipe Level Limit, requiring the crew to Emergency Depressurize the Reactor in accordance with 3-C-2, Emergency RPV Depressurization.

8. When the crew inserts a manual Reactor SCRAM due to high Suppression Pool Water Level, two Control Rods will fail to insert, requiring the crew to take actions to insert the Control Rods in accordance with 3-AOI-100-1, Reactor SCRAM.

9. When the crew is Emergency Depressurizing the Reactor due to rising Suppression Pool Water Level, 480V Shutdown Power to the injection valves on the loop the crew selects to inject water into the core will be lost, requiring action to choose another source for Reactor Water injection

The Scenario ends when the crew has Emergency Depressurized the Reactor and has control of Reactor Water Level above the Top of Active Fuel (TAF, (-) 162 inches) using low pressure systems.

Critical Tasks: 2

1. **When Suppression Pool Water Level cannot be maintained within the safe area of Curve 4, SRV Tail Pipe Level Limit, the crew will insert a manual Reactor SCRAM as directed by the Nuclear Unit Senior Operator (NUSO).**

   a. Safety Significance

   Prevent failure of Primary Containment from over pressurization.

   b. Cues

   Procedural Compliance.
   Suppression Pool Level indication.

   c. **Measured by**

   Observation – Both RPS SCRAM switches are depressed.

   d. **Feedback**

   Control Rods insert to their full in position.

   e. Critical Task Failure Criteria

   The operating crew fails to proceed without delay and in a controlled manner to insert a manual SCRAM before Suppression Pool Water Level enters the 'Action Required' area of Curve 4, SRV Tail Pipe Level Limit.

2. **When Suppression Pool Water Level and RPV Pressure cannot be restored and maintained within the safe area of Curve 4, the NUSO determines that Emergency Depressurization is required. The Operator initiates Emergency Depressurization as directed by the Nuclear Unit Senior Operator.**

   a. **Safety Significance**

   Prevent failure of Primary Containment from over pressurization.

   b. **Cues**

   Procedural Compliance.
   RPV Pressure indication.
   Suppression Pool Level indication.

   c. **Measured by**

   Observation – the Nuclear Unit Senior Operator determines (as indicated by announcement or observable transition to 3-C-2, RPV Emergency Depressurization), Emergency Depressurization is required at or before Suppression Pool Water Level and RPV Pressure cannot be restored and maintained within the safe area of Curve 4.
   AND
   Observation – the Nuclear Unit Senior Operator directs the Operator to open 6 ADS valves

d. **Feedback**

Suppression Pool Water Level trend.
RPV Pressure trend.
MSRV status indication.

e. **Critical Task Failure Criteria**

The operating crew fails to proceed without delay and in a controlled manner to initiate Emergency Depressurization from the time that Suppression Pool Water Level and RPV Pressure cannot be restored and maintained within the safe area of Curve 4.

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 1 Page 1 of 2

Event Description: Transfer Seal Steam to Main Steam

Time	Position	Applicant's Actions or Behavior
	Driver	**Prior to placing the simulator in RUN, start CPERF to record critical parameters.**
	NRC	**If the crew does not proceed to Event 1, request that the Driver insert Event 1.**
	Driver	**If contacted by the Chief Examiner to insert Event 1, contact the Nuclear Unit Supervisor Operator (NUSO) as the Shift Manager and direct the crew to transfer Seal Steam from Auxiliary Steam to Main Steam.**
	NUSO	Directs the Balance of the Plant Operator (BOP) to transfer Seal Steam from Auxiliary Steam to Main Steam in accordance with 3-OI-47C, Seal Steam System, Section 6.1.
	BOP	3-OI-47C, Seal Steam System Section 6.1, Shifting Supply from Auxiliary Steam to Main Steam **NOTES** 1) Section 6.1 is entered with the Seal Steam supply on Auxiliary Steam. 2) Section 6.1 is performed at Panel 3-9-7 in the Control Room unless otherwise specified. 3) To seal the Turbine at startup with less than 250 psig Main Steam Pressure, or with worn packings, the 3-FCV-1-145, STEAM SEAL REGULATOR BYPASS VALVE, is required to be adjusted to supplement 3-PCV-1-147, STEAM SEAL FEED VALVE, to obtain the needed flow. 4) The 3-PCV-1-147, STEAM SEAL FEED VALVE, is designed to handle the Steam Seal Header requirements when Main Steam Pressure exceeds 250 psig. [1] **BEFORE** placing Seal Steam System on Nuclear Steam, **PERFORM** the following: [1.1] **NOTIFY** Radiation Protection that an RPHP is in effect for the impending action to place Seal Steam System on nuclear steam. **RECORD** time Radiation Protection notified in the Narrative Log.

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 1 Page 2 of 2

Event Description: Transfer Seal Steam to Main Steam

Time	Position	Applicant's Actions or Behavior
	NRC	**An RPHP was provided to the crew at turnover.**
	BOP	[2] **CHECK** Reactor Pressure is greater than 200 psig. [3] **ENSURE** OPEN 3-PCV-1-147, STEAM TO STEAM SEAL PRESS REGULATOR by placing 3-HS-1-147, STEAM SEAL REGULATOR, in AUTO. [4] **OPEN** 3-FCV-1-146, MAIN STEAM SUPPLY TO STEAM SEAL VALVE. [5] **CLOSE** 3-FCV-1-154, AUX BOILER SUPPLY TO STEAM SEAL VALVE. [6] **CHECK** Steam Seal Header Pressure, as indicated on 3-PI-1-148A, STEAM SEAL HEADER PRESSURE, is between 2 1/2 and 9 psig. [7] **CLOSE** 3-SHV-012-0638, TURBINE SEAL STM VALVE. (Turbine Building Elevation 586', T16 J-Line near the EHC Unit behind Panel 25-111)
	Driver	**When directed as the Turbine Building AUO to close 3-12-638, TURBINE SEAL STM VALVE, acknowledge the direction and inform the crew that 3-12-638 is closed.**
	Driver	**If contacted as the Boiler AUO that steam load is being removed, acknowledge report.**
	BOP	[8] **ENSURE** CLOSED 3-FCV-001-0149, STEAM SEAL UNLOADING MANUAL BYPASS VALVE. **CAUTION** Throttling 3-BYV-001-0145, STEAM SEAL REG BYPASS VALVE, with Main Steam Pressure above 250 psig could result in excessive vibration of the Steam Seal Header. [9] **THROTTLE** 3-FCV-1-145, STEAM SEAL REGULATOR BYPASS VALVE, to keep Steam Seal Header Pressure, as indicated on 3-PI-1-148A, STEAM SEAL HEADER PRESSURE, between 2 1/2 and 9 psig, if necessary. [10] **CHECK** SPE Vacuum, as indicated on 3-PI-66-54, STEAM PACKING EXHAUST VACUUM, is between 10 and 12 in H2O vacuum.
	NRC	**End of Event 1. Proceed to Event 2, Raise Reactor Power Using Control Rods.**

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 2 Page 1 of 4

Event Description: Raise Reactor Power using Control Rods

Time	Position	Applicant's Actions or Behavior
	NRC	**If the crew does not proceed to Control Rod withdrawal, request that the Driver insert Event 2.**
	Driver	**If requested by the Chief Examiner, contact the NUSO as the Shift Manager and direct the crew to continue the Reactor Startup.**
	NRC	**During Control Rod withdrawal, Event 3, IRM Failure will automatically be inserted. No action is required by the driver to insert Event 3.**
	NUSO	(The crew may elect to conduct a reactivity re-focus brief) Assumes the Reactivity Manager position. Directs the Operator at the Controls (OATC) to raise Reactor Power to 6-7% in preparation for placing the Reactor MODE SWITCH in RUN, in accordance with 3-GOI-100-1A, Unit Startup and Power Operation, 3-OI-85, Control Rod Drive System, and 3-SR-3.1.3.5(A), Control Rod Coupling Integrity Check.
	OATC	3-GOI-100-1A, Unit Startup Section 5.4, Withdrawal of Control Rods while in Mode 2 [83] **CONTINUE** to withdraw Control Rods to raise Reactor Power to 6% to 7% per 3-OI-85, Control Rod Drive System, and 3-SR-3.1.3.5(A), Control Rod Coupling Integrity Check. [84] **ENSURE** all operable APRM downscale alarms are reset and no rod blocks exist.
	OATC	3-OI-85, Control Rod Drive System Section 6.6, Control Rod Withdrawal 6.6.1 Initial Conditions Prior to Withdrawing Control Rods [1] **REVIEW** Precautions and Limitations in Section 3.7 and Section 3.8. [2] **CHECK** the following prior to Control Rod movement: • CRD POWER, 3-HS-85-46 in ON. • Rod Worth Minimizer is operable and LATCHED into the correct ROD GROUP when Rod Worth Minimizer is enforcing (not required with no fuel in RPV)

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 2 Page 2 of 4

Event Description: Raise Reactor Power using Control Rods

Time	Position	Applicant's Actions or Behavior
	OATC	3-OI-85, Control Rod Drive System Section 6.6.2, Actions Required during and Following Control Rod Withdrawal [1] **IF** the Control Rod fails to withdraw, **THEN** Refer to Section 8.15 for additional methods to reposition Control Rod. [2] **IF** the Control Rod double notches, or withdraws past its correct/desired position, **THEN** Refer to Section 6.7 for inserting Control Rod to its correct/desired position. [NRC IR 84-02] [3] **IF** at any time while driving a selected rod during the performance of this section, the Control Rod moves more than one notch from its intended position, **THEN** Refer to 3-AOI-85-7, Mispositioned Control Rod. [4] **OBSERVE** the following during Control Rod repositioning: • Control Rod reed switch position indicators (four rod display) agree with the indication on the Full Core Display. • Nuclear Instrumentation responds as Control Rods move through the core (This ensures Control Rod is following drive during Control Rod movement.) [5] **ATTEMPT** to minimize automatic RBM Rod Block as follows: • **STOP** Control Rod withdrawal (if possible) prior to reaching any RBM Rod Block using the RBM displays on Panel 3-9-5 and PERFORM Step 6.6.2[6]. [6] **IF** Control Rod movement was stopped to keep from exceeding a RBM setpoint or was caused by a RBM Rod Block, **THEN PERFORM** the following at the Unit SRO's discretion to "REINITIALIZE" the RBM: [6.1] **PLACE** 3-HS-85-46, CRD POWER in the OFF position to deselect the Control Rod. [6.2] **PLACE** 3-HS-85-46, CRD POWER, in the ON position. [6.3] **IF** desired, **THEN CONTINUE** to withdrawal Control Rods and **PERFORM** applicable section for Control Rod withdrawal.

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 2 Page 3 of 4

Event Description: Raise Reactor Power using Control Rods

Time	Position	Applicant's Actions or Behavior
	NRC	**Order of Control Rod withdrawal in accordance with 3-SR-3.1.3.5(A), Control Rod Coupling Integrity Check:**

BFN Unit 3	Control Rod Coupling Integrity Check	3-SR-3.1.3.5(A) Rev. 0027 Page 121 of 363

Attachment 5
(Page 20 of 39)

A2 Startup Sequence Control Rod Movement Data Sheet

Date _____

RWM GP	ROD NUMBER	FROM	TO	Rod Movement Completed Signoffs UO (AC) [1]	Peer Check [2]
25	26-35	04	06		
25	34-35	04	06		
25	34-27	04	06		
25	26-27	04	06		
26	10-43	04	06		
26	18-51	04	06		
26	42-51	04	06		
26	50-43	04	06		
26	50-19	04	06		
26	42-11	04	06		
26	18-11	04	06		
26	10-19	04	06		
27	18-35	04	06		
27	26-43	04	06		
27	34-43	04	06		
27	42-35	04	06		
27	42-27	04	06		
27	34-19	04	06		
27	26-19	04	06		
27	18-27	04	06		

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 2 Page 4 of 4

Event Description: Raise Reactor Power using Control Rods

Time	Position	Applicant's Actions or Behavior
	OATC	3-OI-85, Control Rod Drive System Section 6.6.3, Control Rod Notch Withdrawal [1] **SELECT** the desired Control Rod by depressing the appropriate 3-XS-85-40, CRD ROD SELECT pushbutton. [2] **ENSURE** CRD DRIVE WATER HEADER DP is between 250 -270 psid on 3-PDI-85-17A by throttling 3-HS-85-23A, CRD DRIVE WATER PRESS CONTROL VALVE, as necessary. [3] N/A [4] **OBSERVE** the following for the selected Control Rod: • CRD ROD SELECT pushbutton is brightly ILLUMINATED • White light on the Full Core Display ILLUMINATED • Rod Out Permit light ILLUMINATED [5] **CHECK** Rod Worth Minimizer is operable and LATCHED into the correct ROD GROUP when the Rod Worth Minimizer is enforcing. [6] **PLACE** CRD CONTROL SWITCH, 3-HS-85-48, in ROD OUT NOTCH, and **RELEASE**. [7] **OBSERVE** the Control Rod settles into the desired position and the ROD SETTLE light extinguishes. [8] N/A [9] N/A
	OATC	3-OI-85, Control Rod Drive System 6.6.5 Return to Normal After Completion of Control Rod Withdrawal [1] **WHEN** Control Rod movement is no longer desired AND deselecting Control Rods is desired, **THEN**: [1.1] **PLACE** 3-HS-85-46, CRD POWER in OFF. [1.2] **PLACE** 3-HS-85-46, CRD POWER in ON.
	NRC	**End of Event 2. Event 3, IRM Failure is automatically inserted on simulator setup. No action is required by the Driver to insert Event 3.**

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 3 Page 1 of 2

Event Description: IRM Failure

Time	Position	Applicant's Actions or Behavior
	NRC	**Event 3, IRM Failure, is automatically inserted on Simulator setup. No action is required by the Driver to insert Event 3.**
	NRC	**IRM 'G' will need to be ranged up after approximately 10 Control Rods are pulled (about Control Rod 42-11 in Group 26).**
	OATC	During Control Rod withdrawal will be ranging IRM Switches to prevent a Control Rod Block or Reactor SCRAM Signal. When the OATC attempts to range IRM 'G' UP, the reading will not change. Stops Control Rod withdrawal. Notifies the NUSO.
	NUSO	Directs the OATC to bypass IRM 'G' in accordance with 3-OI-92A, Intermediate Range Monitors.
	OATC	3-OI-92A, Intermediate Range Monitors Section 6.1, Bypassing an IRM Channel **NOTES** 1) It is not necessary for a bypassed IRM channel to have its detector inserted into the Core. 2) Only one IRM in each trip system can be bypassed at a time. 3) All operations are performed on Panel 3-9-5 unless specifically stated otherwise. **CAUTION** NPG-SPP 10.4 requires approval of the Plant Manager or his designee prior to any planned operation with IRMs bypassed unless bypassing is specifically allowed within approved procedures. [1] **REVIEW** all precautions and limitations in Section 3.0. [2] **PLACE** the appropriate IRM Bypass selector switch to the BYPASS position: • 3-HS-92-7A/S4A, IRM BYPASS • 3-HS-92-7A/S4B, IRM BYPASS [3] **CHECK** that the Bypassed light is illuminated.

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 3 Page 2 of 2

Event Description: IRM Failure

Time	Position	Applicant's Actions or Behavior
	Driver	**If contacted by the crew as the Shift Manager, acknowledge any report given.** **If contacted as the Plant Manager / Shift Manager for permission to continue Control Rod withdrawal with IRM 'G' bypassed, acknowledge the request and ask for their recommendation. Concur with any recommendation given.**
	OATC	Informs the NUSO that IRM 'G' is bypassed.
	NUSO	References Technical Specification 3.3.1.1, RPS Instrumentation. Declares an Information Only LCO based on only three IRM channels being required per trip system in accordance with Table 3.3.1.1-1 (page 1 of 3).
	NRC	**End of Event 3. Request that the driver insert Event 4, Control Rod Accumulator Inoperable.**

RPS Instrumentation
3.3.1.1

Table 3.3.1.1-1 (page 1 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Intermediate Range Monitors					
a. Neutron Flux - High	2	3	G	SR 3.3.1.1.1 SR 3.3.1.1.3 SR 3.3.1.1.5 SR 3.3.1.1.6 SR 3.3.1.1.9 SR 3.3.1.1.14	≤ 120/125 divisions of full scale
	5(a)	3	H	SR 3.3.1.1.1 SR 3.3.1.1.4 SR 3.3.1.1.9 SR 3.3.1.1.14	≤ 120/125 divisions of full scale
b. Inop	2	3	G	SR 3.3.1.1.3 SR 3.3.1.1.14	NA
	5(a)	3	H	SR 3.3.1.1.4 SR 3.3.1.1.14	NA

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 4 Page 1 of 4

Event Description: Control Rod Accumulator Inoperable

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 5, Control Rod Accumulator Inoperable.**
	NRC	**The alarm will occur on Control Rod 22-27 Accumulator.**
	OATC	Acknowledges and reports the following alarm to the NUSO: • CRD ACCUMULATOR PRESSURE LOW / LEVEL HIGH, 3-9-5A, Window 29
	NUSO	Directs the Balance of Plant Operator (BOP) to respond in accordance with the appropriate Alarm Response Procedure.
	OATC	Alarm Response Procedure, 3-ARP-9-5A CRD ACCUMULATOR PRESSURE LOW / LEVEL HIGH, 3-9-5A, Window 29 Operator Action: A. **CHECK** alarm by amber background light illuminated on Full Core Display. B. **LOG** in the narrative log the Control Rod number and time alarm was received. **NOTE** If any of the following fuses is/are cleared, the local indications at Panel 25-4 and 25-22 will NOT illuminate. C. **IF** multiple accumulator lights are lit on Panel 3-9-5, **THEN CHECK** for cleared fuses 3-FU1-085-25-004G, -004H in Panel 25-4 and 3-FU1-085-25-022G, -022H in Panel 25-22. D. **DISPATCH** personnel to Panel 25-4 (east side), Panel 25-22 (west side) El 565', to determine if level high or pressure low. E. **DEPRESS** push-button for associated HCU to determine if alarm is caused by level high or pressure low as follows: 1. If alarm is due to high level, the red light will extinguish. 2. If light stays illuminated, alarm is due to low N2 pressure.

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 4 Page 2 of 4

Event Description: Control Rod Accumulator Inoperable

Time	Position	Applicant's Actions or Behavior
	Driver	**If contacted as the Reactor Building AUO to respond to the CRD Accumulator alarm, acknowledge the direction. Wait two minutes and report to the crew that CRD 22-27 Accumulator Pressure is 900 psig and lowering. You are unable to raise Accumulator Nitrogen Pressure by recharging.**
	OATC	F. **IF** alarm is valid, **THEN REFER TO** 3-OI-85, Control Rod Drive System and 3-AOI-85-3, CRD System Failure.
	OATC	**NOTE** If accumulator pressure is greater than 940 psig the accumulator is not required to be declared Inoperable when the "star" valve is CLOSED, unless accumulator is unattended. G. **IF** Accumulator Pressure is less than or equal to 940 psig, **THEN DECLARE** Control Rod HCU "INOPERABLE". H. **IF** the associated HCU's nitrogen pressure is found less than 940 psi, **THEN INITIATE** a Condition Report (CR) to calibrate the pressure switch. The HCU will NOT be declared operable until the switch has been calibrated. I. **IF** alarm is due to low pressure with pressure greater than 940 psig and accumulator CANNOT be recharged within one hour, **THEN EVALUATE** per Tech Spec 3.1.5. 1. **IF** the Control Rod is declared SLOW **REFER TO** TECH SPEC 3.1.4. Currently no more than 13 OPERABLE Control Rods shall be slow and no more than 2 OPERABLE Control Rods that are slow shall occupy adjacent locations. 2. **IF** the Control Rod is declared INOPERABLE, **THEN REFER** TO TECH SPEC 3.1.3. J. **RECORD** this evaluation in narrative log. K. N/A

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 4 Page 3 of 4

Event Description: Control Rod Accumulator Inoperable

Time	Position	Applicant's Actions or Behavior	
	NUSO	Technical Specification 3.1.5, Control Rod SCRAM Accumulators LCO 3.1.5: Each Control Rod SCRAM Accumulator shall be OPERABLE APPLICABILITY: Modes 1 and 2 NOTE: Separate Condition entry is allowed for each Control Rod SCRAM Accumulator. **CONDITION**: A.1 One Control Rod SCRAM Accumulator inoperable with Reactor Steam Dome Pressure ≥ 900 psig.	
	NUSO	**REQUIRED ACTION:** A.1 NOTE: Only applicable if the associated Control Rod SCRAM time was within the limits of Table 3.1.4-1 during the last SCRAM time Surveillance. Declare the associated Control Rod SCRAM Time "slow". OR A.2- Declare the associated Control Rod INOPERABLE.	**COMPLETION TIME:** A.1 – 8 hours A.2 – 8 hours
	NRC	**If Tech Spec 3.1.5 A.2 is Declared, THEN Tech Spec 3.1.3 is applicable.**	

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 4 Page 4 of 4

Event Description: Control Rod Accumulator Inoperable

Time	Position	Applicant's Actions or Behavior	
	NUSO	If the Control Rod is declared INOPERABLE, references Tech Spec 3.1.3, Control Rod OPERABILITY. LCO 3.1.3 Each Control Rod shall be OPERABLE APPLICABILITY: MODES 1 and 2 NOTE: Separate Condition entry is allowed for each Control Rod. **CONDITION:** C. One or more Control Rods INOPERABLE for reasons other than Condition A or B.	
	NUSO	**REQUIRED ACTION:** NOTE: RWM may be bypassed as allowed by LCO 3.3.2.1, if required, to allow insertion of INOPERABLE Control Rod and continued operation. C.1 – Fully insert INOPERABLE Control Rod. AND C.2 – Disarm the associated CRD.	**COMPLETION TIME:** C.1 – 3 hours C.2 – 4 hours
	NUSO	If the Control Rod is declared SLOW, references Tech Spec 3.1.4, Control Rod SCRAM Times. Currently, there are less than 13 OPERABLE Control Rods that are slow, and there are no OPERABLE Control Rods that are slow that occupy adjacent locations. Therefore, there are no actions required for Tech Spec 3.1.4, Control Rod SCRAM Times.	
	NRC	**End of Event 4. Request that the driver insert Event 5, Failure of 3A Stack Dilution Fan, Standby Fan Fails to Automatically Start.**	

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 5 Page 1 of 1

Event Description: Failure of 3A Stack Dilution Fan, Standby Fan Fails to Automatically Start

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 4, Failure of 3A Stack Dilution Fan, Standby Fan Fails to Automatically Start.**
	BOP	Acknowledges and reports the following alarm to the NUSO: • STACK GAS DILUTION AIR FLOW LOW, 3-9-7A, Window 3
	NUSO	Directs the BOP to respond in accordance with the appropriate Alarm Response Procedure.
	NRC	**It is acceptable if BOP elects to start 3B Stack Dilution Fan in accordance with 3-OI-66, Section 8.6 instead of using the ARP below.**
	BOP	Alarm Response Procedure, 3-ARP-9-7A STACK GAS DILUTION AIR FLOW LOW, Window 3 Operator Action: A. **CHECK** alternate fan **ON** and damper open, (red light illuminated) on Panel 3-9-7.
	BOP	Determines that the standby Stack Dilution Fan did not automatically start and manually starts 3B Stack Dilution Fan.
	BOP	B. **DISPATCH** personnel to stack to check and report status of the following for both fans: 1. Fan motor. 2. Fan belts. 3. Damper stuck closed. C. **CHECK** Breaker 5E on 480V Diesel Aux Bd A and B.
	Driver	**If contacted as an AUO, acknowledge any direction given.**
	NRC	**End of Event 5. Request that the Driver insert Event 6, 3A Emergency Diesel Generator (EDG) Logic Breaker Tripped.**

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 6 Page 1 of 3

Event Description: 3EA Emergency Diesel Generator (EDG) Logic Breaker Tripped

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 6, 3EA Emergency Diesel Generator (EDG) Logic Breaker Tripped.**
	BOP	Acknowledges and reports the following alarm to the NUSO: • DIESEL GENERATOR 3A CONTROL POWER OFF, 3-9-23A, Window 14
	NUSO	Directs the BOP to respond in accordance with the appropriate Alarm Response Procedure.
	BOP	Alarm Response Procedure, 3-ARP-9-23A DIESEL GENERATOR 3A CONTROL POWER OFF, Window 14 Operator Action: A. **OBSERVE** any other alarms on panels 9-8 or 9-23 which may indicate problem area. B. **CHECK** panels, breakers and batteries. IF necessary, **THEN CHECK** fuses and relays. C. **IF** loss of normal power has occurred, **THEN TRANSFER** to alternate power source. **REFER TO** 0-OI-57D DC Electrical System. D. **REFER TO** TS 3.8.1, 3.8.2, 3.8.4, and 3.8.5.
	Driver	**If contacted as the Outside NUSO, Work Control, AUO, or Electrical Maintenance, acknowledge any direction given.** **Wait 45 seconds and report that the Logic Breaker for EDG '3EA' is tripped. If directed to attempt to close the Logic Breaker, report that the breaker will not close or RESET.**
	NRC	**There are no required actions for Tech Spec 3.3.8.1, LOP Instrumentation or Tech Spec 3.8.7, Distribution Systems – Operating.**

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 6 Page 2 of 3

Event Description: 3EA Emergency Diesel Generator (EDG) Logic Breaker Tripped

Time	Position	Applicant's Actions or Behavior	
	NUSO	Declares 3EA EDG INOPERABLE References Technical Specification 3.8.1, AC Sources – Operating. LCO 3.8.1 The following AC electrical power sources shall be OPERABLE: a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System; b. Unit 3 diesel generators (DGs) with two divisions of 480 V load shed logic and common accident signal logic OPERABLE; and c. Unit 1 and 2 DG(s) capable of supplying the Unit 1 and 2 4.16 kV shutdown board(s) required by LCO 3.8.7, "Distribution Systems - Operating." APPLICABILITY: MODES 1, 2, and 3. **CONDITION:** One required Unit 3 DG INOPERABLE	
	NUSO	**REQUIRED ACTION:** B.1 – Verify power availability from the offsite transmission network. <u>AND</u> B.2 – Evaluate availability of both temporary diesel generators (TDGs). <u>AND</u> B.3. – Declare required feature(s), supported by the inoperable Unit 3 DG, inoperable when the redundant required feature(s) are inoperable.	**COMPLETION TIME:** B.1 – 1 hour <u>AND</u> Once per 8 hours thereafter B.2 – 1 hour <u>AND</u> Once per 12 hours thereafter B.3 – 4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 6 Page 3 of 3

Event Description: 3EA Emergency Diesel Generator (EDG) Logic Breaker Tripped

Time	Position	Applicant's Actions or Behavior	
	NUSO	**REQUIRED ACTION: (continued)** AND B.4.1 Determine OPERABLE Unit 3 DG(s) are not inoperable due to common cause failure. OR B.4.2 – Perform SR 3.8.1.1 for OPERABLE Unit 3 DG(s). AND B.5 – Restore Unit 1 and 2 DG to OPERABLE status	**COMPLETION TIME:** B.4.1 – 24 hours B.4.2 – 24 hours B.5 – 7 days from discovery of unavailability of TDG(s) AND 24 hours from discovery of Condition B entry ≥ 6 days concurrent with unavailability of TDG(s) AND 14 days AND 21 days from discovery of failure to meet LCO
	NRC	**In the interest of time management, if the crew begins to perform 0-SR-3.8.1.A.1, Verification of Offsite Power Availability to 4.16 kV Shutdown Boards, inform the crew that another operator will complete the surveillance.**	
	NRC	**End of Event 6. Request that the driver insert Event 7, High Suppression Pool Water Level / Emergency Depressurization.**	

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 7 Page 1 of 10

Event Description: High Suppression Pool Water Level / Emergency Depressurization

Time	Position	Applicant's Actions or Behavior
	Driver	**When requested by the Chief Examiner, insert Event 7, High Suppression Pool Water Level / Emergency Depressurization.**
	NRC	**Event 8, Two Control Rods Fail to Insert and Event 9, 480V Shutdown Board Trip, will occur during Event 7 and are automatically entered by Simulator Setup. No action is required by the driver to insert Event 8 or Event 9.**
	BOP	Acknowledges and reports the following alarms as they are received: • DRYWELL TO SUPPRESSION CHAMBER DIFFERENTIAL PRESSURE ABNORMAL, 3-9-3B, Window 26 • SUPPRESSION CHAMBER WATER LEVEL ABNORMAL, 3-9-3B, Window 15
	NUSO	Directs the BOP to respond in accordance with the appropriate Alarm Response Procedures.
	BOP	Alarm Response Procedure, 3-ARP-9-3B DRYWELL TO SUPPRESSION CHAMBER DIFFERENTIAL PRESSURE ABNORMAL, Window 26 Operator Action: A. **CHECK** alarm by checking Drywell to Suppression Chamber DP. B. **REFER TO** 3-OI-64, Primary Containment System. C. **REFER TO** Tech Spec Section 3.6.2.6, Drywell-to-Suppression Chamber Differential Pressure.
	NRC	**Due to time constraints, Tech Spec evaluation for this event is not required and should not be used to evaluate the applicant's Tech Spec competency.**

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 7 Page 2 of 10

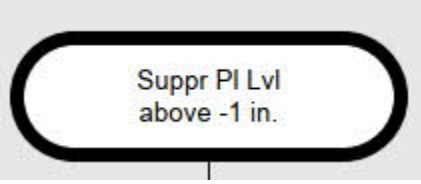
Event Description: High Suppression Pool Water Level / Emergency Depressurization

Time	Position	Applicant's Actions or Behavior
	BOP	Alarm Response Procedure, 3-ARP-9-3B SUPPRESSION CHAMBER WATER LEVEL ABNORMAL, Window 15 Operator Action: A. **CHECK** level using multiple indications. B. **IF** level is low, **THEN DISPATCH** personnel to check for leaks. C. **IF** level is high, **THEN CHECK** for RCIC, HPCI, Core Spray, or RHR draining to Suppression Pool, and CHECK 3-TR-64-161, SUPPRESSION POOL WATER TEMPERATURE and 3-TR-64-162, SUPPRESSION POOL WATER TEMPERATURE. D. **REFER TO** 3-OI-74, Residual Heat Removal System, Sections 8.2, 8.3, and 8.4. E. **REFER TO** Tech Spec Section 3.6.2.2, Suppression Pool Water Level. F. **IF** level is above -1" or below -6.25" **AND NOT** in Mode 4 or Mode 5 **THEN** (otherwise N/A) **ENTER** 3-EOI-2, Primary Containment Control. G. **IF** level is above -1" or below -6.25" **AND** in Mode 4 or Mode 5 **THEN** (otherwise N/A) 1. **EVALUATE** plant conditions to **DETERMINE** if 3-EOI-2 entry is appropriate. 2. **RECORD** actions in NOMS log.
	BOP	Determines that the cause for the Drywell to Suppression Chamber DP alarm is rising Suppression Pool Water Level, and informs the NUSO.
	NUSO	Directs the BOP to monitor Suppression Pool Water Level and to provide an update when level reaches (-) 1 inch.
	BOP	Acknowledges and reports the following alarm to the NUSO when received: • SUPPRESSION POOL LEVEL HIGH, 3-9-3F, Window 12
	NUSO	Directs the BOP to respond in accordance with the appropriate Alarm Response Procedure.

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 7 Page 3 of 10

Event Description: High Suppression Pool Water Level / Emergency Depressurization

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>BOP</td><td>Alarm Response Procedure, 3-ARP-9-3F
SUPPRESSION POOL LEVEL HIGH, Window 12

A. CHECK CST 3 and Suppression Pool level using multiple indications.
B. ENSURE HPCI Suction automatically transfers to the Suppression Pool.
C. IF automatic transfer fails, THEN REFER TO 3-OI-73, High Pressure Coolant Injection System.
D. REFER TO Tech Spec 3.5.1, ECCS - Operating, 3.5.2 and 3.6.2.2, Suppression Pool Water Level.</td></tr>
<tr><td></td><td>NRC</td><td>Due to time constraints, Tech Spec evaluation for this event is not required and should not be used to evaluate the applicant's Tech Spec competency.</td></tr>
<tr><td></td><td>NUSO</td><td>When appropriate, enters 3-EOI-2, Primary Containment Control on high Suppression Pool Water Level (level above (-) 1 inch).</td></tr>
<tr><td></td><td>NUSO</td><td>3-EOI-2, Primary Containment Control
  </td></tr>
<tr><td></td><td>NUSO</td><td>SP/L-1

MONITOR and CONTROL Suppression Pool Water Level (-) 6 inches to (-) 1 inch.
<table><tr><th>IF</th><th>THEN</th></tr><tr><td>Suppression Pool Water Level CANNOT be maintained below (-) 1 inch.</td><td>A</td></tr><tr><td>Suppression Pool Water Level CANNOT be maintained above (-) 6 inches.</td><td>NO ACTION REQUIRED</td></tr></table></td></tr>
</table>

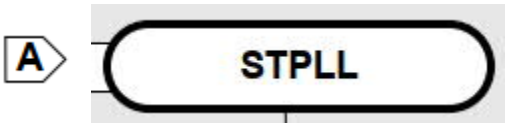
Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 7 Page 4 of 10

Event Description: High Suppression Pool Water Level / Emergency Depressurization

Time	Position	Applicant's Actions or Behavior
	NUSO	 SP/L-3 **MAINTAIN** Suppression Pool Water Level below 19 ft. (APPX 18, 20K) SP/L-4 **WHEN** Suppression Pool Level CANNOT be maintained below (APPX 9) 19 feet **STOP** DW Sprays
	NUSO	Directs the BOP to control Suppression Pool Water Level in accordance with 3-EOI-Appendix-18, Suppression Pool Water Inventory Removal and Makeup.
	Driver	**If contacted as an AUO to perform any steps locally per 3-EOI-Appendix-18, Suppression Pool Water Inventory Removal and Makeup, acknowledge any direction given.** **If contacted as an AUO to verify any valves closed, acknowledge the direction.**
	BOP	3-EOI-Appendix-18, Suppression Pool Water Inventory Removal and Makeup [1] N/A [2] N/A [3] **IF** Directed by the NUSO, **THEN REMOVE** water from Suppression Pool as follows: [3.1] **DISPATCH** personnel to perform the following (Unit 3 RB, Elevation 519 ft, Torus Area): [3.1.1] **VERIFY OPEN** 3-SHV-074-0786A (B), RHR DRAIN PUMP A (B) DISCHARGE SHUTOFF VALVE.

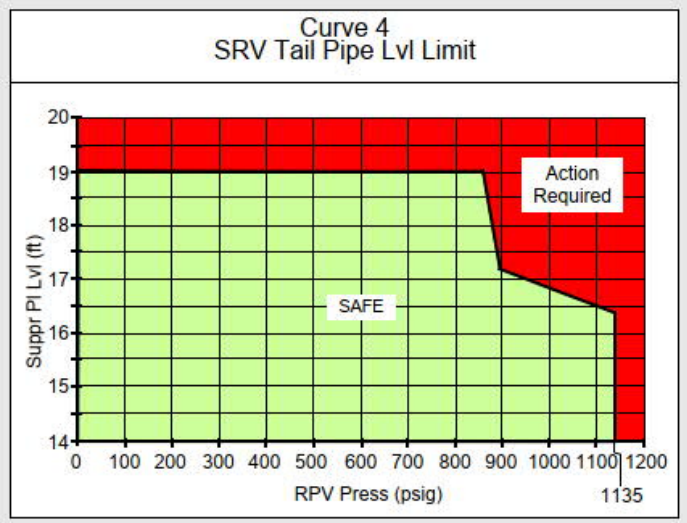
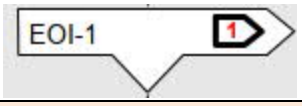
Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 7 Page 5 of 10

Event Description: High Suppression Pool Water Level / Emergency Depressurization

Time	Position	Applicant's Actions or Behavior
	BOP	[3.1.2] **OPEN** the following valves: • 3-SHV-074-0564A(B), RHR DRAIN PUMP A(B) SEAL WATER SUPPLY • 3-SHV-074-0529A (B), RHR DRAIN PUMP A (B) SHUTOFF VALVE [3.1.3] **UNLOCK** and **OPEN** 3-SHV-074-0765A (B), RHR DRAIN PUMP A(B) DISCHARGE. [3.1.4] **NOTIFY** Unit Operator that RHR Drain Pump 3A (3B) is lined up to remove water from Suppression Pool. [3.1.5] **REMAIN** at torus area UNTIL Unit 3 Operator directs starting of RHR Drain Pump 3A (3B). [3.2] **IF** Main Condenser is desired drain path, **THEN OPEN** 3-FCV-74-62, RHR MAIN CONDENSER FLUSH VALVE. [3.3] **IF** Radwaste is desired drain path, **THEN PERFORM** the following: [3.3.1] **ESTABLISH** communications with Radwaste [3.3.2] **OPEN** 3-FCV-74-63, RHR RADWASTE SYSTEM FLUSH VALVE. [3.4] **NOTIFY** personnel in Unit 3 RB, El 519 ft, Torus Area to start RHR Drain Pump 3A(3B). [3.5] **THROTTLE** 3-FCV-74-108, RHR DRAIN PUMP 3A/B DISCHARGE HEADER VALVE, as necessary.
	Driver	**After 2 minutes, report that the outside portions of 3-EOI-Appendix-18, Suppression Pool Water Inventory Removal and Makeup are complete. If directed to start the RHR Drain Pump, report that the RHR Drain Pump has been started.** **If contacted as the Rad Waste Operator, acknowledge any reports or direction given.**
	NUSO	 SP/L-6 **MAINTAIN** Suppression Pool Level within the safe area of Curve 4 (APPX 18, 20K)

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 7 Page 6 of 10

Event Description: High Suppression Pool Water Level / Emergency Depressurization

Time	Position	Applicant's Actions or Behavior
	NUSO	
	NUSO	SP/L-7 **WHEN** Suppression Pool Level CANNOT be maintained within the safe area of Curve 4 (APPX 9) 
	CREW	**Critical Task:** **When Suppression Pool Water Level cannot be maintained within the safe area of Curve 4, SRV Tail Pipe Level Limit, the crew will insert a manual Reactor SCRAM as directed by the Nuclear Unit Senior Operator (NUSO).** **Critical Task Failure Criteria:** **The operating crew fails to proceed without delay and in a controlled manner to insert a manual SCRAM before Suppression Pool Water Level enters the 'Action Required' area of Curve 4, SRV Tail Pipe Level Limit.**

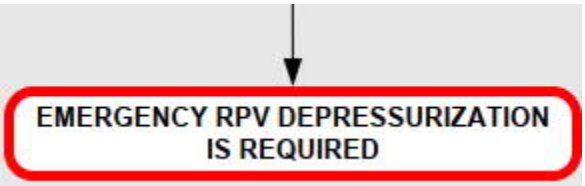
Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 7 Page 7 of 10

Event Description: High Suppression Pool Water Level / Emergency Depressurization

Time	Position	Applicant's Actions or Behavior
	NUSO	Directs the OATC to insert a manual Reactor SCRAM and directs the crew to enter 3-AOI-100-1, Reactor SCRAM.
	NRC	**Event 8, 2 Control Rods Fail to Insert, is automatically entered on Simulator Setup. No action is required by the driver to insert Event 8. See page 27 of 39 for Event 8 actions.**
	OATC	Inserts a manual Reactor SCRAM 3-AOI-100-1, Reactor SCRAM Immediate Actions [1] **DEPRESS** 3-HS-99-5A/S3A, REACTOR SCRAM A and 3-HS-99-5A/S3B, REACTOR SCRAM B, on Panel 3-9-5. [2] **PLACE** REACTOR MODE SWITCH, 3-HS-99-5A/S1, in SHUTDOWN. [3] **IF** all Control Rods can NOT be verified fully inserted, **THEN INITIATE** ARI. (Otherwise MARK N/A).
	OATC	Determines that there are two (2) rods out.
	NRC	**When the Reactor MODE SWITCH is placed in SHUTDOWN, the Feedwater Heater Outlet Isolation Valves will close.** **See page 30 of 39 for actions for Event 9, 480V Shutdown Board Trip.**
	OATC	[4] **IF** Reactor Power is 5% or BELOW, **THEN** (Otherwise MARK N/A) **REPORT** the following to the UNIT SRO: • Reactor SCRAM • Mode Switch is in Shutdown • "All rods in" or "rods out " • Reactor Water Level and trend (recovering or lowering) • Reactor Pressure and trend • MSIV position (Open or Closed) • Power level

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 7 Page 8 of 10

Event Description: High Suppression Pool Water Level / Emergency Depressurization

Time	Position	Applicant's Actions or Behavior
	NUSO	Following the Reactor SCRAM, enters 3-EOI-1A, ATWS RPV Control and directs the crew to perform the following: • Maintain Reactor Pressure to ensure that Suppression Pool Level is maintained within the safe area of Curve 4 in accordance with 3-EOI-Appendix-8B, Reopening MSIVs/Bypass Valve Operation • Maintain Reactor Water Level using in accordance with 3-EOI-Appendix-5D, Injection System Lineup HPCI or 3-EOI-Appendix-5C, Injection System Lineup RCIC • Insert Control Rods
	NUSO	(Continuing actions of 3-EOI-2, Primary Containment Control) SP/L-8 **WHEN** Suppression Pool Level and RPV Pressure CANNOT be maintained within the safe area of Curve 4 (APPX 9). SP/L-9 **STOP** injection into RPV from sources external to Primary Containment **EXCEPT** from systems required to assure Adequate Core Cooling or shut down the Reactor SP/L-10 **WHEN** Suppression Pool Level and RPV Pressure CANNOT be restored and maintained within the safe area of Curve 4 

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 7 Page 9 of 10

Event Description: High Suppression Pool Water Level / Emergency Depressurization

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>CREW</td><td>Critical Task:
When Suppression Pool Water Level and RPV Pressure cannot be restored and maintained within the safe area of Curve 4, the NUSO determines that Emergency Depressurization is required. The Operator initiates Emergency Depressurization as directed by the NUSO.

Critical Task Failure Criteria:
The operating crew fails to proceed without delay and in a controlled manner to initiate Emergency Depressurization from the time that Suppression Pool Water Level and RPV Pressure cannot be restored and maintained within the safe area of Curve 4.</td></tr>
<tr><td></td><td>NUSO</td><td>Enters 2-C-2, Emergency RPV Depressurization

C2-1
<table>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>RPV Water Level CANNOT be determined</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>It is anticipated that RPV depressurization will result in loss of injection required for Adequate Core Cooling</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Containment Water Level CANNOT be maintained below 44 feet</td><td>NO ACTION REQUIRED</td></tr>
</table></td></tr>
<tr><td></td><td>NUSO</td><td>C2-2
<table>
<tr><td>IF</td><td>Drywell Pressure is above 2.45 psig</td></tr>
<tr><td>THEN</td><td>PREVENT injection from ONLY those Core Spray and LPCI pumps NOT required to assure Adequate Core Cooling (APPX 4)</td></tr>
</table></td></tr>
</table>

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 7 Page 10 of 10

Event Description: High Suppression Pool Water Level / Emergency Depressurization

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>NUSO</td><td>C2-3
<table>
<tr><td colspan="2">EMERGENCY DEPRESSURIZE the RPV
IF Suppression Pool Water Level is above 5.5 feet
THEN OPEN 6 MSRVs (ADS Valves preferred)
• OK to exceed 100 F/hr Cooldown Rate</td></tr>
<tr><th>IF</th><th>THEN</th></tr>
<tr><td>Drywell Control Air becomes unavailable</td><td>NO ACTION REQUIRED</td></tr>
<tr><td>Less than 4 MSRVs can be opened
AND
RPV Pressure is 80 psi or more above Suppression Chamber Pressure</td><td>NO ACTION REQUIRED</td></tr>
</table></td></tr>
<tr><td></td><td>NRC</td><td>The first loop of Low Pressure Injection (Core Spray/RHR) that the crew attempts to use will result in a loss of the 480V Shutdown Board for that loop. See Event 9 on 31.</td></tr>
<tr><td></td><td>NRC</td><td>End of Event 7. When the crew has inserted all Control Rods, Emergency Depressurized the Reactor, and has control of Reactor Water level above the Top of Active Fuel ((-) 162 inches) using low pressure systems, end of Scenario.</td></tr>
</table>

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 8 Page 1 of 3

Event Description: Two Control Rods Fail to Insert

Time	Position	Applicant's Actions or Behavior
	NRC	**Event 8 is automatically entered by simulator setup. No action is required by the Driver to insert Event 8.**
	OATC	Following the Reactor SCRAM and after initiating Alternate Rod Insertion (ARI), determines that all Control Rods are not in. Informs the NUSO that two rods are out, and that Reactor Power is less than 5%.
	NUSO	Directs the OATC to insert Control Rods in accordance with 3-AOI-100-1, Reactor SCRAM.
	NRC	**Not all Subsequent Actions of 3-AOI-100-1, Reactor SCRAM, are listed below.**
	OATC	3-AOI-100-1, Reactor SCRAM [16] **IF** all rods are **NOT** inserted to Position 02 or beyond, **THEN DIRECT** Reactor Engineer to commence determination that the Reactor will remain subcritical under all conditions without boron.
	Driver	**If contacted as the Reactor Engineer, acknowledge any direction or report given.** **As necessary, insert the following Events when / if the EOI Appendices are requested:** • **Event 23 – CLOSE 3-85-586, CRD CHARGING WATER VALVE** • **Event 24 – 3-EOI-Appendix-1F, Manual SCRAM** • **Event 25 – 3-EOI-Appendix-2, Defeating ARI Logic Trips** • **Event 26 – 3-EOI-Appendix-8E, Bypassing Group 6 Low RPV Level and High Drywell Pressure Isolation Interlocks** • **Event 27 – OPEN 3-85-586, CRD CHARGING WATER VALVE**
	OATC	[17] **IF** any Control Rod fails to fully insert and it is required to Re-SCRAM, **THEN PERFORM** the following, as required. (Otherwise N/A) [17.1] **RESET** the SCRAM per Steps 4.2[24] thru 4.2[24.12].

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 8 Page 2 of 3

Event Description: Two Control Rods Fail to Insert

Time	Position	Applicant's Actions or Behavior
	OATC	[17.2] **CHECK** WEST and EAST CRD DISCH VOL WTR LVL HIGH HALF SCRAM annunciators (3-XA-55-4A, Window 1 and 3-XA-55-4A, Window 29) are reset. [17.3] **INITIATE** a manual SCRAM. [17.4] **REPEAT** Step 4.2[17], as necessary, as long as rod motion is observed. [18] **IF** any Control Rod fails to fully insert and it is required to Drive Control Rods, **THEN REFER** TO 3-OI-85, Control Rod Drive System.
	OATC	3-OI-85, Control Rod Drive System Section 6.7, Control Rod Insertion [1] **REVIEW** Precautions and Limitations in Sections 3.7 and 3.8. [2] **ENSURE** the following prior to Control Rod movement: • 3-HS-85-46, CRD POWER in ON • ROD WORTH MINIMIZER is operable and LATCHED in to the correct ROD GROUP, when Rod Worth Minimizer is enforcing [3] **OBSERVE** the following during Control Rod repositioning: • Control Rod reed switch position indicators (four rod display) agree with the indication on the Full Core Display. • Nuclear Instrumentation responds as Control Rods move through the core (This ensures Control Rod is following drive during Control Rod movement.) [4] **PERFORM** the following to insert the Control Rod as appropriate. • Control Rod Notch Insertion per Section 6.7.2 • Control Rod Continuous Insertion per Section 6.7.3
	OATC	3-OI-85, Control Rod Drive System Section 6.7.3, Continuous Insertion of Control Rod [1] **CHECK** Section 6.7.1 has been performed. [2] **SELECT** the desired Control Rod by depressing the appropriate 3-XS-85-40, CRD ROD SELECT pushbutton.

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 8 Page 3 of 3

Event Description: Two Control Rods Fail to Insert

Time	Position	Applicant's Actions or Behavior
	OATC	[3] **OBSERVE** the following for the selected Control Rod: • CRD ROD SELECT pushbutton is brightly ILLUMINATED • White light on the Full Core Display ILLUMINATED [4] **PLACE** and HOLD CRD CONTROL SWITCH, 3-HS-85-48, in ROD IN. [5] **WHEN** Control Rod notch reaches the even rod notch position prior to the desired final Control Rod notch position, THEN RELEASE 3-HS-85-48, CRD CONTROL SWITCH.
	NRC	**When the OATC has selected each stuck Control Rod and begins to drive the rod in, the malfunction will clear to allow rod insertion. As a result, the Control Rod will drive in at a much faster rate than normal.**
	OATC	[6] **OBSERVE** the Control Rod settles into desired position and the ROD SETTLE light extinguishes. [7] **IF** the Control Rod double notches or inserts past its correct/desired position, **THEN** with Unit SROs permission return the Control Rod to the intended position per Section 6.6. (Otherwise N/A) [8] **IF** the Control Rod moves more than one notch from its intended position, **THEN PERFORM** 3-AOI-85-7, Mispositioned Control Rod. (Otherwise N/A) [9] **WHEN** Control Rod movement is no longer desired AND deselecting Control Rods is desired, **THEN**: [9.1] PLACE 3-HS-85-46, CRD POWER in OFF. [9.2] PLACE 3-HS-85-46, CRD POWER in ON.
	NRC	**End of Event 8. When the crew has inserted all Control Rods, Emergency Depressurized the Reactor, and has control of Reactor Water Level above the Top of Active Fuel (TAF, (-) 162 inches) using low pressure systems, end of Scenario.**

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 9 Page 1 of 4

Event Description: 480V Shutdown Board Trip

Time	Position	Applicant's Actions or Behavior
	NRC	**Event 9, 480V Shutdown Board Trip, is automatically entered by Simulator Setup. No action is required by the driver to insert Event 9.** **The first loop of Low Pressure Injection (Core Spray/RHR) that the crew attempts to use will result in a loss of the 480V Shutdown Board for that loop.**
	NUSO	During Emergency Depressurization, directs the BOP to maintain Reactor Water Level using Core Spray or RHR in accordance with any of the following EOI Appendices: • 3-EOI-Appendix-6B, Injection Subsystems Lineup – RHR System I LPCI Mode (see below) • 3-EOI-Appendix-6C, Injection Subsystems Lineup – RHR System II LPCI Mode (see page 32 of 39) • 3-EOI-Appendix-6D, Injection Subsystems Lineup –Core Spray System (see page 31 of 39) • 3-EOI-Appendix-6E, Injection Subsystems Lineup – Core Spray System II (see page 33 of 39)
	NRC	**If the crew selects Loop II of RHR or Core Spray to maintain Reactor Water Level, proceed to page 32 of 39 for the procedure(s) for injection. If the crew selects Loop I of RHR see below for the procedure(s) for injection.**
	BOP	**IF USING LOOP I OF RHR FOR INJECTION:** 3-EOI-Appendix-6B, Injection Subsystems Lineup RHR System I LPCI Mode [1] **IF** Adequate core cooling is assured **AND** it becomes necessary to bypass LPCI Injection Valve auto open signal to control injection, **THEN PLACE** 3-HS-74-155A, LPCI SYSTEM I OUTBD INJECTION VALVE BYPASS SELECT, in BYPASS. [2] **ENSURE OPEN** 3-FCV-74-7, RHR SYSTEM I MINIMUM FLOW VALVE.

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 9 Page 2 of 4

Event Description: 480V Shutdown Board Trip

Time	Position	Applicant's Actions or Behavior
	BOP	[3] **ENSURE OPEN** the following valves: • 3-FCV-74-1, RHR PUMP 3A SUPPRESSION POOL SUCTION VALVE • 3-FCV-74-12, RHR PUMP 3C SUPPRESSION POOL SUCTION VALVE [4] **ENSURE CLOSED** the following valves: • 3-FCV-74-61, RHR SYSTEM I DRYWELL SPRAY INBOARD VALVE • 3-FCV-74-60, RHR SYSTEM I DRYWELL SPRAY OUTBOARD VALVE • 3-FCV-74-57, RHR SYSTEM I SUPPRESSION CHAMBER/POOL ISOLATION VALVE • 3-FCV-74-58, RHR SYSTEM I SUPPRESSION CHAMBER SPRAY VALVE • 3-FCV-74-59, RHR SYSTEM I SUPPRESSION POOL COOLING/TEST VALVE [5] **ENSURE** RHR Pump 3A and / or 3C running
	CREW	Determines that 3A 480V Shutdown Board has tripped. Proceeds to use the appropriate EOI Appendix for injection with low pressure systems for the opposite loop.
	BOP	**IF USING LOOP I OF CORE SPRAY FOR INJECTION:** 3-EOI-Appendix-6D, Injection Subsystems Lineup Core Spray System II [1] **VERIFY OPEN** the following valves: • 3-FCV-75-2, CORE SPRAY PUMP 3A SUPPRESSION POOL SUCTION VALVE • 3-FCV-75-11, CORE SPRAY PUMP 3C SUPPRESSION POOL SUCTION VALVE • 3-FCV-75-23, CORE SPRAY SYS I OUTBD INJECTION VALVE [2] **VERIFY CLOSED** 3-FCV-75-22, CORE SPRAY SYS I TEST VALVE. [3] **VERIFY** Core Spray Pump 3A and/or 3C running.

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 9 Page 3 of 4

Event Description: 480V Shutdown Board Trip

Time	Position	Applicant's Actions or Behavior
	CREW	Determines that 3A 480V Shutdown Board has tripped. Proceeds to use the appropriate EOI Appendix for injection with low pressure systems for the opposite loop.
	BOP	**IF USING LOOP II OF RHR FOR INJECTION:** 3-EOI-Appendix-6C, Injection Subsystems Lineup RHR System II LPCI Mode [1] **IF** Adequate Core Cooling is assured **AND**, it becomes necessary to bypass LPCI Injection Valve auto open signal to control injection, **THEN PLACE** 3-HS-74-155B, LPCI SYS II OUTBOARD INJECTION VALVE BYPASS SELECT IN BYPASS. [2] **ENSURE OPEN** 3-FCV-74-30, RHR SYSTEM II MINIMUM FLOW VALVE. [3] **ENSURE OPEN** the following valves: • 3-FCV-74-24, RHR PUMP 3B SUPPRESSION POOL SUCTION VALVE. • 3-FCV-74-35, RHR PUMP 3D SUPPRESSION POOL SUCTION VALVE. [4] **ENSURE CLOSED** the following valves: • 3-FCV-74-75, RHR SYSTEM II DRYWELL SPRAY INBOARD VALVE • 3-FCV-74-74, RHR SYSTEM II DRYWELL SPRAY OUTBOARD VALVE • 3-FCV-74-71, RHR SYSTEM II SUPPR CHAMBER/POOL ISOLATION VALVE • 3-FCV-74-72, RHR SYSTEM II SUPPR CHAMBER SPRAY VALVE • 3-FCV-74-73, RHR SYSTEM II SUPPR POOL COOLING/TEST VALVE [5] **ENSURE** RHR Pump 3B and/or 3D running.

Op Test No.: 21-04 Scenario No. NRC-3 Event No.: 9 Page 4 of 4

Event Description: 480V Shutdown Board Trip

Time	Position	Applicant's Actions or Behavior
	CREW	Determines that 3B 480V Shutdown Board has tripped. Proceeds to use the appropriate EOI Appendix for injection with low pressure systems for the opposite loop.
	BOP	**IF USING LOOP II OF CORE SPRAY FOR INJECTION:** 3-EOI-Appendix-6E, Injection Subsystems Lineup Core Spray System II [1] **VERIFY OPEN** the following valves: • 3-FCV-75-30, CORE SPRAY PUMP 3B SUPPRESSION POOL SUCTION VALVE • 3-FCV-75-39, CORE SPRAY PUMP 3D SUPPRESSION POOL SUCTION VALVE • 3-FCV-75-51, CORE SPRAY SYS II OUTBD INJECTION VALVE [2] **VERIFY CLOSED** 3-FCV-75-50, CORE SPRAY SYSTEM II TEST VALVE. [3] **VERIFY** CS Pump 3B and/or 3D running.
	CREW	Determines that 3B 480V Shutdown Board has tripped. Proceeds to use the appropriate EOI Appendix for injection with low pressure systems for the opposite loop.
	NRC	**End of Event 9. When the crew has Emergency Depressurized the Reactor and has control of Reactor Water Level above the Top of Active Fuel (TAF, (-) 162 inches) using low pressure systems, end of Scenario.**

Scenario Setup
UNIT 3

IC	38
Exam IC	263

Procedure	Revision	Procedure	Revision	Procedure	Revision
OI-47C	23	ARP-7A	30	APPX 18	3
OI-85	92	ARP-23B	29	TS 3.1.3	212
OI-92A	18	EOI-1	13	TS 3.1.5	212
AOI-85-3	13	EOI-2	13	TS 3.1.4	212
AOI-100-1	74	APPX-6B	7	SR 3.1.3.5(A)	27
ARP-3B	23	APPX-6C	8	GOI-100-1A	133
ARP-3F	37	APPX-6D	4		
ARP-5A	54	APPX-6E	4		

Simulator Setup	Verify RWM is properly latched. Verify camera system is powered down (admin password = abcd1234) Start CPERF **PRIOR** to placing the Simulator in RUN
Schedule Files(s):	2104 NRC Scenario 3 UNIT 3.sch
Event Files(s):	2104 NRC Scenario 3 UNIT 3.evt

Schedule File – 2104 NRC Scenario 3 ES-D-2 UNIT 3.sch

Event	Action	Description
	2104 NRC Scenario 3 UNIT 3.evt	
	Insert override XS-92-7/42G to 8	CHANNEL G IRM RANGE SWITCH
4	Insert malfunction RD08R2227 to 95.00000	CRD ACCUMULATOR LOW PRESSURE 22-27
	Insert malfunction PMP-66-31A to FAIL_CONTROL_POWER	42_CONTACTOR STACK DILUTION AIR FAN B
5	Insert override HS-66-29A to STOP	STACK DILUTION FAN 3A
15	Delete malfunction PMP-66-31A	42_CONTACTOR STACK DILUTION AIR FAN B
	Insert override ZLOHS6631A_1 to On	HS-66-31A-Green* STACK DILUTION FAN 3B

Schedule File – 2104 NRC Scenario 3 ES-D-2 UNIT 2.sch

Event	Action	Description
	Insert override ZLOHS6631A_2 to Off	HS-66-31A-RED STACK DILUTION FAN 3B
15	Delete override ZLOHS6631A_1	HS-66-31A-Green* STACK DILUTION FAN 3B
15	Delete override ZLOHS6631A_2	HS-66-31A-RED STACK DILUTION FAN 3B
5	Insert override ZLOHS6629A_1 to Off	HS-66-29A-GREEN STACK DILUTION FAN 3A
6	Insert remote DG01A to OPEN	UNIT 3 DIESEL GENERATOR 3A LOGIC BREAKER
	Insert override ZLOZI7434_1 to On	ZI-74-34-Green* RHR PUMP 3B CST SUCTION VALVE
	Insert override ZLOZI7445_1 to On	ZI-74-45-Green* RHR PUMP 3D CST SUCTION VALVE
	Insert override ZLOZI7411_1 to On	ZI-74-11-Green* RHR PUMP 3A CST SUCTION VLV
	Insert override ZLOZI7531_1 to On	ZI-75-31-Green* CORE SPRAY PUMP 3B CST SUCTION VLV
	Insert override ZLOZI7540_1 to On	ZI-75-40-Green* CORE SPRAY PUMP 3D CST SUCTION VLV
	Insert override ZLOZI7512_1 to On	ZI-75-12-Green* CORE SPRAY PUMP 3C CST SUCTION VALVE
	Insert override ZLOZI753_1 to On	ZI-75-3-Green* CORE SPRAY PUMP 3A CST SUCTION VALVE
7	Insert remote RH07 to OPEN	RHR PUMP B CONDENSATE SUCTION VALVE HCV-74-34
7	Insert remote RH08 to OPEN	RHR PUMP D CONDENSATE SUCTION VALVE HCV-74-45
7	Insert remote RH05 after 180 to OPEN	RHR PUMP A CONDENSATE SUCTION VALVE HCV-74-11
7	Insert remote RH06 after 180 to OPEN	RHR PUMP C CONDENSATE SUCTION VALVE HCV-74-23
7	Insert remote CS06A to ALIGN	ALIGN CONDENSATE STORAGE TANK TO CORE SPRAY LOOP 1
7	Insert remote CS06B to ALIGN	ALIGN CONDENSATE STORAGE TANK TO CORE SPRAY LOOP 2
7	Insert remote FW11 to XCON	CROSS CONNECT CSTS

Schedule File – 2104 NRC Scenario 3 ES-D-2 UNIT 2.sch

Event	Action	Description
17	Insert remote CS06A to NORM	ALIGN CONDENSATE STORAGE TANK TO CORE SPRAY LOOP 1
17	Insert remote CS06B to NORM	ALIGN CONDENSATE STORAGE TANK TO CORE SPRAY LOOP 2
17	Insert remote CS06A after 120 to ALIGN	ALIGN CONDENSATE STORAGE TANK TO CORE SPRAY LOOP 1
17	Insert remote CS06B after 120 to ALIGN	ALIGN CONDENSATE STORAGE TANK TO CORE SPRAY LOOP 2
	Insert malfunction RD06R1023	STICK ANY CONTROL ROD 10-23
	Insert malfunction RD06R1443	STICK ANY CONTROL ROD 14-43
18	Delete malfunction RD06R1023	STICK ANY CONTROL ROD 10-23
28	Delete malfunction RD06R1443	STICK ANY CONTROL ROD 14-43
23	Insert remote RD06 to CLOSE after 60	CRD CHARGING WATER VALVE FCV-3-85-586
24	Schedule F:\Scenarios\Scenario 3\App. 1F.sch	
25	Schedule F:\Scenarios\Scenario 3\App. 2.sch	
26	Schedule F:\Scenarios\Scenario 3\App. 8E.sch	
27	Insert remote RD06 to OPEN after 60	CRD CHARGING WATER VALVE FCV-3-85-586
19	Insert malfunction ED10A after 3	480V SHUTDOWN BOARD 3A FAILURE
20	Insert malfunction ED10A after 3	480V SHUTDOWN BOARD 3A FAILURE
21	Insert malfunction ED10B after 3	480V SHUTDOWN BOARD 3B FAILURE
22	Insert malfunction ED10B after 3	480V SHUTDOWN BOARD 3B FAILURE
17	Insert override HS-3-75A after 30 to CLOSE	HP HTR 3A1 FW OUTLET ISOL VLV
17	Insert override HS-3-76A after 30 to CLOSE	HP HTR 3B1 FW OUTLET ISOL VLV
17	Insert override HS-3-77A after 30 to CLOSE	HP HTR 3C1 FW OUTLET ISOL VLV

Schedule File: APP. 1F.sch

Event	Action	Description
	Insert remote RP13A to BYP after 120	DEFEAT CHANNEL A1 AUTO SCRAM
	Insert remote RP13B to BYP after 120	DEFEAT CHANNEL B1 AUTO SCRAM
	Insert remote RP13C to BYP after 120	DEFEAT CHANNEL A2 AUTO SCRAM
	Insert remote RP13D to BYP after 120	DEFEAT CHANNEL B2 AUTO SCRAM

Schedule File: APP. 2.sch

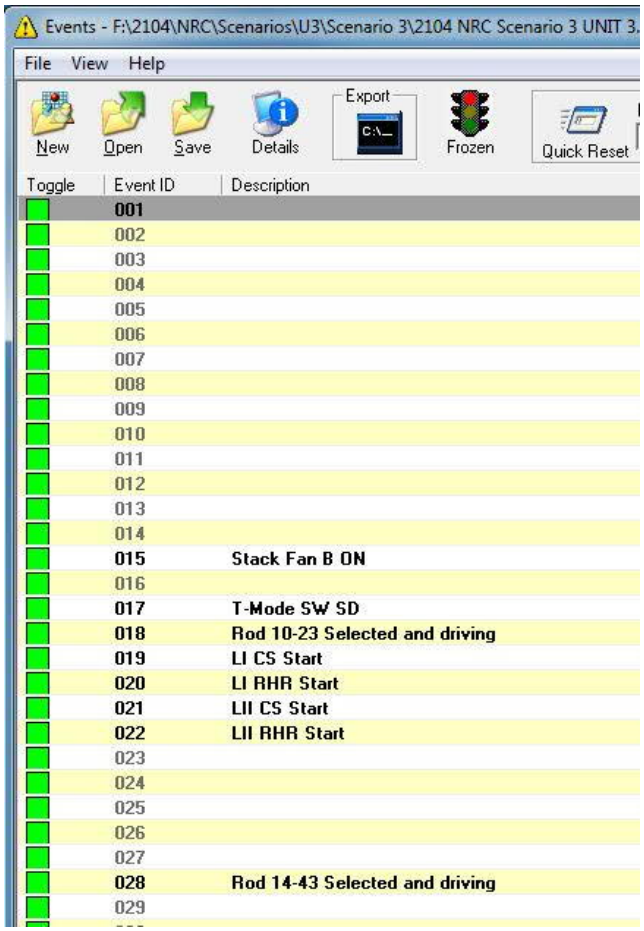
Event	Action	Description
	Insert remote RP12A to TEST after 180	OPERATE LOCAL ATWS MODE SWITCH 3-HS-68-118A
	Insert remote RP12B to TEST after 180	OPERATE LOCAL ATWS MODE SWITCH 3-HS-68-118B

Schedule File: APP. 8E.sch

Event	Action	Description
	Insert remote RP14A to BYP after 300	BYPASS GROUP 6 INBOARD LOW LVL/HI DW PRESS INTLKS
	Insert remote RP14B to BYP after 300	BYPASS GROUP 6 OUTBOARD LOW LVL/HI DW PRESS INTLKS

Event File

List



Details

UNIT 3 SHIFT TURNOVER MEETING			Today
MODE 2	**DAYS ON LINE** **0**	**Drywell Leakage (GPM)** **1.89**	**Protected Equipment** **None**
	PRA (EOOS) -Green		
Rx Power **2.2%**	500Kv GRID - Qualified 161Kv Grid -Qualified	**Floor Drain (GPM)** **0.31**	
MWe **0**	**Last breaker closure** **N/A**	**Equipment Drain (GPM)** **1.58**	

☐Review logs ☐Qualifications ☐Review RCP/Rx Brief ☐Review LCO/OWA Actions ☐Walkdown Panels/Verify EOOS ☐CR Reviews Complete ☐Leadership and Team Effectiveness

CHANGES IN LCOs

IRM 'H' bypassed due to noise. Tech Spec 3.3.1.1 (Information only)

LCOs OF 72 HOURS OR LESS

SIGNIFICANT ITEMS DURING PREVIOUS SHIFT/RADIOLOGICAL CHANGES

Reactor Startup

MAJOR EQUIPMENT CHANGES PLANNED FOR THIS SHIFT

After assuming the shift, Transfer Seal Steam from Auxiliary Steam to Main Steam in accordance with 3-OI-47C, Seal Steam System, Section 6.1. RPHP is in effect.

Continue the Reactor Startup in accordance with 3-GOI-100-1A, Section 5.4[83]. Begin with Group 25 Rods, starting with Control Rod 26-35.

Contact the Ops Superintendent prior to placing the MODE SWITCH in RUN.

Thunderstorm watch was just issued for counties in North Alabama.

OPERATOR WORK AROUNDS **OWAs - 0 Burdens - 0 Challenges - 0**

ODMIs/ACMPs

ONEAs

FIRE RISK SIGNIFICANT ITEMS OOS/FPLCO Actions Due

SCHEDULED ITEMS NOT COMPLETED

Job Performance Measure (JPM)

SITE: BFN		JPM TITLE:	Respond to a Control Rod Drift in accordance with 2-AOI-85-5, Rod Drift In
JPM NUMBER:	80A-U2	REVISION:	5

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-085-AB-05/ Respond to a Control Rod Drift In			
K/A RATINGS:	RO: 3.2 SRO: 3.3			
K/A No. & STATEMENT:	201002 Reactor Manual Control System A2.02; Ability to (a) predict the impacts of the following on the REACTOR MANUAL CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Rod Drift Alarm			
RELATED PRA INFORMATION:	Risk Significant			
SAFETY FUNCTION:	1			

EVALUATION LOCATION:	☐ In-Plant	☒ Simulator	☐ Control Room	☐ Lab
	☐ Other - List			

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 13 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) Y

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 80A-U2

RO _____ SRO _____ DATE: _____

TASK STANDARD: The Examinee is expected to exercise partially withdrawn Control Rods and insert a manual Reactor SCRAM when multiple Control Rods drift into the Core

Operator Fundamental evaluated:
OF-1 Monitoring plant indications and conditions closely.
OF-2 Controlling plant evolutions precisely.

PRA: NA

REFERENCES/PROCEDURES NEEDED: 2-SR-3.1.3.3, 2-AOI-85-5, 2-AOI-100-1

VALIDATION TIME: 13 min

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
0	05/27/10	All	Initial issue
1	09/01/15	1	Incorrect task number; changed to U-085-AB-05: Incorrect malfunction numbers; rd07r0231, rd07r2223 & rd07r3031; Corrected
2	10/09/15	All	Incorporated review comments
3	10/17/16	All	Updated format
4	08/20/20	All	Procedure update
5	1/14/21	All	JPM update

Procedure Revisions

Procedure	Revision
2-SR-3.1.3.3	33
2-AOI-85-5	24
2-AOI-100-1	116

SIMULATOR SETUP

IC	28
Exam IC	N/A

Console Operator Instructions	• Reset to IC 28 • Run schedule file: 2104 NRC JPM a UNIT 2.SCH • Verify event file 2104 NRC JPM a UNIT 2.EVT loads • Place the simulator in RUN to ensure stable conditions • Provide Initial Rod Data Sheet – PRLOG • Endure the candidate has been pre-briefed on 2-SR-3.1.3.3 • Display “CRD Exercise” on ICS Screen. NOTE: CRD EXERCISE MUST BE STARTED ON THE BOOTH ICS COMPUTER (System mimics -> Ops Support -> CRD Exercise Monitor) • When prompted by the Examiner, INSERT - Event 1 to Drift Control Rod 14-31 into the Core • When prompted by the Examiner, INSERT - Event 2 to Drift Control Rod Multiple Control Rods into the Core

Malfunctions	Description	Event	Severity	Delay	Initial set
rd07r1431	Rod 14-31 drifts into core	1	NA	0 sec	NA
rd07r1831	Rod 18-31 drifts into core	2	NA	0 sec	NA
rd07r2223	Rod 22-23 drifts into core	2	NA	30 sec	NA

Remotes	Description	Event	Severity	Delay	Initial set
NONE					

Overrides	Description	Event	Severity	Delay	Initial set
NONE					

Schedule File(s): **2104 NRC JPM a UNIT 2.SCH**
Event File(s): **2104 NRC JPM a UNIT 2.EVT**

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct". (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

- You are an Operator on Unit 2
- The Reactor is at 100% Power

INITIATING CUES:

The Nuclear Unit Senior Operator (NUSO) directs you to perform 2-SR-3.1.3.3, Control Rod Exercise Test for Withdrawn Control Rods, Step 7.3 Exercising a Partially Withdrawn Control Rod.

START TIME:_____

STEP / STANDARD	SAT / UNSAT
EXAMINER NOTE: Ensure the candidate has been pre-briefed on 2-SR-3.1.3.3, Control Rod Exercise Test for Withdrawn Control Rods, Step 7.3, before commencing the JPM.	
Step 1: 2-SR- 3.1.3.3, Control Rod Exercise Test for Withdrawn Control Rods, Step 7.3, Exercising a Partially Withdrawn Control Rod **NOTE** 1) Problem details of any Control Rod issues observed during the performance of this surveillance must be recorded on Attachment 3 for further review and possible corrective maintenance. Slow/fast rod movements or settle times should be noted in the remarks section. 2) Section 7.3 is performed for all Partially Withdrawn Control Rods and performance of steps is represented by initialing the appropriate CRD exercised on Attachment 1. **CAUTIONS** 1) Any mispositioned Control Rod events will be dispositioned by following the direction contained within 2-AOI-85-7. 2) If a Control Rod moves unexpectedly one notch beyond its intended position, notify Unit SRO, obtain Unit SRO concurrence and return the rod to its intended position. 3) At any time Core Thermal Power is less than or equal to 10%, entry into LCO 3.1.6 may be required. **7.3 Exercising a Partially Withdrawn Control Rod** **EXAMINER NOTE: The candidate may select any partially withdrawn Control Rod in any order.** [1] **SELECT** desired Control Rod by **DEPRESSING** appropriate 2-XS-85-40, CRD ROD SELECT pushbutton. Expected Action(s): Selects a partially withdrawn Control Rod.	**Critical Step** _____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 2: [2] **OBSERVE** the following for the selected Control Rod: • **CHECK** 2-XS-85-40, CRD ROD SELECT pushbutton is brightly ILLUMINATED • **CHECK** white light on the Full Core Display is ILLUMINATED • **CHECK** Rod Out Permit light is ILLUMINATED Expected Action(s): Verifies that the appropriate lights are illuminated.	_____SAT _____UNSAT _____N/A
Step 3: [3] **INSERT** Control Rod one notch by performing the following: [3.1] **PLACE** 2-HS-85-48, CRD CONTROL SWITCH in ROD IN and **RELEASE.** [3.2] **OBSERVE** Control Rod settles into the desired position and ROD SETTLE light extinguishes. Expected Action(s): Inserts withdrawn Control Rod one notch.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 4: [3.3] **IF** the Control Rod failed to insert, **THEN PERFORM** the following: (Otherwise N/A) [3.4] **IF** the Control Rod unexpectedly inserts one notch beyond its intended position, **THEN PERFORM** the following: (Otherwise N/A) Expected Action(s): Marks Steps [3.3] and [3.4] as N/A.	_____SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 5: [4] **WITHDRAW** selected Control Rod one notch by performing the following: [4.1] **PLACE** 2-HS-85-48, CRD CONTROL SWITCH in ROD OUT NOTCH and **RELEASE**. [4.2] **OBSERVE** Control Rod settles into the desired position and ROD SETTLE light extinguishes. Expected Action(s): Withdraws withdrawn Control Rod one notch.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 6: [4.3] **IF** Control Rod failed to withdraw, **THEN PERFORM** the following: (Otherwise N/A) [4.4] **IF** Control Rod unexpectedly withdraws one notch beyond its intended position, **THEN PERFORM** the following: (Otherwise N/A) Expected Action(s): Marks Steps [4.3] and [4.4] as N/A.	_____SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 7: [5] **DOCUMENT** completion of Control Rod test as follows: [5.1] PERFORMER • **INITIAL** Attachment 1 (Control Rod Exercise Data Sheet) in the box corresponding to the Control Rod coordinates for the Control Rod just exercised to document proper movement and CRD latching. [5.2] Concurrent Verifier (CV) • **ENSURE** rod inserted and returned to its original position. • **INITIAL** Attachment 2 (Control Rod Concurrent Verifier (CV)Check) in the box corresponding to the Control Rod coordinates for the Rod just exercised. **EXAMINER NOTE: If prompted by applicant for Concurrent Verification, state "Attachment 2 Concurrent Verification has been completed by another Operator."** Expected Action(s): Initials Attachment 1 for exercised Control Rod and continues to exercise Rods.	_____SAT _____UNSAT _____N/A
EXAMINER NOTES: • **Perform above actions for at least two Control Rods.** • **Begin Alternate Path - when satisfied with the number of rod manipulations direct Simulator Booth Operator to insert Event 1 for Control Rod 14-31 Drift In.**	
DRIVER NOTE: **When requested by the Examiner, insert Event 1 to cause Control Rod 14-31 to drift in.**	

STEP / STANDARD	SAT / UNSAT
Step 8: Candidate recognizes Control Rod 14-31 drifting in and responds per 2-AOI-85-5, Rod Drift In. **4.2 Subsequent Actions** [2] **IF** a Control Rod is moving (or has moved) from its intended position without operator actions, **THEN INSERT** the Control Rod to position 00 using CONTINUOUS IN. (Otherwise N/A) [3] **IF** a Control Rod Block occurs during rod insertion due to Rod Worth Minimizer, **THEN BYPASS** the RWM per step 4.2[1] above. (Otherwise N/A) Expected Action(s): Responds in accordance with 2-AOI-85-5, Rod Drift In, and inserts Control Rod 14-31 to full in position as indicated by position 00 indication.	_____ SAT _____UNSAT _____N/A
DRIVER NOTE: **When Control Rod 14-31 reaches position 00, verify that malfunction rd07r1431 (14-31 Control Rod Drift In) is deleted by the simulator setup so that CONTROL ROD DRIFT, (2-9-5A, WINDOW 28) can be reset.**	
EXAMINER NOTES: **Control Rod 14-31 will settle into position 00.** **The Candidate may or may not reset the drift lights and alarms.** **Expected Alarms:** • **CONTROL ROD WITHDRAWAL BLOCK, (2-9-5A, WINDOW 7)** • **ROD BLOCK MONITOR (RBM) DOWNSCALE, (2-9-5A, WINDOW 31)**	
Step 9: [4] **NOTIFY** the Reactor Engineer to Evaluate Core Thermal Limits and Preconditioning Limits for the current Control Rod pattern. Expected Action(s): Candidate notifies Reactor Engineer to Evaluate Core Thermal limits and Preconditioning Limits for the current Control Rod Pattern.	_____SAT _____UNSAT _____N/A
CUE: If contacted as the Reactor Engineer or Assistant Unit Operator acknowledge any direction or information given.	

STEP / STANDARD	SAT / UNSAT
Step 10: [5] **IF** another Control Rod Drift occurs before Reactor Engineering completes the evaluation, • **THEN MANUALLY SCRAM** the Reactor and enter 2-AOI-100-1, Reactor SCRAM. [6] **CHECK** Thermal Limits on ICS (RUNMON). Expected Action(s): Reviews step and may inform the Nuclear Unit Senior Operator (NUSO) of the requirement to insert a Reactor SCRAM if another Control Rod drifts.	_____SAT _____UNSAT _____N/A
EXAMINER NOTE: Acknowledge candidate report.	
EXAMINER NOTE: When ready for multiple rod drifts, direct the Simulator Booth Operator to insert Event 2 (Control Rod 18-31 Rod Drift, and 30 seconds later Control Rod 22-23 Rod Drift).	
DRIVER NOTE: When requested by the Examiner, insert Event 2 (Control Rod 18-31 Drift In). 30 seconds later, Control Rod 22-23 will drift in if a Reactor SCRAM has not been inserted.	
Step 11: **4.1 Immediate Actions** [1] **IF** multiple Control Rods are drifting into core, **THEN MANUALLY SCRAM** Reactor. **REFER TO** 2-AOI-100-1. Expected Action(s): Recognizes that multiple Control Rods are drifting into the Core and inserts a manual Reactor SCRAM in accordance with the Immediate Actions of 2-AOI-85-5, Rod Drift In.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: When informed that multiple Control Rods are drifting, acknowledge the report. At any point following the Reactor SCRAM, request that the Driver place the Simulator in FREEZE and inform the candidate "Another Operator will continue with the Reactor SCRAM actions. This completes your task".	

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct". (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

- You are an Operator on Unit 2
- The Reactor is at 100% Power

INITIATING CUES:

The Nuclear Unit Senior Operator (NUSO) directs you to perform 2-SR-3.1.3.3, Control Rod Exercise Test for Withdrawn Control Rods, Step 7.3 Exercising a Partially Withdrawn Control Rod.

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Inject to the Reactor in accordance with 2-EOI-Appendix-5C, Injection System Lineup - RCIC
JPM NUMBER:		18A-U2	REVISION: 9

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-000-EM-31 / Lineup Injection Systems-RCIC in accordance with EOI Appendix 5C			
K/A RATINGS:	RO: 3.7 SRO: 3.7			
K/A No. & STATEMENT:	217000 Reactor Core Isolation Cooling System (RCIC) A1.01; Ability to predict and/or monitor changes in parameters associated with operating the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) controls including: RCIC Flow			
RELATED PRA INFORMATION:	CDF Contribution = 8%			
SAFETY FUNCTION:	2			

EVALUATION LOCATION:	☐ In-Plant	☒ Simulator	☐ Control Room	☐ Lab
	☐ Other - List			

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 5 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) Y

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 18A-U2

RO _____ SRO _____ DATE: _____

TASK STANDARD: Examinee is expected to inject to the Reactor using the Reactor Core Isolation (RCIC) System, recognize a failure of the Automatic Flow Controller, and take action to re-establish flow to raise Reactor Water Level.

Operator Fundamental evaluated:
OF-1 Monitoring plant indications and conditions closely.
OF-2 Controlling plant evolutions precisely.

REFERENCES/PROCEDURES NEEDED: 2-EOI-APPENDIX-5C

VALIDATION TIME: 5 min

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
7	08/08/17	All	JPM converted to new format
8	11/09/20	All	Updated JPM
9	1/14/21	All	JPM update

Procedure Revisions

Procedure	Revision
2-EOI-APP-5C	7

SIMULATOR SETUP

IC	N/A
Exam IC	280

Console Operator Instructions	• **Reset to IC 280** • **Verify RCIC Controller set to 620 gpm and is in AUTO** • **Run schedule file ILT 2104 NRC JPM –b– 18A.SCH. Verify that Event File ILT 2104 NRC JPM –b– 18A.evt loads** • **Place the simulator in RUN once the candidate states that the task is understood** • **During the JPM, verify that the RCIC Flow Controller Fails 30 seconds after speed rises above 3500 RPM.**

Malfunctions	Description	Event	Severity	Delay	Initial set
RC04	RCIC AUTOMATIC FLOW CONTROLLER FAILURE (FIC-71-36A)	1	0	30	N/A

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct" (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

You are an Operator on Unit 2. A Manual Reactor SCRAM was inserted, and the following conditions exist:

- The High Pressure Coolant Injection (HPCI) System is INOPERABLE
- 2C Reactor Feedwater Pump (RFPT) was controlling Reactor Water Level, but has tripped
- No RFPT can be started
- The Unit Supervisor has entered 2-EOI-1, RPV Control, on low Reactor Water Level

INITIATING CUES:

The Nuclear Unit Senior Operator directs you to restore Reactor Water Level to (+) 2 to (+) 51 inches, using the Reactor Core Isolation Cooling (RCIC) System in accordance with 2-EOI-APPENDIX-5C, Injection System Lineup – RCIC.

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: [1] **PERFORM** the following EOI appendices, if necessary: • Appendix-16A, Bypassing RCIC Low RPV Pressure Isolation • Appendix-16K, Bypassing RCIC High Temperature Isolations Expected Action(s): Determines that neither EOI Appendix is required to run RCIC and continues in this procedure.	_____ SAT _____UNSAT _____N/A
Step 2: [2] **ENSURE RESET** auto isolation logic using 2-XS-71-51A(B), RCIC AUTO-ISOL LOGIC A (B) RESET pushbuttons. Expected Action(s): Determines that no isolation signal is present and verifies that auto isolation logic is reset.	_____ SAT _____UNSAT _____N/A
Step 3: [3] **ENSURE RESET** and **OPEN** 2-FCV-71-9, RCIC TURB TRIP/THROTTLE VALVE. Expected Action(s): Verifies OPEN 2-FCV-71-9, RCIC TURBINE TRIP/THROTTLE VALVE.	_____ SAT _____UNSAT _____N/A
Step 4: [4] **ENSURE** 2-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL, in AUTO with a setpoint at 620 gpm. Expected Action(s): Verifies that 2-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL, is in AUTO and set to 620 gpm.	_____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 5: [5] **OPEN** 2-FCV-71-34, RCIC PUMP MIN FLOW VALVE Expected Action(s): Opens 2-FCV-71-34, RCIC PUMP MIN FLOW VALVE.	_____ SAT _____UNSAT _____N/A
Step 6: [6] **OPEN** 2-FCV-71-39, RCIC PUMP INJECTION VALVE Expected Action(s): Opens 2-FCV-71-39, RCIC PUMP INJECTION VALVE.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 7: [7] **OPEN** 2-FCV-71-25, RCIC LUBE OIL COOLING WTR VALVE Expected Action(s): Opens 2-FCV-71-25, RCIC LUBE OIL COOLING WTR VALVE.	_____ SAT _____UNSAT _____N/A
Step 8: [8] **PLACE** 2-HS-71-31A, RCIC VACUUM PUMP, in START. Expected Action(s): Places 2-HS-71-31A, RCIC VACUUM PUMP, in START.	_____SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 9: **CAUTIONS** 1) Operating RCIC turbine below 2100 RPM may result in unstable system operation and equipment damage. 2) High Suppression Chamber pressure may trip RCIC. 3) Operating RCIC Turbine with suction temperatures above 240°F may result in equipment damage. [9] **OPEN** 2-FCV-71-8, RCIC TURBINE STEAM SUPPLY VLV, to start RCIC turbine. Expected Action(s): Opens 2-FCV-71-8, RCIC TURBINE STEAM SUPPLY VALVE, to start RCIC.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 10: [10] **CHECK** proper RCIC operation by observing the following: A. Speed accelerates above 2100 rpm B. Flow to RPV controlled automatically at 620 gpm C. 2-FCV-71-34, RCIC PUMP MIN FLOW VALVE, closes as flow rises above 120 gpm Expected Action(s): Verifies that: A. RCIC turbine accelerates to >2100 rpm B. RCIC flow stabilizes at 620 gpm C. 2-FCV-71-34, RCIC PUMP MIN FLOW VALVE closes	_____SAT _____UNSAT _____N/A
EXAMINER NOTE: Beginning of Alternate Path. Thirty (30) seconds after RCIC Speed exceeds 3500 rpm, RCIC Flow Controller automatic operation will fail.	

STEP / STANDARD	SAT / UNSAT
Step 11: [11] **ADJUST** 2-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL, as necessary to control injection. Expected Action(s): Controls injection with RCIC. After thirty (30) seconds, determines that the automatic flow controller is failed, and in accordance with OPDP-1, Conduct of Operations, Section 3.3.5, Manual Control of Automatic Systems, places 2-FIC-71-36A, RCIC SYSTEM FLOW/CONTROL in manual. Adjusts the setpoint in manual as necessary to obtain the flow required to control Reactor Water Level.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 12: [12] **IF** BOTH of the following exist: • RCIC Initiation signal is NOT present, **AND** • RCIC flow is below 60 gpm, **THEN ENSURE OPEN** 2-FCV-71-34, RCIC PUMP MIN FLOW VALVE. Expected Action(s): Verifies that a RCIC initiation signal is not present as indicated by the amber lamp 2-IL-71-52, RCIC AUTO INITIATION, being extinguished. If flow drops <60 gpm following the Flow Controller failure, the candidate verifies that the 2-FCV-71-34, RCIC PUMP MIN FLOW VALVE, is OPEN.	_____SAT _____UNSAT _____N/A
Examiner Note: It is not necessary for the candidate to obtain a Reactor Water Level of > (+) 2 inches. A rising trend in Reactor Water Level will suffice.	
CUE: Another Operator will take over Reactor Water Level Control.	

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct" (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

You are an Operator on Unit 2. A Manual Reactor SCRAM was inserted, and the following conditions exist:

- The High Pressure Coolant Injection (HPCI) System is INOPERABLE
- 2C Reactor Feedwater Pump (RFPT) was controlling Reactor Water Level, but has tripped
- No RFPT can be started
- The Unit Supervisor has entered 2-EOI-1, RPV Control, on low Reactor Water Level

INITIATING CUES:

The Nuclear Unit Senior Operator directs you to restore Reactor Water Level to (+) 2 to (+) 51 inches, using the Reactor Core Isolation Cooling (RCIC) System in accordance with 2-EOI-APPENDIX-5C, Injection System Lineup – RCIC.

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Alternate Generator Bus Duct Fans in accordance with 2-OI-47, Turbine-Generator System
JPM NUMBER:	743A-U2	REVISION:	2

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	N/A			
K/A RATINGS:	RO: 3.1 SRO: 2.9			
K/A No. & STATEMENT:	245000 Main Turbine Generator and Auxiliary Systems A4.02: Ability to manually operate and/or monitor in the control room: Generator controls			
RELATED PRA INFORMATION:	Key System Contribution to CDF = N/A			
SAFETY FUNCTION:	4			

EVALUATION LOCATION:	☐ In-Plant	☒ Simulator	☐ Control Room	☐ Lab
	☐ Other - List			

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 5 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) Y

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 743A-U2

RO _____ SRO _____ DATE: _____

TASK STANDARD: Examinee is expected to alternate Turbine-Generator Bus Duct Cooling Fans and respond to a subsequent loss of both Bus Duct Cooling Fans, then insert a manual Reactor SCRAM, and trip the Main Generator.

Operator Fundamental evaluated:
OF-1 Monitoring plant indications and conditions closely.
OF-2 Controlling Plant Evolutions Precisely.

REFERENCES/PROCEDURES NEEDED: 2-OI-47, 2-ARP-9-7A

VALIDATION TIME: 5 min

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

JPM Revision Summary

Rev No.	Effective Date	Pages Affected	Description
0	09/01/20	All	Initial issue
1	1/13/21	All	JPM update
2	04/05/21	All	Procedure update

Procedure Revisions

Procedure	Revision
2-OI-47	191
2-ARP-9-7A	35

SIMULATOR SETUP

IC	28
Exam IC	N/A

Console Operator Instructions	• **Reset to IC 28** • **Run schedule file: 2104 NRC JPM c UNIT 2.SCH** • **Verify event file 2104 NRC JPM c UNIT 2.EVT loads** • **Place the Simulator in RUN to ensure stable conditions** • **Ensure the examinee has been briefed on 2-OI-47, Turbine-Generator System, Section 6.10.1, Alternating Operating Bus Duct Cooling Fans**

Malfunctions	Description	Event	Severity	Delay	Initial set
EG13A	MAIN GENERATOR BUS DUCT COOLING 2A FAN FAILURE, HS-262-1A	1	N/A	2	N/A
EG13B	MAIN GENERATOR BUS DUCT COOLING 2B FAN FAILURE, HS-262-2A	1	N/A	10	N/A

****

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****

INITIAL CONDITIONS:

You are an Operator on Unit 2 with the following plant conditions:

- 2A Bus Duct Cooling Fan must be shut down for mechanical inspection
- All **OUTSIDE** portions of 2-OI-47, Turbine-Generator System, Section 6.10.1, Alternating Operating Bus Duct Cooling Fans have been completed.
- Unit 2 Assistant Unit Operator is standing by locally at 2B Bus Duct Cooling Fan

INITIATING CUES:

The Nuclear Unit Senior Operator has directed you to alternate Turbine-Generator Bus Duct Cooling Fans in accordance with 2-OI-47, Turbine-Generator System, Section 6.10.1, Alternating Operating Bus Duct Cooling Fans.

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: 2-OI-47, Turbine-Generator System Section 6.10.1, Alternating Operating Bus Duct Cooling Fans **NOTES** 1) GENERATOR BUS DUCT FAN FAILURE, (3-9-7A, WINDOW 31) alarm, may be received when performing the following steps, due to securing one fan before starting the next. 2) EWR19-EEB-262-015 has determined acceptability for starting a Bus Duct Cooling Fan with reverse rotation of less than 100 rpm. **CAUTION** 1) Starting Generator Bus Duct Heat Exchanger Fan while rotating greater than 100 rpm in the reverse direction creates potential to damage the fan. U-2 GENERATOR BUS DUCT HTX FAN 2A(2B) BACKDRAFT DMPR, 2-DMP-262-0051(0052), should preclude reverse rotation of the associated fan at speeds greater than 100 rpm. It is acceptable to try restarting the fan one time immediately if the breaker trips on the first attempt. 2) Be aware of any abnormal vibrations or audible sounds in dual fan operation with inlet vane dampers open ref. EWR20MEB262128 Rev. 0. [1] **Starting Bus Duct Cooling Fan A/Stopping Fan B** Expected Action(s): Marks this step as N/A, as 2B Bus Duct Fan is being started as given in the Initial Conditions. Proceeds to Step [2].	_____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 2: [2] Starting Bus Duct Cooling Fan B/Stopping Fan A Steps [2.1] through [2.3] are complete **EXAMINER CUE: If the examinee contacts the Assistant Unit Operator (AUO) for information concerning any portion of Steps [2.1] through [2.3], inform the examinee that the step(s) is(are) complete. If requested, Fan 2B is rotating less than 100 RPM.** Expected Action(s): Marks these steps as complete as given in the Initial Conditions.	_____ SAT _____UNSAT _____N/A
Step 3: **CAUTION** Dual fan operation should be limited to ≤ 5 minutes with inlet vane dampers full open ref. EWR20MEB262128 Rev. 0 **EXAMINER CUE: If contacted as an AUO to verify fan operation, inform the candidate that 2B Bus Duct Fan is operating normally.** [2.4] **MOMENTARILY PLACE** 2-HS-262-0002A, GENERATOR BUS DUCT HX FAN B, in START on Panel 2-9-8. • **CHECK** for proper fan operation Expected Action(s): Starts Bus Duct Fan 2B by placing 2-HS-262-0002A, GENERATOR BUS DUCT HX FAN B, in START.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 4: [2.5] **MOMENTARILY PLACE** 2-HS-262-0001A, GENERATOR BUS DUCT HX FAN A in STOP on Panel 2-9-8. Expected Action(s): Stops Bus Duct Fan 2A by placing 2-HS-262-0001A, GENERATOR BUS DUCT HX FAN, in STOP.	**Critical Step** _____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
EXAMINER NOTE: (BEGIN ALTERNATE PATH) 2B Bus Duct Cooling Fan will trip 10 seconds after 2A Fan is stopped. If the examinee attempts to re-start 2A Fan, it will not start.	
Step 5: **EXAMINER NOTE: It is acceptable for the examinee to reference the Alarm Response Procedure (ARP) in response to the loss of both Bus Duct Fans. There is no Abnormal Operating Procedure (AOI) for this event.** When 2B Bus Duct Fan Trips: Alarm Response Procedure, 2-ARP-9-7A GENERATOR BUS DUCT FAN FAILURE, (2-9-7A, WINDOW 31) Operator Action: A. CHECK Main Bus Cooling Fans, 2-HS-262-1A or 2-HS-262-2A, indicates running on Panel 2-9-8. Expected Action(s): Verifies that **neither** Bus Duct Fan is running.	_____ SAT _____UNSAT _____N/A
Step 6: **CAUTION** Starting Generator Bus Duct Heat Exchanger Fan while rotating greater than 100 rpm in the reverse direction creates potential to damage the fan. U-2 GENERATOR BUS DUCT HTX FAN 2A(2B) BACKDRAFT DMPR, 2-DMP-262-0051(0052), should preclude reverse rotation of the associated fan at speeds greater than 100 rpm. It is acceptable to try restarting the fan one time immediately if the breaker trips on the first attempt. B. **START** 2-HS-262-1A(2A), GENERATOR BUS DUCT HX FAN A(B) using on Panel 2-9-8 to start the standby fan. Expected Action(s): The examinee may attempt to start 2A Bus Duct Fan.	_____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 7: C. **IF** no Fans are operating and the Generator is tied to the grid and loaded to greater than the self-cooled bus rating of 16,500 amps **THEN PERFORM** the following: 1. **IMMEDIATELY INSERT** a manual Reactor SCRAM. Expected Action(s): Verifies Generator amps are above 16,500 and immediately inserts a manual Reactor SCRAM.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 8: 2. **TRIP** the Main Generator Expected Action(s): Trips the Main Generator.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: Following the Reactor SCRAM (a SCRAM report is not required) and Main Turbine Trip, inform the examinee "Another Operator will address plant conditions. This completes your task".	

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct" (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

You are an Operator on Unit 2 with the following plant conditions:

- 2A Bus Duct Cooling Fan must be shut down for mechanical inspection
- All outside portions of 2-OI-47, Turbine-Generator System, Section 6.10.1, Alternating Operating Bus Duct Cooling Fans have been completed
- Unit 2 Assistant Unit Operator is standing by locally at 2B Bus Duct Cooling Fan

INITIATING CUES:

The Nuclear Unit Senior Operator has directed you to alternate Turbine-Generator Bus Duct Cooling Fans in accordance with 2-OI-47, Turbine-Generator System, Section 6.10.1, Alternating Operating Bus Duct Cooling Fans.

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Purge the Drywell with the Primary Containment Purge Filter Fan in accordance 3-OI-64, Primary Containment System
JPM NUMBER:	747-U3	REVISION:	1

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-064-NO-09 / Place Primary Containment Ventilation in Service			
K/A RATINGS:	RO: 3.6 SRO: 3.6			
K/A No. &STATEMENT:	223001 Primary Containment System and Auxiliaries A4.05: Ability to manually operate and/or monitor in the Control Room: Containment/Drywell oxygen concentration			
RELATED PRA INFORMATION:	Key System Contribution to CDF = N/A			
SAFETY FUNCTION:	5			

EVALUATION LOCATION:	☐ In-Plant	☒ Simulator	☐ Control Room	☐ Lab
	☐ Other - List			

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 15 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 747-U3

RO _____ SRO _____ DATE: _____

TASK STANDARD: The Examinee is expected to perform Control Room operations required to air purge the Drywell for Primary Containment entry during an outage.

Operator Fundamental evaluated:
OF-1 Monitoring plant indications and conditions closely.
OF-2 Controlling plant evolutions precisely.

REFERENCES/PROCEDURES NEEDED: 3-OI-64, Section 8.2

VALIDATION TIME: 15 min

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
0	10/27/20	All	Initial issue
1	1/20/21	All	JPM update

Procedure Revisions

Procedure	Revision
3-OI-64	67

SIMULATOR SETUP

IC	28
Exam IC	264

Console Operator Instructions	• **Reset to IC 264** • **Place the simulator in RUN to ensure stable conditions** • **Ensure the candidate has been pre-briefed with marked up 3-OI-64, Primary Containment System, Section 8.2** • **When requested by the candidate, insert Event 1 to start the Containment Purge Filter Fan**

Remotes	Description	Event	Severity	Delay	Initial set
PC06	CTMT PURGE FILTER FAN HS-64-131	1	START	N/A	N/A

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct" (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

You are the Balance of Plant Operator on Unit 3 with the following plant conditions:

- Unit 3 is currently at 100% RTP
- Unit 3 is being shut down for an outage. Reactor Power reduction will start on the next shift
- The Drywell is to be purged with air for Primary Containment entry
- Drywell Control Air is aligned to Plant Control Air

INITIATING CUES:

The Nuclear Unit Senior Operator has directed you to air purge the Drywell for Primary Containment entry in accordance with 3-OI-64, Primary Containment System, Section 8.2 Purging the Drywell with Primary Containment Purge Filter Fan, starting at Step [8].

NOTE: All Precautions and Limitations **AND** Pre-Startup/Standby Readiness requirements have been met.

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: [8] **PLACE** 3-HS-64-142A, DRYWELL DIFFERENTIAL PRESSURE (DP) COMPRESSOR AND VALVES CONTROL, in **OFF.** Expected Action(s): Places 3-HS-64-142A, DRYWELL DIFFERENTIAL PRESSURE(DP) COMPRESSOR AND VALVES CONTROL, in OFF.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 2: [9] **IF** Drywell Control Air **(**DWCA) is aligned to Containment Inerting Nitrogen Source, **THEN ALIGN** DWCA to Plant Control Air. **REFER TO** 3-OI-32A, Drywell Control Air System. Expected Action(s): Marks this step as N/A or completed. **EXAMINER CUE: If the candidate requests the status of Step [9], refer them to the Initial Conditions.**	_____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 3: [10] **ENSURE CLOSED** the following valves (Panel 3-9-3): • 3-FCV-64-31, DRYWELL INBOARD ISOLATION VALVE • 3-FCV-64-34, SUPPRESSION CHAMBER INBOARD ISOLATION VALVE • 3-FCV-76-18, DRYWELL NITROGEN (N2) MAKEUP INBOARD ISOLATION VALVE • 3-FCV-76-19, SUPPRESSION CHAMBER NITROGEN (N2) MAKEUP INBOARD ISOLATION VALVE • 3-FCV-76-24, PRIMARY CONTAINMENT NITROGEN (N2) OUTBOARD ISOLATION VALVE • 3-FCV-64-32, SUPPRESSION CHAMBER VENT INBOARD ISOLATION VALVE • 3-FCV-64-33, SUPPRESSION CHAMBER VENT OUTBOARD ISOLATION VALVE • 3-FCO-64-36, DRYWELL/SUPPRESSION CHAMBER VENT TO STANDBY GAS TREATMENT (SGT) Expected Action(s): Ensures GREEN valve/operator position indicating lamps are illuminated for ALL of the above control switches in Step [10].	_____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 4: **NOTES** 1) If the Reactor Mode switch is taken out of RUN during this procedure, the PRIMARY CONTAINMENT PURGE RUN MODE BYPASS switches are returned to the NORMAL position. 2) Tech Spec 3.6.1.1 shall be referred to before purging in the RUN Mode (MODE 1). 3) The following annunciators are expected when initiating Drywell purging due to gross failure on low Drywell pressure. • Reactor Protection System (RPS) ANALOG TRIP UNIT (ATU) TROUBLE 3-XA-99-1, (3-9-5B, WINDOW 23) • Emergency Core Cooling System (ECCS) ANALOG TRIP UNIT TROUBLE 3-XA-71-60 , (3-9-3E, WINDOW 30) [11] **IF** the REACTOR MODE SWITCH is in RUN, **THEN PLACE** the following switches in the BYPASS position (Panel 3-9-3): • 3-HS-64-24, PRIMARY CONTAINMENT (PC) PURGE DIVISION I RUN MODE BYPASS • 3-HS-64-25, PRIMARY CONTAINMENT (PC) PURGE DIVISION II RUN MODE BYPASS Expected Action(s): Places the following switches in the BYPASS position: • 3-HS-64-24, PRIMARY CONTAINMENT (PC) PURGE DIVISION I RUN MODE BYPASS • 3-HS-64-25, PRIMARY CONTAINMENT (PC) PURGE DIVISION II RUN MODE BYPASS	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 5: [12] RECORD start time in Narrative log. Expected Action(s): Marks this step as completed. **EXAMINER CUE: If requested to RECORD start time, inform examinee that Step [12] is complete.**	_____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 6: [13] OPEN the following valves (Panel 3-9-3): • 3-FCV-64-29, DRYWELL VENT INBOARD ISOLATION VLV, using 3-HS-64-29 • 3-FCV-64-30, DRYWELL VENT OUTBOARD ISOLATION VLV, using 3-HS-64-30 Expected Action(s): Momentarily places 3-HS-64-29 and 3-HS-64-30 in the OPEN position and ensures the indicating lamp is illuminated RED valve position above the associated hand switch.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 7: [14] **MONITOR** Drywell Pressure (Panel 3-9-3). Expected Action(s): Monitors Drywell Pressure on various indications/recorders on Panel 3-9-3 for lowering trend.	_____ SAT _____UNSAT _____N/A
Step 8: [15] **START** 3-HS-64-131, CONTAINMENT PURGE FILTER FAN using (Reactor Building, El 621). Expected Action(s): Dispatches an Assistant Unit Operator (AUO) to start the Containment Purge Filter Fan. **DRIVER CUE: When contacted as an AUO to start the Containment Purge Filter Fan, insert Event 1, and inform the candidate that the Containment Purge Filter Fan is running.**	_____ SAT _____UNSAT _____N/A
EXAMINER NOTE: When Step [15] is performed above, DRYWELL PRESSURE ABNORMAL, (3-9-5B, WINDOW 31) is an expected alarm.	

STEP / STANDARD	SAT / UNSAT
Step 9: [16] **OPEN** the following valves (Panel 3-9-3) A. 3-FCV-64-17, DRYWELL/SUPPRESSION CHAMBER AIR PURGE ISOLATION VLV, using 3-HS-64-17. B. 3-FCV-64-18, DRYWELL ATMOSPHERE SUPPLY INBOARD ISOLATION VLV, using 3-HS-64-18. Expected Action(s): Momentarily places 3-HS-64-17 and 3-HS-64-18 in the OPEN position and ensures the indicating lamp is illuminated RED valve position above the associated hand switch.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: After the completion of Step [16], inform the candidate "Another Operator will continue this procedure. This completes your task".	

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct" (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

You are the Balance of Plant Operator on Unit 3 with the following plant conditions:

- Unit 3 is currently at 100% RTP
- Unit 3 is being shut down for an outage. Reactor Power reduction will start on the next shift
- The Drywell is to be purged with air for Primary Containment entry
- Drywell Control Air has been aligned to Plant Control Air

INITIATING CUES:

The Nuclear Unit Senior Operator has directed you to air purge the Drywell for Primary Containment entry in accordance with 3-OI-64, Primary Containment System, Section 8.2 Purging the Drywell with Primary Containment Purge Filter Fan, starting at Step [8].

NOTE: All Precautions and Limitations **AND** Pre-Startup/Standby Readiness requirements have been met.

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Restore Offsite Power to 4KV Shutdown Board at Panel 3-9-23	
JPM NUMBER:		631-U3	REVISION:	4

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-082-NO-09 / Restore Offsite Power to 4KV Shutdown Board at Panel 9-23			
K/A RATINGS:	RO: 3.4 SRO: 3.4			
K/A No. &STATEMENT:	262001 A.C. Electrical Distribution; A4.02 Ability to manually operate and/or monitor in the control room: Synchroscope, including understanding of running and incoming voltages			
RELATED PRA INFORMATION:	Key System Contribution to CDF = N/A			
SAFETY FUNCTION:	6			

EVALUATION LOCATION:	☐ In-Plant	☒ Simulator	☐ Control Room	☐ Lab
	☐ Other - List			

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 18 minutes TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 631-U3

RO _____ SRO _____ DATE: _____

TASK EXPECTED ACTION(S): The Examinee is expected to restore Offsite Power to 4KV Shutdown Board at Panel 3-9-23.

Operator Fundamental evaluated:
OF-1 Monitoring plant indications and conditions closely.
OF-2 Controlling Plant Evolutions Precisely.

REFERENCES/PROCEDURES NEEDED: 3-OI-82

VALIDATION TIME: 18 minutes

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

JPM Revision Summary

Rev No.	Effective Date	Pages Affected	Description
3	11/02/2020	All	Update JPM
4	01/25/2021	All	Procedure update

Procedure Revisions

Procedure	Revision
3-OI-82	152

SIMULATOR SETUP

IC	28
Exam IC	265

Console Operator Instructions	• Reset to IC 265 • Place the Simulator in RUN and verify stable conditions • Ensure the examinee has been briefed on 3-OI-82, Standby Diesel Generator System, Section 8.3, Restoring Offsite Power to 4KV Shutdown Board at Panel 3-9-23 • Ensure stopwatch is available • Verify that Remote Function ED32A (4KV SD BD A MODE SWITCH) is ENABLED

Malfunctions	Description	Event	Severity	Delay	Initial set
N/A					

****

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****

INITIAL CONDITIONS:

You are an Operator on Unit 3 with the following plant conditions:

- 2 hours ago, 4 KV Shutdown Board 3EA was separated from Offsite Power and is being powered by Emergency Diesel Generator (EDG) 3A
- An Assistant Unit Operators (AUOs) are standing by on station for support
- No inclement weather currently exists in the area

INITIATING CUES:

The Nuclear Unit Senior Operator has directed you to perform the following operation in accordance with 3-OI-82, Standby Diesel Generator System, Section 8.3, Restoring Offsite Power to 4KV Shutdown Board at Panel 9-23:

- Restore Offsite Power to 4KV Shutdown Board 3EA using the Normal Feeder Breaker 1334 while leaving EDG 3A in Parallel with System

START TIME:_____

<table>
<tr><th>STEP / STANDARD</th><th>SAT / UNSAT</th></tr>
<tr><td>
Step 1:

3-OI-82, Standby Diesel Generator (EDG) System
Section 8.3 Restoring Offsite Power to 4KV Shutdown Board at Panel 9-23

NOTES
The following list of 4KV Shutdown Board Normal and Alternate Feeder Breakers may be useful when performing this section:

<table>
<tr><th>Shutdown Board</th><th>3EA</th></tr>
<tr><td>Normal Feeder Breaker</td><td>1334</td></tr>
<tr><td>Alternate Feeder Breaker</td><td>1726</td></tr>
</table>

[1] CHECK 4KV Shutdown Board 3EA is being supplied power by its respective Diesel Generator as the only source of power.

Expected Action(s):

Verifies 4KV Shutdown Board 3EA is being supplied by EDG 3A.
</td><td>_____ SAT
_____UNSAT
_____N/A</td></tr>
<tr><td>
Step 2:

[2] ENSURE the associated 4 KV Shutdown Board auto transfer lockout relay is tripped to MANUAL.

<table>
<tr><th>Diesel</th><th>Handswitch Name</th><th>Handswitch No.</th><th>Panel</th></tr>
<tr><td>3A</td><td>4KV SD BD 3EA AUTO/LOCKOUT RESET</td><td>3-43-211-3EA</td><td>3-9-23</td></tr>
</table>

Expected Action(s):

Ensures 3-43-211-3EA, 4KV SD BD 3EA AUTO/LOCKOUT RESET, is tripped to manual on Panel 3-9-23.
</td><td>_____ SAT
_____UNSAT
_____N/A</td></tr>
</table>

<table>
<tr><th>STEP / STANDARD</th><th>SAT / UNSAT</th></tr>
<tr><td>Step 3:

[3] PLACE the synchroscope switch for the 4KV Shutdown Board feeder breaker that is to be paralleled with the Diesel Generator in ON.

Expected Action(s):

On Panel 3-9-23A, places 3-25-211-3EA/7A, 4KV SHUTDOWN (SD) BOARD (BD) 3EA BREAKER 1334 SYNC, for the 4KV Shutdown Board normal feeder breaker 1334 that is to be paralleled with the Diesel Generator in ON.</td><td>Critical Step

_____ SAT

_____UNSAT

_____N/A</td></tr>
<tr><td>Step 4:

[4] CHECK the applicable 4VKV Unit Board (4KV Bus Tie board) Voltage is between 3950 Volts and 4400 Volts and NOT undergoing abnormal voltage transients.

Expected Action(s):

With SHUTDOWN BOARD 3EA selected using 3-XS-211-3EA, 4KV SHUTDOWN (SD) BOARD (BD) 3EA VOLTAGE SELECT, checks 4KV Shutdown Board 3EA Voltage is between 3950 Volts and 4400 Volts on 3-EI-211-3EA, 4KV SD BD 3EA VOLTS and NOT undergoing abnormal voltage transients.</td><td>_____ SAT

_____UNSAT

_____N/A</td></tr>
<tr><td>Step 5:

[5] CHECK associated incoming frequency is between 59 Hertz and 61 Hertz and NOT undergoing abnormal frequency transients.

<table><tr><th>Shutdown Bd</th><th>Instrument Name</th><th>Instrument No.</th><th>Panel</th></tr><tr><td>3EA or 3EB</td><td>GENERATOR SYNC FREQUENCY</td><td>3-SI-82-3AB</td><td>3-9-23</td></tr></table>
Expected Action(s):

Verifies incoming frequency is between 59 Hertz and 61 Hertz and not undergoing abnormal frequency transients using 3-SI-82-3AB, GENERATOR SYNC FREQUENCY.</td><td>_____ SAT

_____UNSAT

_____N/A</td></tr>
</table>

STEP / STANDARD	SAT / UNSAT
Step 6: **CAUTION** **DO NOT** parallel the Diesel Generators with an unstable Offsite source or during inclement weather (e.g., lightning, heavy winds). [6] **IF** 4VKV Unit Board (4KV Bus Tie board) is experiencing abnormal voltage or frequency conditions, **THEN PERFORM** the following: Expected Action(s): Verifies that there are no abnormal voltage or frequency conditions. As given in the Initial Conditions, there is no inclement weather in the area.	_____ SAT _____UNSAT _____N/A
Step 7: **CAUTION** Only one Unit 1 and 2 Diesel Generator at a time is allowed to be operated in Parallel with System. [7] **PULL and PLACE** the associated Diesel Generator Mode Selector Switch in PARALLELED WITH SYSTEM. **Diesel** | **Handswitch Name** | **Handswitch No.** | **Panel** 3A | DG 3A MODE SELECT | 3-HS-82-3A/5A | 3-9-23 Expected Action(s): Pulls 3-HS-82-3A/5A, DG 3A MODE SELECT SWITCH and places it in PARALLELED WITH SYSTEM.	**Critical Step** _____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 8: **CAUTION** Failure of the PARALLELED WITH SYSTEM light to illuminate in the following step could indicate that the DG is still in SINGLE UNIT operation and result in overload when the DG output breaker is closed. [8] **RELEASE** the Diesel Generator Mode Selector Switch and **OBSERVE** PARALLELED WITH SYSTEM light illuminated. Expected Action(s): Releases 3-HS-82-3A/5A, DG 3A MODE SELECT switch and observes PARALLELED WITH SYSTEM light is illuminated.	_____ SAT _____UNSAT _____N/A
Step 9: [9] **PLACE** the associated Diesel Generator NFPA 805 MODE SWITCH in **ENABLE**. **Diesel** | **Handswitch Name** | **Handswitch No.** | **Panel** 3A | NFPA 805 MODE SWITCH | 3-43-211-03EA/03 | 4KV SDBD 3EA compt 03 Expected Action(s): Directs AUO to place 3-43-211-03EA/03, NFPA 805 MODE SWITCH for EDG 3A, on Panel 4KV SDBD 3EA compt 03 in ENABLE.	_____ SAT _____UNSAT _____N/A
EXAMINER CUE: When directed to place 3-43-211-03EA/03, NFPA 805 MODE SWITCH for EDG 3A on Panel 4KV SDBD 3EA compt 03 in ENABLE, report that the NFPA MODE SWITCH is in the 'enable' position.	

STEP / STANDARD	SAT / UNSAT
Step 10: [10] **ADJUST** Diesel Generator Frequency using the associated Diesel Generator Governor Control Switch to obtain a synchroscope needle rotation of one revolution every 15 to 20 seconds in the SLOW direction. **Diesel** | **Handswitch Name** | **Handswitch No.** | **Panel** 3A | DG 3A GOVERNOR CONTROL | 3-HS-82-3A/3A | 3-9-23 Expected Action(s): Adjusts EDG 3A Frequency using 3-HS-82-3A/3A, DG 3A GOVERNOR CONTROL, to obtain a synchroscope needle rotation in the SLOW direction.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 11: [11] **USE** the associated Diesel Generator Voltage Regulator Control Switch to match Diesel Generator and System Voltages. **Diesel** | **Instrument Name** | **Inst No.** | **Panel** 3A | DG 3A VOLTAGE REGULATOR CONTROL | 3-HS-82-3A/2A | 3-9-23 3A | GEN SYNC REFERENCE VOLTAGE | 3-EI-82-3AB | 3-9-23 3A | SYSTEM SYNC REFERENCE VOLTAGE | 3-EI-211-3EAB/B | 3-9-23 Expected Action(s): Matches EDG 3A Voltage with System Voltage using 3-HS-82-3A/2A, DG 3A VOLT REGULATOR CONTROL SWITCH.	_____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 12: [12] **WHEN** the synchroscope needle is approximately 2 minutes on the right hand side of the 12 o'clock position, **THEN** **CLOSE** the 4KV Shutdown Board Feeder Breaker that is to be paralleled with the Diesel Generator. Expected Action(s): Closes the 4kV Shutdown Board Feeder Breaker 1334 when the synchroscope needle is approximately (+/-) 5 minutes from the 12 o'clock position.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: Following the completion of Step 12, inform the examinee "Another Operator will finish the procedure. This completes your task".	

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct" (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

You are an Operator on Unit 3 with the following plant conditions:

- 2 hours ago, 4 KV Shutdown Board 3EA was separated from Offsite Power and is being powered by Emergency Diesel Generator (EDG) 3A
- An Assistant Unit Operators (AUOs) are standing by on station for support
- No inclement weather currently exists in the area

INITIATING CUES:

The Nuclear Unit Senior Operator has directed you to perform the following operation in accordance with 3-OI-82, Standby Diesel Generator System, Section 8.3, Restoring Offsite Power to 4KV Shutdown Board at Panel 9-23:

- Restore Offsite Power to 4KV Shutdown Board 3EA using the Normal Feeder Breaker 1334 while leaving EDG 3A in Parallel with System

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Respond to Loss of Power to One RPS Bus in accordance with 2-AOI-99-1, Loss of Power to One RPS Bus
JPM NUMBER:	748-U2	REVISION:	0

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-099-AB-01			
K/A RATINGS:	RO: 3.7 SRO: 3.9			
K/A No. &STATEMENT:	212000 Reactor Protection System A2.01; Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: RPS motor-generator set failure			
RELATED PRA INFORMATION:	N/A			
SAFETY FUNCTION:	7			

EVALUATION LOCATION:	☐ In-Plant	☒ Simulator	☐ Control Room	☐ Lab
	☐ Other - List			

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 12 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 748-U2

RO _____ SRO _____ DATE: _____

TASK STANDARD: The Examinee is expected to restore plant conditions to normal following a Loss of Power to One RPS Bus.

Operator Fundamental evaluated:
OF-1 Monitoring plant indications and conditions closely.
OF-2 Controlling plant evolutions precisely.

PRA: NA

REFERENCES/PROCEDURES NEEDED: 2-AOI-99-1

VALIDATIONTIME: 12 min

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
0	11/9/2020	All	Initial issue

Procedure Revisions

Procedure	Revision
2-AOI-99-1	30

SIMULATOR SETUP

IC	28
Exam IC	283

Console Operator Instructions	• Reset to IC 283 • Run Schedule File ILT 2104 NRC JPM f.sch • Place the simulator in RUN to ensure stable conditions

Malfunctions	Description	Event	Severity	Delay	Initial set
NONE					

Remotes	Description	Event	Severity	Delay	Initial set
NONE					

Overrides	Description	Event	Severity	Delay	Initial set
NONE					

Schedule File(s): ILT 2104 NRC JPM f.SCH
Event File(s): N/A

****

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****

INITIAL CONDITIONS:

- You are an Operator on Unit 2
- Unit 2 is operating at 100% Reactor Power
- 2A RPS motor generator tripped, and 2A RPS Bus has been placed on alternate

INITIATING CUES: The Unit 2 Nuclear Unit Senior Operator has directed you to continue with restoring affected systems to normal in accordance with 2-AOI-99-1, Loss of Power to One RPS Bus, Section 4.2 [12].

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: 2-AOI-99-1, Loss of Power to One RPS Bus, Section 4.2 [12] [12] RESET the RPS trip logic half SCRAM at Panel 2-9-5 as follows: **NOTE** The eight CONTROL ROD TEST SCRAM SOLENOID GROUP A and B LIGHTS SHOULD ILLUMINATE. [12.1] **MOMENTARILY PLACE** 2-HS-99-5A-S5, SCRAM RESET as follows: [12.2] RESET FIRST position. (Group 2/3). [12.2] RESET SECOND position. (Group 1/4). [12.4] NORMAL position. Expected Action(s): Resets the RPS trip logic half SCRAM at Panel 2-9-5 by placing 2-HS-99-5A-S5, SCRAM RESET in RESET FIRST position (Group 2/3), then RESET SECOND position (Group 1/4), and finally back to the NORMAL position.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 2: [13] **VERIFY** the following: [13.1] All eight SCRAM SOLENOID GROUP A/B LOGIC RESET lights ILLUMINATED. Expected Action(s): Verifies all eight SCRAM solenoid logic reset lights are illuminated.	_____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 3: [13.2] The following four lights ILLUMINATED: [13.2.1] 2-IL-99-5A/AB, SYSTEM A BACKUP SCRAM VALVE. [13.2.2] 2-IL-99-5A/CD, SYSTEM B BACKUP SCRAM VALVE. Expected Action(s): Verifies that the A and B Backup SCRAM valve lights are illuminated.	_____SAT _____UNSAT _____N/A
Step 4: [13.3] Scram Discharge Volume Vent and Drain Valves indicate OPEN. Expected Action(s): Verifies the eight (8) Scram Discharge Volume Vent and Drain Valves indicate open.	_____ SAT _____UNSAT _____N/A
Step 5: [14] **RESET** PCIS trip logic at Panel 2-9-4 as follows: [14.1] **MOMENTARILY** PLACE 2-HS-64-16A-S32, PCIS DIV I RESET, to left and right RESET positions. [14.2] **VERIFY** the following red lights ILLUMINATED: [14.2.1] 2-IL-64-A1, MSIV GROUP A1. [14.2.2] 2-IL-64-B1, MSIV GROUP B1. **EXAMINER NOTE: Verifying the red lights for 2-IL-64-A1, MSIV GROUP A1 and 2-IL-64-B1, MSIV GROUP B1 are ILLUMINATED, is NOT a Critical Step.** Expected Action(s): On Panel 2-9-4, PLACES 2-HS-64-16A-S32, PCIS DIV I RESET, to left and right RESET positions.	**Critical Step** _____SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 6: [14.3] **MOMENTARILY** PLACE 2-HS-64-16A-S33, PCIS DIV II RESET, to left and right RESET positions. [14.2] **VERIFY** the following red lights ILLUMINATED: [14.2.1] 2-IL-64-A2, MSIV GROUP A2. [14.2.2] 2-IL-64-B2, MSIV GROUP B2. **EXAMINER NOTE: Verifying the red lights for 2-IL-64-A2, MSIV GROUP A2 and 2-IL-64-B2, MSIV GROUP B2 are ILLUMINATED, is NOT a Critical Step.** Expected Action(s): Places 2-HS-64-16A-S33, PCIS DIV II RESET, to left and right RESET positions.	**Critical Step** _____SAT _____UNSAT _____N/A
Step 7: [15] **IF** Unit was in Shutdown Cooling prior to the loss of one RPS Bus, **THEN REFER** to 2-AOI-74-1, Loss of Shutdown Cooling. Expected Action(s): Marks this step as N/A. Initial Conditions state Unit 2 is operating at 100% Reactor Power.	_____ SAT _____UNSAT _____N/A
Step 8: [16] **VERIFY** only one Standby Gas Train operating. Expected Action(s): Determines that all three trains of Standby Gas are running. The candidate may contact Unit 1 to secure two Standby Gas Trains.	_____SAT _____UNSAT _____N/A
DRIVER NOTE: If contacted as Unit 1, perform Standby Gas (SGT) operations as requested by inserting Events as follows: **Event 1 for SGT-A** **Event 2 for SGT-B** **Event 3 for SGT-C**	
EXAMINER NOTE: Any ventilation fan combination on Panel 2-9-25 is acceptable for JPM Steps 9 and 10.	

STEP / STANDARD	SAT / UNSAT
Step 9: [17] **RESET** the Secondary Containment Isolation logic at Panel 2-9-25, as follows: [17.1] **PLACE** 2-HS-64-11A, REACTOR ZONE FANS AND DAMPERS switch to OFF. [17.2] **PLACE** 2-HS-64-3A, REFUEL ZONE FANS AND DAMPERS Switch to OFF. Expected Action(s): Resets Secondary Containment Isolation logic by placing the Reactor and Refuel Fans in OFF on Panel 2-9-25.	**Critical Step** _____SAT _____UNSAT _____N/A
Step 9: [18] **START** the Refuel Zone supply and exhaust fans, at Panel 2-9-25, as follows: [18.1] **PLACE** 2-HS-64-3A, REFUEL ZONE FANS AND DAMPERS Switch in SLOW A (SLOW B) position. Expected Action(s): Places 2-HS-64-3A, REFUEL ZONE FANS AND DAMPERS SWITCH in SLOW A (SLOW B) position.	**Critical Step** _____SAT _____UNSAT _____N/A
Step 10: [19] **START** the Reactor Building supply and exhaust fans, at Panel 2-9-25, as follows: [19.1] **PLACE** 2-HS-64-11A, REACTOR ZONE FANS AND DAMPERS switch to the SLOW A(B) position. Expected Action: Places 2-HS-64-11A, REACTOR ZONE FANS AND DAMPERS SWITCH to the SLOW A(B) position.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: Once Step [19.1] is completed, inform the examinee "Another Operator will continue the procedure. This completes your task".	

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

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****

INITIAL CONDITIONS:

- You are an Operator on Unit 2
- Unit 2 is operating at 100% Reactor Power
- 2A RPS motor generator tripped, and 2A RPS Bus has been placed on alternate

INITIATING CUES: The Unit 2 Nuclear Unit Senior Operator has directed you to continue with restoring affected systems to normal in accordance with 2-AOI-99-1, Loss of Power to One RPS Bus, Section 4.2 [12].

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Respond to Loss of Power to One RPS Bus in accordance with 3-AOI-99-1, Loss of Power to One RPS Bus
JPM NUMBER:	748-U3	REVISION:	0

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-099-AB-01			
K/A RATINGS:	RO: 3.7 SRO: 3.9			
K/A No. &STATEMENT:	212000 Reactor Protection System A2.01; Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: RPS motor-generator set failure			
RELATED PRA INFORMATION:	N/A			
SAFETY FUNCTION:	7			

EVALUATION LOCATION:	☐ In-Plant	☒ Simulator	☐ Control Room	☐ Lab
	☐ Other - List			

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 12 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 748-U3

RO _____ SRO _____ DATE: _____

TASK STANDARD: The Examinee is expected to restore plant conditions to normal following a Loss of Power to One RPS Bus.

Operator Fundamental evaluated:
OF-1 Monitoring plant indications and conditions closely.
OF-2 Controlling plant evolutions precisely.

PRA: NA

REFERENCES/PROCEDURES NEEDED: 3-AOI-99-1

VALIDATIONTIME: 12 min

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
0	11/9/2020	All	Initial issue

Procedure Revisions

Procedure	Revision
3-AOI-99-1	20

SIMULATOR SETUP

IC	28
Exam IC	266

Console Operator Instructions	• Reset to IC 266 • Run Schedule File ILT 2104 NRC JPM f.sch • Place the simulator in RUN to ensure stable conditions

Malfunctions	Description	Event	Severity	Delay	Initial set
NONE					

Remotes	Description	Event	Severity	Delay	Initial set
NONE					

Overrides	Description	Event	Severity	Delay	Initial set
NONE					

Schedule File(s): ILT 2104 NRC JPM f.SCH
Event File(s): N/A

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct". (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

- You are an Operator on Unit 3
- Unit 3 is operating at 100% Reactor Power
- 3A RPS motor generator tripped, and 3A RPS Bus has been placed on alternate

INITIATING CUES: The Unit 3 Nuclear Unit Senior Operator has directed you to continue with restoring affected systems to normal in accordance with 3-AOI-99-1, Loss of Power to One RPS Bus, Section 4.2 [12].

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: 3-AOI-99-1, Loss of Power to One RPS Bus, Section 4.2 [12] [12] RESET the RPS trip logic half SCRAM at Panel 3-9-5 as follows: [12.1] **MOMENTARILY PLACE** 3-HS-99-5A-S5, SCRAM RESET as follows: [12.2] RESET FIRST position. (Group 2/3). [12.2] RESET SECOND position. (Group 1/4). [12.4] NORMAL. Expected Action(s): Resets the RPS trip logic half SCRAM at Panel 3-9-5 by placing 3-HS-99-5A-S5, SCRAM RESET in RESET FIRST position (Group 2/3), then RESET SECOND position (Group 1/4), and finally back to the NORMAL position	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 2: [13] **CHECK** the following conditions: [13.1] All eight SCRAM SOLENOID GROUP A/B LOGIC RESET lights ILLUMINATED. Expected Action(s): Verifies all eight SCRAM solenoid logic reset lights are illuminated.	_____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 3: [13.2] The following four lights ILLUMINATED: [13.2.1] 3-IL-99-5A/AB, SYSTEM A BACKUP SCRAM VALVE. [13.2.2] 3-IL-99-5A/CD, SYSTEM B BACKUP SCRAM VALVE. Expected Action(s): Verifies that the A and B Backup SCRAM valve lights are illuminated.	_____SAT _____UNSAT _____N/A
Step 4: [13.3] Scram Discharge Volume Vent and Drain Valves indicate OPEN. [13.4] Points SOE033 (Channel A3 manual scram) and SOE035 (Channels A1&A2 Auto Scram) on ICS computer or on the First Out Printer reads “NOT TRIP” for RPS “A”. [13.5] N/A Expected Action(s): Verifies the eight (8) Scram Discharge Volume Vent and Drain Valves indicate open. Checks ICS computer points SOE033 and SOE035 or the First Out Printer reads ‘NOT TRIP’ for RPS 2A.	_____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 5: [14] **RESET** PCIS trip logic at Panel 3-9-4 as follows: [14.1] **MOMENTARILY PLACE** 3-HS-64-16A-S32, PCIS DIV I RESET, to left and right RESET positions. [14.2] **CHECK** the following red lights ILLUMINATED: [14.2.1] 3-IL-64-A1, MSIV GROUP A1. [14.2.2] 3-IL-64-B1, MSIV GROUP B1. **EXAMINER NOTES: Verifying the red lights for 3-IL-64-A1, MSIV GROUP A1 and 3-IL-64-B1, MSIV GROUP B1 are ILLUMINATED, is NOT a Critical Step.** Expected Action(s): On Panel 3-9-4, PLACES 3-HS-64-16A-S32, PCIS DIV I RESET, to left and right RESET positions.	**Critical Step** _____SAT _____UNSAT _____N/A
Step 6: [14.3] **MOMENTARILY PLACE** 3-HS-64-16A-S33, PCIS DIV II RESET, to left and right RESET positions. [14.2] **CHECK** the following red lights ILLUMINATED: [14.2.1] 3-IL-64-A2, MSIV GROUP A2. [14.2.2] 3-IL-64-B2, MSIV GROUP B2. **EXAMINER NOTES: Verifying the red lights for 3-IL-64-A2, MSIV GROUP A2 and 3-IL-64-B2, MSIV GROUP B2 are ILLUMINATED, is NOT a Critical Step.** Expected Action(s): On Panel 3-9-4, PLACES 3-HS-64-16A-S33, PCIS DIV II RESET, to left and right RESET positions.	**Critical Step** _____SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 7: [15] **IF** Unit 3 was in Shutdown Cooling prior to the loss of one RPS Bus, **THEN REFER** to Loss of Shutdown Cooling, 3-AOI-74-1. Expected Action(s): Marks this step as N/A. Initial Conditions state Unit 3 is operating at 100% Reactor Power.	_____ SAT _____UNSAT _____N/A
Step 8: [16] **RESET** the Secondary Containment Isolation logic at Panel 3-9-25, as follows: [16.1] **PLACE** 3-HS-64-11A, REACTOR ZONE FANS AND DAMPERS switch to OFF. [16.2] **PLACE** 3-HS-64-3A, REFUEL ZONE FANS AND DAMPERS Switch to OFF. Expected Action(s): On Panel 3-9-25, RESETS the Secondary Containment Isolation logic as follows: • PLACES 3-HS-64-11A, REACTOR ZONE FANS AND DAMPERS switch to OFF • PLACES 3-HS-64-3A, REFUEL ZONE FANS AND DAMPERS Switch to OFF	**Critical Step** _____SAT _____UNSAT _____N/A
Step 9: [16.3] **VERIFY** only one Standby Gas Train operating. Expected Action(s): Determines that all three trains of Standby Gas are running. The candidate may contact Unit 1 to secure two Standby Gas Trains.	_____ SAT _____UNSAT _____N/A
DRIVER NOTE: If contacted as Unit 1, perform Standby Gas (SGT) operations as requested by inserting Events as follows: **Event 1 for SGT-A** **Event 2 for SGT-B** **Event 3 for SGT-C**	

STEP / STANDARD	SAT / UNSAT
EXAMINER NOTE: Any ventilation fan combination on Panel 3-9-25 is acceptable for JPM Steps 10 and 11.	
Step 10: [17] **START** the Refuel Zone supply and exhaust fans, at Panel 3-9-25, as follows: [17.1] **PLACE** 3-HS-64-3A, REFUEL ZONE FANS AND DAMPERS Switch in SLOW A (SLOW B) position. Expected Action(s): On Panel 3-9-25, PLACES 3-HS-64-3A, REFUEL ZONE FANS AND DAMPERS Switch in SLOW A (SLOW B) position.	**Critical Step** _____SAT _____UNSAT _____N/A
Step 11: [18] **START** the Reactor Building supply and exhaust fans, at Panel 3-9-25, as follows: [18.1] **PLACE** 3-HS-64-11A, REACTOR ZONE FANS AND DAMPERS switch to the SLOW A(B) position. Expected Action: On Panel 3-9-25, PLACES 3-HS-64-11A, REACTOR ZONE FANS AND DAMPERS switch to the SLOW A(B) position.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: **Once Step [18.1] is completed, inform the examinee "Another Operator will continue the procedure. This completes your task".**	

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct". (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

- You are an Operator on Unit 3
- Unit 3 is operating at 100% Reactor Power
- 3A RPS motor generator tripped, and 3A RPS Bus has been placed on alternate

INITIATING CUES: The Unit 3 Nuclear Unit Senior Operator has directed you to continue with restoring affected systems to normal in accordance with 3-AOI-99-1, Loss of Power to One RPS Bus, Section 4.2 [12].

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Respond to a loss of Reactor Building Closed Cooling Water (RBCCW) in accordance with 3-AOI-70-1, Loss of RBCCW
JPM NUMBER:	602A-U3	REVISION:	3

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-070-AB-01: Perform manipulations required for a loss of Reactor Building Closed Cooling Water.			
K/A RATINGS:	RO: 3.3 SRO: 3.4			
K/A No. &STATEMENT:	400000 Component Cooling Water System A2.01: Ability to (a) predict the impacts of the following on the CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Loss of CCW pump.			
RELATED PRA INFORMATION:	N/A			
SAFETY FUNCTION:	8			

EVALUATION LOCATION:	☐In-Plant	☒ Simulator	☐ Control Room	☐ Lab
	☐ Other - List			

APPLICABLE METHOD OF TESTING: ☐ Discussion ☒ Simulate/Walkthrough ☐ Perform

TIME FOR COMPLETION: 5 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) Y

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: _602A-U3_

RO SRO DATE: _____

TASK STANDARD: The Examinee is expected to respond to a loss of a Reactor Building Closed Cooling Water (RBCCW) Pump, and take action for a complete loss of RBCCW following Immediate Abnormal Operating Instruction actions

Operator Fundamental evaluated:
OF-2 Controlling plant evolutions precisely.
OF-5 Having a solid understanding of plant design, engineering principles, and sciences.

PRA: NA

REFERENCES/PROCEDURES NEEDED: 3-AOI-70-1

VALIDATION TIME: 5 min

PERFORMANCE TIME: _____

COMMENTS: _____
_____
_____
_____
_____
_____
_____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
0	06/29/2008	All	Initial issue
1	10/31/2016	All	Updated AOI required actions. Updated to new format.
2	03/29/2017	All	Incorporated NRC Prep Week Comments.
3	11/09/20	All	Updated JPM

Procedure Revisions

Procedure	Revision
3-AOI-70-1	20

SIMULATOR SETUP

IC	28
Exam IC	N/A

Console Operator Instructions	• **Reset to IC 28** • **Run Schedule File 2104 NRC JPM g Unit 3.sch** • **Ensure event file 2104 NRC JPM g UNIT 3.evt starts** • **Place the simulator in RUN to ensure stable conditions** • **When directed by the examiner insert Event 1 to trip RBCCW Pump 3A** • **Verify that event 2 (RBCCW Pump 3B trip) is triggered when the 70-48 valve begins to close**

Malfunctions	Description	Event	Severity	Delay	Initial set
SW02A	RBCCW PUMP 3A TRIP	1	NA	NA	TRIP
SW02B	RBCCW PUMP 3B TRIP	2	NA	80	TRIP

Events	Description	Event	Severity	Delay	Initial set
2	70-48 beings to close	NA	NA	NA	NA

Schedule File: 2104 NRC JPM g Unit 3.SCH

Event File: 2104 NRC JPM g Unit 3.EVT

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct". (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS: You are a Unit 3 Operator with Reactor Power is 100%.

There is NO equipment out of service.

INITIATING CUES: Respond to plant conditions.

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: 3-AOI-70-1, Loss of Reactor Building Closed Cooling Water **4.1 Immediate Actions:** [1] **IF** RBCCW Pump(s) has tripped, **THEN** Perform the following (Otherwise N/A): • **SECURE** RWCU Pumps. • **ENSURE** 3-FCV-70-48, RBCCW SECTIONALIZING VLV **CLOSED**. Expected Action(s): Secures RWCU Pumps and verifies that 3-FCV-70-48 is closing.	_____SAT _____UNSAT _____N/A
Examiner Note: (BEGIN ALTERNATE PATH) 3B RBCCW Pump will trip 80 seconds after 3-FCV-70-48 begins to close.	
Step 2: **4.2 Subsequent Actions** **CAUTION** Operations outside of the allowable regions shown on the Power to Flow Map could result in thermal-hydraulic power oscillations and subsequent fuel damage. REFER TO 3-GOI-100-12A for required actions and monitoring to be performed during a power reduction. [1] **IF** Reactor is at power **AND** Drywell Cooling cannot be immediately restored, **THEN PERFORM** the following (otherwise **N/A**): [1.1] **IF** core flow is above 60%, **THEN REDUCE** core flow to between 50-60%. Expected Action(s): Reduces core flow to between 50-60%.	_____SAT _____UNSAT _____N/A

Step 3: [1.2] **MANUALLY SCRAM** the Reactor and **PLACE** MODE Switch in SHUTDOWN. **REFER** TO 3-AOI-100-1, Reactor SCRAM. Expected Action(s): **EXAMINER NOTE: ONLY inserting a manual Reactor SCRAM and placing the Reactor MODE SWITCH are critical in this step.** Inserts a manual Reactor SCRAM and places 3-HS-99-5A-S1, REACTOR MODE SWITCH, in SHUTDOWN.	**Critical Step** _____SAT _____UNSAT _____N/A
Step 4: [1.3] **SHUT DOWN** both Recirc Pumps. • **DEPRESS** 3-HS-96-19, RECIRC DRIVE 3A SHUTDOWN • **DEPRESS** 3-HS-96-20, RECIRC DRIVE 3B SHUTDOWN Expected Action(s): Shutdowns both Recirc Pumps.	**Critical Step** _____SAT _____UNSAT _____N/A
EXAMINER CUE: [After the SCRAM Report is given and both Recirc Pumps are shutdown] "Another Operator will continue with this procedure. This completes your task."	

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct". (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS: You are a Unit 3 Operator with Reactor Power is 100%.

There is NO equipment out of service.

INITIATING CUES: Respond to plant conditions.

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Emergency Vent Primary Containment in accordance with 2-EOI-Appendix-13, Emergency Venting Primary Containment
JPM NUMBER:	55-U2	REVISION:	2

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-000-EM-63 / Emergency Vent Primary Containment in accordance with EOI Appendix 13			
K/A RATINGS:	RO: 3.3 SRO: 3.4			
K/A No. & STATEMENT:	288000 Plant Ventilation Systems A2.01: Ability to (a) predict the impacts of the following on the PLANT VENTILATION SYSTEMS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High Drywell Pressure: Plant-Specific			
RELATED PRA INFORMATION:	Key System Contribution to CDF = N/A			
SAFETY FUNCTION:	9			

EVALUATION LOCATION:	☐ In-Plant	☒ Simulator	☐ Control Room	☐ Lab
	☐ Other - List			

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 5 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 55-U2

RO _____ SRO _____ DATE: _____

TASK STANDARD: The Examinee is expected to Emergency Vent Primary Containment.

Operator Fundamental evaluated:
OF-1 Monitoring plant indications and conditions closely.
OF-2 Controlling Plant Evolutions Precisely.

REFERENCES/PROCEDURES NEEDED: 2-EOI-Appendix-13

VALIDATION TIME: 5 minutes

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
1	09/01/2020	All	Format update
2	1/12/21	All	JPM update

Procedure Revisions

Procedure	Revision
2-EOI-Appendix-13	10

SIMULATOR SETUP

IC	28
Exam IC	284

Console Operator Instructions	• Reset to Exam IC 284 • 2-XS-74-121(129), RHR SYS I(II) CONTAINMENT SPRAY / COOLING VALVE SELECT switches must be placed in NORMAL AFTER SELECT following simulator reset • Place the simulator in RUN to ensure stable conditions

Malfunctions	Description	Event	Severity	Delay	Initial set

Overrides	Description	Event	Severity	Delay	Initial set

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct" (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

You are an Operator on Unit 2 with the following plant conditions:

- A Loss of Coolant Accident (LOCA) has occurred on Unit 2
- The Reactor has SCRAMMED
- Several Control Rods failed to insert on the SCRAM
- All Drywell Sprays have failed
- Drywell Pressure and Temperature are rising

Note: Another Operator is tasked with maintaining Reactor Water Level

INITIATING CUES:

The Nuclear Unit Senior Operator has directed you to emergency vent Primary Containment in accordance with 2-EOI-Appendix-13, Emergency Venting Primary Containment.

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: **EXAMINER NOTE: Verify the candidate has been briefed on 2-EOI-Appendix-13 prior to beginning the JPM.** 2-EOI-Appendix-13, Emergency Venting Primary Containment [1] **NOTIFY** SHIFT MANAGER/SED of the following: • Emergency Venting of Primary Containment is in progress • Off-Gas Release Rate Limits will be exceeded **NOTES** 1) HARDENED CONTAINMENT VENT VALVES 2-FCV-64-221 and 222 may be operated locally with handwheels (U2 RB el. 580, top of clean room, southwest corner). 2) If an alternate DC power source is needed for the HCVS valve solenoids, Att. 4 HCVS Battery Alignment may be performed. 3) If an alternate air supply is needed for the HCVS valves, Att. 5 HCVS Nitrogen Bottle Alignment may be performed. 4) If required, HCVS valves may be operated from the U3 DG building using Att. 6, HCVS Operation from the Remote Operating Station. Expected Action(s): Informs the Shift Manager that Emergency Venting Primary Containment is in progress and that Off-Gas Release Rate Limits will be exceeded. **EXAMINER CUE: Acknowledge any information provided by the candidate to the Shift Manager with respect to Emergency Venting.**	_____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 2: [2] **VENT** the Suppression Chamber as follows (Panel 2-9-3): [2.1] **IF** EITHER of the following exists: • Suppression Pool Water Level CANNOT be determined to be below 26 ft., **OR** • Suppression Chamber CANNOT be vented, **THEN CONTINUE** in this procedure at Step 1.0[3] Expected Action(s): Makes note of Step [2.1] and continues in the procedure.	_____ SAT _____UNSAT _____N/A
Step 3: [2.2] **PLACE** keylock switch 2-HS-64-222B, HARDENED CONTAINMENT VENT OUTBOARD PERMISSIVE, in PERM. [2.3] **CHECK** blue indicating light above 2-HS-64-222B, HARDENED CONTAINMENT VENT OUTBOARD PERMISSIVE, illuminated. **EXAMINER NOTE: ONLY placing keylock switch 2-HS-64-222B in PERMISSIVE is critical in this step.** Expected Action(s): Places 2-HS-64-222B, HARDENED CONTAINMENT VENT OUTBOARD PERMISSIVE, in PERM (permissive) and verifies that the blue indicating light illuminates.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 4: [2.4] **OPEN** 2-FCV-64-222, HARDENED CONTAINMENT VENT OUTBOARD ISOLATION VALVE. Expected Action(s): Opens 2-FCV-64-222, HARDENED CONTAINMENT VENT OUTBOARD ISOLATION VALVE.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER NOTE: When Step [2.4] is performed above, HARDENED CONTAINMENT VENT VALVES MISPOSITIONED (2-9-4C, WINDOW 15) is an expected alarm.	

STEP / STANDARD	SAT / UNSAT
Step 5: [2.5] **PLACE** keylock switch 2-HS-64-221B, HARDENED CONTAINMENT VENT INBOARD PERMISSIVE, in PERM. [2.6] **CHECK** blue indicating light above 2-HS-64-221B, HARDENED CONTAINMENT VENT INBOARD PERMISSIVE, illuminated. **EXAMINER NOTE: ONLY placing keylock switch 2-HS-64-221B in PERMISSIVE is critical in this step.** Expected Action(s): Places keylock switch 2-HS-64-221B, HARDENED CONTAINMENT VENT INBOARD PERMISSIVE, in PERM (permissive) and verifies that the blue light illuminates.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 6: [2.7] **OPEN** 2-FCV-64-221, HARDENED CONTAINMENT VENT INBOARD ISOLATION VALVE. Expected Action(s): Opens 2-FCV-64-221, HARDENED CONTAINMENT VENT INBOARD ISOLATION VALVE.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 7: [2.8] **CHECK** Drywell and Suppression Chamber Pressure lowering. Expected Action(s): Verifies Drywell and Suppression Chamber Pressure are lowering.	_____ SAT _____UNSAT _____N/A
EXAMINER CUE: Inform the candidate "Another Operator will continue with this procedure. This completes your task".	

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct" (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

You are an Operator on Unit 2 with the following plant conditions:

- A Loss of Coolant Accident (LOCA) has occurred on Unit 2
- The Reactor has SCRAMMED
- Several Control Rods failed to insert on the SCRAM
- All Drywell Sprays have failed
- Drywell Pressure and Temperature are rising

Note: Another Operator is tasked with maintaining Reactor Water Level

INITIATING CUES:

The Nuclear Unit Senior Operator has directed you to emergency vent Primary Containment in accordance with 2-EOI-Appendix-13, Emergency Venting Primary Containment.

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Perform Field Actions for a Stuck Open MSRV
JPM NUMBER:	247-U3	REVISION:	4

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-001-AB-01 / Perform actions of Main Steam Relief Valve Stuck Open 3-AOI-1-1			
K/A RATINGS:	RO: 4.1 SRO: 4.2			
K/A No. &STATEMENT:	239002 Relief/Safety Relief Valves A2.03; Ability to (a) predict the impacts of the following on the RELIEF/SAFETY RELIEF VALVES; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck open SRV.			
RELATED PRA INFORMATION:	N/A			
SAFETY FUNCTION:	3			

EVALUATION LOCATION:	☒In-Plant	☐ Simulator	☐ Control Room	☐ Lab
	☐ Other - List			

APPLICABLE METHOD OF TESTING: ☐ Discussion ☒ Simulate/Walkthrough ☐ Perform

TIME FOR COMPLETION: 15 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 247-U3

RO _____ SRO _____ DATE: _____

TASK STANDARD: The Examinee is expected to perform operations to close a stuck open Main Steam Relief Valve (MSRV) from outside the Control Room.

Operator Fundamental evaluated:
OF-2 Controlling Plant Evolutions Precisely.
OF-5 Having a solid understanding of plant design, engineering principles, and sciences.

PRA: N/A

REFERENCES/PROCEDURES NEEDED: 3-AOI-1-1

VALIDATIONTIME: 15 minutes

PERFORMANCE TIME: _____

COMMENTS: _____
_____
_____
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Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
0	2/7/2011	All	Initial Issue
1	9/22/2015	All	Convert to new format
2	8/14/2019	All	Fix typographical issues, make change in one cue due to lack of photograph.
3	1/16/2020	All	JPM format update
4	11/2/2020	All	JPM format update

Procedure Revisions

Procedure	Revision
3-AOI-1-1	14

PLANT STAGING INSTRUCTIONS

LOCATION	Candidates staged in TSC or designated location
CAUTIONS	Inform SM, check protected equipment
LOGISTICS	Staff escort candidate between staging and exam location

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do **NOT** operate any plant equipment. Touch STAAR may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's correct" (or "That's incorrect", if applicable). When you have completed your assigned task, you will say, "My task is complete" and I will acknowledge that your task is complete.

INITIAL CONDITIONS:

You are an Operator on Unit 3.

- Reactor Power is 85%.
- Control Room actions to close MSRV 3-PCV-1-22 have **NOT** been successful.
- The Nuclear Unit Senior Operator has entered 3-AOI-1-1, Relief Valve Stuck Open.

INITIATING CUES:

The Nuclear Unit Senior Operator directs you to attempt to close MSRV 3-PCV-1-22 from outside the Control Room in accordance with 3-AOI-1-1, Step 4.2.3[2].

CAUTION:

DO NOT OPERATE ANY PLANT EQUIPMENT!

PANELS WILL NOT BE OPENED!

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: 3-AOI-1, Relief Valve Stuck Open Section 4.2.3, Attempt to close valve from outside the Control Room: **NOTES** 1) 3-PCV-1-22 is an ADS Valve. 2) 3-PCV-1-22 has two power supplies, it will auto transfer on loss of power and is Normal Seeking. 3) Attachment 1 may be addressed for fuse and breaker information. [2] **IF** 3-PCV-1-22 is NOT closed, **THEN PERFORM** the following: (Otherwise N/A this section.) [2.1] On Panel 3-25-32 **PLACE** the transfer switch associated 3-XS-1-22, MAIN STM LINE B RELIEF VALVE XFR, in EMERG position. Expected action(s): Simulates placing 3-XS-1-22, MAIN STM LINE B RELIEF VALVE XFR in EMERG on Panel -25-32.	_____ SAT _____UNSAT _____N/A
EXAMINER CUE: **(When 3-XS-1-22 is simulated in EMERG): "3-XS-1-22 is in the EMERG Position."** **(When the Control Room is contacted about the position of 3-PCV-1-22): "SRV 1-22 is OPEN."**	
Step 2: [2.2] **IF** the SRV does **NOT** close, **THEN PERFORM** the following while **OBSERVING** the indications for the 3-PCV-1-22 on the Acoustic Monitor: (Otherwise N/A) • **CYCLE** the 3-HS-1-22C, MAIN STM LINE B RELIEF VALVE, to the following positions several times. CLOSE/AUTO to OPEN to CLOSE/AUTO Expected action(s): Simulates cycling 3-HS-1-22C, MAIN STM LINE B RELIEF VALVE.	_____ SAT _____UNSAT _____N/A

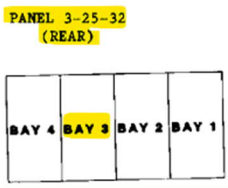
STEP / STANDARD	SAT / UNSAT
EXAMINER CUE: **(As 3-HS-1-22C is cycled): "3-HS-1-22C is in CLOSE/AUTO or OPEN" (as needed).** **(When the Control Room is contacted about the position of 3-PCV-1-22): "SRV 1-22 is OPEN."**	
Step 3: [2.3] **IF** the SRV does **NOT** close, **THEN PERFORM** the following: (Otherwise N/A) A. **VERIFY** the 3-HS-1-22C, MAIN STM LINE B RELIEF VALVE, in the CLOSE/AUTO position. B. **PLACE** the associated transfer switch 3-XS-1-22, MAIN STM LINE B RELIEF VALVE XFR, in NORM position. Expected action(s): Simulates placing 3-HS-1-22C in CLOSE/AUTO and 3-XS-1-22 in NORM.	_____ SAT _____UNSAT _____N/A
EXAMINER CUE: **(As each switch is simulated to be re-positioned as required):** **"3-HS-1-22C is in CLOSE/AUTO"** **"3-XS-1-22 is in NORM"**	
EXAMINER CUE: Acknowledge the report given to the MCR.	
EXAMINER NOTE: Electrical Safety Precautions for the JPM Step 4 below are as follows: **1. Avoid contact** **2. Remove all metal objects** **3. Use a non-conducting pointing device** **4. General PPE – Safety glasses and gloves**	

STEP / STANDARD	SAT / UNSAT
Step 4: **EXAMINER NOTE: *PANELS WILL NOT BE OPENED* The candidate may elect to SIMULATE opening the breakers OR pulling fuses.** [2.4] **IF** the SRV does **NOT** close, **THEN REMOVE** the power from 3-PCV-1-22 by performing one of the following: (Opening breakers are the preferred method) (Otherwise N/A) A. **OPEN** the following breakers: (Preferred method) • 3A 250V RMOV, Compartment 11C2 • 3B 250V RMOV, Compartment 1C1 OR B. In Panel 3-25-32 (Bay 3) **PULL** the following fuses as necessary: • Fuse 3-FU1-001-0022A (Block EE, F2) • Fuse 3-FU1-001-0022B (Block EE, F7) • Fuse 3-FU1-001-0022C (Block EE, F12) • Fuse 3-FU1-001-0022D (Block EE, F15) Expected action(s): Simulates either opening breakers or pulling fuses. **EXAMINER NOTE: If the candidate elects to pull fuses, see the attached page 8 from 3-AOI-1-1, Attachment 1 (Page 3 of 3) for Panel 3-25-32 for the respective fuses in Bay 3.**	**Critical Step** _____ SAT _____UNSAT _____N/A

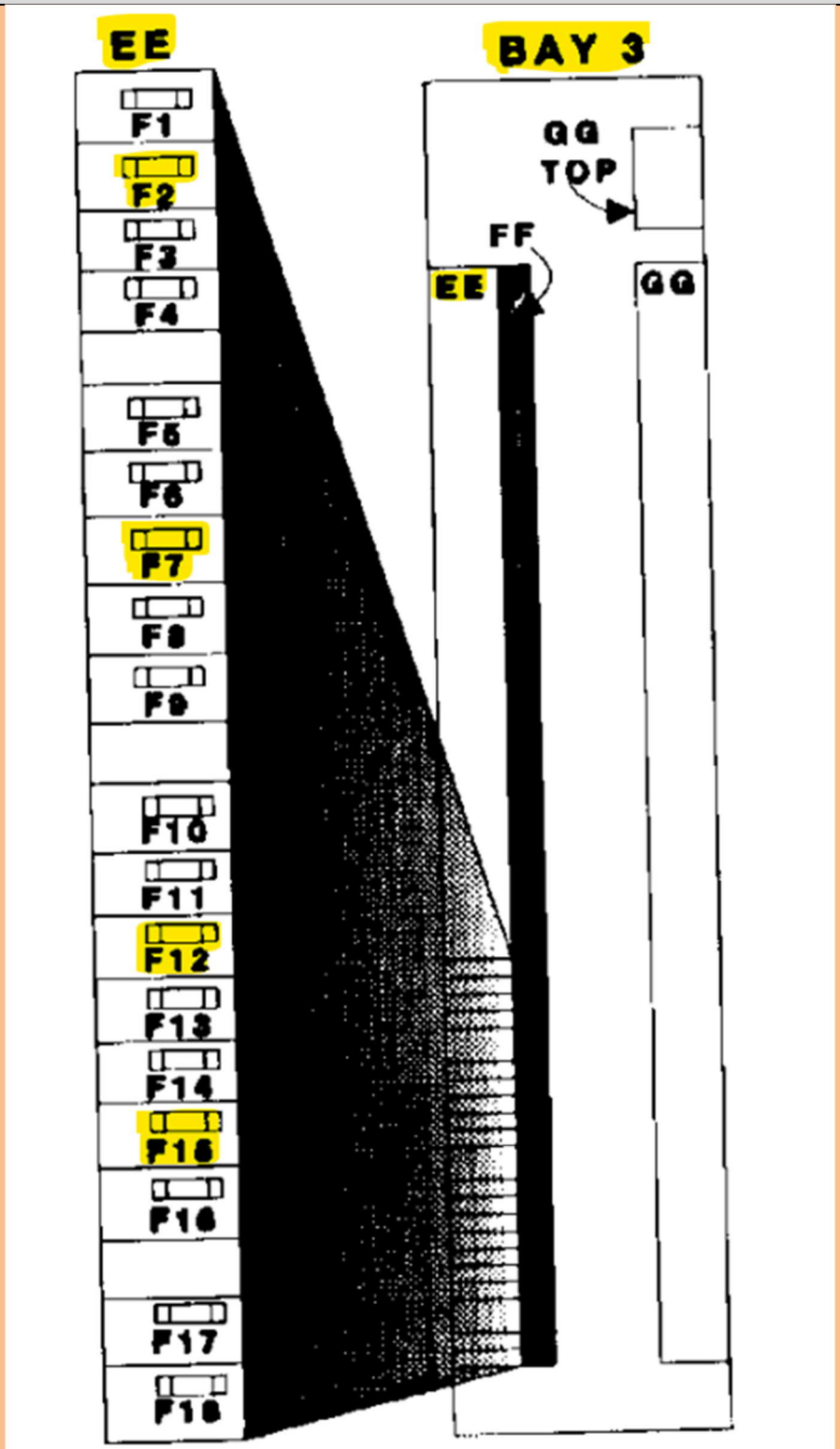
BFN Unit 3	Relief Valve Stuck Open	3-AOI-1-1 Rev. 0014 Page 29 of 29

Attachment 1
(Page 3 of 3)

Unit 3 SRV Solenoid Power Breaker/Fuse Table, Panel 25 32



STEP / STANDARD	SAT / UNSAT



STEP / STANDARD	SAT / UNSAT
EXAMINER CUE: (When the Control Room is contacted about the position of 3-PCV-1-22): "3-PCV-1-22 is CLOSED." **"Another Operator will continue this procedure. This completes your task"**	

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do **NOT** operate any plant equipment. Touch STAAR may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's correct" (or "That's incorrect", if applicable). When you have completed your assigned task, you will say, "My task is complete" and I will acknowledge that your task is complete.

INITIAL CONDITIONS:

You are an Operator on Unit 3.

- Reactor Power is 85%.
- Control Room actions to close MSRV 3-PCV-1-22 have **NOT** been successful.
- The Nuclear Unit Senior Operator has entered 3-AOI-1-1, Relief Valve Stuck Open.

INITIATING CUES:

The Nuclear Unit Senior Operator directs you to attempt to close MSRV 3-PCV-1-22 from outside the Control Room in accordance with 3-AOI-1-1, Step 4.2.3[2].

CAUTION:

DO NOT OPERATE ANY PLANT EQUIPMENT!

PANELS WILL NOT BE OPENED!

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Locally Operate the EHPM Pump in accordance with 1-EOI Appendix-7L, Alternate Injection System Lineup EHPM System
JPM NUMBER:	733A-U1	REVISION:	1

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-000-EM-114/ OPERATE THE EHPM SYSTEM			
K/A RATINGS:	RO: 4.0 SRO: 4.0			
K/A No. &STATEMENT:	295009 Low Reactor Water Level AA1.02; Ability to operate and/or monitor the following as they apply to LOW REACTOR WATER LEVEL: Reactor Water Level Control.			
RELATED PRA INFORMATION:	Risk Significant			
SAFETY FUNCTION:	4			

EVALUATION LOCATION:	☒In-Plant	☐ Simulator	☐ Control Room	☐ Lab
	☐ Other - List			

APPLICABLE METHOD OF TESTING: ☐ Discussion ☒ Simulate/Walkthrough ☐ Perform

TIME FOR COMPLETION: 20 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) Y

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 733A-U1

RO _____ SRO _____ DATE: _____

TASK STANDARD: The Examinee is expected to transfer the Emergency High Pressure Make-up Pump (EHPM) to local control and inject to the Reactor; then, in response to a Loss of Offsite Power, start a Supplemental Diesel Generator.

Operator Fundamental evaluated:
OF-1 Monitoring plant indications and conditions closely.
OF-5 Having a solid understanding of plant design, engineering principles, and sciences.

PRA: N/A

REFERENCES/PROCEDURES NEEDED: 1-EOI-APPENDIX-7L

VALIDATION TIME: 20 minutes

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
0	02/19/2020	All	Initial issue
1	03/16/2021	All	Updated based on NRC Comments

Procedure Revisions

Procedure	Revision
1-EOI-APP-7L	2

PLANT STAGING INSTRUCTIONS

LOCATION	Candidates staged in TSC or designated location
CAUTIONS	Inform SM, check protected equipment
LOGISTICS	Staff escort candidate between staging and exam location

****

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do **NOT** operate any plant equipment. Touch STAAR may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's correct" (or “That's incorrect", if applicable). When you have completed your assigned task, you will say, "My task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

You are an Operator on Unit 1.

- A Loss of Coolant Accident (LOCA) has occurred on Unit 1
- Reactor Water Level is (-) 140 inches and lowering
- Reactor Feed Pumps, HPCI, and RCIC are **NOT** available
- Operation of the Unit 1 EHPM system is **NOT** available at Panel 1-9-21

INITIATING CUES:

The Unit Supervisor directs you to raise Reactor Water Level to (+) 2 to (+) 51 inches using 1-EOI-Appendix-7L, Alternate RPV Injection System Lineup EHPM System, Attachment 2, EHPM Pump Operation from Local Control Panel 1-LNPL-925-6000.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: 1-EOI-Appendix-7L, Alternate RPV Injection System Lineup EHPM System Attachment 2, EHPM Pump Operation from Local Control Panel (LCP) 1-LNPL-925-6000 [1] **IF** 4KV EHPM BOARD 1 is not energized, **THEN ENERGIZE** from a Supplemental Diesel Generator by performing either Attachment 3, 4, or 5. Expected Action(s): Candidate will verify energized Local Control Panel 1-LNPL-925-6000 and continue in this procedure.	_____ SAT _____UNSAT _____N/A
Step 2: [2] **TRANSFER** Unit 1 EHPM Pump control from Main Control Room to Local Control Panel, 1-LPNL-925-6000, by placing EHPM SYSTEM TRANSFER switch, 1-XS-7-411, to LCP Expected Action(s): Candidate simulates placing switch 1-XS-007-0411, EHPM SYS CONTROL TRANSFER, in the LCP position.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: When the candidate simulates placing 1-XS-007-0411 in the Local Control Panel Position, "Switch 1-XS-007-0411 is in the Local Control Panel Position".	

STEP / STANDARD	SAT / UNSAT
CAUTIONS 1) Pump minimum continuous stable operating flow is 431 gpm and maximum continuous stable operating flow is 1250 gpm. Above 1250 gpm, adequate NPSH is not assured. 2) Prolonged EHPM Pump operation on minimum flow or test return mode will add heat to the CST. As decay heat dissipates, it may be necessary to cycle EHPM pump to minimize extended run times. Ref motor start limitations per 1-OI-7, Emergency High Pressure Makeup System. Step 3: [3] **ESTABLISH** Unit 1 RPV injection in BATCH mode as follows: [3.1] **START** EHPM PUMP by placing 1-HS-7-1B, EHPM PUMP START-STOP to START. Expected Action(s): Candidate simulates placing 1-HS-7-1B, EHPM PUMP START-STOP Switch in START.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: When the candidate simulates placing 1-HS-7-1B in the START position, "1-HS-7-1B, EHPM PUMP START-STOP switch is in the START position".	
Step 4: [3.2] **NOTIFY** Unit 1 Main Control Room (MCR) that the next step will inject to the RPV. Expected Action(s): Candidate notifies the MCR that the next step will inject water into the RPV.	_____ SAT _____UNSAT _____N/A
EXAMINER CUE: When the candidate states that the Control Room will be contacted, acknowledge the report given to the MCR.	

STEP / STANDARD	SAT / UNSAT
Step 5: [3.3] **THROTTLE** 1-FCV-007-0008, EHPM PUMP INJECTION VALVE as necessary to establish flow 950-1250 gpm as indicated on 1-FI-007-0403, EHPM SYS NORMAL FLOW. Expected Action(s): Candidate simulates throttling 1-FCV-007-0008, EHPM PUMP INJECTION VALVE to establish flow 950-1250 gpm as indicated on 1-FI-007-0403, EHPM SYS NORMAL FLOW.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: As candidate SIMULATES throttling 1-FCV-007-0008, EHPM PUMP INJECTION VALVE, provide indication that the flow indicated on 1-FI-007-0403, EHPM SYS NORMAL FLOW is rising, and eventually in the range of 950-1250 gpm.	
Step 6: [3.4] **MONITOR** Unit 1 RPV Level on 1-LI-003-0148A, RPV LEVEL 'A', and 1-LI-003-0148B, RPV LEVEL 'B'. Expected Action(s): Candidate monitors 1-LI-003-0148A, RPV LEVEL 'A', or 1-LI-003-0148B, RPV LEVEL 'B'.	_____ SAT _____UNSAT _____N/A
EXAMINER CUE: When the candidate monitors Reactor Water Level, inform the candidate that Reactor Water Level as indicated on 1-LI-003-0148A, RPV LEVEL 'A' and/or 1-LI-003-0148B, RPV LEVEL 'B' is (-) 120 inches and is rising.	
EXAMINER NOTE: Alternate path begins with the next Examiner Cue.	
EXAMINER CUE: Inform the candidate: "You hear a Plant announcement stating that there has been a Loss of Offsite Power. Indicated EHPM System Flow lowers to zero. The NUSO directs you to continue injection with the EHPM pump."	

STEP / STANDARD	SAT / UNSAT
EXAMINER CUE: If candidate attempts to perform Attachment 5, then as the NUSO, direct the performance of Attachment 4.	
Step 7: Due to the Loss of Offsite Power, the candidate returns to Procedure Step [1]: [1] **IF** 4KV EHPM BD 1 is not energized, **THEN ENERGIZE** from a Supplemental Diesel Generator by performing either Attachment 3, 4, or 5. Expected Action(s): Candidate proceeds to Attachment 4 to start the Supplemental Diesel Generator from the Local Control Panel.	_____ SAT _____UNSAT _____N/A
Step 8: 1-EOI-Appendix-7L, Alternate RPV Injection System Lineup EHPM System Attachment 4, Supplemental Diesel Generator Operation from Local Control Panel 1-LPNL-925-6000 **NOTE** When the Supplemental Diesel Generator (SDG) Start Switch is taken to Start, the Pre-Lube Oil Pumps starts immediately to lubricate the Turbo Charger prior to the Diesel starting. Therefore, the diesel will experience a time delay when the diesel start switch is taken to start. [1] **TRANSFER** Supplemental Diesel Generator control from Main Control Room to Local Control Panel, 1-LPNL-925-6000, by placing SUPPLEMENTAL DG TRANSFER switch, 1-XS-83-414, to LCP. Expected Action(s): Candidate simulates placing 1-XS-83-414 in the LCP position.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: When the candidate simulates placing 1-XS-83-114 in the LCP position, "1-XS-83-114 is in the LCP position".	

STEP / STANDARD	SAT / UNSAT
Step 9: [2] **PLACE** SDG hand switch to the START position using the appropriate SDG hand switch. Expected Action(s): Candidate simulates placing either 0-HS-83-A/U1-B, SUPPLEMENTAL DG A START or 0-HS-83-B/U1-B, SUPP DG B START to **START.**	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: When the candidate places either 0-HS-83-A/U1-B or 0-HS-83-B/U1-B in start, "0-HS-83-A/U1-B (or 0-HS-83-B/U1-B) is in start. **If the candidate informs the Main Control Room that either SUPPLEMENTAL DG A (or SUPPLEMENTAL DG B) has been started, acknowledge the report.**	
Step 10: [3] **CHECK** EHPM ALTERNATE SOURCE VOLTAGE on 1-EI-83-413 indicates between 3950 Volts and 4400 Volts. Expected Action(s): Candidate checks 1-EI-83-413, EHPM ALTERNATE SOURCE VOLTAGE indicates between 3950 Volts and 4400 Volts.	_____ SAT _____UNSAT _____N/A
EXAMINER CUE: When Candidate checks 1-EI-83-413, EHPM ALTERNATE SOURCE VOLTAGE, "EHPM ALTERNATE SOURCE VOLTAGE reads between 3950 Volts and 4400 Volts".	
Step 11: [4] **ENSURE OPEN** 1-HS-7-1/1B, 4KV EHPM BOARD NORMAL FEEDER. Expected Action(s): Candidate checks the position of 4KV EHPM BOARD NORMAL FEEDER by looking at the OPEN green light and the CLOSED red light.	_____ SAT _____UNSAT _____N/A
EXAMINER CUE: When candidate checks 1-HS-7-1/1B, "The green light is OFF and the red light is ON".	

STEP / STANDARD	SAT / UNSAT
Step 12: Continue Step [4] to ensure the 4KV EHPM BOARD NORMAL FEEDER is OPEN. Expected Action(s): Candidate simulates placing 1-HS-7-1/1B, 4KV EHPM BOARD NORMAL FEEDER in **TRIP** and verifies the following lights: • OPEN **GREEN** light is **ON** • CLOSED **RED** light is **OFF**	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: When the candidate simulates opening 4KV EHPM BOARD NORMAL FEEDER, "The green light is ON, the red light is OFF".	
Step 13: [5] **CLOSE** 4KV EHPM BOARD ALTERNATE FEEDER by placing 1-HS-7-1/5A, in CLOSE. Expected Action(s): Candidate simulates placing 1-HS-7-1/5B, 4KV EHPM ALTERNATE FEEDER in CLOSE and verifies the following lights: • CLOSED **RED** light lit • OPEN **GREEN** light off	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: When candidate SIMULATES taking 1-HS-007-0001/5B, 4KV EHPM BD ALTERNATE FEEDER, to CLOSE, "the red light is ON, the green light is OFF". "Another Operator will be tasked with completing this procedure".	

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do **NOT** operate any plant equipment. Touch STAAR may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's correct" (or “That's incorrect", if applicable). When you have completed your assigned task, you will say, "My task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

You are an Operator on Unit 1.

- A Loss of Coolant Accident (LOCA) has occurred on Unit 1
- Reactor Water Level is (-) 140 inches and lowering
- Reactor Feed Pumps, HPCI, and RCIC are **NOT** available
- Operation of the Unit 1 EHPM system is **NOT** available at Panel 1-9-21

INITIATING CUES:

The Unit Supervisor directs you to raise Reactor Water Level to (+) 2 to (+) 51 inches using 1-EOI-Appendix-7L, Alternate RPV Injection System Lineup EHPM System, Attachment 2, EHPM Pump Operation from Local Control Panel 1-LNPL-925-6000.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Place Unit 1 Divisional ECCS Analog Trip Unit Inverter in Service in accordance with 0-OI-57C, 208V/120V AC Electrical System, Section 5.2.
JPM NUMBER:	306-U1	REVISION:	9

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-57C-NO-01			
K/A RATINGS:	RO: 3.2 SRO: 3.3			
K/A No. &STATEMENT:	263000 D.C. Electrical Distribution A3.01; Ability to monitor automatic operations of D.C. ELECTRICAL DISTRIBUTION including: Meters, dials, recorders, alarms, and indicating lights.			
RELATED PRA INFORMATION:	Key System Contribution to CDF = N/A			
SAFETY FUNCTION:	6			

EVALUATION LOCATION:	☒In-Plant	☐ Simulator	☐ Control Room	☐ Lab
	☐ Other - List			

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 15 minutes TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 306-U1

RO _____ SRO _____ DATE: _____

TASK STANDARD: Examinee is expected perform operations necessary to place the Division I Emergency Core Cooling System (ECCS) Analog Trip Unit (ATU) Inverter in Service.

Operator Fundamental evaluated:
OF-1 Monitoring plant indications and conditions closely.
OF-2 Controlling Plant Evolutions Precisely.

REFERENCES/PROCEDURES NEEDED: 0-OI-57C

VALIDATION TIME: 15 minutes

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

JPM Revision Summary

Rev No.	Effective Date	Pages Affected	Description
8	10/29/2020	All	Update JPM
9	02/25/2021	All	Procedure update

Procedure Revisions

Procedure	Revision
0-OI-57C	134

PLANT STAGING INSTRUCTIONS

LOCATION	Candidates staged in TSC or designated location
CAUTIONS	Inform SM, check protected equipment
LOGISTICS	Staff escort candidate between staging and exam location

****

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do **NOT** operate any plant equipment. Touch STAAR may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's correct" (or “That's incorrect", if applicable). When you have completed your assigned task, you will say, "My task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

You are an Operator on Unit 1.

- Unit 1 is in cold Shutdown
- The Unit 1 Division I ECCS Analog Trip Unit Inverter was shutdown and taken out of service for preventive maintenance
- The maintenance has been completed and the clearance released and removed

INITIATING CUES:

The Shift Manager has directed you to return the Unit 1 ECCS Analog Trip Unit (ATU) Inverter - Division I to service in accordance with 0-OI-57C, 208V/120V AC Electrical System, Section 5.2.

NOTE:

All Precautions and Limitations in Section 3.0 have been reviewed.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: 0-OI-57C, 208V/120V AC Electrical System Section 5.2, Placing Unit 1 ECCS ATU Inverter Division I, 1-INVT-256-0001 in Service [1] **ENSURE** the 1-INVT-256-0001, ECCS ATU INVERTER Div I is shut down. **REFER TO** Section 7.3. **CAUTION** Unit 1, 1-INVT-256-0001(2), ECCS ATU INVERTER DIV I(II) requires a 60 second wait period prior to restart. Expected Action(s): N/A, given in the Initial Conditions.	_____ SAT _____UNSAT _____N/A
Step 2: [2] **REVIEW** all Precautions and Limitations in Section 3.0. Expected Action(s): The candidate may elect to review Precautions and Limitations, but may not perform this step as it is given in the Initial Conditions.	_____ SAT _____UNSAT _____N/A
Step 3: [3] **CHECK CLOSED** 1-INVT-256-0001, ECCS ATU INVERTER Div I, on the following 250V Reactor MOV Boards: 1B - Compartment 8A (Div I) Expected Action(s): Locates 250V RMOV Board 1B - Compartment 8A (Div I) and simulates checking CLOSED the breaker for 1-INVT-256-0001, ECCS ATU INVERTER Div I.	_____ SAT _____UNSAT _____N/A
EXAMINER CUE: After the breaker is simulated check CLOSED, inform the candidate "The breaker for 1-INVT-256-0001, ECCS ATU INVERTER Div I, is CLOSED."	

STEP / STANDARD	SAT / UNSAT
Step 4: **NOTE** Steps 5.2[4] through 5.2[10] are performed from 1-INVT-256-0001(2), ECCS ATU INVERTER Div I(II), located in Electrical Board Room 1B(1A) EL 593' (621'). [4] **ENSURE** the 1-IL-256-0001/P1, DC INPUT AVAILABLE is illuminated. Expected Action(s): Ensures 1-IL-256-0001/P1, DC INPUT AVAILABLE is illuminated.	_____ SAT _____UNSAT _____N/A
Step 5: [5] **DEPRESS** and **HOLD** 1-HS-256-0001/S4, PRECHARGE. Expected Action(s): Simulates depressing and holding 1-HS-256-0001/S4, PRECHARGE.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 6: [6] **WHEN** the 1-IL-256-0001/P4, PRECHARGE illuminates, **THEN PERFORM** the following: [6.1] **RELEASE** 1-HS-256-0001/S4, PRECHARGE. [6.2] **CLOSE** 1-BRK-256-0001/B1, DC INPUT. Expected Action(s): Simulates releasing 1-HS-256-0001/S4, PRECHARGE and simulates closing 1-BRK-256-0001/B1, DC INPUT.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: 1-IL-256-0001/P4, PRECHARGE light is ON.	

STEP / STANDARD	SAT / UNSAT
Step 7: [7] CHECK AC Volts is between 117 and 123 volts on 1-EI-256-0001/V1, AC VOLTMETER(V1). Expected Action(s): Checks AC Volts between 117 and 123 volts on 1-EI-256-0001/V1, AC VOLTMETER (V1).	_____ SAT _____UNSAT _____N/A
Step 8: [8] CLOSE 1-BKR-256-0001/B2, AC SYSTEM OUTPUT. Expected Action(s): Simulates closing 1-BKR-256-0001/B2, AC SYSTEM OUTPUT.	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: After simulated, inform the candidate "1-BKR-256-0001/B2, AC SYSTEM OUTPUT is CLOSED."	
Step 9: [9] **DEPRESS** 1-HS-256-0001(2)/S1, ALARM RESET. Expected Action(s): Simulates depressing 1-HS-256-0001/S1, ALARM RESET.	_____ SAT _____UNSAT _____N/A
EXAMINER CUE: After simulated, inform the candidate "ALL alarms are clear."	

STEP / STANDARD	SAT / UNSAT
Step 10: [10] **CHECK** the following parameters on 1-INVT-256-0001, ECCS ATU INVERTER Div I: A. 1-IL-256-0001/P2, LOW DC VOLTAGE is OFF. B. 1-IL-256-0001/P3, AC OVERVOLTAGE is OFF. C. AC current is less than 42 Amperes on 1-II-256-0001, AC AMMETER(A1). D. AC voltage is between 117 and 123 volts on 1-EI-256-0001/V1, AC VOLTMETER(V1). E. Frequency is between 59.7 and 60.3 Hz on 1-SI-256-0001/E1, FREQUENCY METER(E1). Expected Action(s): Locates the correct parameters and after CUE (below), accepts readings as normal.	_____ SAT _____UNSAT _____N/A
EXAMINER CUE: **As each parameter is checked, as applicable, inform the candidate:** • **"AC current is reading 5 amps"** • **"AC voltage is reading 120 volts"** • **"Frequency is reading 60.1 Hz"**	
EXAMINER CUE: After the examinee repeats the parameter readings, acknowledge the candidate report that the task is complete.	

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do **NOT** operate any plant equipment. Touch STAAR may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's correct" (or “That's incorrect", if applicable). When you have completed your assigned task, you will say, "My task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS:

You are an Operator on Unit 1.

- Unit 1 is in cold Shutdown
- The Unit 1 Division I ECCS Analog Trip Unit Inverter was shutdown and taken out of service for preventive maintenance
- The maintenance has been completed and the clearance released and removed

INITIATING CUES:

The Shift Manager has directed you to return the Unit 1 ECCS Analog Trip Unit (ATU) Inverter - Division I to service in accordance with 0-OI-57C, 208V/120V AC Electrical System, Section 5.2.

NOTE:

All Precautions and Limitations in Section 3.0 have been reviewed.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Determine Control Rod Withdrawal Requirements
JPM NUMBER:	516	REVISION:	3

TASK APPLICABILITY:	☐ SRO	☐ STA	☒ UO	☐ NAUO
TASK NUMBER / TASK TITLE(S):	N/A			
K/A RATINGS:	RO 4.3			
K/A STATEMENT:	2.1.37 Knowledge of procedures, guidelines, or limitations associated with reactivity management.			
RELATED PRA INFORMATION:	N/A			
SAFETY FUNCTION:	CONDUCT OF OPERATIONS - ADMIN			

EVALUATION LOCATION:	☐ In-Plant	☐ Simulator	☐ Control Room	☐ Lab
	☒ Other - List	Classroom		

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 15 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number 516

RO ____ DATE: _____

TASK STANDARD: Based on Source Range Monitor (SRMs) readings during a Reactor Startup, the Examinee is expected to calculate four doublings and determine that notch Control Rod withdrawal is required.

PRA: NA

REFERENCES/PROCEDURES NEEDED: 2-GOI-100-1A, Unit Startup and Power Operation

VALIDATION TIME: 15 minutes

PERFORMANCE TIME: _____

COMMENTS: _____
_____
_____
_____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____ (Retain entire JPM for records)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
3	03/13/2021	All	Updated JPM

Procedure Revisions

Procedure	Revision
2-GOI-100-1A	181

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS: Unit 2 is in MODE 2 with a Reactor Startup in progress, the initial Source Range Monitor (SRM) counts as follows:

A – 19

C – 19

B – 14

D – 18

INITIATING CUES: The current indication for SRM counts are as follows:

A – 298

C – 330

B – 235

D – 278

The Nuclear Unit Senior Operator (NUSO) has directed you, the Reactor Operator, to determine how Control Rods will be withdrawn based on the conditions given above.

Note: Show all work to support determination

_____
_____
_____
_____
_____
_____
_____
_____

START TIME _____

STEP / STANDARD	SAT / UNSAT
Step 1: 2-GOI-100-1A, Unit Startup and Power Operation, Step 5.4 - Withdrawal of Control Rods while in MODE 2 **NOTE** Source Range Data should be taken just prior to withdrawing Control Rods for Startup. This will minimize a difference in Source Range counts caused by a change in plant conditions. [1] **PERFORM** the following for SRMs on Panel 2-9-5: [1.1] **RECORD** SOURCE RANGE MONITORS reading: CHANNEL **A** LEVEL 19 cps CHANNEL **C** LEVEL 19 cps CHANNEL **B** LEVEL 14 cps CHANNEL **D** LEVEL 18 cps (R) _____ _____ _____ Initials Date Time Expected Action(s): Step [1.1] given from the Initial Conditions	___SAT ___UNSAT ___N/A
Examiner Note: Filling in Initials/Date/Time is NOT required in Steps 5.4 [1], [3], [4], [14]	
Step 2: [2] **RECORD** SOURCE RANGE MONITORS readings in Step 5.4[1.1] on PIP 95-119 on Panel 2-9-5: Expected Action(s): Step [2] will be recorded on the candidate's cue sheet as if on PIP 95-119 on Panel 2-9-5.	___SAT ___UNSAT ___N/A

STEP / STANDARD	SAT / UNSAT
Step 3: **NOTE** A review of startup data has revealed that when count rate doubles five times, criticality is imminent. As an added precaution, the fourth count rate doubling has been chosen as a starting point to limit rod withdrawal to single notch movement. This requirement, along with close monitoring of neutron monitoring instrumentation, should assure a slow controlled approach to criticality. Criticality should be expected at all times. [3] **CALCULATE** SRM count rate at which notch withdrawal limitations is to be imposed by multiplying pre-startup count rate recorded in Step 5.4[1] by a factor of 16. Expected Action(s): Calculates initial SRM count rate recorded in Step 5.4[1] by a factor of 16 (2^4 or four doublings) and fills in the Initials/Date/Time CHANNEL **A** LEVEL - 19 cps X 16 = 304 cps CHANNEL **C** LEVEL - 19 cps X 16 = 304 cps CHANNEL **B** LEVEL - 14 cps X 16 = 224 cps CHANNEL **D** LEVEL - 18 cps X 16 = 288 cps (R) _____ _____ _____ Initials Date Time 1st (R) _____ _____ _____ Initials Date Time Reactor Engineer	**Critical Step** ___SAT ___UNSAT ___N/A

STEP / STANDARD	SAT / UNSAT
Step 4: [4] **RECORD** results below and at Step 5.4[14]: Expected Action(s): Records calculated SRM count rate results below from Step 5.4[3] and at Step 5.4[14] CHANNEL **A** LEVEL 304 cps CHANNEL **C** LEVEL 304 cps CHANNEL **B** LEVEL 224 cps CHANNEL **D** LEVEL 288 cps	___SAT ___UNSAT ___N/A
Examiner Cue: Once Step 5.4 [4] completed, inform the candidate that another Operator is tasked with completing Steps 5.4 [5] through [13] ONLY.	

Step 5:

NOTE

Once required, Control Rod withdrawal is limited to single-notch withdrawal until Reactor power is in the heating range.

CAUTIONS

1) Near end of core life, criticality may occur before five doublings due to a stronger top peak flux and buildup of plutonium.
2) When rod movement is restricted to notch withdrawal, failure to stop at each notch position may result in high notch worth.

Step 5 (con't):

[14] **WHEN** SRMs indicate the calculated values recorded below,

CHANNEL A LEVEL ___ cps

CHANNEL B LEVEL ___ cps

CHANNEL C LEVEL ___ cps

CHANNEL D LEVEL ___ cps

THEN START single-notch withdrawal of Control Rods.

Expected Action(s):

Records calculated SRM count rate results below as directed in Step 5.4[4]

CHANNEL **A** LEVEL 304 cps

CHANNEL **C** LEVEL 304 cps

CHANNEL **B** LEVEL 224 cps

CHANNEL **D** LEVEL 288 cps

Since at least one of the four (given from the cue) SRM counts indicates equal or greater than the calculated value, the candidate determines that single-notch withdrawal (NOT continuous withdrawal) of Control Rods is required.

Given indicated: SRM C – 330 cps and SRM B – 235 cps
Calculated: SRM C – 304 cps and SRM B – 224 cps

Critical Step

___SAT

___UNSAT

___N/A

Examiner Cue: Once Step 5.4[14] in complete AND the candidate reports to the NUSO that single-notch withdrawal of Control Rods is required, acknowledge report.
END OF TASK

STOP TIME _____

Job Performance Measure (JPM)

Provide to Applicant

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS: Unit 2 is in MODE 2 with a Reactor Startup in progress, the initial Source Range Monitor (SRM) counts as follows:

A – 19

C – 19

B – 14

D – 18

INITIATING CUES: The current indication for SRM counts are as follows:

A – 298

C – 330

B – 235

D – 278

The Nuclear Unit Senior Operator (NUSO) has directed you, the Reactor Operator, to determine how Control Rods will be withdrawn based on the conditions given above.

Note: Show all work to support determination

_____
_____
_____
_____
_____
_____
_____
_____

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Placing an RPS Channel in Trip
JPM NUMBER:	745	REVISION:	1

TASK APPLICABILITY:	☐SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-099-SU-02, Perform MSIV Closure – RPS Trip Functional Test			
K/A RATINGS:	RO 3.9			
K/A STATEMENT:	2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc.			
RELATED PRA INFORMATION:	Risk Significant RPS Scram Reduction			
SAFETY FUNCTION:	CONDUCT OF OPERATIONS - ADMIN			

EVALUATION LOCATION:	☐In-Plant	☐ Simulator	☐ Control Room	☐ Lab
	☒ Other - List	Classroom		

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 10 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: __745__

RO ____ SRO ____ DATE: _____

TASK STANDARD: Given a failed Reactor Protection System (RPS) instrument, the Examinee is expected to determine how to place the applicable instrument channel in trip and identify the correct procedure(s)/print(s).

PRA: N/A

REFERENCES/PROCEDURES NEEDED: 2-OI-99, Reactor Protection System
Print 2-730E915-9, Provide hard copy of 2-45E671-26

VALIDATION TIME: ____10 min

PERFORMANCE TIME: _____

COMMENTS: _____
_____
_____
_____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____ (Retain entire JPM for records)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
1	03/12/2021	All	Updated JPM task standard and initiating cue.

Procedure Revisions

Procedure	Revision
2-OI-99	93
2-730E915-9	29
Hard copy 2-45E671-26	5

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

Unit 2 is operating at 100% Rated Thermal Power (RTP).
The Instrument Mechanics conducted testing on 2-PIS-3-22AA, Reactor High Pressure A1 Channel to support a surveillance. The instrument failed to meet its required Acceptance Criteria (AC) steps, resulting in it being declared INOPERABLE.

INITIATING CUES: You are a Unit Operator; the Nuclear Unit Senior Operator (NUSO) has directed you to place 2-PIS-3-22AA, Reactor High Pressure A1 Channel in trip in accordance with plant procedures.

Determine **ALL** of the following:

- List the plant procedure(s)/document(s) used to perform this task
- In accordance with the respective plant procedure(s)/document(s) selected, identify how this task is performed

Answer:

_____

_____

_____

_____

_____

_____

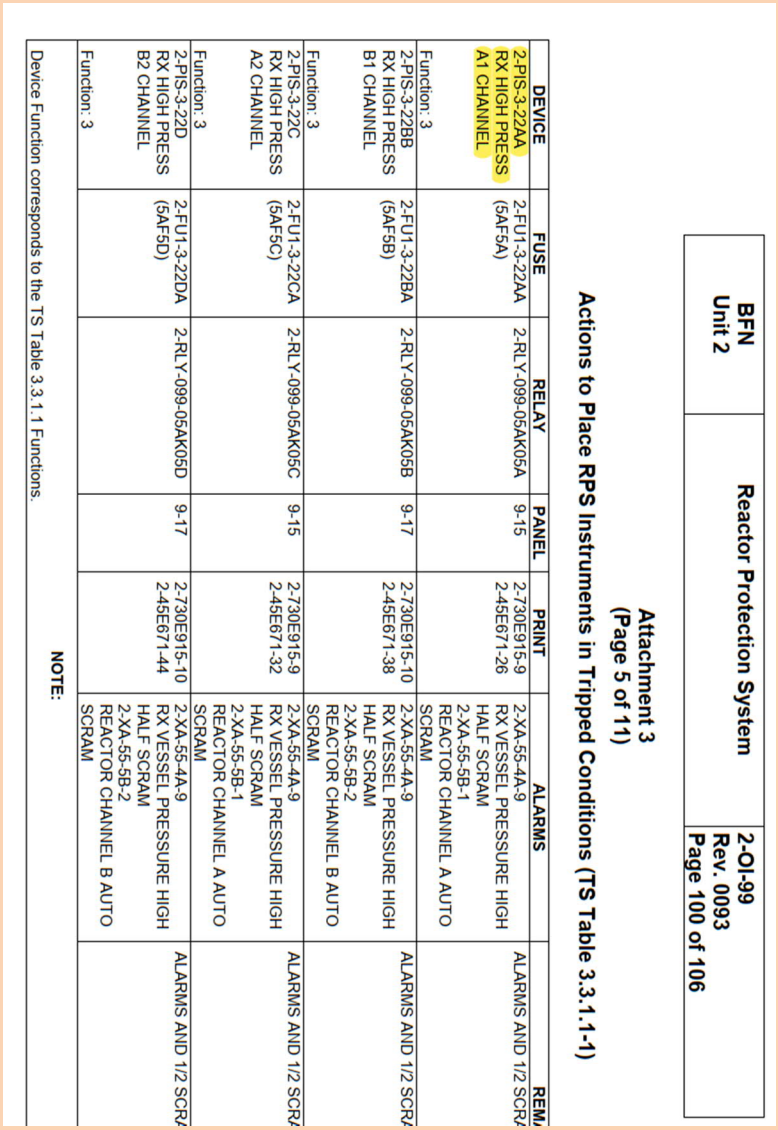
_____

_____

_____

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: Refers to 2-OI-99, Reactor Protection System, Attachment 3 (page 5 of 11) and/or Print 2-730E915-9 (see next page) for 2-PIS-3-22AA, Reactor High Pressure A1 Channel.	**Critical Step** _____ SAT _____UNSAT _____N/A



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Attachment 3
(Page 5 of 11)

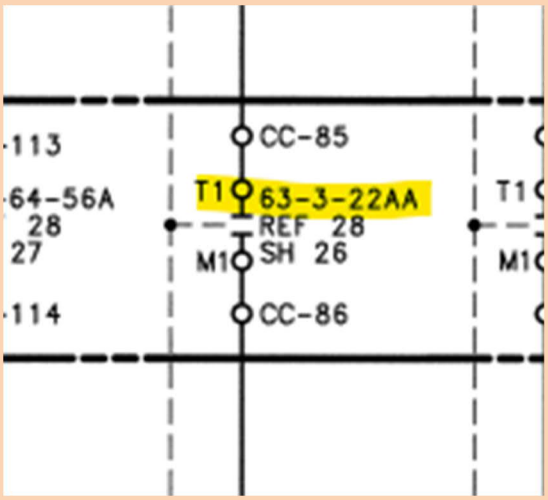
Actions to Place RPS Instruments in Tripped Conditions (TS Table 3.3.1.1-1)

DEVICE	FUSE	RELAY	PANEL	PRINT	ALARMS	REM
2-PIS-3-22AA RX HIGH PRESS A1 CHANNEL	2-FU1-3-22AA (5AF5A)	2-RLY-099-05AK05A	9-15	2-730E915-9 2-45E671-26	ALARMS AND 1/2 SCRA RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-1 REACTOR CHANNEL A AUTO SCRAM	ALARMS AND 1/2 SCRA
Function: 3						
2-PIS-3-22BB RX HIGH PRESS B1 CHANNEL	2-FU1-3-22BA (5AF5B)	2-RLY-099-05AK05B	9-17	2-730E915-10 2-45E671-38	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-2 REACTOR CHANNEL B AUTO SCRAM	ALARMS AND 1/2 SCRA
Function: 3						
2-PIS-3-22C RX HIGH PRESS A2 CHANNEL	2-FU1-3-22CA (5AF5C)	2-RLY-099-05AK05C	9-15	2-730E915-9 2-45E671-32	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-1 REACTOR CHANNEL A AUTO SCRAM	ALARMS AND 1/2 SCRA
Function: 3						
2-PIS-3-22D RX HIGH PRESS B2 CHANNEL	2-FU1-3-22DA (5AF5D)	2-RLY-099-05AK05D	9-17	2-730E915-10 2-45E671-44	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-2 REACTOR CHANNEL B AUTO SCRAM	ALARMS AND 1/2 SCRA
Function: 3						

NOTE:
Device Function corresponds to the TS Table 3.3.1.1 Functions.

Expected Action(s):

Examinee refers to 2-OI-99, Reactor Protection System, Attachment 3 (page 5 of 11) and/or Print 2-730E915-9 (see next page) to reference the respective failed instrument 2-PIS-3-22AA, Reactor High Pressure A1 Channel.

STEP / STANDARD	SAT / UNSAT
Step 1 (continued): Print 2-730E915-9 (2-PIS-3-22AA is located between A-3 and E-3 coordinates).  	
EXAMINER NOTE: Hard copies of print 2-45E671-26 are available if candidate request	

STEP / STANDARD	SAT / UNSAT
Step 2: Determine how the Required Action is performed to place 2-PIS-3-22AA, Reactor High Pressure A1 Channel in trip in accordance with 2-OI-99, Reactor Protection System, Attachment 3 (page 5 of 11) and/or Print 2-730E915-9. Expected Action(s): In accordance with 2-OI-99, Reactor Protection System, Attachment 3 (page 5 of 11) and/or Print 2-730E915-9, determines fuse **2-FU1-3-22AA (5A-F5A)** is required to be removed in order for 2-PIS-3-22AA, Reactor High Pressure A1 Channel to be placed in trip as directed.	**Critical Step** _____ SAT _____UNSAT _____N/A

Step 2 (continued):

2-OI-99, Reactor Protection System, Attachment 3 (page 5 of 11)

BFN Unit 2	Reactor Protection System	2-OI-99 Rev. 0093 Page 100 of 106

Attachment 3
(Page 5 of 11)

Actions to Place RPS Instruments in Tripped Conditions (TS Table 3.3.1.1-1)

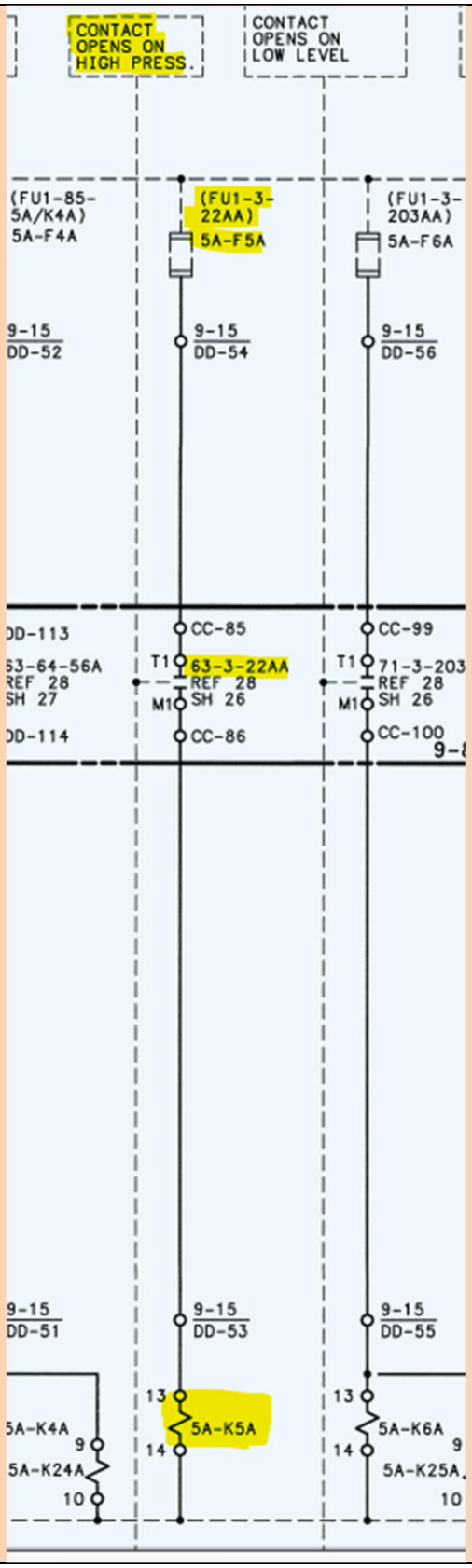
DEVICE	FUSE	RELAY	PANEL	PRINT	ALARMS	REMARKS
2-PIS-3-22AA RX HIGH PRESS A1 CHANNEL	2-FU1-3-22AA (5AF5A)	2-RLY-099-05AK05A	9-15	2-730E915-9 2-45E671-26	RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-1 REACTOR CHANNEL A AUTO SCRAM	ALARMS AND 1/2 SCRAM IN A CHANNEL
Function: 3						
2-PIS-3-22BB RX HIGH PRESS B1 CHANNEL	2-FU1-3-22BA (5AF5B)	2-RLY-099-05AK05B	9-17	2-730E915-10 2-45E671-38	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-2 REACTOR CHANNEL B AUTO SCRAM	ALARMS AND 1/2 SCRAM IN B CHANNEL
Function: 3						
2-PIS-3-22C RX HIGH PRESS A2 CHANNEL	2-FU1-3-22CA (5AF5C)	2-RLY-099-05AK05C	9-15	2-730E915-9 2-45E671-32	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-1 REACTOR CHANNEL A AUTO SCRAM	ALARMS AND 1/2 SCRAM IN A CHANNEL
Function: 3						
2-PIS-3-22D RX HIGH PRESS B2 CHANNEL	2-FU1-3-22DA (5AF5D)	2-RLY-099-05AK05D	9-17	2-730E915-10 2-45E671-44	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-2 REACTOR CHANNEL B AUTO SCRAM	ALARMS AND 1/2 SCRAM IN B CHANNEL
Function: 3						

Device Function corresponds to the TS Table 3.3.1.1 Functions.

NOTE:

Step 2 (continued):

Print 2-730E915-9



EXAMINER CUE: Once the Operator identifies that 2-FU1-3-22AA has to be pulled in accordance with 2-OI-99, Reactor Protection System, Attachment 3 and/or Print 2-730E915-9 for the failed instrument (2-PIS-3-22AA, Reactor High Pressure A1 Channel) Inform the candidate "Another Operator will finish this procedure. This completes your task".

END OF TASK

STOP TIME:_____

Job Performance Measure (JPM)

Provide to Applicant

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

Unit 2 is operating at 100% Rated Thermal Power (RTP).
The Instrument Mechanics conducted testing on 2-PIS-3-22AA, Reactor High Pressure A1 Channel to support a surveillance. The instrument failed to meet its required Acceptance Criteria (AC) steps, resulting in it being declared INOPERABLE.

INITIATING CUES: You are a Unit Operator; the Nuclear Unit Senior Operator (NUSO) has directed you to place 2-PIS-3-22AA, Reactor High Pressure A1 Channel in trip in accordance with plant procedures.

Determine **ALL** of the following:

- List the plant procedure(s)/document(s) used to perform this task
- In accordance with the respective plant procedure(s)/document(s) selected, identify how this task is performed

Answer:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Evaluate Recombiner Performance
JPM NUMBER:	510	REVISION:	4

TASK APPLICABILITY:	☐SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-066-NO-02 / Perform Recombiner Performance Evaluation			
K/A RATINGS:	RO 4.2			
K/A STATEMENT:	2.2.44: 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.			
RELATED PRA INFORMATION:	None			
SAFETY FUNCTION:	EQUIPMENT CONTROL - ADMIN			

EVALUATION LOCATION:	☐In-Plant	☐ Simulator	☐ Control Room	☐ Lab
	☒ Other - List	Classroom		

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 10 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

OPERATOR: _____ JPM Number: __510__

RO ____ SRO ____ DATE: _____

TASK STANDARD: Using plant parameters, the Examinee is expected to perform a Recombiner Performance Evaluation and determine that Acceptance Criteria is not met by concluding that Differential Temperature does not meet procedural requirements for the given Core Thermal Power.

Operator Fundamental evaluated:
OF-1 Monitoring Plant Indications and Conditions Closely

PRA: N/A

REFERENCES/PROCEDURES NEEDED: 3-OI-66

VERIFICATION TIME: __10 min__

PERFORMANCE TIME: _____

COMMENTS: _____
_____
_____
_____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____ (Retain entire JPM for records)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
2	08/16/17	ALL	Converted JPM to new format
3	11/30/20	ALL	Updated JPM
4	03/13/2021	ALL	Updated JPM task standard and initiating cue

Procedure Revisions

Procedure	Revision
3-OI-66	80

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

You are a Unit 3 Operator with the following plant conditions:

- Reactor Power is 91%, nearing the end of a Reactor Startup following an outage
- Hydrogen Water Chemistry System is NOT in-service following being shut down in accordance with 3-OI-4, Hydrogen Water Chemistry System
- Off-Gas Preheater, Recombiner, and SJAEs are in operation in accordance with 3-OI-66, Off-Gas System, Section 5.0.
- The operating steam jet is operating properly

INITIATING CUE:

The Shift Manager has directed you to perform 3-OI-66, Off-Gas System, Section 6.1[1], Recombiner Performance Evaluation using the table below.

State the results of the evaluation and the reason for your determination.

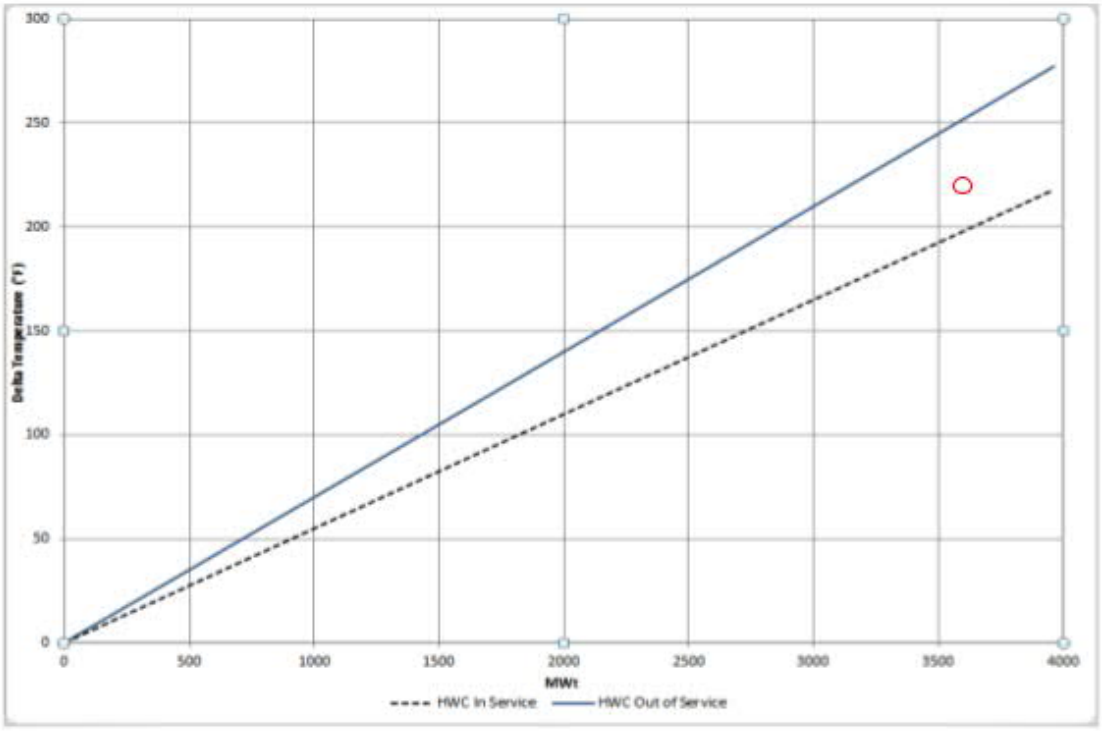
RECOMBINER 3A, INLET TEMP, 3-TI-66-75A	392 ºF
RECOMBINER 3B, INLET TEMP, 3-TI-66-75B	320 ºF
GLY/RECMB/OG MOIST SEP TEMPERATURE, 3-TRS-66-106	
RECOMBINER 3A CENTER, 3-TE-66-77AB	612 ºF
RECOMBINER 3B CENTER, 3-TE-66-77BB	380 ºF
Core Thermal Power (MWt)	3600 MWt
Percent Power (% RTP)	91%
ANALYZER 3A, 3-H2A-66-96A	OPERABLE - reading 0.26% H_2
ANALYZER 3B, 3-H2A-66-96B	OPERABLE - reading 0.26% H_2

KEY

BFN Unit 3	Off-Gas System	3-OI-66 Rev. 0080 Page 145 of 155

Attachment 1
(Page 1 of 1)

Recombine Performance Evaluation - ΔT to Reactor Power



Evaluation is satisfactory when intersection point of ΔT to Reactor Power is above the appropriate line.

For 3952mwt

HWC in service	ΔT ≥ 217°F
HWC out of service	ΔT ≥ 277°F

CURVE FACTORS

Normal Water Chemistry (NWC)	ΔT = 0.070°F per MWt
Hydrogen Water Chemistry (HWC)	ΔT = 0.055°F per MWt

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: **NOTES** 1) The production of hydrogen and oxygen in the Reactor is dependent upon Reactor Power Level and upon the amount of hydrogen injected by the Hydrogen Water Chemistry System if in service. Since the recombination of hydrogen and oxygen is exothermic, the operating temperature of the Recombiner is also dependent upon power level and the status of the HWC System. 2) Following startup, while still at low power, Recombiner performance and hydrogen concentration should be closely monitored. [1] **PERFORM** a Recombiner performance evaluation as follows: [1.1] **DETERMINE** in-service Recombiner Inlet Temperature as indicated on applicable temperature indicator, Panel 3-9-53. • 3-TI-66-75A, RECOMBINER 3A, INLET TEMP • 3-TI-66-75B, RECOMBINER 3B, INLET TEMP Expected Action(s): Determines the in-service Recombiner Operating (Inlet) Temperature as indicated on 3-TI-66-75A, RECOMBINER 3A, INLET TEMP as 392 ºF on Panel 3-9-53 (from handout).	____ SAT ____UNSAT ____N/A
Step 2: [1.2] **DETERMINE** in-service Recombiner Operating (Center) Temperature as indicated on 3-TRS-66-106, GLYCOL/RECOMBINER/OFFGAS MOISTURE SEPARATOR TEMPERATURE recorder, Panel 3-9-53. Expected Action(s): Determines the in-service Recombiner Operating (Center) Temperature as indicated on 3-TE-66-77AB, RECOMBINER 3A CENTER, as 612 ºF, on 3-TRS-66-77, Panel 3-9-53 (from handout).	____ SAT ____UNSAT ____N/A

STEP / STANDARD	SAT / UNSAT
Step 3: [1.3] **CALCULATE** the temperature difference (ΔT) between the values obtained in Steps 6.1[1.1] and 6.1[1.2]. Expected Action(s): Calculates Recombiner 3A Inlet/Center ΔT (612 ºF - 392 ºF) and determines ΔT is 220 ºF.	**Critical Step** ____ SAT _____UNSAT _____N/A
Step 4: [1.4] **DETERMINE** the Reactor Thermal Power (MWt) from process computer. Expected Action(s): Determines Reactor Thermal Power is 3600 MWt from the handout.	____ SAT _____UNSAT _____N/A
Step 5: [1.5] **USING** Attachment 1, **PLOT** the corresponding point of Reactor Power in MWt and ΔT. Expected Action(s): Using Attachment 1, plots corresponding point of Reactor Power (3600 MWt) and ΔT (220 ºF). The candidate also may determine that the required minimum ΔT corresponding to 3600 MWt is 252 ºF. Calculation: ΔT = 0.070 ºF per MWt 0.070 X 3600 = 252 ºF	**Critical Step** ____ SAT _____UNSAT _____N/A
Examiner Note: Either method (calculation or plotting) is acceptable.	

STEP / STANDARD	SAT / UNSAT
Step 6: [1.6] **ENSURE** point on Attachment 1 is above or equal to the appropriate line (HWC In Service or HWC Out of Service). Expected Action(s): Determines from Attachment 1 that calculated ΔT vs MWt plots **BELOW** the HWC Out of Service line. Candidate may also use calculated ΔT from curve factor to determine that actual ΔT (220 ºF) is well below the HWC Out of Service line on graph. When performing either method, the candidate determines that the in-service Recombiner Performance is BELOW the minimum allowable.	**Critical Step** ____ SAT ____UNSAT ____N/A
END OF TASK	

STOP TIME:_____

Job Performance Measure (JPM)

Provide to Applicant

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

You are a Unit 3 Operator with the following plant conditions:

- Reactor Power is 91%, nearing the end of a Reactor Startup following an outage
- Hydrogen Water Chemistry System is NOT in-service following being shut down in accordance with 3-OI-4, Hydrogen Water Chemistry System
- Off-Gas Preheater, Recombiner, and SJAEs are in operation in accordance with 3-OI-66, Off-Gas System, Section 5.0.
- The operating steam jet is operating properly

INITIATING CUE:

The Shift Manager has directed you to perform 3-OI-66, Off-Gas System, Section 6.1[1], Recombiner Performance Evaluation using the table below.

State the results of the evaluation and the reason for your determination.

RECOMBINER 3A, INLET TEMP, 3-TI-66-75A	392 ºF
RECOMBINER 3B, INLET TEMP, 3-TI-66-75B	320 ºF
GLY/RECMB/OG MOIST SEP TEMPERATURE, 3-TRS-66-106	
RECOMBINER 3A CENTER, 3-TE-66-77AB	612 ºF
RECOMBINER 3B CENTER, 3-TE-66-77BB	380 ºF
Core Thermal Power (MWt)	3600 MWt
Percent Power (% RTP)	91%
ANALYZER 3A, 3-H2A-66-96A	OPERABLE - reading 0.26% H_2
ANALYZER 3B, 3-H2A-66-96B	OPERABLE - reading 0.26% H_2

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Review a Radiological Work Permit (RWP)
JPM NUMBER:	682	REVISION:	3

TASK APPLICABILITY:	☐ SRO	☐ STA	☒ UO	☐ NAUO
TASK NUMBER / TASK TITLE(S):	A-000-AD-35 / Use a Radiation Work Permit			
K/A RATINGS:	K/A RATING: RO 3.5			
K/A STATEMENT:	2.3.7 Ability to comply with Radiation Work Permit requirements during normal or abnormal conditions.			
RELATED PRA INFORMATION	N/A			
SAFETY FUNCTION:	RADIATION CONTROL - ADMIN			

EVALUATION LOCATION:	☐ In-Plant	☐ Simulator	☐ Control Room	☐ Lab
	☒ Other - List	Classroom		

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 10 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

OPERATOR: _____ JPM Number: 682

RO ____ SRO ____ DATE: _____

TASK STANDARD: The Examinee is expected to calculate an expected dose between 120 to 127 mrem and determine that the task cannot be completed for the given Radiation Work Permit (RWP).

PRA: NA

REFERENCES/PROCEDURES NEEDED: NPG-SPP-05.18

VALIDATION TIME: 10 minutes

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____ (Retain entire JPM for records)

SIGNATURE: _____ DATE: _____
EXAMINER

JPM Revision Summary

Rev No.	Effective Date	Pages Affected	Description
1	11/19/2020	ALL	JPM update
2	02/25/2021	ALL	RWP format revision
3	03/13/2021	2	Updated task standard

Procedure Revisions

Procedure	Revision
NPG-SPP-05.18	9

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

You are a Unit 3 AUO assigned to a task that will require you to manually close 3-FCV-69-2, RWCU OUTBOARD SUCTION ISOLATION and place a mechanical restraining device on the valve given the following:

- 10 minutes to close the valve
- 15 minutes to install the mechanical restraining device

The dose rate at 3-FCV-69-2, RWCU OUTBOARD SUCTION ISOLATION VALVE, is 300 mrem/hr.

Note: Assume **NO** dose for transit time.

Use the attached Radiological Work Permit **(**RWP) to accomplish your task

INITIATING CUE:

Given the conditions above, determine if this task **CAN/CANNOT** be performed in accordance with the attached Radiological Work Permit **(**RWP).

Note: Show all work to support your answer.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

START TIME: _____

STEP / STANDARD	SAT / UNSAT
Step 1: Calculates expected dose to close 3-FCV-69-2, RWCU OUTBOARD SUCTION ISOLATION, and install a mechanical restraining device on the valve. Expected Action(s): 10 min to close valve + 15 min to install device = 25 min 25/60 = 0.417 hrs 0.417 hrs x 300 mRem/hr = **125 mrem** (close valve, install device) (Between 120.0 to 127.0 mrem is acceptable)	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 2: Determines if task **CAN/CANNOT** be accomplished in accordance with the attached RWP. Expected Action(s): The given RWP limit per entry is **100 mrem** (RWP pg. 2, step 3). Since **125 mrem** is greater than 100 mrem**,** determines that the task **CANNOT** be accomplished in accordance with the given initial conditions and attached RWP.	**Critical Step** _____ SAT _____UNSAT _____N/A

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

You are a Unit 3 AUO assigned to a task that will require you to manually close 3-FCV-69-2, RWCU OUTBOARD SUCTION ISOLATION and place a mechanical restraining device on the valve given the following:

- 10 minutes to close the valve
- 15 minutes to install the mechanical restraining device

The dose rate at 3-FCV-69-2, RWCU OUTBOARD SUCTION ISOLATION VALVE, is 300 mrem/hr.

Note: Assume **NO** dose for transit time.

Use the attached Radiological Work Permit **(**RWP) to accomplish your task

INITIATING CUE:

Given the conditions above, determine if this task **CAN/CANNOT** be performed in accordance with the attached Radiological Work Permit **(**RWP).

Note: Show all work to support your answer.

_____
_____
_____
_____
_____
_____
_____

Provide to Applicant

Radiological Work Permit

Num.21330002 **Rev.** 1 **Status** ACTIVE

BFN

General RWP Information

Description

Unit 3 Maintenance on RWCU (69) Systems, Work Area Description: Unit 3 Areas All Elevations

[RWP LIMITS: 100 mrem Dose Alarm and 500 mrem/hr Dose Rate Alarm]

Start Date: 01-JAN-This year **Dose Alarm:** 100 mrem **ALARA Plan:**

End Date: 01-Jan-Next year **Dose Rate Alarm:** 500 mrem/hr **RWP Type:** GENERAL

RP Coverage: INTERMITTENT **Briefing Type:** INDIVIDUAL

Stop Work Criteria

- STOP WORK in the event of Airborne Radioactivity > 10 DAC.
- HOLD POINT: If Airborne Radioactivity exceeds 0.3 DAC,stop work until a TEDE-ALARA evaluation can be performed IAW NPG-SPP-05.2.5 to evaluate respiratory protection and engineering control requirements.
- STOP WORK in the event Dose Rates at 30 cm are > 500 mrem/hr.
- STOP WORK in the event of a dose alarm or unanticipated dose rate alarm and notify RP immediately.
- STOP WORK in the event Alpha Contamination is greater than anticipated.
- STOP WORK in the event Beta-Gamma Contamination is greater than anticipated.

Expected Radiological Conditions

- **GA Dose Rates:** < 1 mrem/hr to 500 mrem/hr
- **Contact Dose Rates:** < 1 mrem/hr to 1,400 mrem/hr
- **Contamination Levels:** < 1,000 dpm/100cm2 to 10 mrad/hr/100cm2
- **Airborne Levels:** up to 10 DAC or up to 40 DAC-hrs in asingle entry

Respiratory Instructions

The use of respiratory equipment is **CONDITIONAL** based on TEDE-ALARA evaluation results. The following respirators are allowed on this RWP:

Protective Clothing Requirements

Respiratory Instructions

The use of respiratory equipment is **CONDITIONAL** based on TEDE-ALARA evaluation results. The following respirators are allowed on this RWP:

- ULTRATWIN
- PAPR

Protective Clothing Requirements

- SURGEON'S CAP
- SHOE COVERS, ONE PAIR
- MODESTY CLOTHING
- GLOVES, RUBBER, ONE PAIR
- COVERALLS, ONE PAIR
- CLOTH INSERTS
- BOOTIES, ONE PAIR

*21110551

Provide to Applicant

Radiological Work Permit

Num.21330002 **Rev.** 1 **Status** ACTIVE

BFN

Dosimetry Instructions

Required Dosimetry

- TELEMETRY [WRM-2 OR SIMILAR DEVICE
- SELF READING DOSIMETER
- DOSIMETER OF LEGAL RECORD

Dosimetry Comments

- If dosimetry is lost or dropped, where it cannot be retrieved without leaving the immediate vicinity, the following steps shall be followed:
  A. Worker SHALL exit the IMMEDIATELY and report to RP
  B. A Qualified RP Technician shall attempt the recovery of the dosimetry
  C. If an Industrial Safety Hazard exists, a Qualified RP Technician may secure the job site while constantly monitoring the Radiological Conditions in the Area

Special Instructions

- A copy of the RWP is available for review on HIS-20 upon logging in.
- Special Dress Out requirements are permitted for laborers while performing trash and laundry activities.
- Use of respiratory protection equipment is conditional based on TEDE ALARA results.
- During radiological briefings, include discussions of specific anticipated dose rates and actions to be taken in the event of a dose rate alarm.
- RP is not to brief workers to Anticipated Alarms equal to or greater than 1,000 mrem/hr (Whole Body). No more than 3 Dose Rate Alarms are permitted per entry.
- Expected or anticipated SRD dose rate alarms should be planned, documented in eSOMS (include anticipated alarm, location, applicable WO#, and approving RP Supervisor name), and discussed with workers prior to entry into the area.
- Dose rate set points should not exceed the station's threshold for posting and controlling High Radiation Areas.
- Adjustments to SRD Set Points may be performed with approval of RP Supervision. The adjusted SRD Set Points SHALL be documented in eSOMS to include new Set Points, applicable WO#, and approving RP Supervisor name.
- Entry into a Locked High Radiation Area, Very High Radiation Area (LHRA, VHRA) is PROHIBITED on this RWP.

*21110551

Provide to Applicant

Radiological Work Permit

Num.21110551 **Rev.** 1 **Status** ACTIVE

BFN

General Work Instructions

- Radiological Protection (RP) Briefings shall be utilized prior to start of work and prior to moving into a new area to define scope of work and review the area radiological conditions.
- When Logging in to HIS-20 Perform Self-Checking to ensure the proper Work Order/Step and RWP Number is utilized.
- Monitor your SRD frequently. If dose exceeds 80% of SRD setpoint, then place systems and equipment in safe configuration and exit the area.
- During periods when HIS-20 is in the "local" mode, the default set points for the RWP are 50 mrem DOSE ALARM and 80 mrem/hr DOSE RATE ALARM.
- Dressout instructions: single dressout clothing requirements used for this RWP, unless otherwise directed by RP.
- Dressout requirements may be modified based on safety (e.g., rotating equipment, heat stress) and/or radiological conditions with RP Supervisor approval.
- A hood shall be required in a Contaminated Area if the worker is required to wear a Body Harness or utilize a phone.
- Dosimeter to be placed in the chest pocket of the PCs unless otherwise directed by RP.
- Notify RP of any activity requiring climbing 7 feet above the floor level, including temporary or permanent ladders and devices.
- Notify RP prior to any system breach, welding, grinding, or surface disturbing activities. RP shall be present for initial breaches of contaminated systems to ensure proper radiological controls are in place.
- Notify RP if Hoses or Cords Need to Cross the CA Boundary. Hoses and/or Cords must be secured to prevent Contamination outside the CA Boundaries.
- Based on radiological conditions and work activities, ensure the appropriate HEPA Unit/Vacuum is selected, issued and utilized per RP Instruction.
- Avoid Posted Hot Spots and/or Piping with Lead Shielding. Locate and utilize Low Dose Waiting Areas (LDWA). Practice ALARA.
- Upon exiting a CA, proceed to the NEAREST frisker; complete a hand & foot frisk . [If you receive an alarm - NOTIFY RP IMMEDIATELY].
- In the event a frisker is not available when exiting a CA, proceed directly to the NEAREST PCM.
- Upon performing a successful frisk and completion of task, proceed to the nearest PCM and perform a Whole Body Survey. [If the PCM alarms, survey again. If the PCM alarms a second time - NOTIFY RP IMMEDIATELY].
- Upon exiting the RCA, worker shall log out of the RWP in HIS-20.

Prepared by: FLATKINS

RPSS Approval: JAELIAS

RPM Approval: JKSMITH

Final Approval: JNSTYLES

*21110551

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Determine Crew Shift Staffing Requirements
JPM NUMBER:	678	REVISION:	4

TASK APPLICABILITY:	☒SRO	☐STA	☐UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	N/A			
K/A RATINGS:	SRO 3.9			
K/A STATEMENT:	2.1.5 Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.			
RELATED PRA INFORMATION:	None			
SAFETY FUNCTION:	Admin - Conduct of Operations			

EVALUATION LOCATION:	☐In-Plant	☐ Simulator	☐ Control Room	☐ Lab
	☒ Other - List	Classroom		

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 15 mins TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 678

SRO _____ DATE: _____

TASK STANDARD: Given the oncoming Shift Manager Staffing Sheet, the Examinee is expected to determine that all required Operations crew positions are not properly staffed and determine required call-ins in accordance with the applicable Operating Department procedures.

Operator Fundamental evaluated:
OF-3 Operating the Plant with a Conservative Bias

PRA: N/A

REFERENCES/PROCEDURES NEEDED: OPDP-1, NPG-SPP-03.21, OSIL-25, Shift Manager's Staffing Sheet (attached)

VALIDATION TIME: 15 minutes

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

Rev No.	Effective Date	Pages Affected	Description
0	10/03/2018	ALL	New JPM
1	08/15/2019	ALL	Updated JPM
2	10/9/2019	ALL	Removed reference to Tech Specs.
3	09/17/2020	ALL	Updated JPM
4	03/13/2021	ALL	Updated JPM initiating cue, task standard and staffing sheet.

Procedure Revisions

Procedure	Revision
OPDP-1	50
NPG-SPP-03.21	25
OSIL-25	12/18/17
Shift Manager's Staffing Sheet	DAYS

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

You are the Shift Manager (SM) assigned to verify that minimum shift staffing requirements are met for the oncoming shift crew.

INITIATING CUES:

Review the attached Staffing Sheet and determine if any action(s) is/are required in accordance with applicable Operations Department procedures.

Using the attached Staffing Sheet, show all your work as applicable to justify your answer.

KEY Shift Manager Staffing						
3/13/2021	Pager	Phone	DAYS			
GROUP			3			
SM	17-073	7860/2173	Clark			
SM-B						
STA		2168	Turner(*)			
Support						
LEAVE						
U1 NUSO		2175	Turner(*)			
U2 NUSO		2269	Shirley			
U3 NUSO		2373	Bennett			
OS NUSO			Grimme	IC		
WCC			missing			
Support						
LEAVE						
LEAVE			Spears			
U1 BOARD RO		2192	Millsaps			
U1 DESK RO		2191	Sockwell			
U2 BOARD RO		2292	Wright			
U2 DESK RO		2291	missing			
U3 BOARD RO		2392	Cole			
U3 DESK RO		2391	missing			
SST		7687				
Support						
Support						
Leave			Wheeler (SL)	SL		
Leave			Young	AL		
RW UO	60-793	2372	KANEY (s)			
Moving Resin/ULTREX						
ULTREX AUO		2404	REED			
U1 TB AUO	15-026	777-2821	JESS	ER1		
U1 RB AUO	13-604	777-2186	RICHARDSON	OT/ER2		
RW DEMINS	16-745		missing	ER3		
U2 TB AUO	14-932	777-1015	MCBAY	ER4		
U2 RB AUO	90-536	777-0673	MCCALPIN	ER5		
OUTSIDE AUO	60-280	777-2873	SMITH	ER6		
U3 TB AUO	30-618	777-2623	WOODFIN	ER7		
U3 RB AUO	96-024		BERRYMAN	ER8		
CONTROL BAY	13-146	777-2351	BREWER	ER9		
INTAKE AUO/Alt Leak	16-544	614-8530	KING (s)	OT		
WCC						
WCC						
Break in/extra						
Break in/extra						
Break in/extra						
Break in/extra						
Fire Brigade						
Cooling Tower		729-3201				
Cooling Tower		729-3201				
LEAVE						
LEAVE						
LEAVE						
LEAVE			GRAHAM	SL		
LEAVE						

LI - LLRT Lvl I; LII - LLRT Lvl II; S-*OT scheduled OT		% - no license duties(nld)
Maintenance MGR	729-7677 / 434-0824 / 16-057	(I) Incident Commander
Work Week Manager	729-7447	(s) Not emergency Responder Qual'd
OPS Clerks	729-2302/2190	(2) Not Fire Watch Qualified
Cooling Towers	729-3201 / 434-0830/ 729-7616	(d) Check Break in needed
Chemistry	729-2368 / 2913 15-912 / 20-564/19-164	(#) not Clearance writer qual'd (QE only)
ER1-ER9 Assume Emergency Responder Positions		(*) STA Qualified
(TRN) Training (J) JITT (NLD)	No License Duties (CAL) Cancel A/L	& - No clearance quals
After Shift Manager initials, forward a copy to the Operations clerks for retention		

START TIME _____

STEP / STANDARD	SAT / UNSAT
Step 1: OPDP-1, Conduct of Operations. Attachment 1 (Page 2 of 2) Shift Staffing 1.0 SHIFT STAFFING (continued)	_____ SAT _____UNSAT _____N/A

	Minimum Staffing	**BFN**
	Shift Manager (SRO)	1
	Nuclear Unit Senior Operator (SRO)	4
	Unit Operator (UO)	6
	Non Licensed (AUO)	9
	STA**	1
	Incident Commander*	1

*The Incident Commander will be a shift SRO not assigned to a unit or the STA role (PER 217578).

**The STA may fill the NUSO position provided that an additional SRO (not assigned to a unit or as IC) is available and can relieve the STA filling the NUSO position within 10 minutes. The individual relieving the STA must have knowledge of plant conditions in order to perform a turnover without delay. The STA function is still required upon entry into the Fire Safe Shutdown procedures (FSSs).

Expected Action(s):

Reviews OPDP-1, Conduct of Operations Attachment 1 for BFN Staffing requirements

EXAMINER NOTE: The Examinee may initially identify all of the missing operators in any order and/or state a call-in is required to meet minimum staffing in accordance with OPDP-1 by performing the following as applicable for the missing shift operators:

1. Hold operators over from off going shift for no more than 4 hours until Call-ins can be fulfilled for the minimum missing positions in accordance with NPG-SPP-03.21, Nuclear Fatigue Management Program, Section 3.2.7, 2.a.

NPG Standard Programs and Processes	Nuclear Fatigue Management Program	NPG-SPP-03.21 Rev. 0025 Page 29 of 82

3.2.7 Calculating Work Hours (continued)

2. Application

a. By example, if an individual who normally works a 12-hour shift schedule is requested to work additional hours from 0700 to 1900 on Friday, the following should be considered.

(1) Determine if more than 16 hours in a 24-hour period will be exceeded by reviewing hours worked during the 24-hour period prior to the stop time on Friday as reflected in the request to work additional hours.

2. Hold operators over OR arrange for replacement personnel to restore the shift compliment within 2 hours in accordance with OPDP-1, Conduct of Operations Section 2.0.B. Attachment 1.

NPG Standard Department Procedure	Conduct of Operations	OPDP-1 Rev. 0050 Page 52 of 71

Attachment 1
(Page 2 of 2)

Shift Staffing

2.0 NOTIFICATION OF ABSENCES

A. Operations personnel unable to report for shift duty shall, before the scheduled time, inform the SM/NUSO of the situation. The SM or designee shall make necessary arrangements for obtaining a replacement.

B. In the case of illness or unexpected absence of the operations shift compliment personnel, the Shift Manager should hold a shift member over or arrange for replacement personnel to restore the shift complement within two hours.

3. Conduct Call-ins to meet the minimum staffing in accordance with OSIL-25, TVA BFN Operations Section Instruction Letter Overtime, Leave, and Relief Policy, Attachment 2

NOTE: The Examinee is NOT required to fill out the Call-in Request Form

TENNESSEE VALLEY AUTHORITY BROWNS FERRY NUCLEAR PLANT OPERATIONS SECTION INSTRUCTION LETTER OVERTIME, LEAVE, AND RELIEF POLICY	OSIL-25 PAGE 1 OF 3 12/18/17 Attachment 2

Instructions for filling out the Call-in Request Sheet

1) The Unit Operator and/or the Operations Clerk will assign the number of positions required to be filled for the shift in question. This will encompass the required positions and number required in each position including extra personnel required to support shift activities.

2) Shift Manager signs (signature) the call-in request sheet prior to initiating the call-in signifying he concurs with the positions and the number of persons required to fill the shift compliment. This can include any additional personnel required to support extra shift tasks. If the Ops Clerks are performing the OT call-in, the SM approval can be performed by telecom.

3) Columns will be filled out in "YES/NO" format using the following criteria;

   - WORK, "Do you want to work the required shift?" This is to determine whether the individual wants to work the entire shift.
   - WAIVER, "Will you require a waiver to work the entire shift?"
   - FIT FOR DUTY, "Are you fit for duty?" (See Fitness For Duty Below)
   - ALCOHOL, "Have you consumed alcohol in the past 5 hours?" (See Fitness For Duty Below)
   - INITIALS, The Unit Operator or Ops Clerk (caller) initials in the row for the individual which has been called. The person entering the work hours into NFR and the Person performing the NFR entry IV will both initial the row for the individual that is coming in to work. They will also print their name at the bottom of the Call-in Request Form.

4) The SM and the Call Performer will print their name at the bottom of the Call-in Request Form. If the Ops Clerks are performing the OT call-in, the Clerk can print the SM's name on the form.

5) The completed Call-in Request Form shall be forwarded to the Ops NFR Administrator. The Ops NFR Administrator will file the Call-in Request Form in a fire-proof cabinet for the required retention period.

TENNESSEE VALLEY AUTHORITY BROWNS FERRY NUCLEAR PLANT OPERATIONS SECTION INSTRUCTION LETTER OVERTIME, LEAVE, AND RELIEF POLICY	OSIL-25 PAGE 3 OF 3 12/18/17 Attachment 2

Call-in Request Form

Shift/Group: Date: SM (Signature):

Number of Positions

US: UO: AUO: STA: SSS: 1st Responders:

List T&L for call-in by OT hours (list those requiring a waiver last)

Name	Phone #	Work? (Yes/No)	Waiver? (Yes/No)	Fit For Duty? (Yes/No)	Time Called	Time Needed to Report	Alcohol < 5 hrs? (Yes/No)	Call Performer (Initials)	NFR Entry 1st / IV (Initials/ Initials)
Min Shift Staffing position required or other need		Group # with opening		Reason for Min Staffing not met (SL, FSL, etc).					

Name	Phone #	Work? (Yes/No)	Waiver? (Yes/No)	Fit For Duty? (Yes/No)	Time Called	Time Needed to Report	Alcohol < 5 hrs? (Yes/No)	Call Performer (Initials)	NFR Entry 1st / IV (Initials/ Initials)
Min Shift Staffing position required or other need		Group # with opening		Reason for Min Staffing not met (SL, FSL, etc).					
				/					

Name	Phone #	Work? (Yes/No)	Waiver? (Yes/No)	Fit For Duty? (Yes/No)	Time Called	Time Needed to Report	Alcohol < 5 hrs? (Yes/No)	Call Performer (Initials)	NFR Entry 1st / IV (Initials/ Initials)
									/
Min Shift Staffing position required or other need		Group # with opening		Reason for Min Staffing not met (SL, FSL, etc).					

Call Performer (Print): SM Review (Print):

NFR Entry 1st (Print): NFR Entry IV (Print)

Retention Period: One (1) Year Page of Responsibility: Ops NFR Administrator

STEP / STANDARD	SAT / UNSAT
EXAMINER NOTE: If candidate attempts to use waivers as a staffing gap option, state 'waivers are not allowed'.	
Step 1: Examinee reviews the NUSO and Work Control Center (WCC) positions on to determine if minimum staffing is met in accordance with OPDP-1, Attachment 1. Expected Action(s): Examinee notes that 4 NUSOs positions are filled (U1, U2, U3 and the Outside - OS) as required. However, Examinee notes that the following is required in accordance with OPDP-1, Attachment 1 which would be satisfied by the missing WCC position: • **The STA may fill the NUSO position provided that an additional SRO (not assigned to a unit or as IC) is available and can relieve the STA filling the NUSO position within 10 minutes. Given the above, in order to fill the Licensed NUSO-WCC position on shift, the Examinee may perform any of the following: • Hold a Licensed NUSO over from off going shift for up to 4 hours or • Hold a Licensed NUSO over or arrange for replacement personnel to restore the shift compliment within 2 hours or • Conduct Call-in for a Licensed NUSO	**Critical Step** _____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 2: Examinee reviews the Unit Operator/Reactor Operator (RO) positions for the oncoming shift to determine if 6 RO required minimum staffing is met in accordance with OPDP-1, Attachment 1. Expected Action(s): Given the above, in order to fill the U2 and U3 DESK RO missing positions for the oncoming shift, the Examinee may perform any of the following: • Hold 2 Licensed ROs over from off going shift for up to 4 hours or • Hold 2 Licensed ROs over or arrange for replacement personnel to restore the shift compliment within 2 hours or • Conduct Call-ins for 2 Licensed ROs	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER NOTE: (For Step 3) RO Call-in: It is an acceptable practice of Operations to call to fill the SST slot. This is not required in accordance with OPDP-1, but calling enough to fill vacant positions and the SST position is acceptable.	
Step 3: Examinee reviews the 9 Non-Licensed (AUO) / Emergency Responders (ER1-9) positions for the oncoming shift to determine if minimum staffing is met in accordance with OPDP-1, Attachment 1. Expected Action(s): Examinee notes that the Emergency Responder **(ER-3)** position is not filled as assigned for the RW DEMINS AUO position. Given the above, in order to fill the missing **(ER-3)** position for the oncoming shift, the Examinee will perform any of the following: • Assign Reed (ULTREX AUO) or • Hold AUO over from off going shift for up to 4 hours or • Hold AUO over or arrange for replacement personnel to restore the shift compliment within 2 hours or • Conduct Call-in for AUO	**Critical Step** _____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
EXAMINER NOTE: The missing AUO ER-3 position cannot be filled using current on shift AUOs, since they are shown with an (s) beside their names, indicating they are not ER qualified.	

STOP TIME _____

Job Performance Measure (JPM)

Provide to Applicant

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

You are the Shift Manager (SM) assigned to verify that minimum shift staffing requirements are met for the upcoming shift crew.

INITIATING CUES:

Review the attached Staffing Sheet and determine if any action(s) is/are required in accordance with applicable Operations Department procedures.

List any procedure(s) used to justify your answer.

Using the attached Staffing Sheet, show all your work as applicable to justify your answer.

Provide to Applicant Shift Manager Staffing						
3/13/2021	Pager	Phone	DAYS			
GROUP			3			
SM	17-073	7860/2173	Clark			
SM-B						
STA		2168	Turner(*)			
Support						
LEAVE						
U1 NUSO		2175	Turner(*)			
U2 NUSO		2269	Shirley			
U3 NUSO		2373	Bennett			
OS NUSO			Grimme	IC		
WCC						
Support						
LEAVE						
LEAVE			Spears			
U1 BOARD RO		2192	Millsaps			
U1 DESK RO		2191	Sockwell			
U2 BOARD RO		2292	Wright			
U2 DESK RO		2291				
U3 BOARD RO		2392	Cole			
U3 DESK RO		2391				
SST		7687				
Support						
Support						
Leave			Wheeler (SL)	SL		
Leave			Young	AL		
RW UO	60-793	2372	KANEY (s)			
Moving Resin/ULTREX						
ULTREX AUO		2404	REED			
U1 TB AUO	15-026	777-2821	JESS	ER1		
U1 RB AUO	13-604	777-2186	RICHARDSON	OT/ER2		
RW DEMINS	16-745			ER3		
U2 TB AUO	14-932	777-1015	MCBAY	ER4		
U2 RB AUO	90-536	777-0673	MCCALPIN	ER5		
OUTSIDE AUO	60-280	777-2873	SMITH	ER6		
U3 TB AUO	30-618	777-2623	WOODFIN	ER7		
U3 RB AUO	96-024		BERRYMAN	ER8		
CONTROL BAY	13-146	777-2351	BREWER	ER9		
INTAKE AUO/Alt Leak	16-544	614-8530	KING (s)	OT		
WCC						
WCC						
Break in/extra						
Break in/extra						
Break in/extra						
Break in/extra						
Fire Brigade						
Cooling Tower		729-3201				
Cooling Tower		729-3201				
LEAVE						
LEAVE						
LEAVE						
LEAVE			GRAHAM	SL		
LEAVE						

LI - LLRT Lvl I; LII - LLRT Lvl II; S-*OT scheduled OT			% - no license duties(nld)
Maintenance MGR	729-7677 / 434-0824 / 16-057		(I) Incident Commander
Work Week Manager	729-7447		(s) Not emergency Responder Qual'd
OPS Clerks	729-2302/2190		(2) Not Fire Watch Qualified
Cooling Towers	729-3201 / 434-0830/ 729-7616		(d) Check Break in needed
Chemistry	729-2368 / 2913 15-912 / 20-564/19-164		(#) not Clearance writer qual'd (QE only)
ER1-ER9 Assume Emergency Responder Positions			(*) STA Qualified
(TRN) Training (J) JITT (NLD) No License Duties (CAL) Cancel A/L			& - No clearance quals
After Shift Manager initials, forward a copy to the Operations clerks for retention			

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Place an RPS Channel in trip and determine REQUIRED ACTIONS in accordance with Technical Specifications
JPM NUMBER:	745-SRO	REVISION:	1

TASK APPLICABILITY:	☒SRO	☐STA	☒UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	U-099-SU-02, Perform MSIV Closure – RPS Trip Functional Test			
K/A RATINGS:	SRO: 4.2			
K/A STATEMENT:	2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc.			
RELATED PRA INFORMATION:	Risk Significant RPS Scram Reduction			
SAFETY FUNCTION:	Admin - Conduct of Operations			

EVALUATION LOCATION:	☐In-Plant	☐ Simulator	☐ Control Room	☐ Lab
	☒ Other - List	Classroom		

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 15 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: __745-SRO__

RO ____ SRO ____ DATE: _____

TASK STANDARD: Given a failed Reactor Protection System (RPS) instrument, the Examinee is expected to determine:

- The correct Technical Specification CONDITION and REQUIRED ACTION
- How to place the applicable instrument channel in trip and identify the correct procedure(s)/print(s)

PRA: N/A

REFERENCES/PROCEDURES NEEDED: 2-OI-99, Reactor Protection System
Unit 2 Tech Spec 3.3.1.1, RPS Instrumentation, Print 2-730E915-9,
Provide hard copy of 2-45E671-26

VALIDATION TIME: ___15 min_

PERFORMANCE TIME: _____

COMMENTS: _____
_____
_____
_____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____ (Retain entire JPM for records)

SIGNATURE: _____ DATE: _____
EXAMINER

Revision Summary

Rev No.	Effective Date	Pages Affected	Description
0	9/24/20	All	Initial issue
1	03/13/2021	All	Updated JPM

Procedure Revisions

Procedure	Revision
2-OI-99	93
Unit 2 TS 3.3.1.1	Amend. 258
Print 2-730E915-9	29
Hard copy 2-45E671-26	5

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

Unit 2 is operating at 100% Rated Thermal Power (RTP). The Instrument Mechanics conducted testing on 2-PIS-3-22AA, Reactor High Pressure A1 Channel to support a surveillance. The instrument failed to meet its required Acceptance Criteria (AC) steps.

INITIATING CUES: As the Nuclear Unit Senior Operator (NUSO), you are required to determine **ALL** of the following:

- What is/are the Technical Specification Condition(s) and Required Action(s) (if any)?
- List the plant procedure(s)/document(s) used to perform the Technical Specification(s) Required Action(s) (if any)?
- Identify how the Required Action(s) is/are performed in accordance with the respective plant procedure(s)/document(s) from above?

Answer:

_____

_____

_____

_____

_____

_____

_____

_____

_____

START TIME:_____

STEP / STANDARD	SAT / UNSAT
Step 1: Refers to Unit 2 Technical Specification 3.3.1.1, RPS Instrumentation	**Critical Step** _____ SAT _____UNSAT _____N/A

3.3 INSTRUMENTATION

3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Place channel in trip. OR A.2 ----------NOTE---------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ---------- Place associated trip system in trip.	12 hours 12 hours

(continued)

STEP / STANDARD	SAT / UNSAT

Step 1 (cont):

Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Average Power Range Monitors (continued)					
d. Inop	1,2	3(b)	G	SR 3.3.1.1.16	NA
e. 2-Out-Of-4 Voter	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.14 SR 3.3.1.1.16	NA
f. OPRM Upscale	1	3(b)	I	SR 3.3.1.1.1 SR 3.3.1.1.7 SR 3.3.1.1.13 SR 3.3.1.1.16 SR 3.3.1.1.17	NA(e)
3. Reactor Vessel Steam Dome Pressure - High(d)	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.14	≤ 1090 psig
4. Reactor Vessel Water Level - Low, Level 3(d)	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≥ 528 inches above vessel zero
5. Main Steam Isolation Valve - Closure	1	8	F	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 10% closed
6. Drywell Pressure - High	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 2.5 psig
7. Scram Discharge Volume Water Level - High					
a. Resistance Temperature Detector	1,2	2	G	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons
	5(a)	2	H	SR 3.3.1.1.8 SR 3.3.1.1.13 SR 3.3.1.1.14	≤ 50 gallons

Expected Action(s):

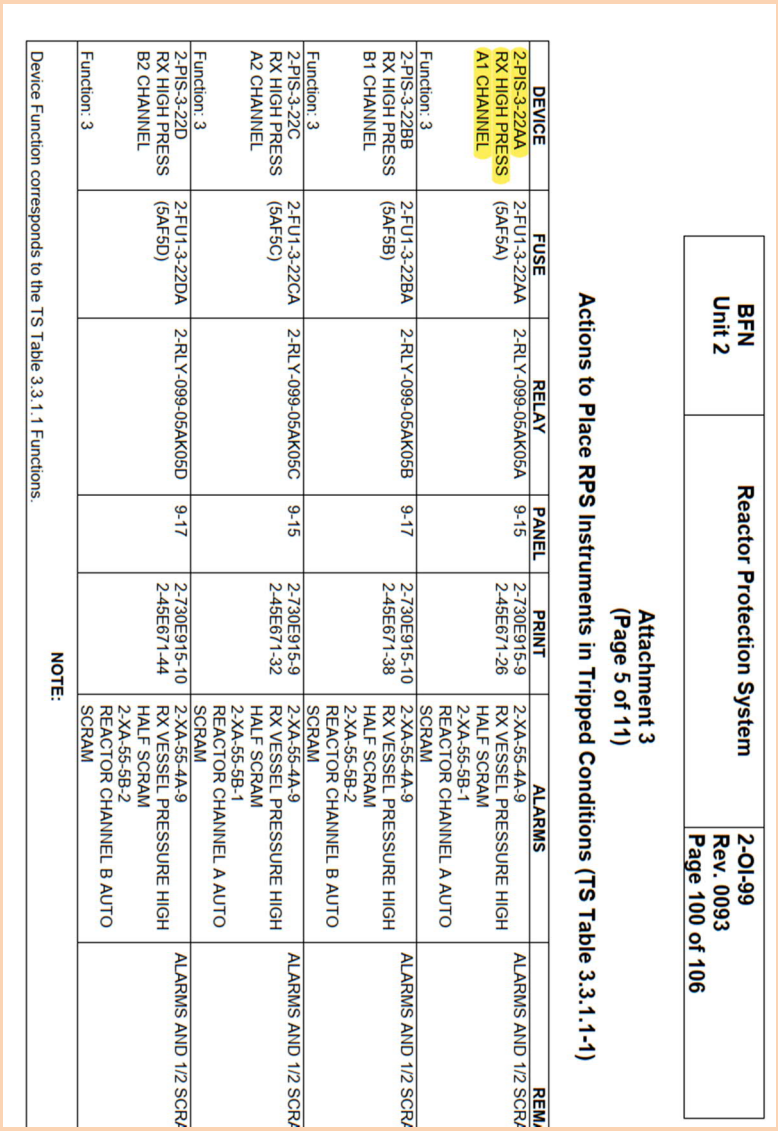
Determines Tech Spec 3.3.1.1 CONDITION A is NOT met and the REQUIRED ACTION is to place the A1 Channel in trip OR Place the associated trip system in TRIP in 12 hours.

EXAMINER NOTE: The Examinee may elect to first refer to Unit 2 Tech Spec 3.3.1.1, RPS Instrumentation and/or refer to 2-OI-99, Reactor Protection System, Attachment 3 (page 5 of 13).

2-OI-99, Reactor Protection System, Attachment 3 list the respective failed instrument's (2-PIS-3-22AA, Reactor High Pressure A1 Channel) fuse, relay, prints and remarks/results.

If candidate elects to place A2 Channel in trip by other than pulling fuse, follow up questions may be warranted.

STEP / STANDARD	SAT / UNSAT
Step 2: Refers to 2-OI-99, Reactor Protection System, Attachment 3 (page 5 of 11) and/or Print 2-730E915-9 (next page) for 2-PIS-3-22AA, Reactor High Pressure A1 Channel.	**Critical Step** _____ SAT _____UNSAT _____N/A



BFN Unit 2 | Reactor Protection System | 2-OI-99 Rev. 0093 Page 100 of 106

Attachment 3
(Page 5 of 11)

Actions to Place RPS Instruments in Tripped Conditions (TS Table 3.3.1.1-1)

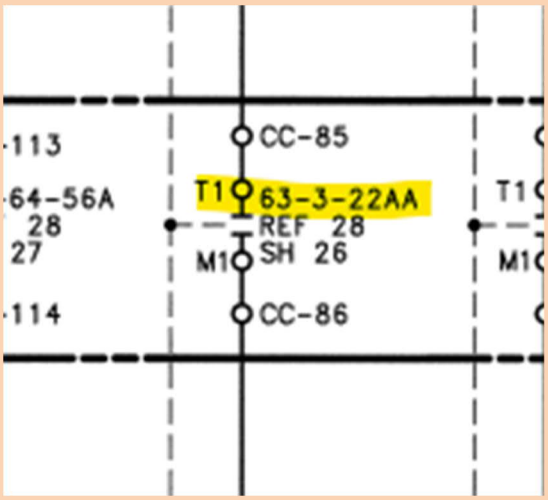
DEVICE	FUSE	RELAY	PANEL	PRINT	ALARMS	REM
2-PIS-3-22AA RX HIGH PRESS A1 CHANNEL	2-FU1-3-22AA (5AF5A)	2-RLY-099-05AK05A	9-15	2-730E915-9 2-45E671-26	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-1 REACTOR CHANNEL A AUTO SCRAM	ALARMS AND 1/2 SCR
Function: 3 2-PIS-3-22BB RX HIGH PRESS B1 CHANNEL	2-FU1-3-22BA (5AF5B)	2-RLY-099-05AK05B	9-17	2-730E915-10 2-45E671-38	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-2 REACTOR CHANNEL B AUTO SCRAM	ALARMS AND 1/2 SCR
Function: 3 2-PIS-3-22C RX HIGH PRESS A2 CHANNEL	2-FU1-3-22CA (5AF5C)	2-RLY-099-05AK05C	9-15	2-730E915-9 2-45E671-32	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-1 REACTOR CHANNEL A AUTO SCRAM	ALARMS AND 1/2 SCR
Function: 3 2-PIS-3-22D RX HIGH PRESS B2 CHANNEL	2-FU1-3-22DA (5AF5D)	2-RLY-099-05AK05D	9-17	2-730E915-10 2-45E671-44	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-2 REACTOR CHANNEL B AUTO SCRAM	ALARMS AND 1/2 SCR
Function: 3						

Device Function corresponds to the TS Table 3.3.1.1 Functions.

NOTE:

Expected Action(s):

Examinee refers to 2-OI-99, Reactor Protection System, Attachment 3 (page 5 of 11) and/or Print 2-730E915-9 (next page) to reference the respective failed instrument 2-PIS-3-22AA, Reactor High Pressure A1 Channel.

STEP / STANDARD	SAT / UNSAT
Step 2 continued: Print 2-730E915-9 (2-PIS-3-22AA is located between A-3 and E-3 coordinates)  	
EXAMINER NOTE: Hard copies of print 2-45E671-26 are available if candidate request	

STEP / STANDARD	SAT / UNSAT
Step 2: Determine how the Required Action is performed to place 2-PIS-3-22AA, Reactor High Pressure A1 Channel in trip in accordance with 2-OI-99, Reactor Protection System, Attachment 3 (page 5 of 11) and/or Print 2-730E915-9. Expected Action(s): In accordance with 2-OI-99, Reactor Protection System, Attachment 3 (page 5 of 11) and/or Print 2-730E915-9, determines fuse **2-FU1-3-22AA (5A-F5A)** is required to be removed in order for 2-PIS-3-22AA, Reactor High Pressure A1 Channel to be placed in trip as directed.	**Critical Step** _____ SAT _____UNSAT _____N/A

Step 2 (continued):

2-OI-99, Reactor Protection System, Attachment 3 (page 5 of 11)

BFN Unit 2	Reactor Protection System	2-OI-99 Rev. 0093 Page 100 of 106

Attachment 3
(Page 5 of 11)

Actions to Place RPS Instruments in Tripped Conditions (TS Table 3.3.1.1-1)

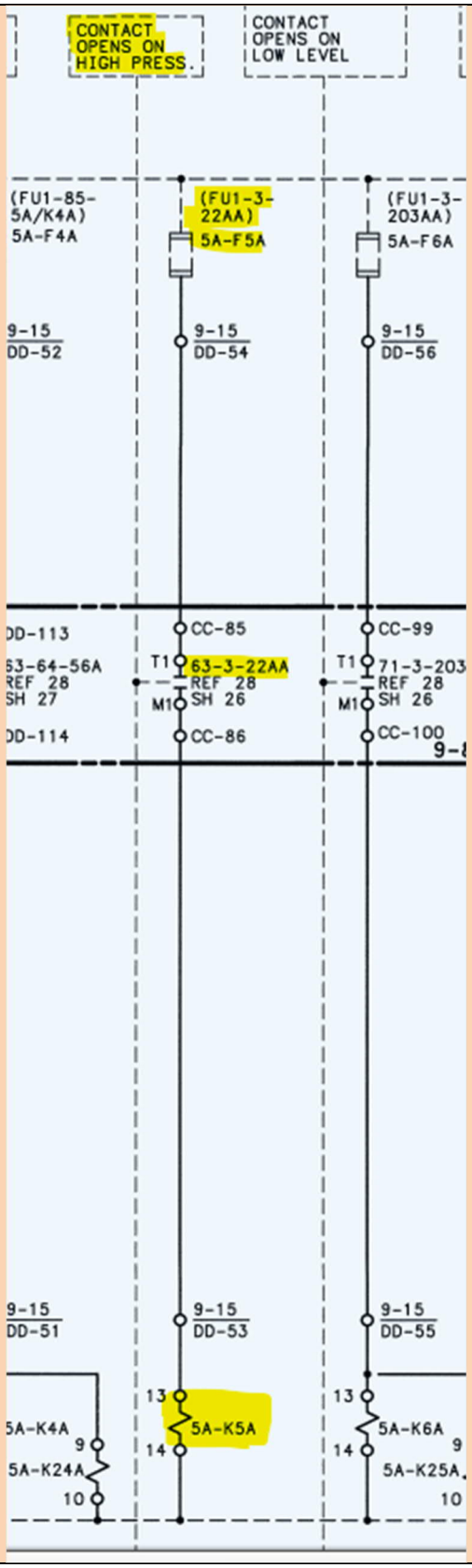
DEVICE	FUSE	RELAY	PANEL	PRINT	ALARMS	REMARKS
2-PIS-3-22AA RX HIGH PRESS A1 CHANNEL	2-FU1-3-22AA (5AF5A)	2-RLY-099-05AK05A	9-15	2-730E915-9 2-45E671-26	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-1 REACTOR CHANNEL A AUTO SCRAM	ALARMS AND 1/2 SCRAM IN A CHANNEL
Function: 3 2-PIS-3-22BB RX HIGH PRESS B1 CHANNEL	2-FU1-3-22BA (5AF5B)	2-RLY-099-05AK05B	9-17	2-730E915-10 2-45E671-38	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-2 REACTOR CHANNEL B AUTO SCRAM	ALARMS AND 1/2 SCRAM IN B CHANNEL
Function: 3 2-PIS-3-22C RX HIGH PRESS A2 CHANNEL	2-FU1-3-22CA (5AF5C)	2-RLY-099-05AK05C	9-15	2-730E915-9 2-45E671-32	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-1 REACTOR CHANNEL A AUTO SCRAM	ALARMS AND 1/2 SCRAM IN A CHANNEL
Function: 3 2-PIS-3-22D RX HIGH PRESS B2 CHANNEL	2-FU1-3-22DA (5AF5D)	2-RLY-099-05AK05D	9-17	2-730E915-10 2-45E671-44	2-XA-55-4A-9 RX VESSEL PRESSURE HIGH HALF SCRAM 2-XA-55-5B-2 REACTOR CHANNEL B AUTO SCRAM	ALARMS AND 1/2 SCRAM IN B CHANNEL
Function: 3						

Device Function corresponds to the TS Table 3.3.1.1 Functions.

NOTE:

Step 3 continued:

Print 2-730E915-9



EXAMINER CUE: Once the examinee identifies that:

1. **Tech Spec 3.3.1.1 CONDITION A is entered with a COMPLETION TIME of 12 hours to place 2-PIS-3-22AA, Reactor High Pressure A1 Channel in trip**

2. **2-OI-99, Reactor Protection System, Attachment 3 and/or by Print 2-730E915-9 must be referenced**

3. **2-FU1-3-22AA has to be pulled in accordance with 2-OI-99, Reactor Protection System, Attachment 3 and/or by Print 2-730E915-9 for the failed instrument (2-PIS-3-22AA, Reactor High Pressure A1 Channel)**

Inform the candidate "Another Operator will finish this procedure. This completes your task".

END OF TASK

STOP TIME:_____

Job Performance Measure (JPM)

Provide to Applicant

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

Unit 2 is operating at 100% Rated Thermal Power (RTP). The Instrument Mechanics conducted testing on 2-PIS-3-22AA, Reactor High Pressure A1 Channel to support a surveillance. The instrument failed to meet its required Acceptance Criteria (AC) steps.

INITIATING CUES: As the Nuclear Unit Senior Operator (NUSO), you are required to determine **ALL** of the following:

- What is/are the Technical Specification Condition(s) and Required Action(s) (if any)?
- List the plant procedure(s)/document(s) used to perform the Technical Specification(s) Required Action(s) (if any)?
- Identify how the Required Action(s) is/are performed in accordance with the respective plant procedure(s)/document(s) from above?

Answer:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Review a completed Surveillance
JPM NUMBER:	746-SRO	REVISION:	5

TASK APPLICABILITY:	☒SRO	☐STA	☐UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	S-000-AD-27, Assess LCO/TRM/ODCM Actions required for INOPERABLE equipment			
K/A RATINGS:	SRO 4.7			
K/A STATEMENT:	2.2.22 Knowledge of limiting conditions for operations and safety limits			
RELATED PRA INFORMATION:	None			
SAFETY FUNCTION:	Equipment Control - Admin			

EVALUATION LOCATION:	☐In-Plant	☐ Simulator	☐ Control Room	☐ Lab
	☒ Other - List	Classroom		

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 15 mins TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 746-SRO

SRO _____ DATE: _____

TASK STANDARD: The Examinee is expected to conduct a review of the Power Availability Surveillance (SR), determine that Board Voltage Acceptance Criteria (AC) has not been met, and determine the required Technical Specification Required ACTIONS as applicable.

Operator Fundamental evaluated:
OF-1 Monitoring Plant Indications and Conditions Closely

PRA: N/A

REFERENCES/PROCEDURES NEEDED: (1) Completed 3-SR-3.8.7.1, Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems, but **NOT** identified by the Unit Operator.
(2) Partially completed TVA 40753, STS
(3) Unit 3 Tech Spec 3.8.7

VALIDATION TIME: 15 minutes

PERFORMANCE TIME: _____

COMMENTS: _____
_____
_____
_____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____ (Retain entire JPM for records)

SIGNATURE: _____ DATE: _____
EXAMINER

Rev No.	Effective Date	Pages Affected	Description
1	09/13/2018	ALL	Updated JPM
2	08/13/2019	ALL	Updated JPM
3	10/9/2019	ALL	Updated JPM
4	9/23/2020	ALL	Updated JPM
5	03/13/2021	ALL	Updated JPM

Procedure Revisions

Procedure	Revision
3-SR-3.8.7.1	15
TVA 40753, STS	3-SR-3.8.7.1
Unit 3 Tech Spec 3.8.7	212

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

Unit 3 is operating at 100% Rated Thermal Power (RTP). You are the Unit 3 Nuclear Unit Senior Operator (NUSO). The Balance of Plant Operator (BOP) has just completed 3-SR-3.8.7.1, Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems, and has given it to you for review.

INITIATING CUES:

Conduct a review of 3-SR-3.8.7.1, Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems.

Determine any additional Required Action(s) in accordance with Technical Specifications as applicable.

START TIME _____

STEP / STANDARD	SAT / UNSAT
Step 1: The Unit 3 Nuclear Unit Senior Operator (NUSO) ensures that the Balance of Plant Operator (BOP) has checked and initialed each step. Expected Action(s): NUSO notes that all initials are present.	_____ SAT _____UNSAT _____N/A
EXAMINER NOTE: For JPM Steps 2-3 below, see next page for 3-SR-3.8.7.1 (page 13)	
Step 2: NUSO checks that the BOP has identified any anomalies. Expected Action(s): NUSO notes that the BOP recorded 432 Volts in 7.3 [1.3.1].	_____ SAT _____UNSAT _____N/A

STEP / STANDARD	SAT / UNSAT
Step 3: NUSO checks that the BOP has identified any anomalies. Expected Action(s): NUSO notes that Step 7.3[1.3.3] CHECK Voltage ≥ 440 volts, is NOT filled out correctly since Step 2 above recorded 7.3[1.3.1] as 432 volts. Step 7.3[1.3.3] is an ACCEPTANCE CRITERIA (AC) step that was incorrectly signed off suggesting that the board voltage met the SR requirement.	**Critical Step** _____ SAT _____UNSAT _____N/A

BFN Unit 3	Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems	3-SR-3.8.7.1 Rev. 0015 Page 13 of 24

Date Today

7.3 **480 V Board Voltages (continued)**

[1.3] 480V SD BD 3B VOLTAGE

[1.3.1] **RECORD** the Voltage below: (N/A if unavailable)

432 VOLTS TJ

[1.3.2] **IF** Voltage is ≥ 500 VOLTS or Voltage Indication is unavailable, **THEN**

PERFORM the following: (Otherwise N/A)

A. **REQUEST** EM to obtain Voltages locally. N/A

B. **RECORD** the Highest Voltage obtained between AΦ to BΦ, BΦ to CΦ, and CΦ to AΦ voltages :

_____ VOLTS N/A

[1.3.3] **CHECK** Voltage ≥ 440 VOLTS TJ (AC)

[1.3.4] **CHECK** Voltage ≤ 508 VOLTS TJ

EXAMINER CUE: For JPM Step 4 below, the Examinee may ask if the voltages have been verified by Electrical Maintenance as noted in P&L's of the SR.
If so, inform examinee that all voltages have been verified as indicated.

Step 4:

NUSO determines that 480V Shutdown Board (SD BD) 3B is INOPERABLE in accordance with Tech Spec 3.8.7.

Expected Action(s):

The NUSO determines that all AC steps are NOT met therefore fails the SR. The NUSO will enter Tech Spec 3.8.7 CONDITION B with REQUIRED ACTION B1 to Restore the Board to OPERABLE status in 8 hours.

Distribution Systems - Operating
3.8.7

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One Unit 3 480 V Shutdown Board inoperable. OR 480 V RMOV Board 3A inoperable. OR 480 V RMOV Board 3B inoperable.	----------NOTE---------- Enter Condition C when Condition B results in no power source to 480 volt RMOV board 3D or 3E. ---------- B.1 Restore Board to OPERABLE status.	8 hours AND 12 days from discovery of failure to meet LCO

Critical Step

_____ SAT

_____UNSAT

_____N/A

STOP TIME _____

Job Performance Measure (JPM)

Provide to Applicant

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

Unit 3 is operating at 100% Rated Thermal Power (RTP). You are the Unit 3 Nuclear Unit Senior Operator (NUSO). The Balance of Plant Operator (BOP) has just completed 3-SR-3.8.7.1, Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems, and has given it to you for review.

INITIATING CUES:

Conduct a review of 3-SR-3.8.7.1, Weekly Check of Power Availability to Required AC and DC Power Distribution Subsystems.

Determine any additional Required Action(s) in accordance with Technical Specifications as applicable.

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Determine ACTIONS required to allow releases in accordance with 0-ODCM-001, OFFSITE DOSE CALCULATION MANUAL
JPM NUMBER:	749-SRO	REVISION:	0

TASK APPLICABILITY:	☒ SRO	☐ STA	☐ UO	☐ NAUO
TASK NUMBER / TASK TITLE(S):	S-000-AD-27 Assess LCO/TRM/ODCM Actions Required for Inoperable Equipment			
K/A RATINGS:	K/A RATING: SRO 4.3			
K/A STATEMENT:	2.3.11 Ability to control radiation releases			
RELATED PRA INFORMATION:	N/A			
SAFETY FUNCTION:	RADIATION CONTROL - ADMIN			

EVALUATION LOCATION:	☐ In-Plant	☐ Simulator	☐ Control Room	☐ Lab
	☒ Other - List	Classroom		

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 15 min TIME CRITICAL (Y/N) N ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 749-SRO

SRO ____ DATE: _____

TASK STANDARD: Given that a Turbine Building Radiation Monitor is taken out of service for maintenance, the Examinee is expected to identify the correct governing plant procedure and the ACTIONS required to allow continued releases.

PRA: N/A

REFERENCES/PROCEDURES NEEDED: ODCM

VALIDATION TIME: 15 minutes

PERFORMANCE TIME: _____

COMMENTS: _____

_____

_____

_____

_____

_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____ (Retain entire JPM for records)

SIGNATURE: _____ DATE: _____
EXAMINER

JPM Revision Summary

Rev No.	Effective Date	Pages Affected	Description
0	03/15/2021	ALL	Initial revision

Procedure Revisions

Procedure	Revision
0-ODCM-001	25

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

You are the Unit 2 Nuclear Unit Senior Operator (NUSO) with the following conditions:

- The Reactor is operating at 100% RTP
- Work Control just notified you that 2-RM-90-249, TURBINE BUILDING EXHAUST RADIATION MONITOR, was just tagged for scheduled maintenance
- Maintenance is expected to last 12 hours

Work Control requests that you ensure compliance with all approved plant procedures for releases.

INITIATING CUE: Given the conditions above, determine the following to ensure compliance for releases via the affected pathway:

- What is/are the required Action(s) to allow releases to continue

Answer:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

START TIME: _____

STEP / STANDARD	SAT / UNSAT
Step 1: Refers to 0-ODCM-001, OFFSITE DOSE CALCULATION MANUAL (see JPM attached page 6 of 8) Expected Action(s): Examinee refers to 0-ODCM-001, OFFSITE DOSE CALCULATION MANUAL, Table 1.1-2 (Page 1 of 2) for applicability to allow releases to continue via this pathway with 2-RM-90-249, Turbine Building Exhaust Radiation Monitor while tagged out of service.	**Critical Step** _____ SAT _____UNSAT _____N/A
Step 2: Refers to 0-ODCM-001, OFFSITE DOSE CALCULATION MANUAL Table 1.1-2 (Page 2 of 2) (see JPM attached page 7 of 8) Expected Action(s): Given 2-RM-90-249, Turbine Building Exhaust Radiation Monitor being tagged out, examinee determines that the following ACTIONS are required to allow effluent releases via the affected pathway to continue: • ACTION 'A' – A temporary monitoring system is installed or grab samples are taken and analyzed at least once every 8 hours • ACTION 'B' – Samples are continuously collected with auxiliary sampling equipment for periods of 7 days and analyzed within 48 hours of the end of the sampling period • ACTION 'D' – The flow rate is estimated at once per 4 hours	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER NOTE: ACTION 'C' is not applicable since the out of service time is expected to exceed the allowable time of 4 hours. **Given in the cue, 2-RM-90-249, Turbine Building Exhaust Radiation Monitor maintenance is expected to last 12 hours.**	

Table 1.1-2 (Page 1 of 2)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Instrument	Minimum Channels/ Devices OPERABLE	Applicability	ACTION
1. STACK (RM-90-147B & -148B)			
a. Noble Gas Monitor	1	*	A/C
b. Iodine Cartridge	1	*	B/C
c. Particulate Filter	1	*	B/C
d. Sampler Flow Abnormal	1	*	C/D
e. Stack Flow (FT, FM, FI-90-271)	1	*	G
2. REACTOR/TURBINE/REFUEL BUILDING VENTILATION ZONE (RM-90-250)			
a. Noble Gas Monitor	1	*	A/C
b. Iodine Sampler	1	*	B/C
c. Particulate Sampler	1	*	B/C
d. Sampler Flowmeter	1	*	C/D
3. TURBINE BUILDING EXHAUST (RM-90-249)			
a. Noble Gas Monitor	1	**	A/C
b. Iodine Sampler	1	**	B/C
c. Particulate Sampler	1	**	B/C
d. Sampler Flowmeter	1	**	C/D
4. TURBINE BUILDING EXHAUST (RM-90-251)			
a. Noble Gas Monitor	1	**	A/C
b. Iodine Sampler	1	**	B/C
c. Particulate Sampler	1	**	B/C
d.Sampler Flowmeter	1	**	C/D
5. RADWASTE BUILDING VENT (RM-90-252)			
a. Noble Gas Monitor	1	*	A/C
b. Iodine Sampler	1	*	B/C
c. Particulate Sampler	1	*	B/C
d. Sampler Flowmeter	1	*	C/D
6. OFFGAS POST TREATMENT			
a. Noble Gas Activity Monitor (RM-90-265, -266)	1	**	F
b. Sample Flow Abnormal (PA-90-262)	1	**	C/D/H

* At all times.
** During releases via this pathway.

Table 1.1-2 (Page 2 of 2)
RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION
TABLE NOTATION

ACTION A
With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via the affected pathway may continue provided a temporary monitoring system is installed or grab samples are taken and analyzed at least once every 8 hours.

ACTION B
With a number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided samples are continuously collected with auxiliary sampling equipment for periods on the order of seven (7) days and analyzed in accordance with the sampling and analysis program specified in Table 2.2-2 within 48 hours after the end of the sampling period.

ACTION C
A monitoring system (this includes the flow instrumentation) may be out of service for 4 hours for functional testing, calibration, or repair without providing, initiating grab sampling, or providing compensatory measures for flow instrumentation.

ACTION D
With the number of channels OPERABLE less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours.

ACTION F
With the number of channels OPERABLE less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue provided grab samples are taken at least once per 8 hours and these samples are analyzed for gross activity within 24 hours. Purging during SI performance is not considered a loss of monitoring capability.

ACTION G
With the number of channels OPERABLE less than required by the Minimum Channels Operable requirement, effluent releases via this pathway may continue provided the flow rate is recorded from 0-FI-90-348 (WRGERMS, Stack Flow Indicator)[BFPER960961]. If both 0-FI-90-271 and 0-FI-90-348 are inoperable, ACTION D applies.

Action H
If RM-90-265 and RM-90-266 are BOTH inoperable, then flow rate is NOT required.

STOP TIME: _____

Job Performance Measure (JPM)

Provide to Applicant

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

You are the Unit 2 Nuclear Unit Senior Operator (NUSO) with the following conditions:

- The Reactor is operating at 100% RTP
- Work Control just notified you that 2-RM-90-249, TURBINE BUILDING EXHAUST RADIATION MONITOR, was just tagged for scheduled maintenance
- Maintenance is expected to last 12 hours

Work Control requests that you ensure compliance with all approved plant procedures for releases.

INITIATING CUE: Given the conditions above, determine the following to ensure compliance for releases via the affected pathway:

- What is/are the required Action(s) to allow releases to continue

Answer:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Job Performance Measure (JPM)

SITE:	BFN	JPM TITLE:	Emergency Action Level Classification
JPM NUMBER:	738-SRO	REVISION:	3

TASK APPLICABILITY:	☒SRO	☐STA	☐UO	☐NAUO
TASK NUMBER / TASK TITLE(S):	S-000-EM-21 / Classify and Declare an Abnormal/Emergency Event			
K/A RATINGS:	SRO 4.6			
K/A STATEMENT:	2.4.41 Knowledge of the Emergency Action Level thresholds and classifications.			
RELATED PRA INFORMATION:	None			
SAFETY FUNCTION:	N/A			

EVALUATION LOCATION:	☐In-Plant	☐ Simulator	☐ Control Room	☐ Lab
	☒ Other - List	Classroom		

APPLICABLE METHOD OF TESTING: ☐ Discussion ☐ Simulate/Walkthrough ☒ Perform

TIME FOR COMPLETION: 15 min TIME CRITICAL (Y/N) Y ALTERNATE PATH (Y/N) N

Developed by: _____ _____
Developer *Date*

(Ensure validator is briefed on exam security per NPG-SPP-17.8.1)
(See JPM Validation Checklist in NPG-SPP-17.8.2)

Validated by: _____ _____
Validator *Date*

Approved by: _____ _____
Site Training Management *Date*

Approved by: _____ _____
Site Training Program Owner *Date*

Job Performance Measure (JPM)

OPERATOR: _____ JPM Number: 738-SRO

SRO _____ DATE: _____

TASK STANDARD: Given plant conditions, the Examinee is expected to declare an ALERT Classification within 15 minutes in accordance with applicable Emergency Preparedness procedures.

Operator Fundamental evaluated:
OF-1 Monitoring Plant Indications and Conditions Closely

PRA: N/A

REFERENCES/PROCEDURES NEEDED: EPIP-1, Attachment 1, HOT INITIATING CONDTIONS-MODES 1-2-3

VALIDATION TIME: 15 minutes

PERFORMANCE TIME: _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

IF UNSAT results are obtained

THEN Retain entire JPM for records. (Otherwise just retain this page.)

SIGNATURE: _____ DATE: _____
EXAMINER

JPM Revision Summary

Rev No.	Effective Date	Pages Affected	Description
0	12/11/2019	ALL	Initial issue
1	10/13/2020	ALL	JPM update
2	02/25/2021	ALL	Procedure update
3	03/13/2021	ALL	Updated JPM
4	04/20/2021	ALL	Revised JPM after Prep Week

Procedure Revisions

Procedure	Revision
EPIP-1, Attachment 1, HOT INITIATING CONDTIONS-MODES 1-2-3	60

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

You are the Shift Manager. Unit 3 is operating at 100% Reactor Power with normal operating plant parameters, with the following plant conditions:

- BFN is currently conducting a Dry Cask Storage Campaign
- Fuel bundle movement is in progress in the Unit 3 Spent Fuel Pool is preparation for loading Dry Casks
- 15 minute average wind speed is 3 mph (at 91 meters)
- 15 minute average wind direction is from 90 degrees (at 91 meters)
- While moving an irradiated fuel bundle, the bundle disengages from the crane and the following conditions occur:
  - Refuel Floor personnel observe the release of gas bubbles from the dropped fuel bundle and evacuate the Refuel Floor
  - FUEL POOL FLOOR AREA RADIATION HIGH (3-RA-90-1A), Panel 3-9-3A, Window 1 alarms
  - REACTOR BUILDING, TURBINE BUILDING, REFUEL ZONE EXHAUST RADIATION HIGH (3-RA-90-250A), Panel 3-9-3A, Window 4 alarms
  - REFUELING ZONE EXHAUST RADIATION HIGH, (3-RA-90-140A), Panel 3-9-3A, Window 34 alarms

Additionally, the following conditions exist:

- **NO** previous Events have been classified; therefore, Emergency Facilities (CECC, TSC. OSC) have **NOT** been staffed
- Emergency Director Judgement shall **NOT** be used as a basis for classification

INITIATING CUE:

Classify the Event and

Record the time of Event Classification, then **IMMEDIATELY** raise your hand.

This JPM is TIME CRITICAL

KEY

RA2:

RA2 - Significant lowering of water level above, or damage to, irradiated fuel.
(1) Uncovery of irradiated fuel in the REFUELING PATHWAY. **OR** (2) Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by alarm on **ANY** of the following radiation monitors: • 1,2,3-RM-90-1A Fuel Pool Floor • 1,2,3-RM-90-142A Reactor Zone Exhaust • 1,2,3-RM-90-250A Reactor, Turbine, Refuel Exhaust • 1,2,3-RM-90-140A Refueling Zone Exhaust **OR** (3) Lowering of spent fuel pool level to 650' 4".

KEY

START TIME: _____

STEP / STANDARD	SAT / UNSAT
EXAMINER NOTE: Hard copies of EPIP-1, Attachment 1, HOT INITIATING CONDTIONS-MODES 1-2-3 will be available.	
EXAMINER NOTE: This JPM is Time Critical, the candidates will have 15 minutes to classify the Event once they understand their task.	
Step 1: Classifies the Event using EPIP-1, Emergency Classification Procedure **3.1 Precautions/Limitations** C. The SM/SED shall assess, classify, and declare an emergency condition within 15 minutes after information is first available to plant operators to recognize that an EAL has been exceeded and to make the declaration promptly upon identification of the appropriate Emergency Classification Level (ECL). Expected Action(s): Refers to EPIP-1, and given the plant conditions Declares an **ALERT – RA2** (Significant lowering of Water Level above, or damage to, irradiated fuel) within 15 minutes based on the following: • Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by alarm on **ANY** of the following radiation monitors: – 3-RM-90-1A, Fuel Pool Floor (alarming) – 3-RM-90-142A, Reactor Zone Exhaust (**NOT** alarming) – 3-RM-90-250A, Reactor, Turbine, Refuel Floor Exhaust (alarming) – 3-RM-90-140A, Refueling Zone Exhaust (alarming) **TIME CLASSIFICATION COMPLETE: _____**	**Critical Step** _____ SAT _____UNSAT _____N/A
EXAMINER CUE: After candidate hands the examiner their documented INITIATING CUE sheet, inform the candidate "Your task is complete."	

STOP TIME:_____

Job Performance Measure (JPM)

Provide to Applicant

****

CLASSROOM: I will explain the initial conditions and state the task to be performed. When your task is given, I will ask if there are any questions before you begin. When you have completed your assigned task, inform the Examiner that your task is complete and you will be escorted to another room to discuss the JPM. When you complete the task successfully, the objective for this Job Performance Measure (JPM) will be satisfied.

****

INITIAL CONDITIONS:

You are the Shift Manager. Unit 3 is operating at 100% Reactor Power with normal operating plant parameters, with the following plant conditions:

- BFN is currently conducting a Dry Cask Storage Campaign
- Fuel bundle movement is in progress in the Unit 3 Spent Fuel Pool is preparation for loading Dry Casks
- 15 minute average wind speed is 3 mph (at 91 meters)
- 15 minute average wind direction is from 90 degrees (at 91 meters)
- While moving an irradiated fuel bundle, the bundle disengages from the crane and the following conditions occur:
  - Refuel Floor personnel observe the release of gas bubbles from the dropped fuel bundle and evacuate the Refuel Floor
  - FUEL POOL FLOOR AREA RADIATION HIGH (3-RA-90-1A), Panel 3-9-3A, Window 1 alarms
  - REACTOR BUILDING, TURBINE BUILDING, REFUEL ZONE EXHAUST RADIATION HIGH (3-RA-90-250A), Panel 3-9-3A, Window 4 alarms
  - REFUELING ZONE EXHAUST RADIATION HIGH, (3-RA-90-140A), Panel 3-9-3A, Window 34 alarms

Additionally, the following conditions exist:

- **NO** previous Events have been classified; therefore, Emergency Facilities (CECC, TSC. OSC) have **NOT** been staffed
- Emergency Director Judgement shall **NOT** be used as a basis for classification

INITIATING CUE:

Classify the Event and

Record the time of Event Classification, then **IMMEDIATELY** raise your hand.

This JPM is TIME CRITICAL