Facility: **Turkey Point Nuclear (PTN) – Units 3 and 4**	Scenario No.: **2**	Op Test No.: **2017-301**
Examiners: ______	Operators:	______ (SRO)
______		______ (RCO)
______		______ (BOP)

Initial Conditions:	The plant is at 100% power (MOL). Online risk is green. B train is protected on both units.
Turnover:	EOOS: B AFW Pump, 3B Isophase Bus Cooler
Critical Tasks:	Close PZR PORV or PORV Block Valve Isolate Feed to the Ruptured S/G

Event.	Malf. No.	Event Type*	Event Description
1	TFH1TV45	I-RCO I-SRO (TS)	PT-3-445, Pressurizer Pressure Instrument, Fails High
2	TAFA213 TFFVV01M	C-BOP C-SRO	CV-3-2011 Fails to Auto Open
3	TFCMM2H4 TFSWV5BA	C-BOP C-SRO	R-19 Fails High LCV-3-6265B Fails to Auto Close
4	TVHHSGC	R-RCO R-SRO (TS) N-BOP	3C SGTL (Shutdown Required)
5	TCB1AMC	C-RCO C-SRO	3A Boric Acid Transfer Pump Trip
6	TVHHSGC	M-RCO M-BOP M-SRO	3C SGTR
7	TFF5AFAF TFF5AFBF	P-RCO	AFW Fails to Actuate
8	TFKC882O	P-BOP	POV-3-4882, ICW to TPCW Hx, Fails to Auto Close

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

SCENARIO SUMMARY

Event 1

Pressurizer Pressure Control Channel, PT-3-445, fails high causing PZR PORV, PCV-3-456, to fail open. The RCO will close the PORV or its Block Valve, MOV-3-535, in accordance with the ARP. The US will enter the 3-ONOP-041.5, PZR Press Control Malfunction, to verify all required actions are complete.

Event 2

The suction pressure on 3B SGFP will lower due to an internal obstruction. The crew will respond using the ARP to validate the low pressure alarm and ensure CV-3-2011 is open. The BOP will open the valve, initiating a medium runback to 85% power. The crew will enter 3-ONOP-089, Turbine Runback, and verify the automatic actions.

Event 3

PRMS Channel R-19, Steam Generator Blowdown, fails high. The blowdown FCVs and Blowdown Tank to canal LCV will get closed signals. The FCVs will close, however, the Blowdown Tank to Canal valve, LCV-3-6265B, will fail to auto close. The BOP will manually close the valve.

Event 4

The 3C Steam Generator will develop a 10 gpm tube leak. The crew will enter in 3-ONOP-071.2, Steam Generator Tube Leakage. The US will determine the leak exceeds the Tech Spec limit of 150 gpd and initate a plant shutdown.

Event 5

During the boration to commence the downpower, the 3A Boric Acid Transfer pump will trip. The RCO will secure the boration in accordance with the ARP. The crew will enter 3-ONOP-046.4, Malfunction of Boron Concentration Control System, and identify the tripped pump. The 3B Boric Acid Transfer pump will be aligned for makeup, and the boration resumed.

Event 6

The 3C S/G leak grows into a tube rupture. The crew takes actions to maximize charging and to isolate letdown. When the leakage exceeds the charging pump capacity with letdown isolated, the crew will trip the reactor and initiate Safety Injection. The crew will enter 3-EOP-E-0, Reactor Trip or Safety Injection.

Event 7

AFW will fail to actuate. The RCO will manually open the steam supply valves to start AFW.

Event 8

Following the Safety Injection, POV-3-4882, ICW to TPCW Hx, will fail to auto close. During the performance of Attachment 3, Prompt Action Verification, the BOP will identify and manually close the valve.

The crew will transition from 3-EOP-E-0 to 3-EOP-E-3 to isolate the ruptured generator and cooldown the RCS. When attempting to isolate the ruptured S/G from the intact S/Gs, it will be unsuccessful due to all of the MSIVs failing open. The crew will then transition to 3-EOP-ECA-3.1, SGTR with Loss of Reactor Coolant – Subcooled Recovery Desired.

The scenario is terminated after the crew transitions to 3-EOP-ECA-3.1 and maximizes charging, or at Lead Evaluator discretion once all critical task have been evaluated.

CRITICAL TASKS		
Event		**Description**
1	**CT1**	**Close PZR PORV or PORV Block Valve** When PZR pressure is less than 2235 psig and the PZR PORV is open, close the PORV or the associated block valve prior to automatic Reactor Trip at 1835 psig. SAFETY SIGNIFICANCE: Failure to isolate the vent path results in direct adverse consequence and significant degradation in the mitigative capability of the plant.
6	**CT2**	**Isolate Feed to Ruptured S/G** During a Steam Generator Tube Rupture, isolate feed to the ruptured SG before the safety valves lift (1085 psig) on an overfill condition. SAFETY SIGNIFICANCE: Failure to control feed to the ruptured S/G can lead to overfill of the ruptured S/G and/or to the release of radioactivity from the ruptured S/G to the environment. An overfilled condition in a S/G increases the potential for damage to unisolable sections of the main steamlines. This increased risk of an unisolable main steamline fault constitutes “a significant reduction of safety margin beyond that irreparably introduced by the scenario.” Additionally, because the overfilled S/G(s) are also ruptured, failure to perform the critical task can lead to the release of fission products to the environment through an unisolable steamline fault. Even if the overfill condition in the ruptured S/G does not cause an unisolable steamline fault, it can still create a high-pressure condition, which leads to the release of fission products to the environment through the S/G PORVs and/or safety valves.

SITE:	**Turkey Point Units 3 and 4 (PTN)**	**Revision #:**	**0-1**
LMS ID:	**L-17-1 N2**	**Rev. Date:**	**1/11/17**
SEG TITLE:	**L-17-1 NRC Exam Scenario 2**		

SEG TYPE: ☐ **Training** ☒ **Evaluation**

PROGRAM: ☐ **LOCT** ☒ **LOIT** ☐ **Other:**

DURATION: **90 minutes**

Developed by:	**Tim Hodge** Instructor/Developer	**7/19/17** Date
Reviewed by:	**Val Miklausich** Instructor (Instructional Review)	**8/1/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**7/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**8/3/17** Date
Approved by:	**Mike Murphy** Training Program Owner (Line)	**7/19/17** Date

SCENARIO REFERENCES		
DOC NO.	**TITLE**	**REV**
3-ARP-097.CR	CONTROL ROOM ANNUNCIATOR RESPONSE PROCEDURES	VARIOUS
3-ONOP-041.5	PRESSURIZER PRESSURE CONTROL MALFUNCTION	4
3-ONOP-046.4	MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM	0
3-ONOP-067	RADIOACTIVE EFFLUENT RELEASE	10
3-ONOP-071.2	STEAM GENERATOR TUBE LEAKAGE	12A
3-ONOP-089	TURBINE RUNBACK	1A
3-EOP-E-0	REACTOR TRIP OR SAFETY INJECTION	13
3-EOP-E-3	STEAM GENERATOR TUBE RUPTURE	10
3-EOP-ECA-3.1	SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED	8
PTN TECH SPEC	PTN TECHNICAL SPECIFICATIONS	303

SIMULATOR EXERCISE GUIDE REQUIREMENTS	
Terminal Objective	Given this simulator scenario and resources normally found in the Control Room, the operating crew will perform Control Room operations IAW approved plant procedures in order to maintain the integrity of the plant and the health and safety of the public.
Enabling Objectives:	Given this simulator scenario and resources normally found in the Control Room, operate in accordance with approved plant procedures, Operations Department Instructions, and management expectations: 1. (ALL) Demonstrate personnel SAFETY awareness in interactions with plant staff and outside agencies. 2. (ALL) Demonstrate ALARA awareness in interactions with plant staff and outside agencies. 3. (ALL) Exchange correct information using 3-point communication/Repeat-backs with Control Room personnel and other plant staff. 4. (ALL) Inform plant personnel and System of plant conditions, as needed. 5. (US) Employ timely and concise crew briefs where appropriate. 6. (ALL) Maintain awareness of plant status and control board indication. 7. (ALL) Correctly diagnose plant situations. 8. (ALL) Solve operational problems as they arise. 9. (RCO/BOP) Manipulate plant controls properly and safely. 10. (ALL) Demonstrate self-checking using STAR and peer checks(when required) 11. (US) Demonstrate command and control of the crew. 12. (US) Coordinate the input of crew members and other plant staff. 13. (US) Utilize the input of crew members and other plant staff. 14. (ALL) Demonstrate conservative decision making. 15. (ALL) Demonstrate teamwork. 16. (ALL) Respond to plant events using procedural guidance (OPs/ONOPs/EOPs) as applicable in accordance with rules of usage. 17. (RCO/BOP) Implement any applicable procedural immediate operator actions without use of references. 18. (SRO) Maintain compliance with Tech Specs. 19. (ALL) Identify/enter applicable Tech Spec action statements. 20. (ALL) Respond to annunciators using ARPs (time permitting). 21. (ALL) Maintain written communication, logs, and documentation as needed to permit post-event reconstruction. Continued on next page

SIMULATOR EXERCISE GUIDE REQUIREMENTS	
	While addressing the following events: 1. PT-3-445, Pressurizer Pressure Instrument, Fails High 2. CV-3-2011 Fails to Auto Open 3. R-19 Fails High LCV-3-6265B Fails to Auto Close 4. 3C SGTL (Shutdown Required) 5. 3A Boric Acid Transfer Pump Trip 6. 3C SGTR 7. AFW Fails to Actuate 8. POV-3-4882, ICW to TPCW Hx, Fails to Auto Close
Prerequisites:	None
Training Resources:	PTN Unit 3 Plant Simulator
Development References:	• TR-AA-220-1003, Initial NRC and Audit Exam Process • TR-AA-230-1000, Systematic Approach to Training Process • TR-AA-230-1007, Conduct of Simulator Training and Evaluation • 0-ADM-232, Time Critical Action Program • OP-AA-100-1000, Conduct Of Operations • OP-AA-103-1000, Reactivity Management • 0-ADM-200, Operations Management Manual • 0-ADM-211, Emergency and Off-Normal Operating Procedure Usage • WCAP-17711-NP, Pressurized Water Reactor Owners Group Westinghouse Emergency Response Guideline Revision 2-Based Critical Tasks
Protected Content:	N/A
Evaluation Method:	Performance Mode
Operating Experience:	None
Risk Significant Operator Actions:	Close PZR PORV or PORV Block Valve Isolate Feed to the Ruptured S/G

TASKS ASSOCIATED WITH THIS SIMULATOR EXERCISE GUIDE

SRO TASK #	TASK TITLE
02028033500	AUTHORIZE UNIT TRIP
02202001300	IDENTIFY/RESPOND TO OFF-NORMAL EVENTS
02041013300	RESPOND TO A PORV MALFUNCTION
02089026300	AUTHORIZE FAST LOAD REDUCTION
02200006300	INVESTIGATE AND CONTROL STEAM GENERATOR TUBE LEAK
02200008500	RESPOND TO A STEAM GENERATOR TUBE RUPTURE
02046049300	RECOVER FROM BORON CONCENTRATION CONTROL SYSTEM MAKEUP FAILURES
02200009300	RESPOND TO UNIT RUNBACK
02200001500	RESPOND TO UNIT TRIP
02200022500	DIAGNOSE CAUSE OF SAFEGUARDS ACTUATION
02041029300	EVALUATE AND RESPOND TO A LOW PRESSURIZER PRESSURE
02063008500	VERIFY SI OPERATION
02200002500	EVALUATE CRITICAL SAFETY FUNCTION (CSF) STATUS TREE OUTPUT

RO TASK #	TASK TITLE
01041013100	RESPOND TO A PORV MALFUNCTION
01041029300	EVALUATE AND RESPOND TO A LOW PRESSURIZER PRESSURE
01074011300	CONTROL S/G LEVEL MANUALLY WITH MAIN FRVS
01028015100	ADJUST POWER LEVEL
01089026300	RESPOND TO / ADJUST TURBINE DURING FAST LOAD REDUCTION
01046007100	BORATE THE RCS VIA THE BLENDER
01046049300	RECOVER FROM BORON CONCENTRATION CONTROL SYSTEM MAKEUP FAILURES
01071001100	ADJUST STEAM GENERATOR BLOWDOWN
01200006300	INVESTIGATE AND CONTROL STEAM GENERATOR TUBE LEAK
01200008500	RESPOND TO A STEAM GENERATOR TUBE RUPTURE
01200001500	RESPOND TO UNIT TRIP
01200022500	DIAGNOSE CAUSE OF SAFEGUARDS ACTUATION
01200044500	RESPOND TO HIGH STEAM GENERATOR LEVEL
01200009300	RESPOND TO UNIT RUNBACK

UPDATE LOG:	
NOTES:	Place this form with the working copies of lesson plans and/or other materials to document changes made between formal revisions. For fleet-wide training materials, keep electronic file of this form in same folder as approved materials. Refer to TR-AA-230-1003 SAT Development for specific directions regarding how and when this form shall be used.

Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / REVIEWER	DATE / DATE
0-0	Initial Revision	L-17-1 NRC Exam	N/A	Note 5 Note 5	Note 5 Note 5
0-1	Validation Comments	NRC Prep Week	N/A	T.Hodge M.Wilson	10/5/17 10/5/17
0-2					
0-3					
0-4					
0-5					

1. Individual updating lesson plan or training material shall complete the appropriate blocks on the Update Log.
2. Describe the change to the lesson plan or training materials.
3. State the reason for the change (e.g., reference has changed, typographical error, etc.)
4. Preparer enters name/date on the Update Log and obtains Training Supervisor approval.
5. Initial dates and site approval on cover page.

SCENARIO SUMMARY

Initial Conditions:
The plant is at 100% power (MOL). Online risk is green. B train is protected on both units

Equipment OOS
B AFW Pump, 3B Isophase Bus Cooler

Event 1
Pressurizer Pressure Control Channel, PT-3-445, fails high causing PZR PORV, PCV-3-456, to fail open. The RCO will close the PORV or its Block Valve, MOV-3-535, in accordance with the ARP. The US will enter the 3-ONOP-041.5, PZR Press Control Malfunction, to verify all required actions are complete.

Event 2
The suction pressure on 3B SGFP will lower due to an internal obstruction. The crew will respond using the ARP to validate the low pressure alarm and ensure CV-3-2011 is open. The BOP will open the valve, initiating a medium runback to 85% power. The crew will enter 3-ONOP-089, Turbine Runback, and verify the automatic actions.

Event 3
PRMS Channel R-19, Steam Generator Blowdown, fails high. The blowdown FCVs and Blowdown Tank to canal LCV will get closed signals. The FCVs will close, however, the Blowdown Tank to Canal valve, LCV-3-6265B, will fail to auto close. The BOP will manually close the valve.

Event 4
The 3C Steam Generator will develop a 10 gpm tube leak. The crew will enter in 3-ONOP-071.2, Steam Generator Tube Leakage. The US will determine the leak exceeds the Tech Spec limit of 150 gpd and initate a plant shutdown.

Event 5
During the boration to commence the downpower, the 3A Boric Acid Transfer pump will trip. The RCO will secure the boration in accordance with the ARP. The crew will enter 3-ONOP-046.4, Malfunction of Boron Concentration Control System, and identify the tripped pump. The 3B Boric Acid Transfer pump will be aligned for makeup, and the boration resumed.

Event 6
The 3C S/G leak grows into a tube rupture. The crew takes actions to maximize charging and to isolate letdown. When the leakage exceeds the charging pump capacity with letdown isolated, the crew will trip the reactor and initiate Safety Injection. The crew will enter 3-EOP-E-0, Reactor Trip or Safety Injection.

Event 7
AFW will fail to actuate. The RCO will manually open the steam supply valves to start AFW.

Event 8
Following the Safety Injection, POV-3-4882, ICW to TPCW Hx, will fail to auto close. During the performance of Attachment 3, Prompt Action Verification, the BOP will identify and manually close the valve.

The crew will transition from 3-EOP-E-0 to 3-EOP-E-3 to isolate the ruptured generator and cooldown the RCS. When attempting to isolate the ruptured S/G from the intact S/Gs, it will be unsuccessful due to all of the MSIVs failing open. The crew will then transition to 3-EOP-ECA-3.1, SGTR with Loss of Reactor Coolant – Subcooled Recovery Desired.

The scenario is terminated after the crew transitions to 3-EOP-ECA-3.1 and maximizes charging, or at Lead Evaluator discretion once all critical task have been evaluated.

CRITICAL TASKS		
Event		**Description**
1	**CT1**	**<u>Close PZR PORV or PORV Block Valve</u>** When PZR pressure is less than 2235 psig and the PZR PORV is open, close the PORV or the associated block valve prior to automatic Reactor Trip at 1835 psig. SAFETY SIGNIFICANCE: Failure to isolate the vent path results in direct adverse consequence and significant degradation in the mitigative capability of the plant.
6	**CT2**	**<u>Isolate Feed to Ruptured S/G</u>** During a Steam Generator Tube Rupture, isolate feed to the ruptured SG before the safety valves lift (1085 psig) on an overfill condition. SAFETY SIGNIFICANCE: Failure to control feed to the ruptured S/G can lead to overfill of the ruptured S/G and/or to the release of radioactivity from the ruptured S/G to the environment. An overfilled condition in a S/G increases the potential for damage to unisolable sections of the main steamlines. This increased risk of an unisolable main steamline fault constitutes “a significant reduction of safety margin beyond that irreparably introduced by the scenario.” Additionally, because the overfilled S/G(s) are also ruptured, failure to perform the critical task can lead to the release of fission products to the environment through an unisolable steamline fault. Even if the overfill condition in the ruptured S/G does not cause an unisolable steamline fault, it can still create a high-pressure condition, which leads to the release of fission products to the environment through the S/G PORVs and/or safety valves.

SEQUENCE OF EVENTS	
Event	**Description**
1	PT-3-445, Pressurizer Pressure Instrument, Fails High
2	CV-3-2011 Fails to Auto Open
3	R-19 Fails High LCV-3-6265B Fails to Auto Close
4	3C SGTL (Shutdown Required)
5	3A Boric Acid Transfer Pump Trip
6	3C SGTR
7	AFW Fails to Actuate
8	POV-3-4882, ICW to TPCW Hx, Fails to Auto Close

SIMULATOR SET UP INSTRUCTIONS	
Check	**Action**
1. _____	Restore IC-1 (100% MOL) or equivalent IC.
2. _____	Unfreeze the Simulator.
3.	*N/A if using saved IC* Perform the following to setup the IC: • Borate 50 gallons • Reduce Turbine Load 8-10 MWe • Return to AUTO and clear Totalizers
4. _____	Open & execute lesson file L-17-1 N2.lsn
5. _____	Trigger the following setup steps: • SETUP – B AFW PUMP OOS • SETUP – 3B ISOPHASE COOLER OOS • SETUP – AFW FAILS TO ACTUATE • SETUP – CV-2011 FAILS TO AUTO OPEN • SETUP – POV-4882 FAILS TO AUTO CLOSE Verify the following steps are in the CONDITIONAL state: • EVENT 5 – 3A BATP TRIPS • EVENT 8 – ALLOW POV-4882 TO CLOSE
6. _____	Place ECO tags on the following components: • B AFW Pump • 3B Isophase Bus Cooler
7. _____	Remove placard above B AFW pump tachometer.
8. _____	Ensure Rod Group Step Counters have completed stepping out.
9. _____	Allow the plant to stabilize.
10. _____	Acknowledge any alarms and freeze Simulator.
11. _____	Ensure B train is protected train on VPA.
12. _____	Ensure a copy of 3-OSP-041.1 is available upon request. (In Booth Acceptable)
13. _____	Perform the SIMULATOR OPERATOR CHECKLIST or equivalent.
14. _____	Place TURNOVER SHEETS on RO's desk or give to the Lead Evaluator.

BRIEFINGS

- Shift turnover information is attached to the back of this guide.
- Ensure all applicants are prior briefed on Appendix E of NUREG 1021, Policies and Guidelines For Taking NRC Examinations.
- Conduct a Crew Pre-brief to cover turnover information. Shift turnover information is attached to the back of this guide.

US: ______________________________

RCO: ______________________________

BOP: ______________________________

SCENARIO NOTE
0-ADM-211 Prudent Operator Actions - If redundant stand-by equipment is available and ready, the operator is permitted to start the redundant equipment for failed or failing operating equipment. Immediate follow up of applicable ARPs and ONOPs (AOPs) shall occur as required.

The crew may attempt to solicit information/direction from AOM, SM, etc. DO NOT provide any direction or recommendation. If necessary, ask for their recommendation on how to proceed, and simply concur.

Critical Tasks are highlighted in red.	**Simulator Operator Actions** are highlighted in blue.	**Operator Verifiable Actions** are Highlighted in green.

EVENT 1 – PT-3-445, PRESSURIZER PRESSURE INSTRUMENT, FAILS HIGH		
3-ONOP-041.5, PRESSURIZER PRESSURE CONTROL MALFUNCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR If desired to save SBT data, **trigger START DATA RECORDER.**	US: Conducts shift turnover.
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 1 – PZR PRESSURE (PT-445) FAILS HIGH.** and Verify **EVENT 1 – PORV INTERLOCK FAILS** is in CONDITIONAL state.	
CT1	**Close PZR PORV or PORV Block Valve** When PZR pressure is less than 2235 psig and the PZR PORV is open, close the PORV or the associated block valve prior to automatic Reactor Trip at 1835 psig.	RCO: • Recognizes PORV 456 Open. • Verifies PZR pressure less than 2235. • Closes PORV PCV-3-456 or MOV-3-535 PORV 456 Block Valve
		BOP: Reviews ARP for A4/1, A9/2. • Checks if alarm is due to instrument failure, then refers to 3-ONOP-041.5, Pressurizer Pressure Control Malfunction.
	BOOTH OPERATOR WCC/I&C: Acknowledge the report.	US: Enters and directs actions of 3-ONOP-041.5, PZR Press Control Malfunction, for response.

EVENT 1 – PT-3-445, PRESSURIZER PRESSURE INSTRUMENT, FAILS HIGH		
3-ONOP-041.5, PRESSURIZER PRESSURE CONTROL MALFUNCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Reviews Foldout Page with crew. • 3-EOP-E-0 Transition Criteria • PORV Isolation/Leaking PORV Identification • Open/Leaking PZR Safety Valve Identification • Spurious Actuation of CV-3-311, Auxiliary Spray Valve. **Foldout Page**
		RCO: Check PZR Pressure Control Instrument Loop Not Failed • Check PT-3-444 - NOT FAILED • Check PT-3-445 - NOT FAILED **(NO)** **RNO:** Verify PCV-3-456 OR MOV-3-535 is CLOSED. **Step 1**
		RCO: • Checks PORVs closed • Checks PZR Spray Valves Closed with PZR pressure normal or trending to normal. • Checks PZR Safety Valves closed. • Check PZR Pressure Stable or Increasing. • Check Pressurizer Pressure Above Normal Value **(NO, Go to step 10)** **Steps 2-6**
		RCO: • Check Pressurizer Pressure Low Or Decreasing. • Maintain PZR Pressure Greater Than 2000 psig. • Check PZR Heater Operable • Check If A PORV Is Leaking **(NO, Go to Step 15)** **Steps 10-13**

EVENT 1 – PT-3-445, PRESSURIZER PRESSURE INSTRUMENT, FAILS HIGH		
3-ONOP-041.5, PRESSURIZER PRESSURE CONTROL MALFUNCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO: • Determine If A Leaking PZR Safety Is Causing Pressure To Decrease **(NO)** • Determine If RCS Leakage Is Causing • Pressure To Decrease **(NO)** • Check Pressurizer Pressure Decreasing **(NO, Go to Step 20)** **Steps 15-17**
		RCO: • Check RCS Pressure Stable • Check If Automatic Pressure Control Can Be Established • Establish Automatic Pressurizer Pressure Controls • Check PORV NOT Leaking • Request Shift Manager Review Plant Technical Specifications For Failed Equipment • Go To Appropriate Procedure As Determined By The Shift Manager **Steps 20-25**
	BOOTH OPERATOR WCC/I&C: Acknowledge the report.	BOP: Notifies WCC to initiate PWO and I&C for troubleshooting.
	NOTE PZR Pressure is LESS THAN limit specified in COLR (2204 psig).	US: Review Tech Specs • LCO 3.2.5.b, DNB Parameters, PZR Pressure less than limit in COLR – Action, restore within 2-hrs or be <5% within next 4-hrs.
	LEAD EVALUATOR When the crew stabilizes RCS pressure, or at Lead Evaluator discretion, proceed to the next event.	US: Conducts crew brief.

EVENT 2 – CV-3-2011 FAILS TO AUTO OPEN		
3-ARP-097.CR.D, D6/3 – SGFP B SUCTION LO PRESS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by Lead Evaluator, **trigger EVENT 2 – 3B SGFP SUCTION PRESSURE.** and Verify **EVENT 2 – ALLOW CV-2011 TO OPEN** is in CONDITIONAL state.	BOP: Reports low suction pressure on 3B Steam Generator Feed Pump.
	NOTE IOAs for Turbine Runback are listed on the next page.	RCO: Reviews ARP for D6/3, SGFP B SUCTION LO PRESS
	BOOTH OPERATOR When CV-3-2011 switch is taken to open, verify **EVENT 2 – ALLOW CV-2011 TO OPEN triggers**. **BOOTH OPERATOR** • Acknowledge communications. • When asked, report all feed train components are operating normal.	BOP: • Check PI-3-1628 on console • Check DCS for PIT-3-1628 • If suction pressure is less than 250 psig, ensure CV-3-2011 open **(NO, Open CV-3-2011)** • Check feed train components for correct operation
	BOOTH OPERATOR Acknowledge requests for support and troubleshooting of 3B SGFP. Report the following, as appropriate: • 3B SGFP is operating normally • Continued operation at current power levels is fine, but do not raise power • Pump is being continuously monitored, will contact if conditions degrade	US: Transitions to 3-ONOP-089, Turbine Runback, to verify automatic actions.

EVENT 2 – CV-3-2011 FAILS TO AUTO OPEN		
3-ONOP-089, TURBINE RUNBACK		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Enters and directs the actions of 3-ONOP-089, Turbine Runback.
	NOTE Steps 1 and 2 are Immediate Operator Actions.	BOP: Verify power is less than 85% AND SGFP was lost **(NO)** **IOA Step 1**
	LEAD EVALUATOR After CV-3-2011 has been opened and the runback IOAs completed, or at Lead Evaluator discretion, proceed to the next event.	RCO/BOP: Check for proper operation of the following: • Steam Dumps • Turbine • Auto Rod Insertion to match T_{avg}/T_{ref} • Main Feedwater Valves • Pressurizer **IOA Step 2**
		BOP: Check Steam Generator levels stabilized and on program. **Step 1**
		RCO: Check T_{avg} is maintained within $\pm 3°F$ of T_{ref}. **Step 2**
		BOP: Check Steam Generator pressures stabilizing. **Step 3**
		RCO: • Check Pressurizer Level stabilizing and trending to Program Level. • Check Pressurizer Pressure stabilizing and trending to 2235 psig. **Steps 4-5**

EVENT 2 – CV-3-2011 FAILS TO AUTO OPEN		
3-ONOP-089, TURBINE RUNBACK		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Check following for proper operation: • Steam Gen Feed Pump Recirc • Condensate Pump Recirc • Heater Drain Pumps • Heater Drain Tank Level Controls • Secondary Heater Level Controls **Step 6**
		Crew: • Monitor Annunciator G 5/1, AXIAL FLUX T.S. LIMIT EXCEEDED –CLEAR. • Monitor Annunciator B 9/2, Axial Flux Tilt - CLEAR • Monitor Annunciator B 8/1, ROD BANK LO LIMIT – CLEAR. • Monitor Annunciator B 8/2 ROD BANK A/B/C/D EXTRA LO LIMIT –CLEAR. **Steps 7-10**
	LEAD EVALUATOR After CV-3-2011 has been opened and the runback IOAs completed, or at Lead Evaluator discretion, proceed to the next event.	

EVENT 3 – R19 FAILS HIGH		
3-ONOP-071.2, STEAM GENERATOR TUBE LEAKAGE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 3 – R19 FAILS HIGH** and Verify **EVENT 3 – ALLOW LCV-6265B TO CLOSE** is in CONDITIONAL state.	RCO: Addresses ARP for H1/4 • Verifies alarm is on R-3-19 • Refers to 3-ONOP-071.2, Steam Generator Tube Leakage
		US: Directs response per 3-ONOP-071.2.
	BOOTH OPERATOR • When LCV-3-6275B is closed, verify **EVENT 3 – ALLOW LCV-6265B TO CLOSE triggers.** • If asked, there is no flow at the S/G sample flow indicators.	US: Reviews Foldout Page with the crew. • 3-EOP-E-0 Transition Criteria • Control Room Ventilation Manual Isolation Criteria • Turbine Load Within 10% Of Target Power Level • Blowdown Release Path Isolation **(YES, Verify the following)** – FCV-3-6278A/B/C Closed – LCV-3-6265B **(NO, Close)** – No S/G Sample flow • AFW Steam Supply Release Path Isolation **Foldout Page**
	NOTE This is a continuous action step.	RCO: Monitor Affected Plant Parameters • Checks PRZ Level - STABLE OR INCREASING – Start Charging Pumps and isolate Letdown as required. – IF PRZ level can NOT be maintained, THEN, manually trip the reactor. **Step 1**
	LEAD EVALUATOR When the crew completes Blowdown Release Path Isolation, or at Lead Evaluator discretion, proceed to the next event.	BOP: Check High Alarm ON For The Following PRMS Channels: • Check R-15 High Alarm light – ON **Step 2**

EVENT 4 – 3C SGTL		
3-ONOP-071.2, STEAM GENERATOR TUBE LEAKAGE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by Lead Evaluator, **trigger EVENT 4 – 3C SGTL.**	BOP: Addresses ARP for H1/4 • Verifies alarm is on R-3-15 • Refers to 3-ONOP-071.2, Steam Generator Tube Leakage
	NOTE 3C S/G Tube leak is ~10 gpm.	US: Directs response per 3-ONOP-071.2.
		US: Reviews Foldout Page with the crew. • 3-EOP-E-0 Transition Criteria • Control Room Ventilation Manual Isolation Criteria • Turbine Load Within 10% Of Target Power Level • Blowdown Release Path Isolation • AFW Steam Supply Release Path Isolation **Foldout Page**
	NOTE This is a continuous action step.	RCO: Monitor Affected Plant Parameters • Checks PRZ Level - STABLE OR INCREASING – Start Charging Pumps and isolate Letdown as required. – IF PRZ level can NOT be maintained, THEN, manually trip the reactor. **Step 1**
		BOP: Check High Alarm ON For The Following PRMS Channels: • Check R-15 High Alarm light – ON **Step 2**

EVENT 4 – 3C SGTL		
3-ONOP-071.2, STEAM GENERATOR TUBE LEAKAGE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Check PRMS Channel R-15 Alarm Valid As Follows • Check readout on affected channel - GREATER THAN OR EQUAL TO ALARM SETPOINT • Check R-15 operability: - RDU green OPERATE LED - ON - Plus sign (+) – ROTATING **Step 3**
		BOP: Check PRMS Channels R-19 For Proper Operation: • Check R-19 High Alarm light – ON **(NO)** **Step 4**
		BOP: Check The Following Radiation Monitors: • Check RAD-3-6417 (SJAE SPING) – ALARM CLEAR • Check RAD-6426 (DAM-1 Monitor) – ALARM CLEAR **Step 5**
		BOP: Checks PRMS Channel Counts – INCREASING OR STABLE AT HIGHER VALUE • R-3-15 **(YES)** • R-3-19 **Step 6**

EVENT 4 – 3C SGTL		
3-ONOP-071.2, STEAM GENERATOR TUBE LEAKAGE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR If asked, there is no flow at the S/G sample flow indicators.	BOP: Check R-3-19 HI ALARM – CLEAR • When the R-3-19 HI ALARM comes in verify the following: – Verify Steam Generator Blowdown Flow Control Valves FCV-3-6278A, B, and C closed – Verify Blowdown Tank to Canal Level Control Valve, LCV-3-6265B is Closed. – Verify NO FLOW on S/G Sample Flow Indicators at the Cold Chem Lab. (Ensures Sample Valves SV-3-2800, SV-3-2801, SV-3-2802 are Closed). **Step 7**
		US: Approximate Tube Leakage: • Determines leakage to be ~10 gpm using any or all off the following: 1. 3-OSP-041.1, RCS LEAK RATE CALCULATION 2. Unit 3 SJAE SPING Primary to Secondary Leak Rate Graph in the Plant Curve Book (Section 5, Figure 14) AND record on ATTACHMENT 7 3. Unit 3 R-15 Primary to Secondary Leak Rate Graph in the Plant Curve Book (Section 5, Figure 15) AND record on ATTACHMENT 7 **Step 8**

EVENT 4 – 3C SGTL		
3-ONOP-071.2, STEAM GENERATOR TUBE LEAKAGE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When RP is asked to check secondary radiation, wait 5-10 min and report 3C MSL radiation > background with the SJAE discharge contaminated. **BOOTH OPERATOR** When Chemistry is asked to sample S/Gs for radiation, wait 5-10 min and report counts highest on 3C SG sample. **NOTE** When identified, FOP criteria for AFW Steam Supply Isolation apply. Those steps are listed on the next page.	BOP: Identify Leaking S/G: • Monitor the following for S/G tube leak indications – Unexplained increase in any S/G level High radiation detected on a S/G sample – High radiation detected on a main steam line – High radiation detected on AFW steam supply line (if running) – High radiation detected from a S/G Blowdown line – Unexplained difference between steam flow and feedwater flow – Increasing radiation levels indicated on R-15, R-19, SPING, AND DAM-1 **Step 9.a**
		BOP: Directs Radiation Protection to: • Monitor radiation levels on Main Steam Lines. • Monitor radiation levels on AFW steam supply line (if running). • Monitor radiation levels on S/G Blowdown lines Monitor airborne activity at Steam Jet Air Ejectors. **Step 9.b**
	BOOTH OPERATOR Acknowledge directions	BOP: Directs Chemistry to • Perform 0-NCAP-104, PRIMARY TO SECONDARY LEAK RATE CALCULATION. • Increase S/G sampling frequency as determined by Nuclear Chemistry. • Monitor DAM-1 and SJAE SPING readings. **Step 9.c**

EVENT 4 – 3C SGTL		
3-ONOP-071.2, STEAM GENERATOR TUBE LEAKAGE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR Acknowledge direction. Wait 5-7 minutes and then report that 3-007 is bound and will not open, maintenance has been contacted for support. Respond to further questions by saying the valve will not open and maintenance is still attempting to open the valve.	BOP: When the 3C Steam Generator is identified as the affected S/G: • Dispatch an operator to close 3-006 and open 3-007 to provide Train 1 steam to the AFW Pumps. **Foldout Page**
	BOOTH OPERATOR When directed, wait 2-3 minutes and then trigger **EVENT 4 – DEENERGIZE MOV-1405.** Report when complete.	US: Determine If Operation May Continue: • Uses 3-ONOP-071.2 Attachment 3 to determine Action level. • Determines SG Tube Leak > T.S. 3.4.6.2.c (10 gpm Identified Leakage) limit of 150 GPD, Action c be in Mode 3 in 6 hours. **Step 10**
	BOOTH OPERATOR Respond as SM.	US: Notifies the Shift Manager To Review The Following Procedures And Make Any Required Notifications • 0-EPIP-20101, Duties of Emergency Coordinator. • 0-ADM-115, Notification of Plant Events. • Verify NRC Resident notified of Fast Load Reduction and S/G Tube Leakage. **Step 11**
		US/BOP: Complete Attachment 1, Fast Load Reductions Maneuvering Plan **Step 12**
		US: Briefs Control Room Personnel Using ATTACHMENT 2 **Step 13**

EVENT 4 – 3C SGTL		
3-ONOP-071.2, STEAM GENERATOR TUBE LEAKAGE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR Respond to notifications as required	BOP: Notify the Following: • System Dispatch • Plant personnel using Page Boost. • Chemistry to perform RCS TS samples (>15% power change) **Step 14**
	BOOTH OPERATOR When the boration is started, verify **EVENT 5 – 3A BATP TRIPS triggers.**	RCO: Begins Boration For Initial T_{ave} Effect • Sets BA totalizer per Attachment 1 • Place the Reactor Makeup Selector Switch to BORATE • Place the RCS Makeup Control Switch to START • Adjust FC-3-113A, Boric Acid Flow Controller to achieve 40 gpm boric acid flow as indicated on FR-3-113 • WHEN T_{avg} begins to lower from the boration, THEN adjust FC-3-113A, Boric Acid Flow Controller, to the boration rate of ATTACHMENT 1 **Step 15**
EVENT 5 – 3A BORIC ACID TRANSFER PUMP TRIPS (listed on page 27)		
		US: Determine Turbine Load Reduction Control **Step 16**

EVENT 4 – 3C SGTL		
3-ONOP-071.2, STEAM GENERATOR TUBE LEAKAGE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	LEAD EVALUATOR When reactor power has been sufficiently reduced, or at Lead Evaluator discretion, proceed to the next event.	BOP: Initiate Turbine Load reduction in MW CNTRL • Select MW CNTRL • Set TARGET power level – MW VALUE from Attachment 1. • Set RAMP RATE – MW/M VALUE from Attachment 1. • Check T_{avg} 1 to 2° F lower than T_{ref}. • Depress GO • Ensure boric acid flow adjusted to rate from Attachment 1. • Go to Step 21. **Step 17**
	BOOTH OPERATOR Respond as SNPO. If asked, idle Charging Pump ready for start.	RCO: Monitor Load Reduction • Maintain T_{avg}/T_{ref} within ± 4°F • Adjusts boration rate as needed • Take manual control of rod control if necessary to control T_{avg} • Monitors Pressurizer Level to maintain on program. • Start 2nd Chg Pp and place 2nd orifice in service. • Refers to Enclosure 1 for expected alarms. **Step 21**
		BOP: Isolate Miscellaneous Flow paths From Leaking S/G • Verify Blowdown Isolation valve CV-3-6275C for 3C S/G CLOSED **Step 22**

EVENT 4 – 3C SGTL		
3-ONOP-071.2, STEAM GENERATOR TUBE LEAKAGE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed to realign Aux Stm Supply, acknowledge request but take no action at this time.	BOP: Isolate Miscellaneous Flow paths From Leaking S/G • Direct Unit 3 Turbine Operator to realign Aux Stm Supply from U4 per Attachment 8. **Step 22**
		RCO: Monitor Boration Rate During Downpower • Monitor for excessive rod movement by monitoring TR-3-409D, Rod Position Bank D • Determine if Insertion Limit and Bank D position are converging at a rate that will cause rod insertion limit alarms • Adjust Power reduction rate as needed to control rod insertion • Increase boration rate and/or total amount as necessary to limit control rod insertion • Monitor Annunciator B8/1, ROD BANK LO LIMIT – CLEAR • Monitor B8/2 ROD BANK A/B/C/D EXTRA LO LIMIT – CLEAR **Steps 23-25**
		US: • Notify The Shift Manager To Refer To Refer To The Following Procedures: – 0-EPIP-20101, Duties Of Emergency Coordinator – 0-ADM-115, Notification Of Plant Events **Step 26**
	LEAD EVALUATOR When reactor sufficient power has been reduced, or at Lead Evaluator discretion, proceed to the next event.	RCO: Energize Pressurizer Backup Heaters **Step 27**

EVENT 5 – 3A BORIC ACID TRANSFER PUMP TRIPS		
3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE Unit Supervisor may direct RCO to start standby BATP.	BOP: Reviews ARP for A2/5. • Directs RCO to secure makeup. • Refers US to 3-ONOP-046.4.
		RCO: Place RCS Makeup Control Switch to STOP.
	BOOTH OPERATOR WCC/I&C: Acknowledge the report.	US: Enters and directs actions of 3-ONOP-046.4, Malfunction of Boron Concentration Control System, for response.
	NOTE Crew may return to shut down immediately after restoring boric acid flow. Return to shut down as listed in Event 4, page 24.	RCO: • Check Boric Acid Flows Abnormal • Verify RCS Makeup Control Switch In MID Position And Makeup Stopped • Check Reactor Makeup Selector Switch In Borate OR Auto • Check If Additional Boric Acid Should Be Added • Check Boric Acid Flow Rate Equal Or Less Than Expected • Calculate Amount Of Boric Acid Needed • Adjust FC-3-113A For Desired Flow • Set Totalizer for Total Acid Needed • Place Reactor Makeup Selector Switch to Borate • Turn RCS Makeup Control Switch to Start • Check One Of Unit 3 BATP Running **(NO)** – Start 3B Boric Acid Transfer Pump – Place 3A BATP switch to STOP • Check Boric Acid Instrumentation **Steps 1-12**

EVENT 5 – 3A BORIC ACID TRANSFER PUMP TRIPS		
3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO: • Check FCV-3-113B Open • Check Flow Rate As Expected • Check Amount Of Acid Needed Was Added • Check If Additional Primary Water Should Be Added **(NO, Go to Step 41)** **Steps 13-16**
	<u>LEAD EVALUATOR</u> Return to shut down as listed in Event 4, page 24.	US: • Report Failures to Supervisor • Notify NPS To Evaluate Plant Conditions • Check Repairs Complete **(NO, WHEN complete, THEN continue with Step 44)** **Steps 41-43**

EVENT 6 – 3C SGTR		
3-EOP-E-0, RX TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by Lead Evaluator, **trigger EVENT 6 – 3C SGTR.**	RCO: • Reports PZR pressure and level lowering – Starts Available Charging pumps – Maximizes Charging flow – Isolates Letdown • Reports PZR level cannot be maintain within 10% of program • Recommends a Manual Rx trip, SI, and Phase A
		US: • Directs 3-EOP-E-0 response after auto Reactor trip. OR • Directs RCO to manually trip the Reactor, then for operators to perform their IOA's.
		RCO: • Manually trips Reactor. • After Power is verified, manually actuates SI and Phase A
	NOTE Steps 1 - 4 of 3-EOP-E-0 are Immediate Operator Actions (IOAs). The board operators will call out the high level steps of the IOAs as each step is completed from memory. Once the IOAs are complete the read though Steps 1 – 4 with the crew.	RO/BOP: Perform IOA's.
		RCO: Verifies Reactor Trip **Step 1**
		BOP: Verify Turbine Trip **Step 2**

EVENT 6 – 3C SGTR		
3-EOP-E-0, RX TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Verifies Power To Emergency 4 KV Buses **Step 3**
		RCO: Checks If SI Is Actuated **Step 4**
		RCO: Checks if SI is required: • Manually actuate SI. • Manually actuate Containment Isolation Phase A. **Step 4 RNO**
		US: Directs 3-EOP-E-0 response and reviews the IOAs.
CT2 ____________	**<u>Isolate Feed To Ruptured S/G</u>** During a Steam Generator Tube Rupture, isolate feed to the ruptured SG before the safety valves lift (1085 psig) on an overfill condition.	US: Reviews FOP for 3-EOP-E-0 with the crew • Adverse Containment Conditions • RCP Trip Criteria • Faulted S/G Isolation Criteria • Ruptured S/G Isolation Criteria **(YES)** – When 3C S/G narrow range level is greater than 7%[27%], close CV-3-2818, CV-3-2833 • AFW System Operation Criteria • CST Makeup Water Criteria • RHR System Operation Criteria **(YES, RCO starts timer)** • Loss Of Offsite Power Or SI On Other Unit • Loss Of Charging Criteria **Foldout Page**

EVENT 6 – 3C SGTR		
3-EOP-E-0, RX TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE Attachment 3 actions start on page 37.	BOP: Continues with ATTACHMENT 3 to complete The Prompt Action Verifications. **Step 5**
EVENT 7 – AFW FAILS TO ACTUATE		
	NOTE Crew may only open MOV-3-1403/1404 due to being supplied from intact S/Gs and reducing radioactive release.	RCO: Check AFW Pumps – AT LEAST TWO RUNNING **(NO, Open steam supply MOVs)** **Step 6**
END OF EVENT 7		
		RCO: • Verify AFW Valve Alignment – PROPER EMERGENCY ALIGNMENT **Step 7**
		RCO: Verify Proper AFW Flow: • Check Narrow Range Level in at least one S/G – GREATER THAN 7%[27%] • Maintain feed flow to S/G until Narrow Range Levels between 21%[27%] and 50% **Step 8**
		RCO: Check RCP Seal Cooling: **Step 9**

EVENT 6 – 3C SGTR		
3-EOP-E-0, RX TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO: • Check any RCPs running • Check T_{avg} stable between 545ºF and 547ºF or trending down to 547ºF. **(NO)** – Stop dumping steam – IF cooldown continues AND is due to excessive feed flow, THEN reduce total feed flow to 400 gpm until Narrow Range Level greater than 7%[27%] in at least one S/G. – IF cooldown continues AND is due to excessive steam flow… **Step 10**
		RCO: Check PRZ PORVs, Spray Valves And Excess Letdown Isolated: **Step 11**
		RCO: Check If RCPs Should Be Stopped: **Step 12**
		RCO: Check If S/Gs Are Faulted: **(NO, Go to Step 14)** **Step 13**
	<u>BOOTH OPERATOR</u> If Chemistry or RP is called, local secondary radiation readings indicate a 3C SGTR.	RCO: Check If S/G Tubes Are Ruptured: **(YES, 3C S/G Ruptured)** **Step 14**
		US: • Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES • Go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1

EVENT 6 – 3C SGTR		
3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Directs 3-EOP-E-3 response. <u>Reviews Foldout Page</u> • Adverse Containment Setpoints • RCP Trip Criteria • SI Re-Initiation Criteria • Secondary Integrity Criteria • Cold Leg Recirculation Switchover Criteria • CST Makeup Water Criteria • Multiple Tube Rupture Criteria • Loss Of Offsite Power Or SI On Other Unit • RHR System Operation Criteria **(YES)** **Foldout Page**
		RCO: • Checks If RCPs Should Be Stopped **Step 1**
	<u>BOOTH OPERATOR</u> If RP is called, report the radiation readings on 3C SG lines are higher than normal.	RCO: Identify Ruptured S/G: • Identify 3C as the Ruptured S/G • Directs RP to take rad readings on Main Steam and Blowdown Lines • Evaluates DAM1 on DCS • Determines ruptured SG by level increase or radiation **Step 2**

EVENT 6 – 3C SGTR		
3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE MOV-3-1405 may already be closed.	BOP: Isolate Flow From Ruptured S/G a. Adjusts 3C S/G Steam Dump To Atmosphere controller setpoint to 1060 psig b. Checks 3C S/G Steam Dump To Atmosphere Closed. – WHEN ruptured S/G pressure is less than 1060 psig, THEN Verify S/G Steam Dump to Atmosphere is closed. c. Close steam supply valves from ruptured 3C S/G to AFW Pumps using Attachment 19 d. Close Blowdown Isolation valve on ruptured S/G, CV-3-6275C e. Close ruptured S/G (3C) MSIV **(NO)** **RNO:** Close all remaining MSIVs **(NO, None will close)** **Step 3**
	LEAD EVALUATOR This is the earliest possible opportunity to terminate the scenario. The terminating cue is on page 36.	US: Go to 3-EOP-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED, Step 1

EVENT 6 – 3C SGTR		
3-EOP-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Directs 3-EOP-ECA-3.1 response. <u>Reviews Foldout Page</u> • Adverse Containment Setpoints • SI Re-Initiation Criteria • Secondary Integrity Criteria • Cold Leg Recirculation Switchover Criteria • CST Makeup Water Criteria • Loss Of Offsite Power Or SI On Other Unit • RHR System Operation Criteria **(YES)** **Foldout Page**
		RCO: • Verify SI Reset • Reset Phase A and Phase B • Verify Instrument Air to CTMT **Steps 1-3**
		BOP: Verify All 4kV Buses Energized By Offsite Power **Step 4**
	<u>BOOTH OPERATOR</u> Acknowledge communications.	RCO: Deenergize PZR Heaters • Position all PZR Heater switches in OFF position • Consult TSC for minimum PZR level to ensure heaters covered • Reset PZR Backup Heater Lockouts using Attachment 4 **Step 5**
		RCO: Check if CTMT Spray Should Be Stopped **Step 6**

EVENT 6 – 3C SGTR

3-EOP-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED

TIME	EVALUATOR ACTIVITIES & NOTES	EXPECTED STUDENT RESPONSE
		BOP: Check Ruptured S/G Level **Step 7**
		RCO: Check if RHR Should Be Stopped **Step 8**
	<u>BOOTH OPERATOR</u> When directed, wait 3-5 minutes and report shield doors closed. Acknowledge all other communication and/or report SAT, as applicable.	BOP: Initiate Evaluation Of Plant Status Using Attachment 8 • Locally Verify Radiation Shield Doors Closed • Check Aux Bldg Radiation Normal • Evaluate Sampling Requirements • Verify ECCS Components Operating Properly **Step 9**
		RCO: Establish Charging Flow • Charging Pumps – AT LEAST ONE RUNNING **(NO, Start one Charging Pump)** • Place RCS Makeup Control switch in STOP • Establish maximum Charging Flow • Verify Charging Pump Suction auto transfers to RWST **Step 10**

The scenario is terminated once the crew maximizes charging, or at Lead Evaluator discretion once all critical task have been evaluated.

***** END OF SCENARIO *****

EVENT 8 – POV-3-4882 FAILS TO AUTO CLOSE		
3-EOP-E-0 ATTACHMENT 3 – PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Check Load Centers Associated With Energized 4 KV Buses – ENERGIZED **Step 1**
		BOP: Verify Feedwater Isolation: • Place Main Feedwater Pump switches in STOP • Feedwater Control Valves – CLOSED • Feedwater Bypass Valves – CLOSED • Feedwater Bypass Isolation Valves – CLOSED • Feedwater Isolation MOVs – CLOSED • Verify Standby Feedwater Pumps – OFF **Step 2**
		BOP: Check If Main Steam Lines Should Be Isolated **Step 3**
		BOP: Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT **Step 4**
		BOP: Verify Pump Operation: • At least two High-Head SI Pumps – RUNNING • Both RHR Pumps – RUNNING **Step 5**

EVENT 8 – POV-3-4882 FAILS TO AUTO CLOSE		
3-EOP-E-0 ATTACHMENT 3 – PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Verify Proper CCW System Operation: • CCW Heat Exchangers – THREE IN SERVICE • CCW Pumps – ONLY TWO RUNNING • CCW Headers – TIED TOGETHER • MOV-3-626, RCP Thermal Barrier CCW Outlet – OPEN **Step 6**
		BOP: Verify Proper ICW System Operation: • Verify ICW Pumps – AT LEAST TWO RUNNING • Verify ICW To TPCW Heat Exchanger – ISOLATED **(NO, Close POV-4882)** • Check ICW Headers – TIED TOGETHER **Step 7**
		BOP: Check Emergency Containment Coolers – ONLY TWO RUNNING **Step 8**
		BOP: Verify Unit 3 Containment Purge Exhaust And Supply Fans – OFF **Step 9**
		BOP: Verify Containment Spray NOT Required: **Step 10**
		BOP: Verify SI – RESET **Step 11**
		BOP: Verify SI Valve Amber Lights On VPB – ALL BRIGHT **Step 12**

EVENT 8 – POV-3-4882 FAILS TO AUTO CLOSE		
3-EOP-E-0 ATTACHMENT 3 – PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Verify SI Flow: • RCS pressure – LESS THAN 1625 PSIG[1950 PSIG] • High-Head SI Pump flow indicator – CHECK FOR FLOW • RCS pressure – LESS THAN 275 PSIG[575 PSIG] • RHR Pump flow indicator – CHECK FOR FLOW **Step 13**
	BOOTH OPERATOR When directed, **trigger LOA – ALIGN U4 HHSI TO U3 RWST.** Wait 5 minutes and report local operator steps complete.	BOP: Realign SI System: • Check Procedure Entry Status – E-0 ENTERED FROM 3-ONOP-047.1, LOSS OF CHARGING FLOW IN MODES 1 THROUGH 4 **(NO)** • Verify Unit 3 High-Head SI Pumps – TWO RUNNING • Stop both Unit 4 HHSI pumps. • Direct Unit 4 Reactor Operator to align Unit 4 High-Head SI Pump suction to Unit 3 RWST using Attachment 1. **Step 14**
		BOP: Verify Containment Isolation Phase A – RESET **Step 15**
		BOP: Reestablish RCP Cooling: • Check RCPs – AT LEAST ONE RUNNING **(NO, Go to step 17)** **Step 16**
		BOP: Verify Control Room Ventilation Isolation: **Step 17**

EVENT 8 – POV-3-4882 FAILS TO AUTO CLOSE		
3-EOP-E-0 ATTACHMENT 3 – PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When requested, **trigger LOA – PLACE PAHMS IN SERVICE.** Wait 5 minutes and report local operator steps complete.	BOP: Place Hydrogen Monitors In Service Using 3-NOP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM • For Each Hydrogen Monitor A/B – ENSURE FUNCTION SELECTOR switch is in SAMPLE. – PLACE control switch in ANALYZE. – PRESS the REMOTE SELECTOR button. – PRESS the ALARM RESET button. • Dispatch an operator to complete local step of 3-NOP-094 **Step 18**
	BOOTH OPERATOR When called, report that both Unit 4 EDGs are running unloaded.	BOP: Verify All Four EDGs – RUNNING **Step 19**
	BOOTH OPERATOR When called, report both 4kV buses are energized from the Unit 4 SUT and 4D bus is aligned to 4B bus.	BOP: Verify Power To Emergency 4 KV Buses **Step 20**
		BOP: Notify Unit Supervisor Of The Following: • Attachment 3 is complete • Any safeguards equipment that is NOT In the required condition • Status of Containment pressure continuous action **Step 21**

Discussion Points are intentionally NOT included in evaluated scenarios. However, space is available below to document follow-up questions when further information is required to determine an evaluation outcome.

FOLLOW-UP QUESTIONS

QUESTION #1

ANSWER #1

QUESTION #2

ANSWER #2

SIMULATOR POST-SCENARIO RESTORATION:

_______ 1. Restore per Simulator Operator Checklist.

_______ 2. Once exams are complete, restore from SEI-19, Simulator Exam Security.

OPERATIONS SHIFT TURNOVER REPORT

UNIT 3 RISK: GREEN (ACCEPTABLE) PROTECTED TRAIN: B	UNIT 4 RISK: GREEN (ACCEPTABLE) PROTECTED TRAIN: B

ONCOMING CREW ASSIGNMENTS

Shift Mgr:			**Inside SNPO:**	
Field Supv.:			**Outside SNPO:**	
Admin RCO:			**ANPO:**	
Unit 3			**Unit 4**	
Unit Supv.:			**Unit Supv.:**	
RCO:			**RCO:**	
NPO:			**NPO:**	

PLANT STATUS

Unit 3			**Unit 4**	
Mode:	1		**Mode:**	1
Power:	100%		**Power:**	100%
MWe:	844		**MWe:**	842
Gross Leakrate:	0.11 gpm		**Gross Leakrate:**	0.09 gpm
RCS Boron Conc:	831		**RCS Boron Conc:**	642

Operational Concerns:

B AFW pump taken OOS 24 hours ago for an oil change, expected back by the end of tomorrow peak shift. Two trains verified operable.
3B Isophase Fan OOS for fan repair. Estimated completion time is one week. 3A Isophase Fan Guarded.

U3 Anticipated LCO Actions:

None

U4 Anticipated LCO Actions:

None

Results of Offgoing Focus Area:

UNIT 3 STATUS

REACTOR OPERATOR

UNIT RISK: GREEN (ACCEPTABLE)   PROTECTED TRAIN: B

Mode:	1
Power:	100%
MWe	844
Tavg:	580°F
RCS Pressure:	2235
RCS Boron Conc:	831

RCS Leakrate	
Gross:	0.11 GPM
Unidentified	0.04 GPM
Charging Pps:	0.00 GPM

Accumulator Ref Levels	
A	6700
B	6700
C	6700

Abnormal Annunciators:

Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	

Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items")

T.S.A.S / Component: Reason: Entry Date:	B AFW pump, 3.7.1.2 – Action 3 Oil Change 24 hours ago
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	

REACTOR OPERATOR (CONT'D)
UNIT RISK: GREEN (ACCEPTABLE)   PROTECTED TRAIN: B
Changes to Risk Significant Equipment:
No recent changes from last shift. OLRM: GREEN PROTECTED TRAIN: B
Upcoming Reactivity Management Activities:
Maintain 98.5% to 99.99% Xe is stable.
Upcoming Major POD Activities:
NONE
Upcoming ECOs to Hang and /or Release:
• Hang – None • Release – None
Evolutions or Compensatory Actions in Progress:
NONE
General Information, Remarks, and Operator Work Around Status:
• Weather forecast is overcast skies with scattered pockets of severe rain. • U3 supplying Aux Steam • Air In-leakage = 0.0 SCFM

Facility: **Turkey Point Nuclear (PTN) – Units 3 and 4**		Scenario No.: **3**	Op Test No.: **2017-301**
Examiners:	____________	Operators:	____________ (SRO)
	____________		____________ (RCO)
	____________		____________ (BOP)

Initial Conditions:	The plant is at 60% power (MOL). Online risk is green. B train is protected on both units.
Turnover:	EOOS: B AFW Pump, 3B Isophase Bus Cooler
Critical Tasks:	Establish HHSI Flow Isolate AFW Flow to Faulted S/G

Event	Malf. No.	Event Type*	Event Description
1	TVF1M87D	I-BOP I-SRO (TS)	FT-3-487, 3B S/G Feed Flow Transmitter, Drifts High
2	TFH1TV60	I-RCO I-SRO (TS)	LT-3-460, Pressurizer Level Transmitter, Fails Low
3	TAKD032	C-BOP C-SRO	3A TPCW Pump Cavitation
4	TVKALTBA TFKV609O	C-RCO C-SRO	3A RCP Thermal Barrier Leak RCV-3-609, CCW Surge Tank Vent, Fails To Auto Close
5	TFC1DRO TVCAPCR2 TFC1DOR2	R-RCO R-SRO N-BOP	3A & 3B CRDM Fans Trip (Shutdown Required)
6	TVHHSGA TVSVV41A	M-RCO M-BOP M-SRO	3A S/G Faulted Rupture
7	TFQ634CF TFQ634DF	P-RCO	All SI Pumps Fail to Auto Start
8	TFKGV4BA TFKGV4AA	P-BOP	Control Room HVAC Fails To Align on SI

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

SCENARIO SUMMARY

Event 1

3B S/G Feed Water Flow transmitter, FT-3-487, drifts high. The BOP will take manual control of 3B S/G level and restore level to normal. The crew may use the ARP or 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection, to select operable channels and restore 3B S/G level control to automatic. The US will enter 3-ONOP-049.1 to verify all required actions are complete and to determine which bistables need to be tripped.

Event 2

Pressurizer Level transmitter, LT-3-460, will fail low. The PZR Heaters will trip and letdown will isolate. The US will enter 3-ONOP-041.6, Pressurizer Level Control Malfunction. The RCO will select an operable channel, re-establish normal letdown flow, and restore PZR level. The US will also enter 3-ONOP-049.1 to verify all required actions are complete and to determine which bistables need to be tripped.

Event 3

The 3A TPCW pump will begin cavitating, as indicated by fluctuating amps. The BOP will start the standby TPCW pump in accordance with the ARP. The US may enter 3-ONOP-008, Turbine Plant Cooling Water Malfunction, to verify all required actions are complete.

Event 4

A thermal barrier leak will develop on the 3A RCP. CCW head tank level and R-17 will begin to rise. The crew will enter the ARP and close RCV-3-609, Head Tank Vent, due to it failing to auto close. When the annunciator for R-17 alarms, the crew will enter the ARP and validate the alarm and verify auto actions have occurred. The US will enter 3-ONOP-067, Radioactive Effluent Release.

Event 5

3A CRDM breaker will fail open. Over the next 60 seconds, amps on the 3B CRDM will continue to rise until it trips on overload. The crew will enter the ARP following the trip of the first CRDM. After the second cooler trips, the crew will transition to 3-GOP-100, Fast Load Reduction, and commence a unit shutdown.

Event 6

The 3A Steam Generator develops a tube rupture. The crew will take actions to maximize charging and to isolate letdown. When the leakage exceeds the charging capacity, the crew will trip the reactor and enter 3-EOP-E-0, Reactor Trip Or Safety Injection. When the reactor trips, RV-1400, A S/G Safety Valve, will fail open.

Event 7

All HHSI pumps will fail to start on the Safety Injection. The RCO will manually start HHSI pumps to establish injection flow to the RCS as indicated on FI-3-943, SI Cold Leg Flow.

Event 8

When SI actuates, Control Room Ventilation fails to properly align for recirculation. The BOP will manually open Emergency Inlet Dampers D-2 and D-3 per 3-EOP-E-0 Attachment 3, Prompt Action Verifications.

The crew will transition from 3-EOP-E-0 to 3-EOP-E-2, Faulted Steam Generator Isolation, to isolate the faulted generator, and then to 3-EOP-E-3, Steam Generator Tube Rupture, to isolate the ruptured generator. The crew will then transition to 3-EOP-ECA-3.1, SGTR with Loss of Reactor or Secondary Coolant – Subcooled Recovery Desired, due to the fault being on the ruptured generator.

The scenario is terminated after the crew transitions to 3-EOP-ECA-3.1 and maximizes charging, or at Lead Evaluator discretion once all critical task have been evaluated.

CRITICAL TASKS		
Event		**Description**
6	**CT1**	**<u>Establish Flow from at least One HHSI Pump</u>** Following a reactor trip and conditions requiring a safety injection, establish flow from at least one HHSI pump prior to RCS pressure lowering to the point of Accumulator Injection. SAFETY SIGNIFICANCE: Failure to manually start at least one HHSI pump that can be manually started from the Control Room would significantly reduce safety margin beyond that irreparably introduced by the scenario.
6	**CT2**	**<u>Isolate AFW Flow to Faulted S/G</u>** During a MSLB stop AFW flow to the faulted Steam Generator prior to reaching an Orange Path on Integrity (Any RCS_{cold} Leg <280°F). SAFETY SIGNIFICANCE: Failure to isolate a Faulted Steam Generator that can be isolated causes an additional challenge to the Integrity Critical Safety Function.

SITE:	**Turkey Point Units 3 and 4 (PTN)**	**Revision #:**	**0-1**
LMS ID:	**L-17-1 N3**	**Rev. Date:**	**1/11/17**
SEG TITLE:	**L-17-1 NRC Exam Scenario 3**		

SEG TYPE: ☐ **Training** ☒ **Evaluation**

PROGRAM: ☐ **LOCT** ☒ **LOIT** ☐ **Other:**

DURATION: **90 minutes**

Developed by:	**Tim Hodge** Instructor/Developer	**7/20/17** Date
Reviewed by:	**Val Miklausich** Instructor (Instructional Review)	**8/1/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**7/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**8/3/17** Date
Approved by:	**Mike Murphy** Training Program Owner (Line)	**7/20/17** Date

SCENARIO REFERENCES		
DOC NO.	**TITLE**	**REV**
3-ARP-097.CR	CONTROL ROOM ANNUNCIATOR RESPONSE PROCEDURES	VARIOUS
3-NOP-030	COMPONENT COOLING WATER SYSTEM	28A
3-ONOP-008	TURBINE PLANT COOLING WATER MALFUNCTION	2
3-ONOP-030	COMPONENT COOLING WATER MALFUNCTION	8A
3-ONOP-041.6	PRESSURIZER LEVEL CONTROL MALFUNCTION	2
3-ONOP-049.1	DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR	4
3-ONOP-067	RADIOACTIVE EFFLUENT RELEASE	10
3-GOP-100	FAST LOAD REDUCTION	13A
3-EOP-E-0	REACTOR TRIP OR SAFETY INJECTION	13
3-EOP-E-2	FAULTED STEAM GENERATOR ISOLATION	4
3-EOP-E-3	STEAM GENERATOR TUBE RUPTURE	10
3-EOP-ECA-3.1	SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED	8
PTN TECH SPEC	PTN TECHNICAL SPECIFICATIONS	303

SIMULATOR EXERCISE GUIDE REQUIREMENTS	
Terminal Objective	Given this simulator scenario and resources normally found in the Control Room, the operating crew will perform Control Room operations IAW approved plant procedures in order to maintain the integrity of the plant and the health and safety of the public.
Enabling Objectives:	Given this simulator scenario and resources normally found in the Control Room, operate in accordance with approved plant procedures, Operations Department Instructions, and management expectations: 1. (ALL) Demonstrate personnel SAFETY awareness in interactions with plant staff and outside agencies. 2. (ALL) Demonstrate ALARA awareness in interactions with plant staff and outside agencies. 3. (ALL) Exchange correct information using 3-point communication/Repeat-backs with Control Room personnel and other plant staff. 4. (ALL) Inform plant personnel and System of plant conditions, as needed. 5. (US) Employ timely and concise crew briefs where appropriate. 6. (ALL) Maintain awareness of plant status and control board indication. 7. (ALL) Correctly diagnose plant situations. 8. (ALL) Solve operational problems as they arise. 9. (RCO/BOP) Manipulate plant controls properly and safely. 10. (ALL) Demonstrate self-checking using STAR and peer checks(when required) 11. (US) Demonstrate command and control of the crew. 12. (US) Coordinate the input of crew members and other plant staff. 13. (US) Utilize the input of crew members and other plant staff. 14. (ALL) Demonstrate conservative decision making. 15. (ALL) Demonstrate teamwork. 16. (ALL) Respond to plant events using procedural guidance (OPs/ONOPs/EOPs) as applicable in accordance with rules of usage. 17. (RCO/BOP) Implement any applicable procedural immediate operator actions without use of references. 18. (SRO) Maintain compliance with Tech Specs. 19. (ALL) Identify/enter applicable Tech Spec action statements. 20. (ALL) Respond to annunciators using ARPs (time permitting). 21. (ALL) Maintain written communication, logs, and documentation as needed to permit post-event reconstruction. Continued on next page

SIMULATOR EXERCISE GUIDE REQUIREMENTS	
	While addressing the following events: 1. FT-3-487, 3B S/G Feed Flow Transmitter, Drifts High 2. LT-3-460, Pressurizer Level Transmitter, Fails Low 3. 3A TPCW Pump Cavitation 4. 3A RCP Thermal Barrier Leak 5. 3A & 3B CRDM Fans Trip (Shutdown Required) 6. 3A S/G Faulted Rupture 7. All SI Pumps Fail to Auto Start 8. Control Room HVAC Fails To Align on SI
Prerequisites:	None
Training Resources:	PTN Unit 3 Plant Simulator
Development References:	• TR-AA-220-1003, Initial NRC and Audit Exam Process • TR-AA-230-1000, Systematic Approach to Training Process • TR-AA-230-1007, Conduct of Simulator Training and Evaluation • 0-ADM-232, Time Critical Action Program • OP-AA-100-1000, Conduct Of Operations • OP-AA-103-1000, Reactivity Management • 0-ADM-200, Operations Management Manual • 0-ADM-211, Emergency and Off-Normal Operating Procedure Usage • WCAP-17711-NP, Pressurized Water Reactor Owners Group Westinghouse Emergency Response Guideline Revision 2-Based Critical Tasks
Protected Content:	N/A
Evaluation Method:	Performance Mode
Operating Experience:	None
Risk Significant Operator Actions:	Establish HHSI Flow Isolate AFW Flow to Faulted S/G

TASKS ASSOCIATED WITH THIS SIMULATOR EXERCISE GUIDE

SRO TASK #	TASK TITLE
02008001300	RESPOND TO TURBINE PLANT COOLING WATER (TPCW) MALFUNCTIONS
02028033500	AUTHORIZE UNIT TRIP
02202001300	IDENTIFY/RESPOND TO OFF-NORMAL EVENTS
02041057300	RESPOND TO PRESSURIZER LEVEL CONTROL CHANNEL MALFUNCTION
02067009300	RESPOND TO PROCESS RADIATION MONITOR ALARM(S)
02200046500	RESPOND TO STEAM GENERATOR LOW LEVEL
02089026300	AUTHORIZE FAST LOAD REDUCTION
02200001500	RESPOND TO UNIT TRIP
02200007500	RESPOND TO A STEAM LINE FAULT
02200008500	RESPOND TO A STEAM GENERATOR TUBE RUPTURE
02200021500	RESPOND TO A LOSS OF COOLANT ACCIDENT
02200022500	DIAGNOSE CAUSE OF SAFEGUARDS ACTUATION
02063008500	VERIFY SI OPERATION
02200002500	EVALUATE CRITICAL SAFETY FUNCTION (CSF) STATUS TREE OUTPUT

RO TASK #	TASK TITLE
01008001300	RESPOND TO TURBINE PLANT COOLING WATER SYSTEM MALFUNCTION
01074011300	CONTROL S/G LEVEL MANUALLY WITH MAIN FRVS
01041057300	RESPOND TO PRESSURIZER LEVEL CONTROL CHANNEL MALFUNCTION
01067009300	RESPOND TO PROCESS RADIATION MONITOR ALARM(S)
01028015100	ADJUST POWER LEVEL
01089026300	RESPOND TO / ADJUST TURBINE DURING FAST LOAD REDUCTION
01046007100	BORATE THE RCS VIA THE BLENDER
01200001500	RESPOND TO UNIT TRIP
01063008500	VERIFY SAFETY INJECTION OPERATION
01200008500	RESPOND TO A STEAM GENERATOR TUBE RUPTURE
01200007500	RESPOND TO A STEAM LINE FAULT
01200021500	RESPOND TO A LOSS OF COOLANT ACCIDENT
01200022500	DIAGNOSE CAUSE OF SAFEGUARDS ACTUATION
01200046500	RESPOND TO STEAM GENERATOR LOW LEVEL

UPDATE LOG:					
NOTES:	Place this form with the working copies of lesson plans and/or other materials to document changes made between formal revisions. For fleet-wide training materials, keep electronic file of this form in same folder as approved materials. Refer to TR-AA-230-1003 SAT Development for specific directions regarding how and when this form shall be used.				
Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.					
#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER	DATE
				REVIEWER	DATE
0-0	Initial Revision	L-17-1 NRC Exam	N/A	Note 5	Note 5
				Note 5	Note 5
0-1	Validation Comments	NRC Prep Week	N/A	T.Hodge	10/5/17
				M.Wilson	10/5/17

1. Individual updating lesson plan or training material shall complete the appropriate blocks on the Update Log.
2. Describe the change to the lesson plan or training materials.
3. State the reason for the change (e.g., reference has changed, typographical error, etc.)
4. Preparer enters name/date on the Update Log and obtains Training Supervisor approval.
5. Initial dates and site approval on cover page.

SCENARIO SUMMARY

Initial Conditions:

The plant is at 60% power (MOL). Online risk is green. B train is protected on both units

Equipment OOS

B AFW Pump, 3B Isophase Bus Cooler

Event 1

3B S/G Feed Water Flow transmitter, FT-3-487, drifts high. The BOP will take manual control of 3B S/G level and restore level to normal. The crew may use the ARP or 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection, to select operable channels and restore 3B S/G level control to automatic. The US will enter 3-ONOP-049.1 to verify all required actions are complete and to determine which bistables need to be tripped.

Event 2

Pressurizer Level transmitter, LT-3-460, will fail low. The PZR Heaters will trip and letdown will isolate. The US will enter 3-ONOP-041.6, Pressurizer Level Control Malfunction. The RCO will select an operable channel, re-establish normal letdown flow, and restore PZR level. The US will also enter 3-ONOP-049.1 to verify all required actions are complete and to determine which bistables need to be tripped.

Event 3

The 3A TPCW pump will begin cavitating, as indicated by fluctuating amps. The BOP will start the standby TPCW pump in accordance with the ARP. The US may enter 3-ONOP-008, Turbine Plant Cooling Water Malfunction to verify all required actions are complete.

Event 4

A thermal barrier leak will develop on the 3A RCP. CCW head tank level and R-17 will begin to rise. The crew will enter the ARP and close RCV-3-609, Head Tank Vent, due to it failing to auto close. When the annunciator for R-17 alarms, the crew will enter the ARP and validate the alarm and verify auto actions have occurred. The US will enter 3-ONOP-067, Radioactive Effluent Release.

Event 5

3A CRDM breaker will fail open. Over the next 60 seconds, amps on the 3B CRDM will continue to rise until it trips on overload. The crew will enter the ARP following the trip of the first CRDM. After the second cooler trips, the crew will transition to 3-GOP-100, Fast Load Reduction, and commence a unit shutdown.

Event 6

The 3A Steam Generator develops a tube rupture. The crew will take actions to maximize charging and to isolate letdown. When the leakage exceeds the charging capacity, the crew will trip the reactor and enter 3-EOP-E-0, Reactor Trip Or Safety Injection. When the reactor trips, RV-1400, A S/G Safety Valve, will fail open.

Event 7

All HHSI pumps will fail to start on the Safety Injection. The RCO will manually start HHSI pumps to establish injection flow to the RCS as indicated on FI-3-943, SI Cold Leg Flow.

Event 8

When SI actuates, Control Room Ventilation fails to properly align for recirculation. The BOP will manually open Emergency Inlet Dampers D-2 and D-3 per 3-EOP-E-0 Attachment 3, Prompt Action Verifications.

The crew will transition from 3-EOP-E-0 to 3-EOP-E-2, Faulted Steam Generator Isolation, to isolate the faulted generator, and then to 3-EOP-E-3, Steam Generator Tube Rupture, to isolate the ruptured generator. The crew will then transition to 3-EOP-ECA-3.1, SGTR with Loss of Reactor or Secondary Coolant – Subcooled Recovery Desired, due to the fault being on the ruptured generator.

The scenario is terminated after the crew transitions to 3-EOP-ECA-3.1 and maximizes charging, or at Lead Evaluator discretion once all critical task have been evaluated.

CRITICAL TASKS		
Event		**Description**
6	**CT1**	**<u>Establish Flow from at least One HHSI Pump</u>** Following a reactor trip and conditions requiring a safety injection, establish flow from at least one HHSI pump prior to RCS pressure lowering to the point of Accumulator Injection. SAFETY SIGNIFICANCE: Failure to manually start at least one HHSI pump that can be manually started from the Control Room would significantly reduce safety margin beyond that irreparably introduced by the scenario.
6	**CT2**	**<u>Isolate AFW Flow to Faulted S/G</u>** During a MSLB stop AFW flow to the faulted Steam Generator prior to reaching an Orange Path on Integrity (Any RCS_{cold} Leg <280°F). SAFETY SIGNIFICANCE: Failure to isolate a Faulted Steam Generator that can be isolated causes an additional challenge to the Integrity Critical Safety Function.

SEQUENCE OF EVENTS	
Event	**Description**
1	FT-3-487, 3B S/G Feed Flow Transmitter, Drifts High
2	LT-3-460, Pressurizer Level Transmitter, Fails Low
3	3A TPCW Pump Cavitation
4	3A RCP Thermal Barrier Leak
5	3A & 3B CRDM Fans Trip (Shutdown Required)
6	3A S/G Faulted Rupture
7	All SI Pumps Fail to Auto Start
8	Control Room HVAC Fails To Align on SI

SIMULATOR SET UP INSTRUCTIONS	
Check	**Action**
1. _____	Restore IC-24 (60% MOL) or equivalent IC.
2. _____	Unfreeze the Simulator.
3. _____	Perform the following to setup the IC: • Reduce letdown to one orifice in service (close CV-3-200B) • Reduce charging to one pump running (secure 3C Charging Pump) • Place 3C Charging Pump controller in Manual @ 20% demand • Stabilize letdown/charging flow balance
4. _____	Open & execute lesson file L-17-1 N3.lsn
5. _____	Trigger the following setup steps: • SETUP – B AFW PUMP OOS • SETUP – 3B ISOPHASE COOLER OOS • SETUP EVENT 4 – RV-609 FAILS TO AUTO CLOSE • SETUP EVENT 7 – ALL HHSI PPS FAIL TO AUTO START • SETUP EVENT 8 – DAMPERS FAIL TO AUTO OPEN Verify the following steps are in the CONDITIONAL state: • EVENT 8 – ALLOW OPENING D2 • EVENT 8 – ALLOW OPENING D3
6. _____	Place ECO tags on the following components: • B AFW Pump • 3B Isophase Bus Cooler
7. _____	Remove placard above B AFW pump tachometer.
8. _____	Ensure Rod Group Step Counters have completed stepping out.
9. _____	Allow the plant to stabilize.
10. _____	Acknowledge any alarms and freeze Simulator.
11. _____	Ensure B train is protected train on VPA.
12. _____	Perform the SIMULATOR OPERATOR CHECKLIST or equivalent.
13. _____	Place TURNOVER SHEETS on RO's desk or give to the Lead Evaluator.

BRIEFINGS

- Shift turnover information is attached to the back of this guide.
- Ensure all applicants are prior briefed on Appendix E of NUREG 1021, Policies and Guidelines For Taking NRC Examinations.
- Conduct a Crew Pre-brief to cover turnover information. Shift turnover information is attached to the back of this guide.

US: ______________________________

RCO: ______________________________

BOP: ______________________________

SCENARIO NOTE

0-ADM-211 Prudent Operator Actions - If redundant stand-by equipment is available and ready, the operator is permitted to start the redundant equipment for failed or failing operating equipment. Immediate follow up of applicable ARPs and ONOPs (AOPs) shall occur as required.

The crew may attempt to solicit information/direction from AOM, SM, etc. DO NOT provide any direction or recommendation. If necessary, ask for their recommendation on how to proceed, and simply concur.

Critical Tasks are highlighted in red.	Simulator Operator Actions are highlighted in blue.	Operator Verifiable Actions are Highlighted in green.

EVENT 1 – FT-3-487, 3B S/G FEED FLOW TRANSMITTER, DRIFTS HIGH		
3-ONOP-049.1, DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CH		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE Ensure the Simulator is in **RUN** before the crew enters the Simulator.	US: Conducts shift turnover.
	BOOTH OPERATOR When directed by Lead Evaluator, **trigger EVENT 1 – FT-3-487 DRIFTS HIGH**	BOP: Recognizes and reports FT-3-487 failure. **PROMPT ACTIONS** • Takes manual control of 3B S/G level control valve, FCV-3-488. • Restores 3B S/G level to normal.
		RCO: Reviews ARP for C4/2 & C6/2 • CHECK LI-3-486 or LI-3-488, B STM GEN LEVEL, controlling channel for SG Level deviation. • CHECK Feedwater Controllers, FIC-3-488A or FIC-3-488B, for indications of failure, alarm, or input signal failures. • CHECK Feedwater Controller Inputs • IF alarm is due to instrument failure, THEN REFER TO 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels.
		US: Enters and directs actions of 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels, for response.

EVENT 1 – FT-3-487, 3B S/G FEED FLOW TRANSMITTER, DRIFTS HIGH		
3-ONOP-049.1, DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CH		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE The crew may use the ARP to select an operable channel and restore automatic level control.	BOP: • Verify FT-3-487 failure by channel check comparison. • Verify no off-normal conditions exist on FT-3-486. • Place 3B S/G Feed Water Flow Control Transfer Switch to FT-3-486 (Yellow) • MAY Place 3B S/G Steam Flow Control Transfer Switch to FT-3-485 (Yellow) • Ensure 3B S/G level is returned to auto. **Steps 1-4**
	BOOTH OPERATOR WCC/I&C: Acknowledge the report. I&C would like to be present when bistables are tripped. They will be in the control in one hour. If asked to locally check FT-3-487, wait 2-3 minutes and then report nothing visibility wrong.	BOP: Notifies WCC to initiate PWO and I&C for troubleshooting.
	BOOTH OPERATOR If dispatched to reset AMSAC, wait 2-3 minutes and then **trigger LOA – RESET AMSAC**	US: Reviews Tech Specs **LCO 3.3.1, FU 12**, Low S/G Level with Steam/FW Flow Mismatch – Action 6, trip bistables within 6 hrs **Steps 5-6**
	LEAD EVALUATOR When S/G level control is restored to auto, or at Lead Evaluator discretion, proceed to the next event.	US: Conducts crew brief.

EVENT 2 – LT-3-460, PRESSURIZER LEVEL TRANSMITTER, FAILS LOW		
3-ONOP-041.6, PRESSURIZER LEVEL CONTROL MALFUNCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead evaluator, **trigger EVENT 2 – LT-3-460 FAILS LOW**	RCO: Reports LT-3-460 failed low
	NOTE Failure of LT-3-460 will cause Letdown to isolate and PZR Heaters to de-energize.	BOP: • Acknowledges A8/4, PZR PROT HI LVL, A9/4, PZR CTRL HI/LO LVL • CHECK LI-459A/460/461 less than or equal to 6%. • Check LCV-3-460, and CV-3-200A/B/C closed. • CHECK Control and Backup heaters OFF • Recommends entry into 3-ONOP-041.6, Pressurizer Level Control Malfunction.
		US: Directs 3-ONOP-041.6 response.
	NOTE • May place LC-3-459G, Master Charging Pump Controller, in manual. • May secure a charging pump.	RCO: • Check Pressurizer level indicators LI-3-459A, LI-3-460 AND LI-3-461 – Selects ch 1 & 3 PZR level control (Position 2) • Maintain PZR level on program per Enclosure 1 • Place LR-3-459 Channel Select Pressurizer Level Recorder to position 1 or 3. **Steps 1-4**

EVENT 2 – LT-3-460, PRESSURIZER LEVEL TRANSMITTER, FAILS LOW		
3-ONOP-041.6, PRESSURIZER LEVEL CONTROL MALFUNCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE This failure may cause VCT Auto Makeup.	RCO: Restore Letdown Flow • Place LC-3-459G, Pzr Lvl Inst Man/Auto Station, in Manual AND adjust charging flow as required for increased letdown flow. • Throttle Low Pressure LTDN Controller, PCV-3-145, as necessary to prevent LTDN relief valve from lifting. • Manually control Low Pressure Letdown Control Valve, PCV-3-145, to limit pressure spike. • Open High Pressure L/D Isol Vlv from Loop B Cold Leg, LCV-3-460. • Open L/D Isolation Valves, CV-3-200 A, B, or C as required to restore pressurizer level to programmed level. • Return Lower Pressure Letdown Control Valve, PCV-3-145, to Automatic. **Step 5**
		RCO: • Restore PRZ heaters to automatic operation or take manual control. • Maintain pressurizer level to be consistent with programmed level as indicated in Enclosure 1. – WHEN desired, THEN place LC-3-459G in Automatic. **Steps 7–8**
		US: Perform actions required by 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels. **Step 9**

EVENT 2 – LT-3-460, PRESSURIZER LEVEL TRANSMITTER, FAILS LOW		
3-ONOP-049.1, DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CH		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Enters and directs actions of 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels, for response
		BOP: • Verify LT-3-460 failure by comparison with LT-3-459/461 and known plant parameters and conditions • Verify no off-normal conditions exist on LT-3-459/461 • Verify ch 1 & 3 PZR level control in (Position 2) • Verify LR-3-459 Channel Selected to Pressurizer Level Recorder to position 1 or 3 • Verify PZR level control function is returned to automatic. **Steps 1–5**
	BOOTH OPERATOR If asked, I&C would like to be present when bi-stables are tripped. They will be in the control room in about an hour.	US Reviews Tech Specs **LCO 3.3.1, FU 9**, High PZR Level – Action 13, trip bistables in 6 hrs
	BOOTH OPERATOR WCC/I&C: Acknowledge the report. If asked, I&C would like to be present when bi-stables are tripped. They will be in the control room in one hour.	US • Notifies WCC to initiate PWO and I&C for troubleshooting. • Notifies Plant Management IAW 0-ADM-115.
	LEAD EVALUATOR When PZR level control is restored to auto, or at Lead Evaluator discretion, proceed to the next event.	US: Conducts crew brief.

EVENT 3 – 3A TPCW PUMP CAVITATION		
3-ONOP-008, TURBINE PLANT COOLING WATER MALFUNCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by Lead Evaluator, **trigger EVENT 3 – 3A TPCW PP CAVITATION**	
		BOP: Reports 3A TPCW amps and TPCW pressure fluctuating.
	BOOTH OPERATOR • If asked to investigate 3A TPCW Pp while amps are fluctuating, report that it sounds like it's pumping marbles. • If asked to investigate 3A TPCW Pp while amps are stable, report nothing obviously wrong. • If asked, report 3B TPCW Pp is ready for start; when started, report SAT start. • Report all other local investigations requested are SAT, as appropriate. • If asked, report SAT stop of 3A TPCW Pp.	RCO: Reviews ARP for I5/4, TPCW HI TEMP/LO PRESS • Use DCS to check TPCW Temperature • IF TPCW header low pressure condition exists: – Start 3B TPCW pump – MONITOR pump amp indication on 3C04. – Locally CHECK for system leakage, including TPCW Supplemental Cooling Chiller(s) • REFER TO 3-ONOP-008, Turbine Plant Cooling Water Malfunction.
	NOTE May not stop pump simply due to cavitation since starting the standby pump will cause cavitation to cease.	BOP: Stop 3A TPCW pump.
	NOTE May not enter ONOP due to resolving using ARP guidance.	US: Enter and direct the actions of 3-ONOP-008, TPCW Malfunction

EVENT 3 – 3A TPCW PUMP CAVITATION		
3-ONOP-008, TURBINE PLANT COOLING WATER MALFUNCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE May not enter ONOP due to resolving using ARP guidance. **NOTE** May have been previously started in accordance with ARP guidance.	BOP: • Check All TPCW Pump Alarms Off • Verify TPCW Pumps At Least One Running • Check TPCW Header Pressure, I5/4, NOT Lit **(NO)** **RNO: Start 3B TPCW Pump** • Check Proper ICW Lineup to TPCW Hxs • Check For Abnormal Surge Tank Lvl **(NO, Go to Step 12)** **Steps 1-5**
		BOP: • Check Cooling To TPCW Hxs • Locally Verify TPCW Strainer ΔP • Check F6/5 – OFF • Check Generator Alarms – OFF • Check Pump Alarms – OFF • Check Proper TPCW Operation • Check Temperature Of Components Supplied By Turbine Plant Cooling Water - STABLE OR DECREASING • Go To Appropriate Plant Procedure As Determined By Shift Manager **Steps 12-19**
	LEAD EVALUATOR When 3B TPCW Pump has been started, or at Lead Evaluator discretion, proceed to the next event.	

EVENT 4 – 3A RCP THERMAL BARRIER LEAK		
3-ONOP-067, RADIOACTIVE EFFLUENT RELEASE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 4 – THERMAL BARRIER LEAK** **and then** Verify **EVENT 4 – ALLOW RCV-609 TO CLOSE** is in CONDITIONAL state	BOP: Reviews ARP for H8/6, CCW HEAD TANK HI LEVEL
	BOOTH OPERATOR When the RCO closes RCV-3-609, verify **EVENT 4 – ALLOW RCV-609 TO CLOSE triggers.** **NOTE** • If R17A/B readings are not yet rising, the crew may refer to 3-NOP-030, CCW System. • If radiation levels are rising, but the alarm has not yet come in, the crew may refer to 3-ONOP-030, CCW Malfunction.	RCO: • Check indication on LI-3-614A • If any CCW pump cavitating…. • If high level, then: – Ensure RCV-3-609, Head Tank Vent Valve, is closed. – If voiding suspected…. – If NO abnormal CCW radiation, refer to 3-NOP-030. • If low level…. • If Head Tank level cannot be maintained, refer to 3-ONOP-030.
	LEAD EVALUATOR When RCV-3-609 has been closed, or at Lead Evaluator discretion, proceed to the next event.	BOP: Reviews ARP for H1/4, PRMS HI RAD • IF alarm is on R-17A/B, then REFER to 3-ONOP-067, Radioactive Effluent Release, for expected automatic actions. • CHECK alarm valid as follows: – CHECK FAIL/TEST light NOT LIT. – PUSH FAIL/TEST light (meter reading of 288 or 289K) – PUSH SOURCE CHECK light (should get meter increase). – PUSH HIGH ALARM light to determine if meter level is above high alarm setpoint

EVENT 4 – 3A RCP THERMAL BARRIER LEAK		
3-ONOP-067, RADIOACTIVE EFFLUENT RELEASE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Enter and direct the actions of 3-ONOP-067, Radioactive Effluent Release
		US: Review the Foldout Page • Notify plant personnel • IF a Reactor Trip occurs AND any following PRMS alarms Actuate, THEN within 30 minutes of the alarm, manually align Control Room ventilation in the Emergency Recirculation Mode R-15/19/20 • **IF** any PRMS high alarm occurs **AND** automatic actions are required, **THEN** verify the applicable automatic actions for the occurring PRMS HIGH ALARMS: – R-17A/B HIGH ALARM, RCV-3-609, CCW Head Tank Vent Valve – CLOSED **(NO, Close RCV-609)** **Foldout Page**
		BOP: Check High Alarm On R-17B **Step 1**

EVENT 4 – 3A RCP THERMAL BARRIER LEAK		
3-ONOP-067, RADIOACTIVE EFFLUENT RELEASE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE Parts of this step may have been completed using the ARP.	BOP: • Check R17B readout GREATER THAN OR EQUAL TO ALARM SETPOINT • Check channel operability as follows – Depress and hold FAIL/TEST pushbutton on affected PRMS Channel – Check readout - EQUAL TO 288K OR 289K – Release FAIL/TEST pushbutton • Check affected PRMS drawer responds to source check • Check for PRMS channel failure – Check Fail indicator – OFF – Display and recorder reading – **NOT** FAILED LOW **Step 2**
	BOOTH OPERATOR Acknowledge reports to SM, RP and Chemistry. If asked to survey or sample CCW for elevated radiation, wait 3-5 minutes and report that radiation surveys and samples indicated elevated radiation levels in Unit 3 CCW.	US: • Notify the Shift Manager of problem with R-17B. • Direct Radiation Protection Shift Supervisor to conduct radiological surveys to confirm validity of alarm. • Direct Chemistry to perform sampling to confirm validity of alarm. **Step 2 RNO**
		BOP: Check R-17A and R-17B High Alarms – OFF **(NO, Go to Step 29)** **Step 3**

EVENT 4 – 3A RCP THERMAL BARRIER LEAK		
3-ONOP-067, RADIOACTIVE EFFLUENT RELEASE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR If asked, report that CCW Supplemental Cooling is NOT in service.	RCO: Check CCW System For High Activity • Announce the high radiation alarm on page system and warn personnel to remain clear of all CCW piping • Verify RCV-3-609, CCW Head Tank vent Valve - CLOSED • Direct Chemistry Department to sample CCW System to determine its activity level • Route any known CCW system leakage to the WHUT floor drain **Step 29**
		Crew: • Check Normal CCW Temperatures And Flows Out Of RCP Thermal Barriers • Check Normal CCW Temperature And Flow Out Of NRHX • Check Normal CCW Temperature And Flow Out Of Seal Water Heat Exchanger • Check Normal CCW Temperature And Flow Out Of In-Service Spent Fuel Pit HXs • Check Normal CCW Temperature And Flow Out Of Excess Letdown HX • Check 3A RHR Pump AND 3A RHR Heat Exchanger - IN SERVICE **(NO, Go to Step 37)** **Step 30 - 35**
	LEAD EVALUATOR When RCV-3-609 has been closed, or at Lead Evaluator discretion, proceed to the next event.	RCO: Check 3B RHR Pump AND 3B RHR Heat Exchanger - IN SERVICE **(NO, Go to Step 39)** **Step 37**

EVENT 5 – 3A & 3B CRDM FANS TRIP		
3-GOP-100, FAST LOAD REDUCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead evaluator, **trigger EVENT 5 - CRDM FANS TRIP**	
	NOTE The 2nd fan trips 60 seconds after the first fan. **BOOTH OPERATOR** If dispatched to check CRMD fan breakers, wait 2-3 minutes and then report both breakers, 30629(3A) and 30727(3B), are closed. If asked, report that neither have any obvious issues. **BOOTH OPERATOR** If asked to cycle either breaker, use the appropriate trigger and report when each action is complete.	BOP: Reviews ARP for I8/5, CRDM COOLER FAN TRIP • CHECK indicating lights to determine affected CRDM Cooler on VPB. • TAKE affected CRDM Cooler control switch to OFF. • ENSURE remaining CRDM Cooler in service. • IF neither fan will start, THEN PERFORM the following commence shutdown using 3-GOP-100, Fast Load Reduction.
	BOOTH OPERATOR For cycling 3A CRDM breaker, 30629: **EVENT 5 – OPEN 3A CRDM BKR** **EVENT 5 – CLOSE 3A CRDM BKR** For cycling 3B CRDM breaker, 30727: **EVENT 5 – OPEN 3B CRDM BKR** **EVENT 5 – CLOSE 3B CRDM BKR** Report when complete.	US: • Directs actions to reduce Rx power per 3-GOP-100. • Completes Attachment 3 • Brief the crew per Attachment 4 **Steps 1-2**
		US: Reviews Foldout page with crew. • 3-EOP-E-0 Transition Criteria • Notify Chemistry Department • Boration Stop Criteria • Restore Blender to AUTO **Foldout Page**

EVENT 5 – 3A & 3B CRDM FANS TRIP		
3-GOP-100, FAST LOAD REDUCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR Acknowledge notifications.	BOP: Notify The Following Of Fast Load Reduction • System Dispatcher • Plant personnel using the Page Boost • Chemistry to start RCS sampling is required according to Tech Spec Table 4.4-4. **Step 3**
		RCO: Begin Boration For Initial T_{avg} Effect • Set the Boric Acid Totalizer to total boric acid volume value determined on Attachment 3. • Place the Reactor Makeup Selector Switch to BORATE. • Place the RCS Makeup Control Switch to START. • Adjust FC-3-113A, Boric Acid Flow Controller, to achieve 40 gpm boric acid flow as indicated on FR-3-113. • WHEN T_{avg} begins to lower from the boration, THEN adjust FC-3-113A, Boric Acid Flow Controller, to load reduction value from Attachment 3. **Step 4**
		US: Determine Turbine Load Reduction in MW CNTRL **Step 5**

EVENT 5 – 3A & 3B CRDM FANS TRIP		
3-GOP-100, FAST LOAD REDUCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Initiate Turbine Load Reduction in MW CNTRL • Select MW CNTRL • Set TARGET power level – MW VALUE from Attachment 3 • Set RAMP RATE – MW/M VALUE FROM Attachment 3. • Check T_{avg} has lowered 1° to 2°F from the initial value prior to boration. • Depress GO • Ensure FC-3-113A, Boric Acid Flow Controller, has been adjusted to the load reduction boration rate. Go to Step 10 **Step 6**
		BOP: Monitor Load Reduction • Adjusts power reduction rate to maintain T_{avg}/T_{ref} within limits of Attachment 3. • Monitors S/G level control to ensure feed reg valves properly maintain level control in automatic. • Refer to Enclosure 1 for expected alarms. **Step 10**
	<u>BOOTH OPERATOR</u> Respond as SNPO. If asked, idle Charging Pump ready for start.	RCO: • Maintain pressurizer level to ensure that automatic pressurizer level control maintains level on program. • If needed, starts 2nd Chg Pp and places 2nd orifice in service. • Adjusts boration rate to maintain T_{avg}/T_{ref} within ±4°F ΔT. • Refer to Enclosure 1 for expected alarms. **Step 10**

EVENT 5 – 3A & 3B CRDM FANS TRIP		
3-GOP-100, FAST LOAD REDUCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO: Monitor Boration Rate • Monitor for excessive rod movement by monitoring TR-3-409D, Rod Position Bank D. • Determine if Insertion Limit and Bank D position are converging at a rate that will cause rod insertion limit alarms. • Adjust power reduction rate as needed to control rod insertion • Increase boration rate and/or total amount as necessary to limit control rod insertion **Step 11**
		RCO: • Monitor Annunciator B 8/1, ROD BANK LO LIMIT – CLEAR • Monitor B 8/2 ROD BANK A/B/C/D EXTRA LO LIMIT – CLEAR **Steps 12-13**
	BOOTH OPERATOR Acknowledge notification to refer to E-Plan and ADM-115.	US: Have SM refer to the following procedures: • 0-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR • 0-ADM-115, NOTIFICATION OF PLANT EVENTS **Step 14**
	LEAD EVALUATOR When reactor power has been sufficiently, or at Lead Evaluator discretion, proceed to the next event.	RCO: Energize Pressurizer Backup Heaters **Step 15**

EVENT 6 – 3A S/G FAULTED RUPTURE		
3-ONOP-071.2, STEAM GENERATOR TUBE LEAKAGE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 6 - 3A SGTR.** When the reactor is tripped, verify **EVENT 6 – 3A S/G FAULT triggers.** **NOTE** The tube rupture ramps in over 5 minutes. The crew will meet conditions to trip in ~2 minutes. The US may direct actions to maximize charging, isolate letdown, and trip the reactor without entering 3-ONOP-071.2.	
	NOTE Due to the size, the US may direct the actions of 3-ONOP-041.3, Excessive RCS Leakage. The trip criteria are similar and still lead to E-0 transition criteria being met. US may use PZR Pressure <2000 psig from 3-ONOP-041.5 as trip criteria.	BOP: Reviews ARP for H1/4, PRMS HI RADIATION • Checks alarm on R-15 • REFER TO 3-ONOP-071.2, Steam Generator Tube Leakage. • Check S/G Feedwater flows and levels for indication of a Ruptures S/G.
		RCO: Checks PZR pressure and level for indication of a tube rupture.
	NOTE May trip prior to entering 3-ONOP-071.2. The actions for 3-EOP-E-0 start on the next page.	US: Enters and directs the actions of 3-ONOP-071.2, Steam Generator Tube Leakage.
		US: Reviews the Foldout page with the crew. • 3-EOP-E-0 Transition Criteria IF RCS leakage > Charging Pp capacity AND Letdown Isolated, THEN Manually trip Rx and perform E-0. When power is verified, initiate SI and Phase A. **Foldout Page**

EVENT 6 – 3A S/G FAULTED RUPTURE		
3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE Steps 1 - 4 of 3-EOP-E-0 are Immediate Operator Actions (IOAs). The board operators will call out the high level steps of the IOAs as each step is completed from memory. Once the IOAs are complete, the US will read through Steps 1 – 4 with the crew.	US: • Directs 3-EOP-E-0 response after auto Reactor trip. OR • Directs RCO to manually trip the Reactor, then for operators to perform their IOA's.
		RCO: Manually trips Reactor.
		RO/BOP: Perform IOA's.
		RCO: Verifies Reactor Trip **Step 1**
		BOP: Verify Turbine Trip **Step 2**
		BOP: Verifies Power To Emergency 4 KV Buses **Step 3**
EVENT 7 – ALL SI PUMPS FAIL TO AUTO START		
CT1 ____________	**Establish HHSI Flow** Establish HHSI flow prior to Accumulator injection. Accumulators inject based on their pressure. (625-665 psig)	RCO: Checks If SI Is Actuated **(NO)** **RNO:** Check if SI is required **(YES)** • Manually actuate SI **(NO, Manually start HHSI Pps to establish flow)** • Manually actuate Containment Isolation Phase A. **Step 4**
END OF EVENT 7		

EVENT 6 – 3A S/G FAULTED RUPTURE		
3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Directs 3-EOP-E-0 response and reviews the IOAs.
CT2 ____________	**<u>Isolate AFW To Faulted S/G</u>** During MSLB, isolate AFW flow to faulted S/G prior to Orange Path on Integrity (Any RCS_{cold} Leg <280°F). **<u>NOTE</u>** Indication of the rupture may not be apparent at this point due to changing plant conditions. The fault is the procedural priority, and rupture criteria will be evaluated for later.	US: Reviews FOP for 3-EOP-E-0 with the crew • Adverse Containment Conditions • RCP Trip Criteria **(YES, trip all RCPs)** • Faulted S/G Isolation **(YES, Isolate AFW flow to 3A S/G)** – Maintain total feed >400 gpm – When 3A S/G <9% WR [<27% NR], adjust intact S/G SDTA setpoints to match S/G pressure • Ruptured S/G Isolation Criteria **(YES, Isolate AFW flow to 3A S/G)** • AFW System Operation Criteria • CST Makeup Water Criteria • RHR System Operation Criteria **(YES, RCO starts timer)** • Loss Of Offsite Power Or SI On Other Unit • Loss Of Charging Criteria **Foldout Page**
	<u>NOTE</u> Attachment 3 actions start on page 37.	BOP: Continues with ATTACHMENT 3 to complete The Prompt Action Verifications. **Step 5**
		RCO: • Check AFW Pumps • Verify AFW Valve Alignment • Verify Proper AFW Flow • Check Thermal Barrier Alarms **Steps 6-9**

EVENT 6 – 3A S/G FAULTED RUPTURE		
3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE May not close MSIVs if crew determines leak is upstream, and thus unisolable. Determination, one way or another, may be appropriate follow up question.	RCO: Check any RCPs running. **(NO)** • Check RCS Cold Leg temperatures between 545°F and 547°F or trending down to 547°F. **(NO)** – Stop dumping steam. – Reduce AFW flow to 400 gpm – Close MSIVs **Step 10**
		RCO: • Check PRZ PORVs, Spray Valves And Excess Letdown Isolated: • Check if RCPs Should Be Stopped: **Steps 11-12**
		RCO: Check If S/Gs Are Faulted: **(YES, 3A S/G Faulted)** **Step 13**
		US: • Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES • Go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1

EVENT 6 – 3A S/G FAULTED RUPTURE		
3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: • Conducts EOP transition brief. • Directs 3-EOP-E-2 response.
		US: Reviews the Foldout page with the crew. • Containment Adverse **Foldout Page**
	<u>BOOTH OPERATOR</u> When directed to perform Attachment 1, wait 3-5 minutes and then **trigger LOA – DEENERGIZE AND CLOSE MOV-1403.** Report when complete.	BOP: • Check MSIV and Bypass Valves on Faulted S/G Closed: • Check if <u>Any</u> S/G is NOT Faulted • Identify Faulted S/G **(3A)** • Isolated Faulted S/G – Verify FRV Isolation valve closed – Verify Bypass Isolation valve closed – Isolate AFW flow – Dispatch Operator to isolate steam supply from faulted S/G using Att 1 **Steps 1-4**
		RCO: Stabilize RCS Hot Leg Temperatures **Step 5**
	<u>BOOTH OPERATOR</u> If Chemistry or RP is called, report local secondary radiation readings and samples are highest on 3A S/G.	BOP: • Check CST Levels • Check Secondary Radiation **(NO)** **Steps 6-7**
	<u>LEAD EVALUATOR</u> This is the earliest possible opportunity to terminate the scenario. The terminating cue is on page 36.	US: Go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1 **Step 8**

EVENT 6 - 3A S/G FAULTED RUPTURE		
3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Directs 3-EOP-E-3 response. <u>Reviews Foldout Page</u> • Adverse Containment Setpoints • RCP Trip Criteria • SI Re-Initiation Criteria • Secondary Integrity Criteria • Cold Leg Recirculation Switchover Criteria • CST Makeup Water Criteria • Multiple Tube Rupture Criteria • Loss Of Offsite Power Or SI On Other Unit. • RHR System Operation Criteria **(YES)** **Foldout Page**
		RCO: • Checks If RCPs Should Be Stopped **Step 1**
	<u>BOOTH OPERATOR</u> If called as RP, report the radiation readings on 3A S/G lines are higher than normal.	RCO: Identify Ruptured S/G: • Identify 3A as the Ruptured S/G • Directs RP to take rad readings on Main Steam and Blowdown Lines • Evaluates DAM1 on DCS • Determines ruptured SG by level increase or radiation **Step 2**

EVENT 6 - 3A S/G FAULTED RUPTURE		
3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO: Isolate Flow From Ruptured S/G a. Adjusts 3A S/G Steam Dump To Atmosphere controller setpoint to 1060 psig b. Checks 3A S/G Steam Dump To Atmosphere Closed c. Close steam supply valves from ruptured 3A S/G to AFW Pumps using Attachment 17 **Step 3**
		BOP: • Check SI reset • Check AMSAC reset • Check Both AFW Auto Start White Lights – OFF (3QR50 AND 3QR51) • Close 3A Steam Generator AFW Steam Supply, MOV-3-1403 • Dispatch an Operator to de-energize breaker 4D01-28 for MOV-3-1403. • Verify MOV-3-1403 – CLOSED • Notify Unit Supervisor That 3A S/G AFW Steam Supply Is Isolated and Attachment 17 is complete. **Attachment 17**
	NOTE MSIV may have been closed previously.	BOP: d. Verify 3A S/G Blowdown Isolation e. Closes Ruptured S/G (3A) MSIV **Step 3**
	BOOTH OPERATOR When dispatched to realign Aux Steam, acknowledge but take no action.	BOP: f. Align Main Steam auxiliaries using Attachment 5 **Step 3**

EVENT 6 - 3A S/G FAULTED RUPTURE		
3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When dispatched to close 3-10-121A and 3-10-891 for S/G 3A per Attachment 16, wait 5 minutes and report steps complete.	BOP: f. Isolate miscellaneous flow paths from 3A S/G using Attachment 16. • Verify 3A S/G Blowdown Sample MOV, MOV-3-1427 – CLOSED • Dispatches Operator to locally isolate – 3A S/G Main Steamline Steam Trap 3-10-121A – Steam Sample Valves 3-10-891 for S/G 3A • Inform Unit Supervisor That Attachment 16 is Complete. **Step 3**
		BOP: • Check 3A S/G Level Narrow Range level – GREATER THAN 7%[27%] • Stop feed flow stopped to the 3A S/G. **Step 4**
		US: Checks 3A S/G pressure greater than 450 psig **(NO)** **Step 5**
		US: Go to 3-EOP-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED, Step 1

EVENT 6 – 3A S/G FAULTED RUPTURE		
3-EOP-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Directs 3-EOP-ECA-3.1 response. Reviews Foldout Page • Adverse Containment Setpoints • SI Re-Initiation Criteria • Secondary Integrity Criteria • Cold Leg Recirculation Switchover Criteria • CST Makeup Water Criteria • Loss Of Offsite Power Or SI On Other Unit • RHR System Operation Criteria **(YES)** **Foldout Page**
		RCO: • Verify SI Reset • Reset Phase A and Phase B • Verify Instrument Air to CTMT **Steps 1-3**
		BOP: Verify All 4kV Buses Energized By Offsite Power **Step 4**
	BOOTH OPERATOR Acknowledge communications.	RCO: Deenergize PZR Heaters • Position all PZR Heater switches in OFF position • Consult TSC for minimum PZR level to ensure heaters covered • Reset PZR Backup Heater Lockouts using Attachment 4 **Step 5**
		RCO: Check if CTMT Spray Should Be Stopped **Step 6**

EVENT 6 – 3A S/G FAULTED RUPTURE		
3-EOP-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Check Ruptured S/G Level **Step 7**
		RCO: Check if RHR Should Be Stopped **Step 8**
	<u>BOOTH OPERATOR</u> • After directed, wait 3-5 minutes and report shield doors closed. • Acknowledge all other communication and/or report SAT, as applicable.	BOP: Initiate Evaluation Of Plant Status Using Attachment 8 • Locally Verify Radiation Shield Doors Closed • Check Aux Bldg Radiation Normal • Evaluate Sampling Requirements • Verify ECCS Components Operating Properly **Step 9**
		RCO: Establish Charging Flow • Charging Pumps – AT LEAST ONE RUNNING **(NO, Start one Charging pump)** • Place RCS Makeup Control switch in STOP • Establish maximum Charging Flow • Verify Charging Pump Suction auto transfers to RWST **Step 10**
The scenario is terminated once the crew maximizes charging, or at Lead Evaluator discretion once all critical task have been evaluated.		
***** END OF SCENARIO *****		

EVENT 8 – CONTROL ROOM HVAC FAILS TO ALIGN ON SI		
3-EOP-E-0 ATTACHMENT 3 – PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Check Load Centers Associated With Energized 4 KV Buses – ENERGIZED **Step 1**
		BOP: Verify Feedwater Isolation: • Place Main Feedwater Pump switches in STOP • Feedwater Control Valves – CLOSED • Feedwater Bypass Valves – CLOSED • Feedwater Bypass Isolation Valves – CLOSED • Feedwater Isolation MOVs – CLOSED • Verify Standby Feedwater Pumps – OFF **Step 2**
		BOP: Check If Main Steam Lines Should Be Isolated **Step 3**
		BOP: Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT **Step 4**
		BOP: Verify Pump Operation: • At least two High-Head SI Pumps – RUNNING • Both RHR Pumps – RUNNING **Step 5**

EVENT 8 – CONTROL ROOM HVAC FAILS TO ALIGN ON SI		
3-EOP-E-0 ATTACHMENT 3 – PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Verify Proper CCW System Operation: • CCW Heat Exchangers – THREE IN SERVICE • CCW Pumps – ONLY TWO RUNNING • CCW Headers – TIED TOGETHER • MOV-3-626, RCP Thermal Barrier CCW Outlet – OPEN **Step 6**
		BOP: Verify Proper ICW System Operation: • Verify ICW Pumps – AT LEAST TWO RUNNING • Verify ICW To TPCW Heat Exchanger – ISOLATED • Check ICW Headers – TIED TOGETHER **Step 7**
		BOP: Check Emergency Containment Coolers – ONLY TWO RUNNING **Step 8**
		BOP: Verify Unit 3 Containment Purge Exhaust And Supply Fans – OFF **Step 9**
		BOP: Verify Containment Spray NOT Required: **Step 10**
		BOP: Verify SI – RESET **Step 11**

EVENT 8 – CONTROL ROOM HVAC FAILS TO ALIGN ON SI		
3-EOP-E-0 ATTACHMENT 3 – PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Verify SI Valve Amber Lights On VPB – ALL BRIGHT **Step 12**
		BOP: Verify SI Flow: • RCS pressure – LESS THAN 1625 PSIG[1950 PSIG] • High-Head SI Pump flow indicator – CHECK FOR FLOW • RCS pressure – LESS THAN 275 PSIG[575 PSIG] • RHR Pump flow indicator – CHECK FOR FLOW **Step 13**
	<u>BOOTH OPERATOR</u> When directed, **trigger LOA – ALIGN U4 HHSI TO U3 RWST.** Wait 5 minutes and report complete.	BOP: Realign SI System: • Check Procedure Entry Status – E-0 ENTERED FROM 3-ONOP-047.1, LOSS OF CHARGING FLOW IN MODES 1 THROUGH 4 **(NO)** • Verify Unit 3 High-Head SI Pumps – TWO RUNNING • Stop both Unit 4 HHSI pumps. • Direct Unit 4 Reactor Operator to align Unit 4 High-Head SI Pump suction to Unit 3 RWST using Attachment 1. **Step 14**
		BOP: Verify Containment Isolation Phase A – RESET **Step 15**
		BOP: Reestablish RCP Cooling: • Check RCPs – AT LEAST ONE RUNNING **(NO, Go to step 17)** **Step 16**

EVENT 8 – CONTROL ROOM HVAC FAILS TO ALIGN ON SI		
3-EOP-E-0 ATTACHMENT 3 – PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When opened, verify **EVENT 8 – ALLOW OPENING D2** and **EVENT 8 – ALLOW OPENING D3 trigger.**	BOP: Verify Control Room Ventilation Isolation: **(NO, Manually open dampers D2 & D3)** **Step 17**
	BOOTH OPERATOR When requested, **trigger LOA – PLACE PAHMS IN SERVICE.** Wait 5 minutes and report local operator actions are complete.	BOP: Place Hydrogen Monitors In Service Using 3-NOP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM • For Each Hydrogen Monitor A/B – ENSURE FUNCTION SELECTOR switch is in SAMPLE. – PLACE control switch in ANALYZE. – PRESS the REMOTE SELECTOR button. – PRESS the ALARM RESET button. • Dispatch an operator to complete local step of 3-NOP-094 **Step 18**
	BOOTH OPERATOR When called, report that both Unit 4 EDGs are running unloaded.	BOP: Verify All Four EDGs – RUNNING **Step 19**
	BOOTH OPERATOR When called, report both 4kV buses are energized from the Unit 4 SUT and 4D bus is aligned to 4B bus.	BOP: Verify Power To Emergency 4 KV Buses: **Step 20**
		BOP: Notify Unit Supervisor Of The Following: • Attachment 3 is complete • Any safeguards equipment that is NOT In the required condition • Status of Containment pressure continuous action **Step 21**

Discussion Points are intentionally NOT included in evaluated scenarios. However, space is available below to document follow-up questions when further information is required to determine an evaluation outcome.

FOLLOW-UP QUESTIONS

QUESTION #1

ANSWER #1

QUESTION #2

ANSWER #2

SIMULATOR POST-SCENARIO RESTORATION:

_______ 1. Restore per Simulator Operator Checklist.

_______ 2. Once exams are complete, restore from SEI-19, Simulator Exam Security.

OPERATIONS SHIFT TURNOVER REPORT

UNIT 3 RISK: GREEN (ACCEPTABLE) PROTECTED TRAIN: B	UNIT 4 RISK: GREEN (ACCEPTABLE) PROTECTED TRAIN: B

ONCOMING CREW ASSIGNMENTS

Shift Mgr:		**Inside SNPO:**	
Field Supv.:		**Outside SNPO:**	
Admin RCO:		**ANPO:**	
Unit 3		**Unit 4**	
Unit Supv.:		**Unit Supv.:**	
RCO:		**RCO:**	
NPO:		**NPO:**	

PLANT STATUS

Unit 3		**Unit 4**	
Mode:	1	**Mode:**	1
Power:	60%	**Power:**	100%
MWe:	468	**MWe:**	842
Gross Leakrate:	.11 gpm	**Gross Leakrate:**	0.09 gpm
RCS Boron Conc:	963 ppm	**RCS Boron Conc:**	642 ppm

Operational Concerns:

B AFW pump taken OOS 24 hours ago for an oil change, expected back by the end of tomorrow peak shift. Two trains verified operable.

3B Isophase Fan OOS for fan repair. Estimated completion time is one week. 3A Isophase Fan Guarded.

Return to full power expected next shift.

MIMS alarms are inhibited.

U3 Anticipated LCO Actions:

None

U4 Anticipated LCO Actions:

None

Results of Offgoing Focus Area:

UNIT 3 STATUS

REACTOR OPERATOR

UNIT RISK: GREEN (ACCEPTABLE)   PROTECTED TRAIN: B

Mode:	1
Power:	60%
MWe	468
Tavg:	565°F
RCS Pressure:	2235
RCS Boron Conc:	963 ppm

RCS Leakrate	
Gross:	0.11 GPM
Unidentified	0.04 GPM
Charging Pps:	0.00 GPM

Accumulator Ref Levels	
A	6700
B	6692
C	6695

Abnormal Annunciators:

Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	

Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items"

T.S.A.S / Component: Reason: Entry Date:	B AFW pump, 3.7.1.2 – Action 3 Oil Change 24 hours ago
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	

REACTOR OPERATOR (CONT'D)

UNIT RISK: GREEN (ACCEPTABLE)   PROTECTED TRAIN: B

Changes to Risk Significant Equipment:

No recent changes from last shift.

OLRM: GREEN

PROTECTED TRAIN: B

Upcoming Reactivity Management Activities:

Maintain 60% to 61.5%
Xe is stable.

Upcoming Major POD Activities:

NONE

Upcoming ECOs to Hang and /or Release:

- Hang – None
- Release – None

Evolutions or Compensatory Actions in Progress:

STA monitoring MIMS every 2 hrs.

General Information, Remarks, and Operator Work Around Status:

- Weather forecast is overcast skies with scattered pockets of severe rain.
- U3 supplying Aux Steam
- Air In-leakage = 0.0 SCFM

Facility: **Turkey Point Nuclear (PTN) – Units 3 and 4** Scenario No.: **4** Op Test No.: **2017-301**

Examiners: ______________ Operators: ______________ (SRO)
______________ ______________ (RCO)
______________ ______________ (BOP)

Initial Conditions:		The plant is at 60% power (MOL). Online risk is green. B train is protected on both units.	
Turnover:		EOOS: B AFW Pump, 3B Isophase Bus Cooler	
Critical Tasks:		Start Standby ICW Pump Initiate Emergency Boration	

Event	Malf. No.	Event Type*	Event Description
1	TFKCSMA	C-BOP C-SRO (TS)	3B ICW Pump Sheared Shaft
2	TVHHIFL	C-RCO C-SRO (TS)	Rx Vessel Inner Flange Leak
3	TVS1M3WD	I-BOP I-SRO (TS)	FT-3-474, 3A S/G Steam Flow Transmitter, Drifts Low
4	TFBVC07 TFB1SN5L	I-RCO I-SRO	TE-3-144, Non-Regen Hx Outlet Temperature, Fails Low
5	TVHHOFL	R-RCO N-BOP R-SRO	Rx Vessel Outer Flange Leak (Shutdown Required)
6	TFLID11(41) TFL2RTAB TFL4AF TFL2C(B)RXT TFL10101(2)	M-RCO M-BOP M-SRO	Sequentially Dropped Rods (ATWS)
7	TFSVV31A	P-BOP	MOV-3-1431, MSR Stop Valve, Fails to Auto Close
8	TFBVC63	P-RCO	MOV-3-350, Emergency Borate Valve, Fails to Open

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

SCENARIO SUMMARY

Event 1

The 3B ICW Pump will fail due to a sheared shaft. The BOP will use the guidance in the ARP and 3-NOP-019, Intake Cooling Water, to start the standby ICW pump and secure 3B ICW pump.

Event 2

A leak develops on the inner seal of the reactor vessel flange. The RCO will confirm and then isolate the leak in accordance with the ARP.

Event 3

3A S/G Steam Flow Transmitter, FT-3-474, will drift low. The BOP will take manual control of the 3A S/G level and restore level to normal. The crew may use the ARP or 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels, to select operable channels and restore 3A S/G level control to automatic. The US will enter 3-ONOP-049.1 to verify all required actions are complete and to determine which bistables need to be tripped.

Event 4

The RTD on TE-3-144, Non-Regen Hx Outlet Temperature, fails low. TC-3-144A throttles to reduce CCW flow to the non-regen heat exchanger, increasing letdown temperature. TCV-3-143, L/D Demin Divert Valve, will fail to automatically divert at 135°F. In accordance with the ARP, the RCO manually align TCV-3-143 to VCT-DIVERT position and take manual control of TC-3-144A to reduce and maintain letdown temperature.

Event 5

The outer seal on the reactor vessel flange develops a leak, resulting in an RCS leak. The crew will enter 3-ONOP-041.3, Excessive RCS Leakage, and 3-ONOP-067, Radioactive Effluent Release. Due to the size and location, a unit shutdown will be required. The crew will enter 3-GOP-100, Fast Load Reduction.

Event 6

Two rods will drop into the core in short succession, requiring a unit trip. The unit will not trip from either switch in the control room, and the rods will fail to insert in both auto and manual. The crew will transition to 3-EOP-FR-S.1, Response to Nuclear Power Generation/ATWS, and initiate an emergency boration.

Event 7

After the BOP trips the turbine, the MSR Stop Valve, MOV-3-1431, will fail to close. The BOP will take the control switch to close to manually close the valve.

Event 8

Emergency Boration Valve, MOV-3-350, will fail to open from the control room. The RCO will open CVCS Makeup valves FCV-3-113A and FCV-3-113B, and then dispatch an operator to open 3-356, Manual Emergency Boration Valve, to commence emergency boration flow.

After the crew initiates emergency boration, an operator will be dispatched to locally trip the unit by locally opening the Reactor Trip and Bypass breakers, and the MG Set Input and Output breakers at the 3B MCC. After the unit is tripped, the crew will return to 3-EOP-E-0, and then transition to 3-EOP-ES-0.1, Reactor Trip Response.

The scenario is terminated after the crew transitions back to 3-EOP-E-0, or at Lead Evaluator discretion once all critical tasks have been evaluated.

CRITICAL TASKS		
Event		**Description**
1	**CT1**	**<u>Start The Standby ICW Pump</u>** Following a loss of one running ICW pump, start the standby ICW pump within 30 minutes. (0-ADM-232, Time Critical Operator Action Program, Attachment 2) SAFETY SIGNIFICANCE: A single ICW pump could potentially be required to deliver high flow. At low intake levels, there is insufficient NPSH available for a single operating ICW pump to provide the required high flow. The PTN PSA Model assumes the Operator will either throttle flow or start an addition ICW pump with 30 minutes of single pump operation.
8	**CT2**	**<u>Initiate Emergency Boration</u>** During an ATWS with a failure of rods to insert, initiate emergency boration within 10 minutes of the reactor trip failure. SAFETY SIGNIFICANCE – Failure to insert negative reactivity, results in an unnecessary situation in which the reactor remains critical or returns to a critical condition. 10 minute allowance is sufficient to dispatch local trip actions and is also IAW the PTN PSA Model.

SITE:	**Turkey Point Units 3 and 4 (PTN)**	**Revision #:**	**0-1**
LMS ID:	**L-17-1 N4**	**Rev. Date:**	**1/11/17**

As-administered Scenario 4, includes pen and ink change, Page 14.

SEG TITLE: **L-17-1 NRC Exam Scenario 4**

SEG TYPE: ☐ **Training** ☒ **Evaluation**

PROGRAM: ☐ **LOCT** ☒ **LOIT** ☐ **Other:**

DURATION: **90 minutes**

Developed by:	**Tim Hodge** Instructor/Developer	**7/25/17** Date
Reviewed by:	**Val Miklausich** Instructor (Instructional Review)	**8/1/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**7/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**8/3/17** Date
Approved by:	**Mike Murphy** Training Program Owner (Line)	**7/25/17** Date

SCENARIO REFERENCES		
DOC NO.	**TITLE**	**REV**
3-ARP-097.CR	CONTROL ROOM ANNUNCIATOR RESPONSE PROCEDURES	VARIOUS
3-NOP-019	INTAKE COOLING WATER SYSTEM	31
3-ONOP-041.3	EXCESSIVE REACTOR COOLANT SYSTEM LEAKAGE	0C
3-ONOP-067	RADIOACTIVE EFFLUENT RELEASE	10
3-ONOP-049.1	DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CHANNEL	4
3-GOP-100	FAST LOAD REDUCTION	13A
3-EOP-E-0	REACTOR TRIP OR SAFETY INJECTION	13
3-EOP-F-0	CRITICAL SAFETY FUNCTION STATUS TREES	4
3-EOP-FR-S.1	RESPONSE TO NUCLEAR POWER GENERATION/ATWS	4A
3-EOP-ES-0.1	REACTOR TRIP RESPONSE	14
PTN TECH SPEC	PTN TECHNICAL SPECIFICATIONS	303

SIMULATOR EXERCISE GUIDE REQUIREMENTS	
Terminal Objective	Given this simulator scenario and resources normally found in the Control Room, the operating crew will perform Control Room operations IAW approved plant procedures in order to maintain the integrity of the plant and the health and safety of the public.
Enabling Objectives:	Given this simulator scenario and resources normally found in the Control Room, operate in accordance with approved plant procedures, Operations Department Instructions, and management expectations: 1. (ALL) Demonstrate personnel SAFETY awareness in interactions with plant staff and outside agencies. 2. (ALL) Demonstrate ALARA awareness in interactions with plant staff and outside agencies. 3. (ALL) Exchange correct information using 3-point communication/Repeat-backs with Control Room personnel and other plant staff. 4. (ALL) Inform plant personnel and System of plant conditions, as needed. 5. (US) Employ timely and concise crew briefs where appropriate. 6. (ALL) Maintain awareness of plant status and control board indication. 7. (ALL) Correctly diagnose plant situations. 8. (ALL) Solve operational problems as they arise. 9. (RCO/BOP) Manipulate plant controls properly and safely. 10. (ALL) Demonstrate self-checking using STAR and peer checks(when required) 11. (US) Demonstrate command and control of the crew. 12. (US) Coordinate the input of crew members and other plant staff. 13. (US) Utilize the input of crew members and other plant staff. 14. (ALL) Demonstrate conservative decision making. 15. (ALL) Demonstrate teamwork. 16. (ALL) Respond to plant events using procedural guidance (OPs/ONOPs/EOPs) as applicable in accordance with rules of usage. 17. (RCO/BOP) Implement any applicable procedural immediate operator actions without use of references. 18. (SRO) Maintain compliance with Tech Specs. 19. (ALL) Identify/enter applicable Tech Spec action statements. 20. (ALL) Respond to annunciators using ARPs (time permitting). 21. (ALL) Maintain written communication, logs, and documentation as needed to permit post-event reconstruction. Continued on next page

SIMULATOR EXERCISE GUIDE REQUIREMENTS	
	While addressing the following events: 1. 3B ICW Pump Sheared Shaft 2. Rx Vessel Inner Flange Leak 3. FT-3-474, 3A S/G Steam Flow Transmitter, Drifts Low 4. TE-3-144, Non-Regen Hx Outlet Temperature, Fails Low 5. Rx Vessel Outer Flange Leak (Shutdown Required) 6. Sequentially Dropped Rods (ATWS) 7. MOV-3-1431, MSR Stop Valve, Fails to Auto Close 8. MOV-3-350, Emergency Borate Valve, Fails to Open
Prerequisites:	None
Training Resources:	PTN Unit 3 Plant Simulator
Development References:	• TR-AA-220-1003, Initial NRC and Audit Exam Process • TR-AA-230-1000, Systematic Approach to Training Process • TR-AA-230-1007, Conduct of Simulator Training and Evaluation • 0-ADM-232, Time Critical Action Program • OP-AA-100-1000, Conduct Of Operations • OP-AA-103-1000, Reactivity Management • 0-ADM-200, Operations Management Manual • 0-ADM-211, Emergency and Off-Normal Operating Procedure Usage • WCAP-17711-NP, Pressurized Water Reactor Owners Group Westinghouse Emergency Response Guideline Revision 2-Based Critical Tasks
Protected Content:	N/A
Evaluation Method:	Performance Mode
Operating Experience:	None
Risk Significant Operator Actions:	Start Standby ICW Pump Initiate Emergency Boration

TASKS ASSOCIATED WITH THIS SIMULATOR EXERCISE GUIDE

SRO TASK #	TASK TITLE
02019005100	AUTHORIZE INTAKE COOLING WATER PUMP STARTS
02028033500	AUTHORIZE UNIT TRIP
02041068300	RESPOND TO EXCESSIVE RCS LEAKAGE
02200046500	RESPOND TO STEAM GENERATOR LOW LEVEL
02089026300	AUTHORIZE FAST LOAD REDUCTION
02200001500	RESPOND TO UNIT TRIP
02200021500	RESPOND TO LOSS OF COOLANT ACCIDENT
02200022500	DIAGNOSE CAUSE OF SAFEGUARDS ACTUATION
02063008500	VERIFY SI OPERATION
02028009500	RESPOND TO ANTICIPATED TRANSIENT WITHOUT SCRAM (ATWS)
2202001300	IDENTIFY/RESPOND TO OFF-NORMAL EVENTS
02200002500	EVALUATE CRITICAL SAFETY FUNCTION (CSF) STATUS TREE OUTPUT

RO TASK #	TASK TITLE
01019005100	START INTAKE COOLING WATER PUMPS
01047013100	START A CHARGING PUMP
01041068300	RESPOND TO EXCESSIVE RCS LEAKAGE
01028015100	ADJUST POWER LEVEL
01200046500	RESPOND TO STEAM GENERATOR LOW LEVEL
01074011300	CONTROL S/G LEVEL MANUALLY WITH MAIN FRVS
01046007100	BORATE THE RCS VIA THE BLENDER
01089026300	RESPOND TO / ADJUST TURBINE DURING FAST LOAD REDUCTION
01200001500	RESPOND TO UNIT TRIP
01200021500	RESPOND TO LOSS OF COOLANT ACCIDENT
01200022500	DIAGNOSE CAUSE OF SAFEGUARDS ACTUATION
01063008500	VERIFY SAFETY INJECTION OPERATION
01028009500	RESPOND TO ATWS

UPDATE LOG:

NOTES:	Place this form with the working copies of lesson plans and/or other materials to document changes made between formal revisions. For fleet-wide training materials, keep electronic file of this form in same folder as approved materials. Refer to TR-AA-230-1003 SAT Development for specific directions regarding how and when this form shall be used.

Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / REVIEWER	DATE / DATE
0-0	Initial Revision	L-17-1 NRC Exam	N/A	Note 5	Note 5
				Note 5	Note 5
0-1	Validation Comments	NRC Prep Week	N/A	T.Hodge	10/5/17
				M.Wilson	10/5/17
0-2					
0-3					
0-4					
0-5					

1. Individual updating lesson plan or training material shall complete the appropriate blocks on the Update Log.
2. Describe the change to the lesson plan or training materials.
3. State the reason for the change (e.g., reference has changed, typographical error, etc.)
4. Preparer enters name/date on the Update Log and obtains Training Supervisor approval.
5. Initial dates and site approval on cover page.

SCENARIO SUMMARY

Initial Conditions:

The plant is at 60% power (MOL). Online risk is green. B train is protected on both units

Equipment OOS

B AFW Pump, 3B Isophase Bus Cooler

Event 1

The 3B ICW Pump will fail due to a sheared shaft. The BOP will use the guidance in the ARP and 3-NOP-019, Intake Cooling Water, to start the standby ICW pump and secure 3B ICW pump.

Event 2

A leak develops on the inner seal of the reactor vessel flange. The RCO will confirm and then isolate the leak in accordance with the ARP.

Event 3

3A S/G Steam Flow Transmitter, FT-3-474, will drift low. The BOP will take manual control of the 3A S/G level and restore level to normal. The crew may use the ARP or 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels, to select operable channels and restore 3A S/G level control to automatic. The US will enter 3-ONOP-049.1 to verify all required actions are complete and to determine which bistables need to be tripped.

Event 4

The RTD on TE-3-144, Non-Regen Hx Outlet Temperature, fails low. TC-3-144A throttles to reduce CCW flow to the non-regen heat exchanger, increasing letdown temperature. TCV-3-143, L/D Demin Divert Valve, will fail to automatically divert at 135°F. In accordance with the ARP, the RCO manually align TCV-3-143 to VCT-DIVERT position and take manual control of TC-3-144A to reduce and maintain letdown temperature.

Event 5

The outer seal on the reactor vessel flange develops a leak, resulting in an RCS leak. The crew will enter 3-ONOP-041.3, Excessive RCS Leakage, and 3-ONOP-067, Radioactive Effluent Release. Due to the size and location, a unit shutdown will be required. The crew will enter 3-GOP-100, Fast Load Reduction.

Event 6

Two rods will drop into the core in short succession, requiring a unit trip. The unit will not trip from either switch in the control room, and the rods will fail to insert in both auto and manual. The crew will transition to 3-EOP-FR-S.1, Response to Nuclear Power Generation/ATWS, and initiate an emergency boration.

Event 7

After the BOP trips the turbine, the MSR Stop Valve, MOV-3-1431, will fail to close. The BOP will take the control switch to close to manually close the valve.

Event 8

Emergency Boration Valve, MOV-3-350, will fail to open from the control room. The RCO will open CVCS Makeup valves FCV-3-113A and FCV-3-113B, and then dispatch an operator to open 3-356, Manual Emergency Boration Valve, to commence emergency boration flow.

After the crew initiates emergency boration, an operator will be dispatched to locally trip the unit by locally opening the Reactor Trip and Bypass breakers, and the MG Set Input and Output breakers at the 3B MCC. After the unit is tripped, the crew will return to 3-EOP-E-0, and then transition to 3-EOP-ES-0.1, Reactor Trip Response.

The scenario is terminated after the crew transitions back to 3-EOP-E-0, or at Lead Evaluator discretion once all critical tasks have been evaluated.

CRITICAL TASKS		
Event		**Description**
1	CT1	**Start The Standby ICW Pump** Following a loss of one running ICW pump, start the standby ICW pump within 30 minutes. (0-ADM-232, Time Critical Operator Action Program, Attachment 2) SAFETY SIGNIFICANCE: A single ICW pump could potentially be required to deliver high flow. At low intake levels, there is insufficient NPSH available for a single operating ICW pump to provide the required high flow. The PTN PSA Model assumes the Operator will either throttle flow or start an addition ICW pump with 30 minutes of single pump operation.
8	CT2	**Initiate Emergency Boration** During an ATWS with a failure of rods to insert, initiate emergency boration within 10 minutes of the reactor trip failure. SAFETY SIGNIFICANCE: Failure to insert negative reactivity, results in an unnecessary situation in which the reactor remains critical or returns to a critical condition. 10 minute allowance is sufficient to dispatch local trip actions and is also IAW the PTN PSA Model.

SEQUENCE OF EVENTS	
Event	**Description**
1	3B ICW Pump Sheared Shaft
2	Rx Vessel Inner Flange Leak
3	FT-3-474, 3A S/G Steam Flow Transmitter, Drifts Low
4	TE-3-144, Non-Regen Hx Outlet Temperature, Fails Low
5	Rx Vessel Outer Flange Leak (Shutdown Required)
6	Sequentially Dropped Rods (ATWS)
7	MOV-3-1431, MSR Stop Valve, Fails to Auto Close
8	MOV-3-350, Emergency Borate Valve, Fails to Open

SIMULATOR SET UP INSTRUCTIONS	
Check	**Action**
1. _____	Restore IC-24 (60% MOL) or equivalent IC.
2. _____	Unfreeze the Simulator.
3. _____	Perform the following to setup the IC: • Reduce letdown to one orifice in service (close CV-3-200B) • Reduce charging to one pump running (secure 3C Charging Pump) • Place 3C Charging Pump controller in Manual @ 20% demand • Stabilize letdown/charging flow balance
4. _____	Open & execute lesson file L-17-1 N4.lsn
5. _____	Trigger the following setup steps: • SETUP – B AFW PUMP OOS • SETUP – 3B ISOPHASE COOLER OOS • SETUP EVENT 6 – ATWS • SETUP EVENT 7 – MSR STOP VALVE (MOV-1431) FAILS TO CLOSE • SETUP EVENT 8 – MOV-350 FAILED CLOSED Verify the following steps are in the CONDITIONAL state: • SETUP EVENT 6 – ROD MOTION FAILS • EVENT 7 – ALLOW MOV-1431 TO CLOSE
6. _____	Place ECO tags on the following components: • B AFW Pump • 3B Isophase Bus Cooler
7. _____	Remove placard above B AFW pump tachometer.
8. _____	Ensure Rod Group Step Counters have completed stepping out.
9. _____	Allow the plant to stabilize.
10. _____	Acknowledge any alarms and freeze Simulator.
11. _____	Ensure B train is protected train on VPA.
12. _____	Ensure a copy of 3-OSP-041.1 is available upon request. (In Booth Acceptable)
13. _____	Perform the SIMULATOR OPERATOR CHECKLIST or equivalent.
14. _____	Place TURNOVER SHEETS on RO's desk or give to the Lead Evaluator.

BRIEFINGS

- Shift turnover information is attached to the back of this guide.
- Ensure all applicants are prior briefed on Appendix E of NUREG 1021, Policies and Guidelines For Taking NRC Examinations.
- Conduct a Crew Pre-brief to cover turnover information. Shift turnover information is attached to the back of this guide.

US: ______________________________

RCO: ______________________________

BOP: ______________________________

SCENARIO NOTE

0-ADM-211 Prudent Operator Actions - If redundant stand-by equipment is available and ready, the operator is permitted to start the redundant equipment for failed or failing operating equipment. Immediate follow up of applicable ARPs and ONOPs (AOPs) shall occur as required.

The crew may attempt to solicit information/direction from AOM, SM, etc. DO NOT provide any direction or recommendation. If necessary, ask for their recommendation on how to proceed, and simply concur.

<u>Critical Tasks</u> are highlighted in red.	**<u>Simulator Operator Actions</u>** are highlighted in blue.	**<u>Operator Verifiable Actions</u>** are Highlighted in green.

EVENT 1 – 3B ICW PUMP SHEARED SHAFT		
3-ARP-097.CR.I, I4/4 – ICW HEADER A/B LO PRESS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	<u>NOTE</u> Ensure the Simulator is in **RUN** before the crew enters the Simulator.	US: Conducts shift turnover.
	<u>BOOTH OPERATOR</u> When directed by the Lead Evaluator, **trigger EVENT 1 - 3B ICW PUMP SHEARED SHAFT.**	BOP: Notices 3B ICW Pump amps trending high and then falling low.
CT1 **Start Time** ____________	**<u>Start Standby ICW Pump</u>** Following a loss of one running ICW pump, start the standby ICW pump within 30 minutes.	RCO: Reviews ARP for I4/4, ICW HEADER A/B LO PRESS.
	<u>NOTE</u> The US may direct the BOP to start the 3A ICW pump and to secure the 3B ICW pump using 3-NOP-019, Intake Cooling Water System, or 0-ADM-211.	US: Directs the BOP to start 3A ICW Pump and secure 3B ICW Pump.
CT1 **Stop Time** ____________	**<u>BOOTH OPERATOR</u>** If asked to check the ICW pumps, wait 2-3 minutes and then report a SAT start on the 3A ICW pump and nothing obviously wrong with the 3B ICW pump.	BOP: • Starts the 3A ICW pump. • Secures the 3B ICW pump • Dispatches Operator to check ICW Pumps.
	<u>BOOTH OPERATOR</u> If the 3A ICW pump is started BEFORE the trigger activates (30 min), right click on trigger **3C ICW PUMP TRIP FOR CT** and select BYPASS. If the pump was started in time but the trigger went through without being bypassed, go to the Summary page, then Pending tab, and delete the pending trigger TVKB003X.	

EVENT 1 – 3B ICW PUMP SHEARED SHAFT		
3-ARP-097.CR.I, I4/4 – ICW HEADER A/B LO PRESS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR If asked to locally check ICW flow, wait 2 minutes and then report actual flow *[Schematic\Common Services\Intake Cooling]* If dispatched to check ICW piping and heat exchangers, wait 5 minutes and report no leaks found. **NOTE** The US may determine that entry into the ONOP is not required.	BOP: Reviews ARP for I4/4, ICW HEADER A/B LO PRESS. • Check ICW header pressure indicators, PI-3-1619 or PI-3-1620 less than or equal to 10 psig on VPA. • Locally Check ICW piping and heat exchangers for leaks. • IF operating a single ICW Pump, THEN Check total ICW flow is less than 18,500 gpm. • Refer to 3-ONOP-019, Intake Cooling Water Malfunction.
	BOOTH OPERATOR Acknowledge communications.	BOP: • Notify Maintenance to make repairs • Notify WCC to generate of PWO.
	BOOTH OPERATOR If directed by the crew to rackout 3B ICW Pump Breaker, wait 7-10 minutes and then call the control room to verify that they are ready for you to rackout the breaker and then **trigger LOA – RACKOUT 3B ICW PUMP BKR**. Report when complete.	US: Review Tech Specs • **LCO 3.7.3.b**, Action b, 72 hours to restore 2 ICW Pumps from independent power supplies. • Once 3AB17 is racked out, then the ACTION shifts to **3.7.3.a** – Action a, 14 days to restore pump.
	LEAD EVALUATOR When the standby ICW pump has been started, or at Lead Evaluator discretion, proceed to the next event.	

EVENT 2 – RX VESSEL INNER FLANGE LEAK		
3-ARP-097.CR.A, A3/6 – RX VESSEL FLANGE LEAK-OFF HI TEMP		
TIME	**EVALUATOR ACTIVITIES & NOTEs**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 2 – RX VESSEL INNER FLANGE LEAK.**	
		BOP: Reviews ARP for A3/6, RX VESSEL FLANGE LEAK-OFF HI TEMP
	BOOTH OPERATOR Acknowledge communications and notifications.	RCO: • Check TI-3-401, RX VESSEL LEAKOFF TEMP >150°F on VPA • Close CV-3-544, RX VESSEL LEAKOFF ISOL VLV TO RCDT • Observe temperature drop on TI-3-401
	NOTE May take over 30 minutes to clear alarm, depending on how quickly it was closed. Once the valve has been closed, or at Lead Evaluator discretion, proceed to the next event.	RCO: If alarm clears, THEN: • Open CV-3-544, RX VESSEL LEAKOFF ISOL VLV TO RCDT to confirm leak • Close CV-3-544, RX VESSEL LEAKOFF ISOL VLV TO RCDT
	NOTE Leak is isolable by closing CV-3-544. Crew will initially be in LCO 3.4.6.2.b. Once the leak is isolated, LCO 3.4.6.2.d will apply. LCO 3.4.6.2 action D entry misidentified in D-2 and removed per pen-ink change	US: Review Tech Specs • **LCO 3.4.6.2.b,** 1 gpm Unidentified Leakage – Action b, reduce leakage in 4 hrs or be in Hot STBY in next 6 hrs • ~~**LCO 3.4.6.2.d,** 10 gpm Identified Leakage~~ – ~~Action d, reduce leakage in 1 hr or be in Hot STBY in next 6 hrs~~
	LEAD EVALUATOR When the valve has been closed, or at Lead Evaluator discretion, proceed to the next event.	RCO: Monitor for outer seal leakage: • R11/R12 • Containment Sump

EVENT 3 – FT-3-474, 3A S/G STEAM FLOW TRANSMITTER, DRIFTS LOW		
3-ONOP-049.1, DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CH		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 3 - 3A S/G STEAM FLOW (FT-474) DRIFTS LOW.**	BOP: Recognizes and reports FT-3-474 is failing low. **PROMPT ACTIONS** • Takes manual control of 3A S/G level control valve FCV-3-478. • Restores 3A S/G level to normal.
		RCO: Reviews ARP for C4/1, C5/1, C6/1, C7/1, and D7/1. • Ensures BOP takes Prompt Actions – Take manual control of level. – Return SG levels to normal. • Checks if alarm is due to instrument failure, then refers to 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels.
	NOTE The crew may use direction in the ARP to select alternate input signals and return 3A S/G level control to automatic before entering 3-ONOP-049.1.	US: Enters and directs actions of 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels, for response
	BOOTH OPERATOR If dispatched to reset AMSAC, wait 3-5 minutes and then **trigger LOA - RESET AMSAC.** Report when complete. **BOOTH OPERATOR** If asked to locally investigate transmitters, wait 2-3 minutes and report no abnormalities noticed.	BOP: 1. Verify FT-3-475 failure by channel check comparison. 2. Verify no off-normal conditions exist on FT-3-476. 3. Place 3A S/G Steam Flow Control Transfer Switch to FT-3-475 (Ch IV - Yellow) 4. MAY Place 3A S/G Feed Water Flow Control Transfer Switch to FT-3-476 (Ch IV - Yellow) 5. Ensure 3A S/G level is returned to auto.

EVENT 3 – FT-3-474, 3A S/G STEAM FLOW TRANSMITTER, DRIFTS LOW		
3-ONOP-049.1, DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CH		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Reviews Tech Specs **LCO 3.3.1, FU 12**, Low S/G Level with Steam/FW Flow Mismatch – Action 6, trip bistables in 6 hrs **LCO 3.3.2, FU 1**, Safety Injection **f.** High Steam Flow with Low S/G Pressure or Low T_{avg} – Action 15, trip bistables in 6 hrs **LCO 3.3.2, FU 4**, Steam Line Isolation **d.** High Steam Flow with Low S/G Pressure or Low T_{avg}) – Action 15, trip bistables in 6 hrs
	<u>BOOTH OPERATOR</u> Acknowledge notifications and request for additional support. If asked, I&C would like to be present when the bi-stables are tripped. They will be in the control room as soon as their work package is ready, about an hour.	US: • Identify Bistables which need to be tripped. • Initiate a Plant Work Order AND notify the I&C Supervisor.
	<u>LEAD EVALUATOR</u> When S/G level control is restored to auto, or at Lead Evaluator discretion, proceed to the next event.	US: Conducts crew brief.

EVENT 4 – TE-3-144, NON-REGEN HX OUTLET TEMPERATURE, FAILS LOW		
3-ARP-097.CR.A, A3/5 – LTDN DEMIN HI TEMP/FLOW DIVERTED		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by Lead Evaluator**, trigger EVENT 4 – L/D TEMP RTD (TE-144) FAILS LOW.** and Verify **EVENT 4 – ALLOW TCV-143 TO DIVERT** is in CONDITIONAL state.	RCO: Reports rising letdown temperature.
		BOP: Reviews ARP for A3/5, LTDN DEMIN HI TEMP/FLOW DIVERTED
	BOOTH OPERATOR • Acknowledge communications. • If asked to investigate valve, wait 1-2 minutes and then report that nothing is obviously wrong.	RCO: Alarm Confirmation • Check TCV-3-143 diverting to VCT **(NO)** • Check TI-3-144 >135°F but less than TI-3-140, REGEN HX OUTLET TEMP **(NO, TE-3-144 failed low)**
	BOOTH OPERATOR When RCO manually diverts, verify **EVENT 4 – ALLOW TCV-143 TO DIVERT triggers.** **BOOTH OPERATOR** When dispatched to check CCW flow to on FI-3-620/620A, wait 1-2 minutes and then report flow using SIM Schematic. *[Schematic/Common Services/CCW]*	RCO: • Ensure TCV-3-143 diverting letdown to VCT **(NO, align to VCT-DIVERT)** • If TI-3-143 equals TI-3-140, THEN: − Check FI-3-620 and FI-3-620A between 100-800 gpm
	NOTE Reducing demand on controller will open the valve and increase CCW flow to non-regen cooler, reducing letdown temp.	RCO: If alarm is due to low CCW flow, THEN: − Place TC-3-144A in Manual − Reduce L/D Temp manually
	LEAD EVALUATOR When TC-3-144A has been placed in manual and letdown temperature is lowering, or at Lead Evaluator discretion, proceed to the next event.	

EVENT 5 – RX VESSEL OUTER FLANGE LEAK		
3-ONOP-041.3, EXCESSIVE REACTOR COOLANT SYSTEM LEAKAGE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 5 – RX VESSEL OUTER FLANGE LEAK.**	RCO: Report indications of RCS leakage.
		BOP: Reviews ARP for G5/3, CTMT LVL INCREASING >1 GPM.
	BOOTH OPERATOR Acknowledge notifications.	RCO: Alarm Confirmation • Check sump recorders • Check ERDADS
	NOTE Crew may determine leak is unisolable and too large for continued operation and commence a shutdown in accordance with T.S. without entering 3-ONOP-041.3.	RCO: • Monitor RCS parameters • Monitor CCW parameters • Perform 3-OSP-041.1 to determine RCS leak rate • Go To 3-ONOP-041.3, Excessive Reactor Coolant System Leakage
		US: Enters and directs actions of 3-ONOP-041.3, Excessive RCS System Leakage, for response.
		US: Reviews Foldout page with crew. • 3-EOP-E-0 Transition Criteria **Foldout Page**
		RCO: • Maintain RCS Inventory • Check RCS Inventory Decreasing **(NO, Go to Step 10)** **Step 1-2**

EVENT 5 – RX VESSEL OUTER FLANGE LEAK		
3-ONOP-041.3, EXCESSIVE REACTOR COOLANT SYSTEM LEAKAGE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO: Monitor RCS Leakage • Check if leak is isolable **(NO, Go to Step 11)** **Step 10**
	NOTE R11/12 may not be rising yet. If crew progresses quickly, these valves will be closed during 3-EOP-FR-S.1. **NOTE** The actions for 3-ONOP-067 begin on the next page. However, crew may go directly to 3-GOP-100.	BOP: Check for Additional Indications of RCS Leakage • R11/R12 Stable or Decreasing **(NO)** – Close CV-3-2819 and 2826 – Close CV-3-2821 and 2822 – Perform 3-ONOP-067 while continuing with this procedure **Step 11**
	BOOTH OPERATOR If the crew decides to use 3-GOP-103, call as the SM and direct them to shutdown using 3-GOP-100. **NOTE** The actions for 3-GOP-100 begin on the page 21.	RCO: Determine if RCS Leakage is within limits of T.S. **(NO, Perform 3-GOP-103 or 3-GOP-100, while continuing with this procedures)** **Step 12**
	BOOTH OPERATOR Respond as SM and acknowledge.	US: Notify SM to refer to 0-EPIP-20101. **Step 13**
	BOOTH OPERATOR Respond as RP and acknowledge.	BOP: • Request RP to conduct surveys and post areas as required. • Check if Leakage Isolated **(NO, Return to Step 1)** **Steps 14-15**

EVENT 5 – RX VESSEL OUTER FLANGE LEAK		
3-ONOP-067, RADIOACTIVE EFFLUENT RELEASE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE Crew may go directly to 3-GOP-100.	US: Enters and directs actions of 3-ONOP-067, Radioactive Effluent Release, for response.
		US: Reviews Foldout page with crew. • Notify personnel via page boost • If trip occurs AND R15/19/20 alarms... • If PRMS alarm occurs, verify automatic actions occur (R11/12) – CTMT purge valves closed – CTMT IA bleed valves closed – CTMT purge fans off – CR ventilation in Recirc **Foldout Page**
		BOP: • Check High Alarm on R11/12 • Check Alarm Setpoint Exceeded • Check R11/12 High Alarm Off **(NO, Go to Step 16)** **Step 1-3**
	BOOTH OPERATOR • Respond as SNPO and report that the alarm has been silenced and no abnormal indications exist. • Respond as RP and Chemistry, as appropriate, and acknowledge.	BOP: Check for High CTMT Airborne Activity **Step 16**
		US: Return to Step 1 **Step 17**

EVENT 5 – RX VESSEL OUTER FLANGE LEAK		
3-GOP-100, FAST LOAD REDUCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: • Directs actions to reduce Rx power per 3-GOP-100. • Completes Attachment 3 • Brief the crew per Attachment 4 **Steps 1-2**
		US: Reviews Foldout page with crew. • 3-EOP-E-0 Transition Criteria • Notify Chemistry Department • Boration Stop Criteria • Restore Blender to AUTO **Foldout Page**
	<u>BOOTH OPERATOR</u> Acknowledge notifications.	BOP: Notify The Following Of Fast Load Reduction • System Dispatcher • Plant personnel using the Page Boost • Chemistry to start RCS sampling is required according to Tech Spec Table 4.4-4. **Step 3**

EVENT 5 – RX VESSEL OUTER FLANGE LEAK		
3-GOP-100, FAST LOAD REDUCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO: Begin Boration For Initial T_{avg} Effect • Set the Boric Acid Totalizer to total boric acid volume value determined on Attachment 3. • Place the Reactor Makeup Selector Switch to BORATE. • Place the RCS Makeup Control Switch to START. • Adjust FC-3-113A, Boric Acid Flow Controller, to achieve 40 gpm boric acid flow as indicated on FR-3-113. • WHEN T_{avg} begins to lower from the boration, THEN adjust FC-3-113A, Boric Acid Flow Controller, to load reduction value from Attachment 3. **Step 4**
		US: Determine Turbine Load Reduction in MW CNTRL **Step 5**
		BOP: Initiate Turbine Load Reduction in MW CNTRL • Select MW CNTRL • Set TARGET power level – MW VALUE from Attachment 3 • Set RAMP RATE – MW/M VALUE FROM Attachment 3. • Check T_{avg} has lowered 1° to 2°F from the initial value prior to boration. • Depress GO • Ensure FC-3-113A, Boric Acid Flow Controller, has been adjusted to the load reduction boration rate. Go to Step 10 **Step 6**

EVENT 5 – RX VESSEL OUTER FLANGE LEAK		
3-GOP-100, FAST LOAD REDUCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Monitor Load Reduction • Adjusts power reduction rate to maintain T_{avg}/T_{ref} within limits of Attachment 3. • Monitors S/G level control to ensure feed reg valves properly maintain level control in automatic. • Refer to Enclosure 1 for expected alarms. **Step 10**
	<u>BOOTH OPERATOR</u> Respond as SNPO. If asked, idle Charging Pump ready for start.	RCO: • Maintain pressurizer level to ensure that automatic pressurizer level control maintains level on program. • If needed, starts 2nd Chg Pp and places 2nd orifice in service. • Adjusts boration rate to maintain T_{avg}/T_{ref} within ±4°F ΔT. • Refer to Enclosure 1 for expected alarms. **Step 10**
		RCO: Monitor Boration Rate • Monitor for excessive rod movement by monitoring TR-3-409D, Rod Position Bank D. • Determine if Insertion Limit and Bank D position are converging at a rate that will cause rod insertion limit alarms. • Adjust power reduction rate as needed to control rod insertion • Increase boration rate and/or total amount as necessary to limit control rod insertion **Step 11**

EVENT 5 – RX VESSEL OUTER FLANGE LEAK		
3-GOP-100, FAST LOAD REDUCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO: • Monitor Annunciator B 8/1, ROD BANK LO LIMIT – CLEAR • Monitor B 8/2 ROD BANK A/B/C/D EXTRA LO LIMIT – CLEAR **Steps 12-13**
	BOOTH OPERATOR Acknowledge notification to refer to E-Plan and ADM-115.	US: Have SM refer to the following procedures: • 0-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR • 0-ADM-115, NOTIFICATION OF PLANT EVENTS **Step 14**
	LEAD EVALUATOR When power has been sufficiently reduced, or at Lead Evaluator discretion, proceed to the next event.	RCO: Energize Pressurizer Backup Heaters **Step 15**

EVENT 6 – SEQUENTIALLY DROPPED RODS (ATWS)		
3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 6 – DROPPED ROD (D8)** and Verify **EVENT 6 – DROPPED ROD (H8) triggers.** (1 minute delay)	RCO: • Recognizes multiple dropped rods • Recommends Reactor trip
	NOTE Crew may secure load reduction.	US: • Directs 3-EOP-E-0 response after auto Reactor trip. OR • Directs RCO to manually trip the Reactor, then for operators to perform their IOA's.
CT2 **Start Time** __________	**Initiate Emergency Boration** During an ATWS, initiate emergency boration within 10 minutes of reactor trip failure. The Start Time is when the 2nd Trip Switch tried fails to trip the reactor.	RCO: Verifies Reactor Trip **(NO)** • Attempts to trip the Reactor manually. – Console C/S – VPB C/S • Reports Reactor power is greater than 5% and Intermediate Range Power is NOT stable or decreasing. **Step 1**
		US: • Monitor Critical Safety Functions using 3-EOP-F-0, Critical Safety Function Status Trees. • Directs operators to perform IOAs of 3-EOP-FR-S.1, Response To Nuclear Power Generation/ATWS.

EVENT 6 – SEQUENTIALLY DROPPED RODS (ATWS)		
3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	CAUTION RCPs should NOT be tripped with reactor power greater than 5%. **NOTE** Step 1 and Step 2 are IMMEDIATE OPERATOR ACTION steps.	RCO: Verify Reactor Trip **(NO)** • Manually trip reactor **(NO)** • Place Rods in Manual • Manually insert Rods **(NO)** **Step 1**
	BOOTH OPERATOR When BOP takes switch to close, verify **EVENT 7 – ALLOW MOV-1431 TO CLOSE triggers.**	BOP: Verify Turbine Trip **(NO)** • MSR Stop Valves Closed **(NO, Manually close MSR Stop Valves)** **Step 2**
	NOTE If the the closing of MOV-3-1431 is delayed, another CT may be introduced due to continued cooldown of the RCS.	US: Reviews Foldout Page with the crew. • Adverse Containment **Foldout Page**
		BOP: Checks AFW Pumps All Running **(NO, Manually open AFW steam supply valves)** **Step 3**

EVENT 6 – SEQUENTIALLY DROPPED RODS (ATWS)		
3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
CT2 **Stop Time** __________	**Initiate Emergency Boration** During an ATWS, initiate emergency boration within 10 minutes of reactor trip failure. The Stop Time is when FCV-3-113A/113B are opened and boration flow established. **BOOTH OPERATOR** When dispatched to locally open 3-356, wait 1-2 minutes and then **trigger EVENT 8 – LOCALLY OPEN 3-356** **NOTE** Crew may start additional charging pump and/or adjust speed to establish desired flow.	RCO: Initiates Emergency Boration • Verifies SI reset • Verifies at least one Charging pump running. • Stops Makeup System • Starts Boric Acid Pump 3A or 3B • Open MOV-3-350, Emergency Boration Valve **(NO)** – Open FCV-3-113A – Open FCV-3-113B – Locally open 3-356, Manual Emergency Boration Valve – When 3-356 is open, close FCV-3-113B • Open HCV-3-121 • Verify CV-3-310A open • Establishes Emergency Boration Flow – FI-3-110 > 60 gpm – FI-3-122A > 45 gpm **Step 4**
	NOTE Valves may have been closed during 3-ONOP-041.3, depending on crew timing.	RCO: Verify Containment Ventilation Isolation **(NO, Close CV-3-2819/2826)** **Step 5**
	BOOTH OPERATOR When dispatched to locally trip the reactor, wait 2-3 minutes and then **trigger LOA – LOCALLY TRIP RX.** Report when complete.	RCO: Check If Rx Trip Has Occurred **(NO)** • Dispatches U3 Operator to 3B MCC Room to locally trip Reactor. • Directs Opening: - 3A & 3B Reactor Trip Bkrs - 3A & 3B Reactor Trip Bypass Bkrs - 3A/3B MG Set Gen Output Bkrs - 3A/3B MG Set Gen Input Bkrs **Step 6**

EVENT 6 – SEQUENTIALLY DROPPED RODS (ATWS)		
3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE If the reactor has been locally tripped, the crew will go to step 16.	RCO: ➔ Check If Reactor Is Subcritical: • Power range channels < 5% AND • Intermediate range – Negative SUR • Observe CAUTION prior to Step 16 **Step 7**
		BOP: ➔ Check S/G Level • Narrow Range Level in at least one S/G – GREATER THAN 7%[27%] • Control feed flow to maintain Narrow Range Level between 21%[27%] and 50% **Step 8**
		RCO: Verify All Dilution Paths Isolated **Step 9**
		RCO: Check For Reactivity Insertion From Uncontrolled RCS Cool Down **Step 10**
		BOP: Check Main Steamline Isolation AND Bypass Valves Closed **Step 11**
		BOP: Identify Faulted S/G **(NO, Go to Step 14)** **Step 12**
		RCO: Check Core Exit TCs Less Than 1200°F **Step 14**
		RCO: Verify Reactor Subcritical **Step 15**

EVENT 6 – SEQUENTIALLY DROPPED RODS (ATWS)		
3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	<u>LEAD EVALUATOR</u> This is the earliest possible opportunity to terminate the scenario. The terminating cue is on page 31.	US: • Ensures boration continues until subsequent actions to verify adequate Shutdown Margin is obtained. • Return to 3-EOP-E-0, Reactor Trip or Safety Injection Step 1. **Step 16**

EVENT 6 – SEQUENTIALLY DROPPED RODS (ATWS)		
3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO: Verifies Reactor Trip **Step 1**
		BOP: Verify Turbine Trip **Step 2**
		BOP: Verify Power To Emergency 4 KV Buses **Step 3**
		RCO: Check If SI Is Actuated **Step 4**
		US: • Monitor Critical Safety Functions using 3-EOP-F-0, Critical Safety Function Status Trees. • Go to 3-EOP-ES-0.1, Reactor Trip Response, Step 1.

EVENT 6 – SEQUENTIALLY DROPPED RODS (ATWS)		
3-EOP-ES-0.1, REACTOR TRIP RESPONSE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Enters and directs actions of 3-EOP-ES-0.1, Reactor Trip Response.
		US: Reviews Foldout page with crew. • SI Actuation Criteria • Pressurizer Level Criteria • S/G Level Criteria Using AFW • CST Makeup Water Criteria • CR Ventilation Manual Isolation Criteria **Foldout Page**
		RCO: Check RCS Temperature Control • Check AFW Pumps At Least Two Running • Check RCPs Any Running • Check RCS T_{avg} using DCS **Step 1**
		BOP: Check Feedwater Status • Check RCS T_{avg} <554°F • Verify Main FRV Closed and in Manual • Manually close Feedwater Isolation Valves (MOV-3-1407/1408/1409) • Check S/G NR Level >7% In At Least One S/G • Check All S/G NR Levels >16% • Check AFW Not Actuated • Stop all but one Main Feedwater Pump **Step 2**
		RCO: Verify All Control Rods Fully Inserted **Step 3**

EVENT 6 – SEQUENTIALLY DROPPED RODS (ATWS)		
3-EOP-ES-0.1, REACTOR TRIP RESPONSE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When asked, report that both Unit 4 4kV buses are energized by offsite power.	BOP: Check 4kV Status to Both Unit 3 & Unit 4 **Step 4**
		RCO: • Check Pressurizer Level Control • Check Pressurizer Pressure Control **Steps 5-6**
		BOP: • Check S/G Levels • Verify 4kV Bus Status • Establish S/G Pressure Control **Steps 7-9**
		RCO: • Check 3B RCP Running • Check SR Detectors Should Be Energized - Transfer Nuclear Recorder to SOURCE RANGE scale **Steps 10-11**
		BOP: • Verify All Heater Drain Pumps Stopped • Stop All But One Condensate Pump • Perform Attachment 8 While Continuing With This Procedure **Step 12**
The scenario is terminated after the crew transitions back to 3-EOP-E-0, or at Lead Evaluator discretion once all critical tasks have been evaluated.		
***** END OF SCENARIO *****		

Discussion Points are intentionally NOT included in evaluated scenarios. However, space is available below to document follow-up questions when further information is required to determine an evaluation outcome.

FOLLOW-UP QUESTIONS

QUESTION #1

ANSWER #1

QUESTION #2

ANSWER #2

SIMULATOR POST-SCENARIO RESTORATION:

_______ 1. Restore per Simulator Operator Checklist.

_______ 2. Once exams are complete, restore from SEI-19, Simulator Exam Security.

OPERATIONS SHIFT TURNOVER REPORT

UNIT 3 RISK: GREEN (ACCEPTABLE) PROTECTED TRAIN: B	UNIT 4 RISK: GREEN (ACCEPTABLE) PROTECTED TRAIN: B

ONCOMING CREW ASSIGNMENTS

Shift Mgr:			**Inside SNPO:**	
Field Supv.:			**Outside SNPO:**	
Admin RCO:			**ANPO:**	
Unit 3			**Unit 4**	
Unit Supv.:			**Unit Supv.:**	
RCO:			**RCO:**	
NPO:			**NPO:**	

PLANT STATUS

Unit 3			**Unit 4**	
Mode:	1		**Mode:**	1
Power:	60%		**Power:**	100%
MWe:	468		**MWe:**	842
Gross Leakrate:	.11 gpm		**Gross Leakrate:**	0.09 gpm
RCS Boron Conc:	963 ppm		**RCS Boron Conc:**	642 ppm

Operational Concerns:

B AFW pump taken OOS 24 hours ago for an oil change, expected back by the end of tomorrow peak shift. Two trains verified operable.

3B Isophase Fan OOS for fan repair. Estimated completion time is one week. 3A Isophase Fan Guarded.

Return to full power expected next shift.

MIMS alarms are inhibited.

U3 Anticipated LCO Actions:

None

U4 Anticipated LCO Actions:

None

Results of Offgoing Focus Area:

UNIT 3 STATUS

REACTOR OPERATOR

UNIT RISK: GREEN (ACCEPTABLE)   PROTECTED TRAIN: B

Mode:	1
Power:	60%
MWe	468
Tavg:	565°F
RCS Pressure:	2235
RCS Boron Conc:	963 ppm

RCS Leakrate	
Gross:	0.11 GPM
Unidentified	0.04 GPM
Charging Pps:	0.00 GPM

Accumulator Ref Levels	
A	6700
B	6692
C	6695

Abnormal Annunciators:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	

Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items"	
T.S.A.S / Component: Reason: Entry Date:	B AFW pump, 3.7.1.2 – Action 3 Oil Change 24 hours ago
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	

REACTOR OPERATOR (CONT'D)
UNIT RISK: GREEN (ACCEPTABLE)   PROTECTED TRAIN: B
<u>Changes to Risk Significant Equipment:</u>
No recent changes from last shift. OLRM: GREEN PROTECTED TRAIN: B
<u>Upcoming Reactivity Management Activities:</u>
Maintain 60% to 61.5% Xe is stable.
<u>Upcoming Major POD Activities:</u>
NONE
<u>Upcoming ECOs to Hang and /or Release:</u>
• Hang – None • Release – None
<u>Evolutions or Compensatory Actions in Progress:</u>
STA monitoring MIMS every 2 hrs.
<u>General Information, Remarks, and Operator Work Around Status:</u>
• Weather forecast is overcast skies with scattered pockets of severe rain. • U3 supplying Aux Steam • Air In-leakage = 0.0 SCFM

Facility: **Turkey Point Nuclear (PTN) – Units 3 and 4** Scenario No.: **5** Op Test No.: **2017-301**

Examiners: ____________ Operators: ____________ (SRO)

____________ ____________ (RCO)

____________ ____________ (BOP)

Initial Conditions:	The plant is at 10^{-8} amps (BOL). Online risk is green. B train is protected on both units.
Turnover:	EOOS: None
Critical Tasks:	Close PORV or Block Valve, and Spray Valve Reenergize 3A 4kV Bus

Event	Malf. No.	Event Type*	Event Description
1	N/A	R-RCO N-BOP R-SRO	Raise Power
2	N/A	SRO (TS)	3B HHSI Pump Oiler
3	TVKALKST	C-RCO C-SRO	CCW Leak
4	TFE3HFXR TFE3Q27L	C-BOP C-SRO (TS)	Loss of 3H LC (Fails to Auto Swap)
5	TVH1TX44	I-RCO I-SRO	PT-3-444, PZR Pressure Transmitter, Drifts High
6	TVSWV8C TFSWV5BA	C-BOP C-SRO	FCV-3-6278C, S/G C Blowdown Flow Control Valve, Leakby
7	TVHPBOTL TFE2Z51S	M-RCO M-BOP M-SRO	PZR Surge Line Break 3B 4kV Bus Lockout
8	TFL3SIA1 TFL3SIA2	P-RCO	SI Fails to Auto Actuate
9	TFE2Z50S	P-BOP	Loss of 3A 4kV Bus (Loss of All AC)

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

SCENARIO SUMMARY

Event 1
The RCO will pull rods to raise power to the POAH, approximately 3-5%, in accordance with 3-GOP-301, Hot Standby to Power Operation. The BOP will maintain Steam Generator levels in manual on the FRV Bypasses.

Event 2
A field Operator will report a broken oiler on the 3B HHSI Pump due to scaffolding impact. The US will review and determine applicable Tech Specs.

Event 3
A CCW leak will develop, causing head tank level to begin to lower. The crew will respond in accordance with the ARP and the RCO will open MOV-3-832, CCW Surge Tank Makeup, to refill the tank. The crew will dispatch an operator to investigate for and isolate the leak. The tank will be filled to normal band, and MOV-3-832 closed.

Event 4
The 3H Load Center feeder breaker, 30402, will spuriously trip. A relay failure will cause the 3H LC to fail to auto swap to the A train. The BOP will respond in accordance with the ARP and manually align the 3H LC to 3C LC.

Event 5
PZR Pressure Transmitter, PT-3-444, slowly drifts high. The PZR Spray Valves, PCV-3-455A and PCV-3-455B, will begin to open, reducing PZR Pressure. The RCO will respond in accordance with the ARP and take manual control of PC-3-444J, PZR Pressure Controller, and fully lower demand to close the sprays, close the PORV (if opened), energize the PZR Heaters, and restore PZR Pressure. The US will enter the 3-ONOP-041.5, PZR Press Control Malfunction, to verify all required actions are complete.

Event 6
S/G C Blowdown Flow Control Valve, FCV-3-6278C, will develop significant leakby. Additionally, the Blowdown Tank to Canal Valve, LCV-3-6265B, will fail to modulate as necessary to maintain Blowdown Tank level, resulting in a high level alarm. The crew will respond in accordance with the ARP and isolate S/G C Blowdown by closing the Blowdown Isolation Valve, CV-3-6275C. The BOP will need to adjust feed to the C S/G to compensate for the increased blowdown until it is isolated.

Event 7
A leak on the PZR Surge Line will develop, leading to SI and automatic reactor trip. When the Low PZR Pressure SI signal actuates, the 3B 4kV bus will lockout. The bus will remain locked out for the remainder of the scenario. The crew will enter 3-EOP-E-0, Reactor Trip or Safety Injection.

Event 8
Safety Injection will fail to auto actuate. The RCO will manually actuate Safety Injection and Phase A Containment Isolation by depressing manual pushbuttons. 3B SI Pump will not be available due to lockout on 3B 4kV Bus.

Event 9
When the 3C RCP is tripped during the Foldout Page, the 3A 4kV bus will spuriously lockout, resulting in a Loss of All AC Power. The crew will transition to 3-EOP-ECA-0.0, Loss of All AC Power. The BOP will reset the 3A 4kV bus lockout and manually start the 3A EDG (auto start failure). Once started, it will automatically reenergize the 3A 4kV bus. The crew will restart safeguards equipment and return to 3-EOP-E-0.

Prior to transitioning to 3-EOP-E-1, the crew will monitor CSFS Trees and identify a Red path on integrity exists, requiring a transition to 3-EOP-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition. The crew will determine that a 1-hr soak is required and mark the time.

The scenario is terminated once a 1-hr soak has been determined to be required, or at Lead Evaluator discretion once all critical tasks have been evaluated.

CRITICAL TASKS		
Event		**Description**
5	**CT1**	**Close PZR Spray Valve and PORV or PORV Block Valve** When PZR pressure is less than 2235 psig and the PZR Spray valve is open, close the Spray valve and the PORV or its associated block valve prior automatic reactor trip at 1835 psig. SAFETY SIGNIFICANCE: Failure to isolate the vent path results in direct adverse consequence and significant degradation in the mitigative capability of the plant.
9	**CT2**	**Re-energize 3A 4kV Bus** Following a Loss Of All AC, restore power to the 3A 4kV Bus prior to actuating SI and within 30 minutes of the loss of power. SAFETY SIGNIFICANCE: The failure to energize an AC emergency bus in a timely manner constitutes a misoperation or incorrect crew performance in which the crew does not prevent a degraded emergency power capacity. The 30 minute time limit is based minimizing DC bus battery depletion and the requirement to manually load a de-energized DC bus battery charger onto the operating EDG. (0-ADM-232, Attachment 1, Time Critical Operator Actions)

SITE:	**Turkey Point Units 3 and 4 (PTN)**	**Revision #:**	**0-1**
LMS ID:	**L-17-1 N5**	**Rev. Date:**	**1/11/17**
SEG TITLE:	**L-17-1 NRC Exam Scenario 5**		

SEG TYPE: ☐ **Training** ☒ **Evaluation**

PROGRAM: ☐ **LOCT** ☒ **LOIT** ☐ **Other:**

DURATION: **90 minutes**

Developed by:	**Tim Hodge** Instructor/Developer	**7/25/17** Date
Reviewed by:	**Val Miklausich** Instructor (Instructional Review)	**8/3/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**7/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**8/3/17** Date
Approved by:	**Mike Murphy** Training Program Owner (Line)	**7/25/17** Date

SCENARIO REFERENCES		
DOC NO.	**TITLE**	**REV**
3-ARP-097.CR	CONTROL ROOM ANNUNCIATOR RESPONSE PROCEDURES	VARIOUS
3-NOP-071	STEAM GENERATOR BLOWDOWN RECOVERY SYSTEM	7
3-GOP-301	HOT STANDBY TO POWER OPERATION	42
3-ONOP-041.5	PRESSURIZER PRESSURE CONTROL MALFUNCTION	4
3-EOP-E-0	REACTOR TRIP OR SAFETY INJECTION	13
3-EOP-ECA-0.0	LOSS OF ALL AC POWER	12A
3-EOP-E-1	LOSS OF REACTOR OR SECONDARY COOLANT	9
3-EOP-FR-P.1	RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION	5
3-EOP-F-0	CRITICAL SAFETY FUNCTION STATUS TREES	4
PTN TECH SPEC	PTN TECHNICAL SPECIFICATIONS	303

SIMULATOR EXERCISE GUIDE REQUIREMENTS	
Terminal Objective	Given this simulator scenario and resources normally found in the Control Room, the operating crew will perform Control Room operations IAW approved plant procedures in order to maintain the integrity of the plant and the health and safety of the public.
Enabling Objectives:	Given this simulator scenario and resources normally found in the Control Room, operate in accordance with approved plant procedures, Operations Department Instructions, and management expectations: 1. (ALL) Demonstrate personnel SAFETY awareness in interactions with plant staff and outside agencies. 2. (ALL) Demonstrate ALARA awareness in interactions with plant staff and outside agencies. 3. (ALL) Exchange correct information using 3-point communication/Repeat-backs with Control Room personnel and other plant staff. 4. (ALL) Inform plant personnel and System of plant conditions, as needed. 5. (US) Employ timely and concise crew briefs where appropriate. 6. (ALL) Maintain awareness of plant status and control board indication. 7. (ALL) Correctly diagnose plant situations. 8. (ALL) Solve operational problems as they arise. 9. (RCO/BOP) Manipulate plant controls properly and safely. 10. (ALL) Demonstrate self-checking using STAR and peer checks(when required) 11. (US) Demonstrate command and control of the crew. 12. (US) Coordinate the input of crew members and other plant staff. 13. (US) Utilize the input of crew members and other plant staff. 14. (ALL) Demonstrate conservative decision making. 15. (ALL) Demonstrate teamwork. 16. (ALL) Respond to plant events using procedural guidance (OPs/ONOPs/EOPs) as applicable in accordance with rules of usage. 17. (RCO/BOP) Implement any applicable procedural immediate operator actions without use of references. 18. (SRO) Maintain compliance with Tech Specs. 19. (ALL) Identify/enter applicable Tech Spec action statements. 20. (ALL) Respond to annunciators using ARPs (time permitting). 21. (ALL) Maintain written communication, logs, and documentation as needed to permit post-event reconstruction. Continued on next page

SIMULATOR EXERCISE GUIDE REQUIREMENTS	
	While addressing the following events: 1. Raise Power 2. 3B HHSI Pump Oiler 3. CCW Leak 4. Loss of 3H LC (Fails to Auto Swap) 5. PT-3-444, PZR Pressure Transmitter, Drifts High 6. FCV-3-6278C, S/G C Blowdown Flow Control Valve, Leakby 7. PZR Surge Line Break/3B 4kV Bus Lockout 8. SI Fails to Auto Actuate 9. Loss of 3A 4kV Bus (Loss of All AC)
Prerequisites:	None
Training Resources:	PTN Unit 3 Plant Simulator
Development References:	• TR-AA-220-1003, Initial NRC and Audit Exam Process • TR-AA-230-1000, Systematic Approach to Training Process • TR-AA-230-1007, Conduct of Simulator Training and Evaluation • 0-ADM-232, Time Critical Action Program • OP-AA-100-1000, Conduct Of Operations • OP-AA-103-1000, Reactivity Management • 0-ADM-200, Operations Management Manual • 0-ADM-211, Emergency and Off-Normal Operating Procedure Usage • WCAP-17711-NP, Pressurized Water Reactor Owners Group Westinghouse Emergency Response Guideline Revision 2-Based Critical Tasks
Protected Content:	N/A
Evaluation Method:	Performance Mode
Operating Experience:	None
Risk Significant Operator Actions:	Close PZR Spray Valve and PORV or Block Valve Reenergize 3A 4kV Bus

TASKS ASSOCIATED WITH THIS SIMULATOR EXERCISE GUIDE

SRO TASK #	TASK TITLE
02200023100	COORDINATE UNIT STARTUP
02200002500	EVALUATE CRITICAL SAFETY FUNCTION (CSF) STATUS TREE OUTPUT
02041029300	EVALUATE AND RESPOND TO A LOW PRESSURIZER PRESSURE
02063008500	VERIFY SI OPERATION
2200022500	DIAGNOSE CAUSE OF SAFEGUARDS ACTUATION
02200001500	RESPOND TO UNIT TRIP
02202001300	IDENTIFY/RESPOND TO OFF-NORMAL EVENTS
02041068300	RESPOND TO EXCESSIVE RCS LEAKAGE
02005015500	RESPOND TO A LOSS OF ALL AC POWER
02005017500	RECOVER FROM A LOSS OF ALL AC POWER - SI REQUIRED
02200021500	RESPOND TO A LOSS OF COOLANT ACCIDENT
02200044500	RESPOND TO STEAM GENERATOR HIGH LEVEL
02200050500	RESPOND TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

RO TASK #	TASK TITLE
01200023100	COORDINATE UNIT STARTUP
01028015100	ADJUST POWER LEVEL
01041027100	ADJUST PRESSURIZER PRESSURE MANUALLY USING THE MASTER CONTROLLER (444J)
01030008300	RESPOND TO COMPONENT COOLING WATER SYSTEM MALFUNCTIONS
01200044500	RESPOND TO STEAM GENERATOR HIGH LEVEL
01063008500	VERIFY SAFETY INJECTION OPERATION
01200001500	RESPOND TO UNIT TRIP
01005015500	RESPOND TO A LOSS OF ALL AC POWER
01005017500	RECOVER FROM A LOSS OF ALL AC POWER - SI REQUIRED
01041068300	RESPOND TO EXCESSIVE RCS LEAKAGE
01005030100	TRANSFER D 4KV BUS FROM B TO A 4KV BUS
01200022500	DIAGNOSE CAUSE OF SAFEGUARDS ACTUATION
01200021500	RESPOND TO A LOSS OF COOLANT ACCIDENT
01200050500	RESPOND TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

UPDATE LOG:	
NOTES:	Place this form with the working copies of lesson plans and/or other materials to document changes made between formal revisions. For fleet-wide training materials, keep electronic file of this form in same folder as approved materials. Refer to TR-AA-230-1003 SAT Development for specific directions regarding how and when this form shall be used.

Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / REVIEWER	DATE / DATE
0-0	Initial Revision	L-17-1 NRC Exam	N/A	Note 5	Note 5
				Note 5	Note 5
0-1	Validation Comments	NRC Prep Week	N/A	T.Hodge	10/5/17
				M.Wilson	10/5/17
0-2					
0-3					
0-4					
0-5					

1. Individual updating lesson plan or training material shall complete the appropriate blocks on the Update Log.
2. Describe the change to the lesson plan or training materials.
3. State the reason for the change (e.g., reference has changed, typographical error, etc.)
4. Preparer enters name/date on the Update Log and obtains Training Supervisor approval.
5. Initial dates and site approval on cover page.

SCENARIO SUMMARY

Initial Conditions:

The plant is at 10^{-8} amps (BOL). Online risk is green. B train is protected on both units

Equipment OOS

None

Event 1

The RCO will pull rods to raise power to the POAH, approximately 3-5%, in accordance with 3-GOP-301, Hot Standby to Power Operation. The BOP will maintain Steam Generator levels in manual on the FRV Bypasses.

Event 2

A field Operator will report a broken oiler on the 3B HHSI Pump due to scaffolding impact. The US will review and determine applicable Tech Specs.

Event 3

A CCW leak will develop, causing head tank level to begin to lower. The crew will respond in accordance with the ARP and the RCO will open MOV-3-832, CCW Surge Tank Makeup, to refill the tank. The crew will dispatch an operator to investigate for and isolate the leak. The tank will be filled to normal band, and MOV-3-832 closed.

Event 4

The 3H Load Center feeder breaker, 30402, will spuriously trip. A relay failure will cause the 3H LC to fail to auto swap to the A train. The BOP will respond in accordance with the ARP and manually align the 3H LC to 3C LC.

Event 5

PZR Pressure Transmitter, PT-3-444, slowly drifts high. The PZR Spray Valves, PCV-3-455A and PCV-3-455B, will begin to open, reducing PZR Pressure. The RCO will respond in accordance with the ARP and take manual control of PC-3-444J, PZR Pressure Controller, and fully lower demand to close the sprays, close the PORV (if opened), energize the PZR Heaters, and restore PZR Pressure. The US will enter the 3-ONOP-041.5, PZR Press Control Malfunction, to verify all required actions are complete.

Event 6

3C S/G Blowdown Flow Control Valve, FCV-3-6278C, will develop significant leakby. Additionally, the Blowdown Tank to Canal Valve, LCV-3-6265B, will fail to modulate as necessary to maintain Blowdown Tank level, resulting in a high level alarm. The crew will respond in accordance with the ARP and isolate 3C S/G Blowdown by closing the Blowdown Isolation Valve, CV-3-6275C. The BOP will need to adjust feed to the 3C S/G to compensate for the increased blowdown until it is isolated.

Event 7

A leak on the PZR Surge Line will develop, leading to SI and automatic reactor trip. When the Low PZR Pressure SI signal actuates, the 3B 4kV bus will lockout. The bus will remain locked out for the remainder of the scenario. The crew will enter 3-EOP-E-0, Reactor Trip or Safety Injection.

Event 8

Safety Injection will fail to auto actuate. The RCO will manually actuate Safety Injection and Phase A Containment Isolation by depressing manual pushbuttons. 3B SI Pump will not be available due to lockout on 3B 4kV Bus.

Event 9

When the 3C RCP is tripped during the Foldout Page, the 3A 4kV bus will spuriously lockout, resulting in a Loss of All AC Power. The crew will transition to 3-EOP-ECA-0.0, Loss of All AC Power. The BOP will reset the 3A 4kV bus lockout and manually start the 3A EDG (auto start failure). Once started, it will automatically reenergize the 3A 4kV bus. The crew will restart safeguards equipment and return to 3-EOP-E-0.

Prior to transitioning to 3-EOP-E-1, the crew will monitor CSFS Trees and identify a Red path on integrity exists, requiring a transition to 3-EOP-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition. The crew will determine that a 1-hr soak is required and mark the time.

The scenario is terminated once a 1-hr soak has been determined to be required, or at Lead Evaluator discretion once all critical tasks have been evaluated.

CRITICAL TASKS		
Event		**Description**
5	**CT1**	**<u>Close PZR Spray Valve and PORV or PORV Block Valve</u>** When PZR pressure is less than 2235 psig and the PZR Spray valve is open, close the Spray valve and the PORV or its associated block valve prior automatic reactor trip at 1835 psig. SAFETY SIGNIFICANCE: Failure to isolate the vent path results in direct adverse consequence and significant degradation in the mitigative capability of the plant.
9	**CT2**	**<u>Re-energize 3A 4KV Bus</u>** Following a Loss Of All AC, restore power to the 3A 4KV Bus prior to actuating SI and within 30 minutes of the loss of power. SAFETY SIGNIFICANCE: The failure to energize an AC emergency bus in a timely manner constitutes a misoperation or incorrect crew performance in which the crew does not prevent a degraded emergency power capacity. The 30 minute time limit is based minimizing DC bus battery depletion and the requirement to manually load a de-energized DC bus battery charger onto the operating EDG. (0-ADM-232, Attachment 1, Time Critical Operator Actions)

SEQUENCE OF EVENTS	
Event	**Description**
1	Raise Power
2	3B HHSI Pump Oiler
3	CCW Leak
4	Loss of 3H LC (Fails to Auto Swap)
5	PT-3-444, PZR Pressure Transmitter, Drifts High
6	FCV-3-6278C, S/G C Blowdown Flow Control Valve, Leakby
7	PZR Surge Line Break/3B 4kV Bus Lockout
8	SI Fails to Auto Actuate
9	Loss of 3A 4kV Bus (Loss of All AC)

SIMULATOR SET UP INSTRUCTIONS	
Check	**Action**
1. ____	Restore IC-37 (10^{-8} amps BOL) or equivalent IC.
2. ____	Unfreeze the Simulator.
3. ____	Open & execute lesson file L-17-1 N5.lsn
4. ____	Trigger the following setup steps: • SETUP EVENT 7 – SI FAILS TO AUTO ACTUATE • SETUP EVENT 8 – 3A EDG FAILS TO AUTO START
5. ____	Mark up copy of 3-GOP-301, Hot Standby to Power Operation
6. ____	Ensure Rod Group Step Counters have completed stepping out.
7. ____	Allow the plant to stabilize.
8. ____	Acknowledge any alarms and freeze Simulator.
9. ____	Ensure B train is protected train on VPA.
10. ____	Perform the SIMULATOR OPERATOR CHECKLIST or equivalent.
11. ____	Place TURNOVER SHEETS on RO’s desk or give to the Lead Evaluator.

BRIEFINGS

- Shift turnover information is attached to the back of this guide.
- Ensure all applicants are prior briefed on Appendix E of NUREG 1021, Policies and Guidelines For Taking NRC Examinations.
- Conduct a Crew Pre-brief to cover turnover information. Shift turnover information is attached to the back of this guide.

US: ______________________________

RCO: ______________________________

BOP: ______________________________

SCENARIO NOTE

0-ADM-211 Prudent Operator Actions - If redundant stand-by equipment is available and ready, the operator is permitted to start the redundant equipment for failed or failing operating equipment. Immediate follow up of applicable ARPs and ONOPs (AOPs) shall occur as required.

The crew may attempt to solicit information/direction from AOM, SM, etc. DO NOT provide any direction or recommendation. If necessary, ask for their recommendation on how to proceed, and simply concur.

Critical Tasks are highlighted in red.	**Simulator Operator Actions** are highlighted in blue.	**Operator Verifiable Actions** are Highlighted in green.

EVENT 1 – RAISE POWER TO 3-5%		
3-GOP-301, HOT STANDBY TO POWER OPERATION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE The Reactivity briefing will occur prior to assuming the watch in the Simulator Briefing Room. Allow up to 30 minutes for the briefing before the crew enters the control room.	CREW: Participates in reactivity briefing for raising Rx power to 3-5% / POAH.
	NOTE Maneuvering Guidelines are attached to the back of this Scenario Guide.	US: Directs the evolution per 3-GOP-301, Hot Standby to Power Operation, in accordance Step 5.45.
		RCO: Pull Rods to establish a startup rate not to exceed 1 dpm while below the POAH.
		BOP: Adjusts Steam Dumps to Atmosphere and Feedwater flow to maintain S/G Level on program when POAH is reached.
		RCO: Once above the POAH withdrawals rods continues to raise power with a startup rate not to exceed .5 dpm.
	LEAD EVALUATOR When the crew raises power above the POAH, or at Lead Evaluator discretion, proceed to the next event.	

EVENT 2 – 3B HHSI PUMP OILER		
TECHNICAL SPECIFICATIONS – 3.5.2		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, call as the SNPO and report that a piece of scaffolding fell and broke off the 3B HHSI Pump outboard bearing oiler and all the oil emptied onto the floor. The oil is being contained and cleaned with rags.	
	BOOTH OPERATOR Acknowledge communications.	BOP: Call WCC for support.
		RCO: Place 3B HHSI Pump in PTL
	BOOTH OPERATOR If directed to rackout the 3B HHSI pump breaker, 3AB12, wait 10-15 minutes and **trigger EVENT 2 – RACKOUT 3B HHSI PUMP BKR.** Report when complete.	
		US: Review Tech Specs • **LCO 3.5.2**, Action c, restore pump within 30 days or be in HOT STBY in the next 12 hrs and in HOT SHUTDOWN in the following 6 hrs.
	LEAD EVALUATOR When the Tech Spec review has been completed, or at Lead Evaluator discretion, proceed to the next event.	

EVENT 3 – CCW LEAK		
3-ARP-097.CR.H, H7/6 – CCW SURGE TANK LO LEVEL		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 3 – CCW LEAK.**	RCO: Reports CCW Head Tank Low Level.
		BOP: Reviews ARP for H8/6, CCW HEAD TANK HI/LO LEVEL
	NOTE MOV-3-832 is a throttle valve.	RCO: • Check CCW Head Tank level indication, LI-3-614A on VPB. • Open fill valve, MOV-3-832, PRIMARY WATER MAKEUP TO CCW SURGE TANK, to restore level to normal (10-85%).
	BOOTH OPERATOR Acknowledge communications.	BOP: Dispatch an operator to check for CCW Leaks.
	BOOTH OPERATOR AFTER the crew has opened MOV-3-832 AND 2-3 minutes after being dispatched to check for leaks, **trigger LOA – ISOLATE LEAK**. When complete, report that the leak was a drain line valve, 3-1173, in Unit 3 CCW Hx room and it has been isolated.	RCO: Close fill valve, MOV-3-832, PRIMARY WATER MAKEUP TO CCW SURGE TANK, to maintain level.
	LEAD EVALUATOR When level in the CCW Head Tank level has been stabilized, or at Lead Evaluator discretion, proceed to the next event.	

EVENT 4 – LOSS OF 3H LC		
3-ARP-097.CR.F, F9/6 – 480V SWING LC H UNDERVOLTAGE/TROUBLE		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by Lead Evaluator, **trigger EVENT 4 – LOSS OF 3H LC.**	BOP: Reports loss of voltage on 3H LC.
		RCO: Reviews ARP for F9/6, 480V SWING LC H UNDERVOLTAGE/TROUBLE
	BOOTH OPERATOR If asked to investigate, report the following, as appropriate: • Both D LC feeder breakers, 30402 and 35001, are tripped. • No targets on the 3H Load Center or the feeder breakers. • No obvious issues with the bus or any of the breakers. • If electrical is called, report no abnormalities on the bus.	RCO: Alarm Confirmation • Check auto bus transfer Operator Actions • Ensure bus feeder breakers swap to alternate supply **(NO)** **ARP**
	BOOTH OPERATOR When the transfer switch is taken to 3C LC position, verify **EVENT 4 – ALIGN H LC TO C LC triggers.**	BOP: • Manually transfer 3H LC to 3C LC • Check voltage on all phases of 3C and 3D Load Centers • Start 3B Charging Pump
	BOOTH OPERATOR As necessary, acknowledge and confirm any check or field manipulations (ie opening/closing elevator breaker). Report SAT, as applicable, when investigating components after swap.	US: Review Tech Specs • **LCO 3.8.3.1.b**, Action a, reenergize train within 8 hrs or be in HOT STANDBY within the next 6 hrs and in COLD SHUTDOWN within the following 30 hrs.
	LEAD EVALUATOR When 3H LC has been energized, or at Lead Evaluator discretion, proceed to the next event.	

EVENT 5 – PT-3-444, PZR PRESSURE TRANSMITTER, DRIFTS HIGH		
3-ONOP-041.5, PRESSURIZER PRESSURE CONTROL MALFUNCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 5 – PZR PRESSURE (PT-444) DRIFTS HIGH.** and Verify **EVENT 5A – PORV INTERLOCK FAILS** is in CONDITIONAL state.	
CT1	**Close PZR Spray Valve and PORV** When PZR pressure is less than 2235 psig and the PZR Spray valve is open, close the Spray valve and the PORV or its associated block valve prior automatic reactor trip at 1835 psig.	RCO: • Recognizes RCS Pressure lowering and PZR Spray valves are open. • Closes PZR Spray Valves PCV-3-455A and PCV-3-455B. • If opened, close PORV PCV-3-455C.
	BOOTH OPERATOR When the RCO has manual control of PZR Pressure, select BYPASS for the CONDITIONAL triggers **5A**, **5B**, and **5C**. These are included for CT validity and are no longer required once the CT has been met.	BOP: Reviews ARP for A9/2, PZR CONTROL HI/LO LEVEL. • Checks if alarm is due to instrument failure, then refers to 3-ONOP-041.5, Pressurizer Pressure Control Malfunction.
	BOOTH OPERATOR WCC/I&C: Acknowledge the report.	US: Enters and directs actions of 3-ONOP-041.5, PZR Press Control Malfunction, for response.
		US: Reviews Foldout Page with crew. • 3-EOP-E-0 Transition Criteria • PORV Isolation/Leaking PORV Identification • Open/Leaking PZR Safety Valve Identification • Spurious Actuation of CV-3-311, Auxiliary Spray Valve. **Foldout Page**

EVENT 5 – PT-3-444, PZR PRESSURE TRANSMITTER, DRIFTS HIGH		
3-ONOP-041.5, PRESSURIZER PRESSURE CONTROL MALFUNCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE Sprays can be closed using their individual controllers or by taking manual control of PC-3-444J. PC-3-444J may already be in Manual control.	RCO: Check PT-3-444 - NOT FAILED **(NO)** • Verify PCV-3-455C Closed • Take Manual control of PC-3-444J Check PT-3-445 - NOT FAILED **Step 1**
		RCO: • Checks PORVs closed • Checks PZR Spray Valves Closed with PZR pressure normal or trending to normal. • Checks PZR Safety Valves closed. • Check PZR Pressure Stable or Increasing. • Check Pressurizer Pressure Above Normal Value **(NO, Go to step 10)** **Steps 2-6**
		RCO: • Check Pressurizer Pressure Low Or Decreasing. • Maintain PZR Pressure Greater Than 2000 psig. • Check PZR Heater Operable • Check If A PORV Is Leaking **(NO, Go to Step 15)** **Steps 10-13**
		RCO: • Determine If A Leaking PZR Safety Is Causing Pressure To Decrease **(NO)** • Determine If RCS Leakage Is Causing • Pressure To Decrease **(NO)** • Check Pressurizer Pressure Decreasing **(NO, Go to Step 20)** **Steps 15-17**

EVENT 5 – PT-3-444, PZR PRESSURE TRANSMITTER, DRIFTS HIGH

3-ONOP-041.5, PRESSURIZER PRESSURE CONTROL MALFUNCTION

TIME	EVALUATOR ACTIVITIES & NOTES	EXPECTED STUDENT RESPONSE
		RCO: • Check RCS Pressure Stable • Check If Automatic Pressure Control Can Be Established **(NO)** - Notify I&C - Continue efforts to establish automatic pressure control - Return to Step 20 **Steps 20-21**
	BOOTH OPERATOR WCC/I&C: Acknowledge the report.	BOP: Notifies WCC to initiate PWO and I&C for troubleshooting.
	NOTE This LCO is only applicable in MODE 1.	US: Review Tech Specs • LCO 3.2.5.b, Action, restore within 2 hrs or be <5% within next 4 hrs.
	LEAD EVALUATOR When the crew has stabilized RCS pressure, or at Lead Evaluator discretion, proceed to the next event.	US: Conducts crew brief.

EVENT 6 – FCV-3-6278C, S/G C BLOWDOWN FLOW CONTROL VALVE, LEAKBY		
3-ARP-097.CR.F, F1/6 – S/G BLOWDOWN TANK HI/LO LEVEL		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by Lead Evaluator, **trigger EVENT 6 – S/G C BLOWDOWN FCV-6278C LEAKBY.** and Verify **EVENT 6 – ALLOW LCV-6265B TO CLOSE** is in CONDITIONAL state.	
	BOOTH OPERATOR When asked, wait 3-5 minutes and report blowdown tank level is 743”.	BOP: Reports high blowdown tank level.
	BOOTH OPERATOR Acknowledge communications.	RCO: Reviews ARP for F1/6, S/G BLOWDOWN TANK HI/LO LEVEL.
	BOOTH OPERATOR When directed to close local isolation valve, wait 3-5 minutes **trigger LOA – CLOSE SGB-009.** Report when complete.	RCO/BOP: • Ensure FCVs closed • Secure blowdown (Close, CV-3-6275C, S/G C Blowdown Isolation Valve) • Notify Chemistry • Close SGB-3-009
	NOTE May refer to 3-NOP-071 to secure blowdown.	BOP: Control S/G Levels by adjusting FRV Bypass valves
	LEAD EVALUATOR When blowdown has been isolated and S/G levels have been stabilized, or at Lead Evaluator discretion, proceed to the next event.	

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 7 – PZR SURGE LINE BREAK.** and Verify **EVENT 7 – 3B 4KV BUS LOCKOUT** is in CONDITIONAL state.	RCO: Recognizes / reports lowering RCS Pressure.
	BOOTH OPERATOR When RCS pressure <1730 psig, verify **EVENT 7 – 3B 4KV BUS LOCKOUT triggers.**	RCO: • Verifies PZR sprays valves are closed • Maximizes charging • Isolates letdown • Recommends Reactor trip
	NOTE Due to the size of the leak, the crew may decide to trip the unit prior to maximizing charging and isolating letdown.	US: Determines RCS pressure cannot be maintained >2000 psig and directs the RCO to trip the reactor and perform IOAs of 3-EOP-E-0.
	NOTE Steps 1 - 4 of 3-EOP-E-0 are Immediate Operator Actions (IOAs). The board operators will call out the high level steps of the IOAs as each step is completed from memory.	US: • Directs 3-EOP-E-0 response after auto Reactor trip. OR • Directs RCO to manually trip the Reactor, then for operators to perform their IOA's.
		RCO: Verifies Reactor Trip. **Step 1**

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When called, report the following, as appropriate: • 3B 4kV bus has overcurrent targets • 3D 4kV bus has nothing obviously wrong. • 3A EDG running and nothing obviously wrong. • Acknowledge all other communications or requests for support.	BOP: • Verify Turbine Trip • Verify Power to Emergency 4kV Buses **(NO, 3D Bus not energized)** **RNO:** Realign 3D 4kV bus to 3A 4kV Bus. - Open 3AB19 - Open 3AD01 - Close 3AD01 - Close 3AA17 **Steps 2-3**
EVENT 8 – SI FAILS TO AUTO ACTUATE		
		RCO: Checks If SI Is Actuated **(NO)** **RNO:** Check if SI is required **(YES)** • Manually actuate SI and Phase A. **Step 4**
END OF EVENT 8		
	BOOTH OPERATOR When 3A RCP is tripped, verify **EVENT 7 – LOSS OF 3A 4KV BUS triggers.** **NOTE** When 3A 4kV Bus, the crew will transition to 3-EOP-ECA-0.0, Loss of All AC Power.	US: Reviews Foldout Page with the crew 1. Adverse CTMT Conditions **(YES)** 2. RCP Trip Criteria **(YES, Trip 3A RCP)** 3. Faulted S/G Isolation Criteria 4. Ruptured S/G Isolation Criteria 5. AFW System Operation Criteria **(YES)** 6. CST Makeup Water Criteria 7. RHR System Operation Criteria **(YES, RCO starts timer)** 8. Loss Of Offsite Power Or SI On Other Unit 9. Loss Of Charging Criteria **Foldout Page**
		US: Directs transition to 3-EOP-ECA-0.0, Loss of All AC Power.

EVENT 9 – LOSS OF 3A 4KV BUS		
3-EOP-ECA-0.0, LOSS OF ALL AC POWER		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Updates crew on loss of 3A 4kV bus.
CT2 **Start Time** __________	**<u>Re-energize 3A 4kV Bus</u>** Following a Loss Of All AC, restore power to the 3A 4kV Bus prior to actuating SI and within 30 minutes of the loss of power.	US: Directs the crew to perform Immediate Operator Actions for 3-EOP-ECA-0.0, Loss of All AC Power.
		RCO: Verify Reactor Trip **Step 1**
		BOP: Verify Turbine Trip **Step 2**
		RCO: Check If RCS Is Isolated **Step 3**
		BOP: Verify Proper AFW Flow **Step 4**
	<u>NOTE</u> If 3A 4kV bus is chosen as the priority, go to Step 5.b on the next page.	US: Check EDG Priority 3A **(NO, Go to Step 5.o)** **Step 5.a**
		BOP: Check 3B Bus Lockout Reset **(NO)** • Reset the Lockout Relay **(NO)** • <u>IF</u> Lockout relay can **NOT** be reset, <u>AND</u> EDG Priority was 3B, <u>THEN</u> return to Step 5.b. Go to Step 5.b. **Step 5.o**

EVENT 9 – LOSS OF 3A 4KV BUS		
3-EOP-ECA-0.0, LOSS OF ALL AC POWER		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Check 3A Bus Lockout Reset **(NO)** • Reset the Lockout Relay **Step 5.b**
		BOP: Check 3A EDG Lockout Reset **Step 5.c**
	NOTE May have been started earlier during IOAs of 3-EOP-E-0.	BOP: Check 3A EDG Running **(NO)** • Manually start 3A EDG from Control Room **Step 5.d**
CT2 **Stop Time**	**Re-energize 3A 4kV Bus** Following a Loss Of All AC, restore power to the 3A 4kV Bus prior to actuating SI and within 30 minutes of the loss of power.	BOP: Check 3A 4kV Bus Energized **Step 5.e**
		BOP: • 3D 4kV Bus Aligned to Energized Bus - Verify open 3C CCW and 3C ICW pump breakers - Align 3D 4kV bus to 3A 4kV bus Close 3AA17 • Required Safeguards Equipment Operating **(NO, Manually start safeguards equipment)** **Step 5.f**
	NOTE If a Red path on Integrity exists, the crew will transition to 3-EOP-FR-P.1. The steps for P.1 begin on page 29. If not, the crew will return to 3-EOP-E-0 on the next page.	US: Check status of 3-EOP-F-0, CSFS Trees, prior to entering this procedure – INFORMATION ONLY **(NO)** • Implement FRPs as required **(YES, RED Path on Integrity)** **Step 5.g**

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE When a Red path on Integrity comes in, the crew will transition to 3-EOP-FR-P.1. The steps for P.1 begin on page 29.	US: Directs transition back to procedure and step in effect.
		US: Reviews Foldout Page with the crew 1. Adverse CTMT Conditions **(YES)** 2. RCP Trip Criteria **(YES, All Tripped)** 3. Faulted S/G Isolation Criteria 4. Ruptured S/G Isolation Criteria 5. AFW System Operation Criteria **(YES)** 6. CST Makeup Water Criteria 7. RHR System Operation Criteria **(YES, RCO starts timer)** 8. Loss Of Offsite Power Or SI On Other Unit 9. Loss Of Charging Criteria **Foldout Page**
	NOTE ATTACHMENT 3, Prompt Action Verifications, start on page 31.	BOP: Continues with ATTACHMENT 3 to complete The Prompt Action Verifications. **Step 5**
		RCO: • Check AFW Pumps At Least Two Running • Verify Proper AFW Valve Alignment • Verify Proper AFW Flow • Check All Thermal Barrier Alarms Clear **Steps 6-9**

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	LEAD EVALUATOR When AFW flow has been reduced to 400 gpm, or at Lead Evaluator discretion, proceed to the next event.	RCO: • Check RCPs Any Running **(NO)** • Checks RCS Cold Leg temperatures STABLE BETWEEN 545°F AND 547°F or trending down to 547ºF. **(NO)** - Stop dumping steam. - Reduce total feed flow to 400 gpm until narrow range level greater than 7% [27%] in at least one S/G. - If continues and is due to excessive steam flow, then close MSIVs. **Step 10**
		RCO: • Check PRZ PORVs, Spray Valves And Excess Letdown Isolated • Check If RCPs Should Be Stopped • Check If S/Gs Are Faulted • Check if S/G Tubes Are Ruptured • Check if RCS Is Intact **(NO)** **Steps 11-15**
	NOTE If a Red path on Integrity exists, the crew will transition to 3-EOP-FR-P.1. These steps begin on page 29. If not, the crew will return to 3-EOP-E-1 on the next page.	CREW: Monitor Critical Safety Functions using 3-EOP-F-0, Critical Safety Function Status Trees.
		US: Directs transition to 3-EOP-E-1, Loss of Reactor or Secondary Coolant.

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: • Conducts EOP transition brief. • Directs 3-EOP-E-1 response.
	NOTE The steps for 3-EOP-E-1 are included for reference until the crew satisfies the terminating criteria of a 1-hr soak determination and all CTs being satisfied. The terminating criteria are located on page 30.	US: Reviews Foldout Page with the crew. • Containment Adverse • RCP Trip Criteria • SI Termination Criteria • Secondary Integrity Criteria • E-3 Transition Criteria • Cold Leg Recirculation Switchover Criteria • Recirculation Sump Blockage • CST Makeup Water Criteria • Loss of Offsite Power or Unit 4 SI • RHR Sys Operation Criteria • Loss Of Charging Criteria **Foldout Page**
		RCO: Check If RCPs Should Be Stopped. (RCPs Stopped) **Step 1**
	BOOTH OPERATOR Acknowledge the request for Chemistry and HP support.	BOP: • Check If S/Gs are NOT Faulted • Check Intact S/G Levels • Check Secondary Radiation **Steps 2-4**
		RCO: • Checks PRZ PORVs And Block Valves • Check SI Reset • Reset Phase A and Phase B **Steps 5-7**

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO/BOP: Verify Instrument Air To Containment **Step 8**
		RCO: Check Power Supply To All Charging Pumps aligned to offsite power **(NO)** **Step 9**
	<u>BOOTH OPERATOR</u> If asked, report pumps “ready for start” and “SAT start”, as applicable.	RCO: Check If Charging Flow Has Been Established. • Verify at least one charging pump is running. • Establish desired charging by performing ATTACHMENT 2, steps 3 through 5. - Place RCS Makeup Control Switch in STOP - Start additional Charging pumps if needed. - Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow. - Verify charging pump suction auto transfers to RWST. - Notify Unit Supervisor That Attachment 2 Is Complete. **Step 10**
		RCO: • Check if SI Flow Should Be Terminated • Check if CTMT Spray Should Be Stopped • Check if RHR Should Be Stopped • Check RCS And S/G Pressure **Steps 11-14**

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR If directed to stop 4A and 4B EDG, acknowledge request. **BOOTH OPERATOR** If dispatched to place any stopped EDGs in standby, acknowledge request.	BOP: Check If Diesel Generators Should Be Stopped: a. Stop 3A and 3B EDG by placing its Normal Stop/Normal Start switch in NORMAL STOP position. b. Direct Unit 4 RCO to stop any unloaded diesel generator by placing its Normal Stop/Normal Start switch in NORMAL STOP position. c. Dispatch Operator to place any stopped EDGs in standby using 3/4-OP-023, EMERGENCY DIESEL GENERATOR **Step 15**
	BOOTH OPERATOR If dispatched to unlock and close cold leg recirc breakers, wait 2-3 minutes and **trigger LOA - ENERGIZE TRAIN A SI RECIR MOVS** and **trigger LOA - ENERGIZE TRAIN B SI RECIR MOVS** Report when complete. **BOOTH OPERATOR** When asked, wait 2-3 minutes and report shield doors are closed. **BOOTH OPERATOR** Respond as RP and acknowledge request for surveys. If asked later, report surveys are normal.	US: Initiate Evaluation Of Plant Status • Verify SI System aligned in the RWST Injection Mode. • Dispatch and Operator to Locally unlock and close the following breakers: - Train A MOV breakers using Attachment 4, Section 1.0. - Train B MOV breakers using Attachment 4, Section 2.0. - RHR Pumps – ONE AVAILABLE - At Least One Sump Flowpath • Locally Check Radiation Shield Doors Closed • Check Aux Bldg Radiation Normal **Step 16**
	NOTE End of scripted actions of 3-EOP-E-1.	

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-FR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Enters and directs actions of 3-EOP-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition.
		US: Reviews Foldout Page with crew • Adverse CTMT **(YES)** **Foldout Page**
		RCO: Check RCS Pressure – GREATER THAN 275 PSIG [575 PSIG] **(NO)** **Step 1**
		BOP: RCS Cold Leg Temperatures – DECREASING **(IF NO, Go to Step 3)** Try to stop RCS cooldown: • Verify S/G Steam Dump To Atmosphere Valves – CLOSED • Verify steam Dump To Condenser Valves – CLOSED • IF RHR System in service THEN stop any cool down from RHR System • Control feed flow to non-faulted S/G to stop RCS cooldown. • Minimize cooldown from faulted S/G **Step 2**
		RCO: • Check PZR PORV Block Valves • Check If PZR PORVs Should Be Closed • Check HHSI Pps Any Running • Check if SI Can Be Terminated **(NO, Go to Step 23)** **Steps 3-6**

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-FR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO: Cooldown rate in RCS Cold Leg >100°F in Any 60 Minute Period **(YES)** **Step 23**
		US: Determine a 1-hr soak is required.
	LEAD EVALUATOR This is the earliest possible opportunity to terminate the scenario.	US: Return to Procedure and Step in Effect. **Step 24**
The scenario is terminated once a 1-hr soak has been determined to be required, or at Lead Evaluator discretion once all critical tasks have been evaluated.		
***** END OF SCENARIO *****		

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-E-0 ATTACHMENT 3, PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Check Load Centers Associated With Energized 4 KV Buses – ENERGIZED **Step 1**
		BOP: Verify Feedwater Isolation: **Step 2**
		BOP: Check If Main Steam Lines Should Be Isolated **Step 3**
		BOP: Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT **Step 4**
		BOP: Verify Pump Operation: a. At least two High-Head SI Pumps – RUNNING b. Both RHR Pumps – RUNNING **Step 5**
		BOP: Verify Proper CCW System Operation: **Step 6**
		BOP: Verify Proper ICW System Operation: • Verify ICW Pumps – AT LEAST TWO RUNNING • Verify ICW To TPCW Heat Exchanger – ISOLATED: • Check ICW Headers – TIED TOGETHER **Step 7**

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-E-0 ATTACHMENT 3, PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Check Emergency Containment Coolers – ONLY TWO RUNNING **Step 8**
		BOP: Verify Unit 3 Containment Purge Exhaust And Supply Fans – OFF **Step 9**
		BOP: Verify Containment Spray Not Required **Step 10**
		BOP: Verify SI – RESET **Step 11**
		BOP: Verify SI Valve Amber Lights On VPB – ALL BRIGHT **Step 12**
		BOP: Verify SI Flow: • RCS pressure – LESS THAN 1625 PSIG[1950 PSIG] • High-Head SI Pump flow indicator – CHECK FOR FLOW **Step 13**

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-E-0 ATTACHMENT 3, PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When requested, wait 5-7 minutes and **trigger LOA – ALIGN U4 HHSI TO U3 RWST** Report when complete.	BOP: Realign SI System: • Check Procedure Entry Status – E-0 ENTERED FROM 3-ONOP-047.1, LOSS OF CHARGING FLOW IN MODES 1 THROUGH 4 **(NO)** • Verify Unit 3 High-Head SI Pumps – TWO RUNNING • Stop both Unit 4 High-Head SI • Pumps and place in standby • Direct Unit 4 Reactor Operator to align Unit 4 High-Head SI Pump suction to Unit 3 RWST using Attachment 1. **Step 14**
		BOP: Verify Containment Isolation Phase A – RESET **Step 15**
		BOP: Reestablish RCP Cooling: • Check RCPs – AT LEAST ONE RUNNING **(NO)** • Go to Step 17 **Step 16**
		BOP: Verify Control Room Ventilation Isolation **Step 17**
	BOOTH OPERATOR When requested, **trigger LOA – PLACE PAHMS IN SERVICE,** wait 3-5 minutes and report complete.	BOP: Place Hydrogen Monitors In Service Using 3-NOP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM **Step 18**
	BOOTH OPERATOR When asked, report that Unit 4 EDGs are running unloaded.	BOP: Verify All Four EDGs – RUNNING **Step 19**

EVENT 7 – PZR SURGE LINE BREAK		
3-EOP-E-0 ATTACHMENT 3, PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Verify Power To Emergency 4 KV Buses **(NO, Start one train of Chilled Water)** **Step 20**
		BOP: Notify Unit Supervisor Of The Following: • Attachment 3 is complete • Any safeguards equipment that is NOT running is in the required condition • Status of Containment pressure continuous action **Step 21**

Discussion Points are intentionally NOT included in evaluated scenarios. However, space is available below to document follow-up questions when further information is required to determine an evaluation outcome.

FOLLOW-UP QUESTIONS

QUESTION #1

ANSWER #1

QUESTION #2

ANSWER #2

SIMULATOR POST-SCENARIO RESTORATION:

______ 1. Restore per Simulator Operator Checklist.

______ 2. Once exams are complete, restore from SEI-19, Simulator Exam Security.

OPERATIONS SHIFT TURNOVER REPORT

UNIT 3 RISK: GREEN (ACCEPTABLE) PROTECTED TRAIN: B	UNIT 4 RISK: GREEN (ACCEPTABLE) PROTECTED TRAIN: B

ONCOMING CREW ASSIGNMENTS

Shift Mgr:			Inside SNPO:	
Field Supv.:			Outside SNPO:	
Admin RCO:			ANPO:	
Unit 3			Unit 4	
Unit Supv.:			Unit Supv.:	
RCO:			RCO:	
NPO:			NPO:	

PLANT STATUS

Unit 3			Unit 4	
Mode:	2		Mode:	1
Power:	10^{-8} amps		Power:	100%
MWe:	0		MWe:	842
Gross Leakrate:	0.11 gpm		Gross Leakrate:	0.09 gpm
RCS Boron Conc:	1695 ppm		RCS Boron Conc:	642

Operational Concerns:

Plant Start Up last shift following a 10 day outage to repair Feed Water Line Leak.
A crew is in JITT for Turbine Roll and power accession.
MIMS alarms are inhibited.

U3 Anticipated LCO Actions:

None

U4 Anticipated LCO Actions:

None

Results of Offgoing Focus Area:

UNIT 3 STATUS

REACTOR OPERATOR

UNIT RISK: GREEN (ACCEPTABLE)   PROTECTED TRAIN: B

Mode:	2
Power:	10^{-8} amps
MWe	0
Tavg:	547°F
RCS Pressure:	2235
RCS Boron Conc:	1695 ppm

RCS Leakrate	
Gross:	0.11 GPM
Unidentified	0.04 GPM
Charging Pps:	0.00 GPM

Accumulator Ref Levels	
A	6700
B	6692
C	6695

Abnormal Annunciators:

Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	

Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items"

T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	

REACTOR OPERATOR (CONT'D)
UNIT RISK: GREEN (ACCEPTABLE)   PROTECTED TRAIN: B
Changes to Risk Significant Equipment:
No recent changes from last shift. OLRM: GREEN PROTECTED TRAIN: B
Upcoming Reactivity Management Activities:
Approval granted to withdraw rods to 128 steps to raise power to Raise Power to 3-5% to roll the Turbine per 3-GOP-301 Step 5.45. JITT crew will then place unit online and continue power increase to 30%.
Upcoming Major POD Activities:
Roll the Turbine Place the Unit Online Continue power increase to 30%.
Upcoming ECOs to Hang and /or Release:
• Hang – None • Release – None
Evolutions or Compensatory Actions in Progress:
STA monitoring MIMS every 2 hrs.
General Information, Remarks, and Operator Work Around Status:
• Weather forecast is overcast skies with scattered pockets of severe rain. • U4 supplying Aux Steam

FOR TRAINING USE ONLY

TURKEY POINT

Reactivity Manipulation Table
(USE ONLY AS GUIDELINE)

REACTOR ENGINEERING

Unit 3 Cycle 29 BOC Power Ascension Rev. 0

ELAPSED TIME	POWER (%)	CBD (Steps)	AFD (%)	RAOC (Limit)	BORON (ppm)	CHANGE (ppm)	DILUTE (gal)	BORATE (gal)
00:00	0	110	-0.00	N/A	1695	*	*	*
00:02	0	112	-0.00	N/A	1695	*	*	*
00:04	0	114	-0.00	N/A	1695	*	*	*
00:06	0	116	-0.00	N/A	1695	*	*	*
00:08	0	118	-0.1	N/A	1695	*	*	*
00:10	0	120	-0.1	N/A	1695	*	*	*
00:12	0.1	122	-0.1	N/A	1695	*	*	*
00:14	0.5	124	-0.2	N/A	1695	*	*	*
00:16	2.0	126	-0.2	N/A	1695	*	*	*
00:18	3.0	128	-0.2	N/A	1695	*	Note 3	*

NOTES

1. Withdraw rods to establish a SUR of 1 dpm to raise power from 10^{-8} amps to the Point Of Adding Heat

2. The SUR should be limited to .5 dpm above the Point Of Adding Heat

3. Once power is leveled at ~ 3-5% dilute and operate control rods as required to maintain RCS temperature for current power plateau.

Facility: **Turkey Point Nuclear (PTN) – Units 3 and 4** Scenario No.: **7** Op Test No.: **2017-301**

Examiners: ______ (SRO) ______ (RCO) ______ (BOP)

As-administered Scenario 7 revised to reflect post-scenario identified CRITICAL TASK.

Refer to Scenario 7, Form ES-D-1 (pg 3) and Form ES-D-2 (pg 30)

CT is applicable to Day 4, Run 3 crew only.

Initial Conditions:	The plant is at 100% power (MOL). Online risk is green. B train is protected on both units.
Turnover:	EOOS: B AFW Pump, 3B Isophase Bus Cooler
Critical Tasks:	Isolate AFW Flow to Faulted S/G Establish Standby Feedwater

Event	Malf. No.	Event Type*	Event Description
1	TVKKA2 TFK4B49	C-BOP C-SRO	3A2 CWP Motor Overload MOV-3-1415 Fails to Close
2	FIC488ATFPWR TFF1M87M	I-BOP I-SRO (TS)	3B S/G FRV Primary Controller Loses Power FT-3-487, B S/G Feed Flow Transmitter, Fails As-Is
3	TFLISB71 TFLISB81	I-RCO I-SRO (TS)	Misaligned Rods
4	N/A	R-RCO N-BOP R-SRO	GOP-100 <90% (Rod Misalignment)
5	TVHR0001	C-RCO C-SRO	Fuel Failure
6	TVSBVL3	M-RCO M-BOP M-SRO	3C S/G Fault Outside CTMT
7	TFL3FNO	P-BOP	FW Isolation Fails to Actuate
8	TFHV55CO TFHV55CF	P-RCO	PORV Drifts Off Closed Seat

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

SCENARIO SUMMARY

Event 1
The 3A2 Circulating Water pump bearing will degrade, causing amps to increase and causing a motor overload annunciator. The crew will respond using the ARP and manually trip the pump. When MOV-3-1415, 3A2 CWP Discharge Valve, begins to stroke closed following the pump trip, it will fail on overload. The BOP will dispatch an operator to reset the breaker in accordance with the ARP, and then reattempt to close the valve.

Event 2
The 3B S/G FRV Primary Controller, FIC-3-488A, will lose power. The backup will automatically take over control. When the controller loses power, the 3B S/G Feed Flow Transmitter, FT-3-487, will fail as-is. When level deviates from program, the BOP will take manual control of the backup controller and maintain 3B S/G Level on program. The crew may use the ARP or 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection, to select operable channels and restore 3B S/G level control to automatic. The US will enter 3-ONOP-049.1 to verify all required actions are complete and to determine which bistables need to be tripped.

Event 3
Shutdown Bank B Rods F8 and K8 momentarily lose power to their stationary gripper coils causing the two rods to fall into the core approximately 30 steps. The crew will respond in accordance with the ARP and enter 3-ONOP-028.1, RCC Misalignment.

Event 4
After the crew determines that the rods will not be able to be properly aligned within the 1 hr limit, they will commence a 3-GOP-100, Fast Load Reduction, shutdown to <90% power as required by Tech Specs.

Event 5
A fuel failure will develop, as indicated by a rising trend on R-20, RCS Letdown. The crew will validate the alarm using the ARP and 3-ONOP-067, Radioactive Effluent Release. After verification, the crew will transition to 3-ONOP-041.4, Excessive Reactor Coolant System Activity. The RCO maximize letdown and start a second charging pump in accordance with 3-OP-047, Charging and Letdown.

Event 6
A fault will develop on the 3C Steam Generator outside of containment, upstream of the MSIV. A reactor trip and Safety Injection will occur. The crew will enter 3-EOP-E-0, Reactor Trip or Safety Injection. The 3C S/G will blowdown resulting in a loss of steam supply to the A AFW pump, and ultimately a loss of the A AFW Pump. The C AFW pump governor will fail, resulting in a loss of feed and requiring a transition to 3-EOP-FR-H.1, Response to Loss of Secondary Heat Sink.

Event 7
The Safety Injection will demand a Feedwater Isolation, but the relays will fail to actuate. The BOP will manually operate the Feedwater Isolation valves during Attachment 3, Prompt Action Verification, of 3-EOP-E-0.

Event 8
Following the faulted S/G, PCV-3-455C, Pressurizer PORV, will drift slightly off its closed seat. The RCO will attempt to manually close the PORV, but the valve will not respond. The RCO will close MOV-3-536, PORV Block Valve, to isolate the leaking PORV.

The crew will establish Standby Feedwater in accordance with 3-EOP-FR-H.1 and then transition back to 3-EOP-E-0 and initiate a boration. The crew will then transition to 3-EOP-E-2, Faulted Steam Generator Isolation, to complete isolation of 3C Steam Generator. After isolation is verified, will transition to 3-EOP-E-1, Loss of Reactor or Secondary Coolant, and secure RHR pumps.

The scenario is terminated after the crew transitions to 3-EOP-E-1 and secures RHR pumps, or at Lead Evaluator discretion once all critical tasks have been evaluated.

CRITICAL TASKS		
Event		**Description**
6	**CT1**	**<u>Isolate AFW Flow to Faulted S/G</u>** During a MSLB stop AFW flow to the faulted Steam Generator prior to reaching an Orange Path on Integrity (Any RCS_{cold} Leg <280°F). SAFETY SIGNIFICANCE: Failure to isolate a Faulted Steam Generator that can be isolated causes an additional challenge to the Integrity Critical Safety Function.
6	**CT2**	**<u>Establish Standby Feedwater</u>** During a loss of heat sink, establish feedwater flow to at least one Steam Generator prior to reaching 9% WR S/G Level. SAFETY SIGNIFICANCE: Failure to establish feedwater flow results in having to rely on the lower-priority action of establishing RCS bleed and feed to minimize core uncovery. This action fails to prevent degradation of any barrier to fission product release.

6	**CT3**	**Post-scenario Critical Task (CT applicable to Day 4, Run 3 crew)** **<u>Do not initiate feedwater flow to a dry, faulted Steam Generator</u>** During secondary heat sink restoration activities, do not establish feedwater flow to a dry (< 9% Wide –Range Steam Generator Water Level), faulted (un-isolable leak present) Steam Generator. SAFETY SIGNIFICANCE: Performance of the above results in an increased potential for a direct environmental release path of fission products due to the occurrence of fuel failure (Scenario 7 - Event 5) in conjunction with an un-isolable S/G fault outside containment (Scenario 7 - Event 6) coupled with the thermal stresses induced on the faulted S/G's tubesheet due to the initiation of feedwater flow.

SITE: **Turkey Point Units 3 and 4 (PTN)** **Revision #:** **0-1**

LMS ID: **L-17-1 N7** **Rev. Date:** **1/11/17**

SEG TITLE: **L-17-1 NRC Exam Scenario 7**

SEG TYPE: ☐ **Training**

PROGRAM: ☐ **LOCT** ☒ **LOIT**

DURATION: **90 minutes**

As-administered Scenario 7 revised to reflect post-scenario identified CRITICAL TASK and pen and ink change.

1) For CT, refer to Scenario 7, Form ES-D-1 (pg 3) and Form ES-D-2 (pg 30)

2) For Pen and Ink change, refer to ES-D-2 (pg 14).

Both CT and pen-ink change applicable to Day 4, Run 3 crew only.

Developed by:	**Tim Hodge**	**7/27/17**
	Instructor/Developer	Date
Reviewed by:	**Val Miklausich**	**8/3/17**
	Instructor (Instructional Review)	Date
Validated by:	**Mike Murphy**	**7/27/17**
	SME (Technical Review)	Date
Approved by:	**Mark Wilson**	**8/3/17**
	Training Supervision	Date
Approved by:	**Mike Murphy**	**7/27/17**
	Training Program Owner (Line)	Date

SCENARIO REFERENCES		
DOC NO.	**TITLE**	**REV**
3-ARP-097.CR	CONTROL ROOM ANNUNCIATOR RESPONSE PROCEDURES	VARIOUS
3-OP-047	CVCS – CHARGING AND LETDOWN	23A
3-GOP-100	FAST LOAD REDUCTION	13A
3-ONOP-014	MAIN CONDENSER LOSS OF VACUUM	9
3-ONOP-028.1	RCC MISALIGNMENT	4
3-ONOP-041.4	EXCESSIVE REACTOR COOLANT SYSTEM ACTIVITY	4B
3-ONOP-049.1	DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CHANNELS	4
3-ONOP-067	RADIOACTIVE EFFLUENT RELEASE	10
3-EOP-E-0	REACTOR TRIP OR SAFETY INJECTION	13
3-EOP-E-1	LOSS OF REACTOR OR SECONDARY COOLANT	9
3-EOP-E-2	FAULTED STEAM GENERATOR ISOLATION	4
3-EOP-FR-H.1	RESPONSE TO LOSS OF SECONDARY HEAT SINK	10
3-EOP-F-0	CRITICAL SAFETY FUNCTION STATUS TREES	4
PTN TECH SPEC	PTN TECHNICAL SPECIFICATIONS	303

SIMULATOR EXERCISE GUIDE REQUIREMENTS	
Terminal Objective	Given this simulator scenario and resources normally found in the Control Room, the operating crew will perform Control Room operations IAW approved plant procedures in order to maintain the integrity of the plant and the health and safety of the public.
Enabling Objectives:	Given this simulator scenario and resources normally found in the Control Room, operate in accordance with approved plant procedures, Operations Department Instructions, and management expectations: 1. (ALL) Demonstrate personnel SAFETY awareness in interactions with plant staff and outside agencies. 2. (ALL) Demonstrate ALARA awareness in interactions with plant staff and outside agencies. 3. (ALL) Exchange correct information using 3-point communication/Repeat-backs with Control Room personnel and other plant staff. 4. (ALL) Inform plant personnel and System of plant conditions, as needed. 5. (US) Employ timely and concise crew briefs where appropriate. 6. (ALL) Maintain awareness of plant status and control board indication. 7. (ALL) Correctly diagnose plant situations. 8. (ALL) Solve operational problems as they arise. 9. (RCO/BOP) Manipulate plant controls properly and safely. 10. (ALL) Demonstrate self-checking using STAR and peer checks(when required) 11. (US) Demonstrate command and control of the crew. 12. (US) Coordinate the input of crew members and other plant staff. 13. (US) Utilize the input of crew members and other plant staff. 14. (ALL) Demonstrate conservative decision making. 15. (ALL) Demonstrate teamwork. 16. (ALL) Respond to plant events using procedural guidance (OPs/ONOPs/EOPs) as applicable in accordance with rules of usage. 17. (RCO/BOP) Implement any applicable procedural immediate operator actions without use of references. 18. (SRO) Maintain compliance with Tech Specs. 19. (ALL) Identify/enter applicable Tech Spec action statements. 20. (ALL) Respond to annunciators using ARPs (time permitting). 21. (ALL) Maintain written communication, logs, and documentation as needed to permit post-event reconstruction. Continued on next page

SIMULATOR EXERCISE GUIDE REQUIREMENTS	
	While addressing the following events: 1. 3A2 CWP Motor Overload MOV-3-1415 Fails to Close 2. 3B S/G FRV Primary Controller Loses Power FT-3-487, B S/G Feed Flow Transmitter, Fails As-Is 3. Misaligned Rods 4. GOP-100 <90% (Rod Misalignment) 5. Fuel Failure 6. 3C S/G Fault Outside CTMT 7. FW Isolation Fails to Actuate 8. PORV Drifts Off Closed Seat
Prerequisites:	None
Training Resources:	PTN Unit 3 Plant Simulator
Development References:	• TR-AA-220-1003, Initial NRC and Audit Exam Process • TR-AA-230-1000, Systematic Approach to Training Process • TR-AA-230-1007, Conduct of Simulator Training and Evaluation • 0-ADM-232, Time Critical Action Program • OP-AA-100-1000, Conduct Of Operations • OP-AA-103-1000, Reactivity Management • 0-ADM-200, Operations Management Manual • 0-ADM-211, Emergency and Off-Normal Operating Procedure Usage • WCAP-17711-NP, Pressurized Water Reactor Owners Group Westinghouse Emergency Response Guideline Revision 2-Based Critical Tasks
Protected Content:	N/A
Evaluation Method:	Performance Mode
Operating Experience:	None
Risk Significant Operator Actions:	Isolate AFW Flow to Faulted S/G Establish Standby Feedwater

TASKS ASSOCIATED WITH THIS SIMULATOR EXERCISE GUIDE

SRO TASK #	TASK TITLE
02041047300	INVESTIGATE AND RESPOND TO RCS HIGH ACTIVITY ALARM
02063008500	VERIFY SAFETY INJECTION OPERATION
02067009300	RESPOND TO PROCESS RADIATION MONITOR ALARMS
02089026300	AUTHORIZE FAST LOAD REDUCTION
02028033500	AUTHORIZE UNIT TRIP
02200001500	RESPOND TO UNIT TRIP
02202001300	IDENTIFY/RESPOND TO OFF-NORMAL EVENTS
02074016500	RESPOND TO A LOSS OF HEAT SINK FOLLOWING A REACTOR TRIP
02200022500	DIAGNOSE CAUSE OF SAFEGUARDS ACTUATION
02200002500	EVALUATE CRITICAL SAFETY FUNCTION (CSF) STATUS TREE OUTPUT

RO TASK #	TASK TITLE
01041047300	INVESTIGATE AND RESPOND TO RCS HIGH ACTIVITY ALARM
01063008500	VERIFY SAFETY INJECTION OPERATION
01067009300	RESPOND TO PROCESS RADIATION MONITOR ALARMS
01074011300	CONTROL STEAM GENERATOR LEVEL MANUALLY WITH MAIN FRVS
01074014100	PLACE FEEDWATER CONTROL IN AUTOMATIC
01089026300	RESPOND TO / ADJUST TURBINE DURING FAST LOAD REDUCTION
01200001500	RESPOND TO UNIT TRIP
01200022500	DIAGNOSE CAUSE OF SAFEGUARDS ACTUATION
01074016500	RESPOND TO A LOSS OF HEAT SINK FOLLOWING A REACTOR TRIP

UPDATE LOG:					
NOTES:	Place this form with the working copies of lesson plans and/or other materials to document changes made between formal revisions. For fleet-wide training materials, keep electronic file of this form in same folder as approved materials. Refer to TR-AA-230-1003 SAT Development for specific directions regarding how and when this form shall be used.				
Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.					
#	**DESCRIPTION OF CHANGE**	**REASON FOR CHANGE**	**AR/TWR#**	**PREPARER**	**DATE**
				REVIEWER	**DATE**
0-0	Initial Revision	L-17-1 NRC Exam	N/A	Note 5	Note 5
				Note 5	Note 5
0-1	Validation Comments	NRC Prep Week	N/A	T.Hodge	10/5/17
				M.Wilson	10/5/17
0-2					
0-3					
0-4					
0-5					

1. Individual updating lesson plan or training material shall complete the appropriate blocks on the Update Log.
2. Describe the change to the lesson plan or training materials.
3. State the reason for the change (e.g., reference has changed, typographical error, etc.)
4. Preparer enters name/date on the Update Log and obtains Training Supervisor approval.
5. Initial dates and site approval on cover page.

SCENARIO SUMMARY

Initial Conditions:
The plant is at 100% power (MOL). Online risk is green. B train is protected on both units.

Equipment OOS
B AFW Pump, 3B Isophase Bus Cooler

Event 1
The 3A2 Circulating Water pump bearing will degrade, causing amps to increase and causing a motor overload annunciator. The crew will respond using the ARP and manually trip the pump. When MOV-3-1415, 3A2 CWP Discharge Valve, begins to stroke closed following the pump trip, it will fail on overload. The BOP will dispatch an operator to reset the breaker in accordance with the ARP, and then reattempt to close the valve.

Event 2
The 3B S/G FRV Primary Controller, FIC-3-488A, will lose power. The backup will automatically take over control. When the controller loses power, the 3B S/G Feed Flow Transmitter, FT-3-487, will fail as-is. When level deviates from program, the BOP will take manual control of the backup controller and maintain 3B S/G Level on program. The crew may use the ARP or 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection, to select operable channels and restore 3B S/G level control to automatic. The US will enter 3-ONOP-049.1 to verify all required actions are complete and to determine which bistables need to be tripped.

Event 3
Shutdown Bank B Rods F8 and K8 momentarily lose power to their stationary gripper coils causing the two rods to fall into the core approximately 30 steps. The crew will respond in accordance with the ARP and enter 3-ONOP-028.1, RCC Misalignment.

Event 4
After the crew determines that the rods will not be able to be properly aligned within the 1 hr limit, they will commence a 3-GOP-100, Fast Load Reduction, shutdown to <90% power as required by Tech Specs.

Event 5
A fuel failure will develop, as indicated by a rising trend on R-20, RCS Letdown. The crew will validate the alarm using the ARP and 3-ONOP-067, Radioactive Effluent Release. After verification, the crew will transition to 3-ONOP-041.4, Excessive Reactor Coolant System Activity. The RCO maximize letdown and start a second charging pump in accordance with 3-OP-047, Charging and Letdown.

Event 6
A fault will develop on the 3C Steam Generator outside of containment, upstream of the MSIV. A reactor trip and Safety Injection will occur. The crew will enter 3-EOP-E-0, Reactor Trip or Safety Injection. The 3C S/G will blowdown resulting in a loss of steam supply to the A AFW pump, and ultimately a loss of the A AFW Pump. The C AFW pump governor will fail, resulting in a loss of feed and requiring a transition to 3-EOP-FR-H.1, Response to Loss of Secondary Heat Sink.

Event 7
The Safety Injection will demand a Feedwater Isolation, but the relays will fail to actuate. The BOP will manually operate the Feedwater Isolation valves during Attachment 3, Prompt Action Verification, of 3-EOP-E-0.

SCENARIO SUMMARY

Event 8

Following the faulted S/G, PCV-3-455C, Pressurizer PORV, will drift slightly off its closed seat. The RCO will attempt to manually close the PORV, but the valve will not respond. The RCO will close MOV-3-536, PORV Block Valve, to isolate the leaking PORV.

The crew will establish Standby Feedwater in accordance with 3-EOP-FR-H.1 and then transition back to 3-EOP-E-0 and initiate a boration. The crew will then transition to 3-EOP-E-2, Faulted Steam Generator Isolation, to complete isolation of 3C Steam Generator.

The scenario is terminated after the crew transitions to 3-EOP-E-2 and isolates feed to the faulted S/G, or at Lead Evaluator discretion once all critical tasks have been evaluated.

CRITICAL TASKS		
Event		**Description**
6	**CT1**	**Isolate AFW Flow to Faulted S/G** During a MSLB stop AFW flow to the faulted Steam Generator prior to reaching an Orange Path on Integrity (Any RCS_{cold} Leg <280°F). SAFETY SIGNIFICANCE: Failure to isolate a Faulted Steam Generator that can be isolated causes an additional challenge to the Integrity Critical Safety Function.
6	**CT2**	**Establish Standby Feedwater** During a loss of heat sink, establish feedwater flow to at least one Steam Generator prior to reaching 9% WR S/G Level. SAFETY SIGNIFICANCE: Failure to establish feedwater flow results in having to rely on the lower-priority action of establishing RCS bleed and feed to minimize core uncovery. This action fails to prevent degradation of any barrier to fission product release.

6	**CT3**	**Post-scenario Critical Task (CT applicable to Day 4, Run 3 crew)** **Do not initiate feedwater flow to a dry, faulted Steam Generator** During secondary heat sink restoration activities, do not establish feedwater flow to a dry (< 9% Wide –Range Steam Generator Water Level), faulted (un-isolable leak present) Steam Generator. SAFETY SIGNIFICANCE: Performance of the above results in an increased potential for a direct environmental release path of fission products due to the occurrence of fuel failure (Scenario 7 - Event 5) in conjunction with an un-isolable S/G fault outside containment (Scenario 7 - Event 6) coupled with the thermal stresses induced on the faulted S/G's tubesheet due to the initiation of feedwater flow.

SEQUENCE OF EVENTS	
Event	**Description**
1	3A2 CWP Motor Overload MOV-3-1415 Fails to Close
2	3B S/G FRV Primary Controller Loses Power FT-3-487, B S/G Feed Flow Transmitter, Fails As-Is
3	Misaligned Rods
4	GOP-100 <90% (Rod Misalignment)
5	Fuel Failure
6	3C S/G Fault Outside CTMT
7	FW Isolation Fails to Actuate
8	PORV Drifts Off Closed Seat

SIMULATOR SET UP INSTRUCTIONS	
Check	**Action**
1. _____	Restore IC-1 (100% MOL) or equivalent IC.
2. _____	Unfreeze the Simulator.
3. _____	Open & execute lesson file L-17-1 N7.lsn
4. _____	Trigger the following setup steps: • SETUP – B AFW PUMP OOS • SETUP – 3B ISOPHASE COOLER OOS • SETUP EVENT 7 – FW ISOLATION FAILS TO ACTUATE Verify the following steps are in the CONDITIONAL state: • EVENT 6 – LOSS OF C AFW PP
5. _____	Place ECO tags on the following components: • B AFW Pump • 3B Isophase Bus Cooler
6. _____	Remove placard above B AFW pump tachometer.
7. _____	Ensure Rod Group Step Counters have completed stepping out.
8. _____	Allow the plant to stabilize.
9. _____	Acknowledge any alarms and freeze Simulator.
10. _____	Ensure B train is protected train on VPA.
11. _____	Perform the SIMULATOR OPERATOR CHECKLIST or equivalent.
12. _____	Place TURNOVER SHEETS on RO’s desk or give to the Lead Evaluator.

BRIEFINGS

- Shift turnover information is attached to the back of this guide.
- Ensure all applicants are prior briefed on Appendix E of NUREG 1021, Policies and Guidelines For Taking NRC Examinations.
- Conduct a Crew Pre-brief to cover turnover information. Shift turnover information is attached to the back of this guide.

US: ______________________________

RCO: ______________________________

BOP: ______________________________

SCENARIO NOTE

0-ADM-211 Prudent Operator Actions - If redundant stand-by equipment is available and ready, the operator is permitted to start the redundant equipment for failed or failing operating equipment. Immediate follow up of applicable ARPs and ONOPs (AOPs) shall occur as required.

The crew may attempt to solicit information/direction from AOM, SM, etc. DO NOT provide any direction or recommendation. If necessary, ask for their recommendation on how to proceed, and simply concur.

Critical Tasks are highlighted in red.	**Simulator Operator Actions** are highlighted in blue.	**Operator Verifiable Actions** are Highlighted in green.

EVENT 1 – 3A2 CWP MOTOR OVERLOAD		
3-ARP-097.CR.I, I1/1 – CWP A1/A2 MOTOR OVERLOAD		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR If it is desired to recorded data, **trigger START DATA RECORDER.**	US: Conducts shift turnover.
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 1 – 3A2 CWP MOTOR OVERLOAD.**	BOP: Recognize and report elevated amps on 3A2 Circulating Water Pump.
	NOTE The alarm comes in ~45 seconds after the bearing failure is triggered.	RCO: Reviews ARP for I1/1, CWP A1/A2 MOTOR OVERLOAD
		BOP: 1. Check the following: – 3A2 CWP amps ≥240 amps – MOV-3-1415 Open **Alarm Confirmation**
	BOOTH OPERATOR When dispatched, wait 1-2 minutes and report 3A2 CWP bearing temperatures are elevated with abnormal noises and vibrations from the pump. Oil levels are SAT. **NOTE** The pump will trip ~90 seconds after the switch is taken to Stop.	BOP: 1. Locally Check the following: – Motor and bearing temperatures – Oil level – Vibration/noise 2. If elevated current conditions persist or increase, perform the following: – Stop 3A2 CWP – Monitor condenser vacuum **Operator Actions**

EVENT 1 – 3A2 CWP MOTOR OVERLOAD

3-ARP-097.CR.I, I1/5 – CWP A2 MOV-1415 MOTOR OVERLOAD

Crew 3 administration pen and ink change: “This is not possible” provided as cue (by simulator booth) to applicant direction to close MOV-3-1415 using local manual pushbutton. Although not anticipated as the applicant success path during on-site validation, this was an ARP I1/5 procedurally directed action (Step 4) and the simulator booth was instructed by Examiner Team to close MOV-3-1415 per the applicant direction.

	S	EXPECTED STUDENT RESPONSE
		RCO: Reviews ARP for I1/5, CWP A2 MOV-1415 MOTOR OVERLOAD.
	BOOTH OPERATOR Report the following, as appropriate: • Valve is approximately 95% open. • Handwheel will NOT engage, the valve can NOT be locally closed.	BOP: • Check valve position locally • If valve is full open **(NO)** • If valve tripped during CWP start **(NO)** **Steps 1-3**
	BOOTH OPERATOR If asked for breaker status, report 30916 is tripped, but nothing obviously wrong. When directed to reset breaker, wait 1-2 minutes and **trigger LOA – RESET 30916.** Report when complete.	BOP: If valve tripped during CWP stop, then: • Reset 30916 • Close MOV-3-1415 by taking control switch for 3A2 CWP to Stop **Step 4**
	NOTE If the crew closes MOV-3-1415 quickly, they may not get the low vacuum alarm.	RCO: Reviews ARP for E5/3, CONDENSER LO VACUUM
		US: Enters and directs actions of 3-ONOP-014, Main Condenser Loss of Vacuum.
	BOOTH OPERATOR When directed to place hogging jet in service, wait 2-3 minutes and **trigger LOA – PLACE HOGGING JET IN SERVICE.** Report when complete.	BOP: Dispatch operator to place SJAE hogging jet in service. **IOA**
	NOTE This Tech Spec is ONLY applicable if the Hogging Jet is placed in service.	US: Review Tech Specs • **LCO 3.3.3.3, FU 19.c**, Condenser Air Ejector Monitors – Action 34, restore within 7 days or submit Special Report within the next 14 days
	LEAD EVALUATOR When the discharge MOV has been closed, or at Lead Evaluator discretion, proceed to the next event.	US: Conducts crew brief.

EVENT 2 – 3B S/G FRV PRIMARY CONTROLLER LOSES POWER		
3-ONOP-049.1, DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CH		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by Lead Evaluator, **trigger EVENT 2 – 3B FRV CONTROLLER (FIC-488A) LOSES POWER.**	BOP: Recognizes and reports FIC-3-488A failure.
	NOTE The 3B S/G Feed Flow Transmitter fails as-is when power is lost. They may not notice the failure before responding to the power failure. Whenever the transmitter failure is recognized, they will perform the Prompt Actions of the ARP.	BOP: Recognizes and reports FT-3-487 failure. **PROMPT ACTIONS** • Takes manual control of 3B S/G level control valve, FCV-3-488. • Restores 3B S/G level to normal.
	BOOTH OPERATOR • If dispatched to check FIC-3-488A breaker, 3P07-13, wait 3-5 minutes and report that it's tripped. • If asked to reset, report that it will not reset.	RCO: Reviews ARP for C6/2, SG B LEVEL DEVIATION/CNTRL TROUBLE • CHECK LI-3-486 or LI-3-488, B STM GEN LEVEL, controlling channel for SG Level deviation. • CHECK Feedwater Controllers, FIC-3-488A or FIC-3-488B, for indications of failure, alarm, or input signal failures. – Primary Controller in Manual – Primary Controller Transferred to Backup in Auto or Manual – Fail or ALM Lamp Lit • CHECK Feedwater Controller Inputs • IF alarm is due to instrument failure, THEN REFER TO 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels.
		US: Enters and directs actions of 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels.

EVENT 2 – 3B S/G FRV PRIMARY CONTROLLER LOSES POWER		
3-ONOP-049.1, DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CH		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE The crew may use the ARP to select an operable channel and restore automatic level control.	BOP: • Verify FT-3-487 failure by channel check comparison. • Verify no off-normal conditions exist on FT-3-486. • Place 3B S/G Feed Water Flow Control Transfer Switch to FT-3-486 (Yellow) • MAY Place 3B S/G Steam Flow Control Transfer Switch to FT-3-485 (Yellow) • Ensure 3B S/G level is returned to auto. **Steps 1-4**
	BOOTH OPERATOR WCC/I&C: Acknowledge the report. I&C would like to be present when bistables are tripped. They will be in the control in one hour. If asked to locally check FT-3-487, wait 2-3 minutes and report nothing obviously wrong.	BOP: Notifies WCC to initiate PWO and I&C for troubleshooting.
		US: Reviews Tech Specs • **LCO 3.3.1 FU 12**, Low S/G Level with Steam/FW Flow Mismatch) – Action 6, trip bistables in 6 hrs **Step 6**
	LEAD EVALUATOR When S/G level control is restored to automatic, or at Lead Evaluator discretion, proceed to the next event.	US: Conducts crew brief.

EVENT 3 – MISALIGNED RODS		
3-ONOP-028.1, RCC MISALIGNMENT		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 3 – MISALIGNED RODS** and Verify **EVENT 3B – MISALIGNED RODS triggers.** (deletes failure so that rods only insert about 36 steps)	BOP: Reviews ARP for B9/3, SHUTDOWN RODS OFF TOP/DEVIATION • Check RPI for deviations in any bank • If misaligned, refer to 3-ONOP-028.1
	BOOTH OPERATOR Acknowledge communications.	US: Enters and directs response using 3-ONOP-028.1, RCC Misalignment.
		RCO: Place Rod Motion Selector to Manual **Step 1**
	BOOTH OPERATOR • Report that Rx Engineering has done an evaluation and determined that current RPI indication represents actual rod position. • Report that I&C has determined the cause to be a faulty power supply, and estimate 4 hrs until repairs are complete.	RCO: • Borate/dilute and/or adjust turbine load to maintain T_{avg}/T_{ref} within 3°F – Do not withdraw rods until aligned • Notify Reactor Engineering • Notify I&C **Steps 2-4**
	NOTE T.S. 3.1.3.1.b is applicable while >90%. Once power is <90%, T.S. 3.1.3.1.a applies. T.S. 3.1.3.5 applies in both cases.	US: Review Tech Specs • **LCO 3.1.3.1.b**, Action b, within 1 hr restore OR be be <90% OR be in HOT STBY within following 6 hrs • **LCO 3.1.3.1.a**, Action c, within 1hr restore OR be in HOT STBY within following 6 hrs • **LCO 3.1.3.5**, within 1 hr fully withdraw rods OR declare rod inoperable and apply T.S. 3.1.3.1
	LEAD EVALUATOR When rods have been placed in Manual, or at Lead Evaluator discretion, proceed to the next event.	

EVENT 4 – DOWNPOWER DUE TO ROD MISALIGNMENT		
3-GOP-100, FAST LOAD REDUCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Directs transition to 3-GOP-100, Fast Load Reduction.
	BOOTH OPERATOR If called for permission to use rods, report that using rods is NOT recommended during downpower.	US: • Completes Attachment 3 • Brief the crew per Attachment 4 **Steps 1-2**
		US: Reviews Foldout page with crew. • 3-EOP-E-0 Transition Criteria • Notify Chemistry Department • Boration Stop Criteria • Restore Blender to AUTO **Foldout Page**
	BOOTH OPERATOR Acknowledge notifications.	BOP: Notify The Following Of Fast Load Reduction • System Dispatcher • Plant personnel using the Page Boost • Chemistry to start RCS sampling is required according to Tech Spec Table 4.4-4. **Step 3**

EVENT 4 – DOWNPOWER DUE TO ROD MISALIGNMENT		
3-GOP-100, FAST LOAD REDUCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO: Begin Boration For Initial T_{avg} Effect • Set the Boric Acid Totalizer to total boric acid volume value determined on Attachment 3. • Place the Reactor Makeup Selector Switch to BORATE. • Place the RCS Makeup Control Switch to START. • Adjust FC-3-113A, Boric Acid Flow Controller, to achieve 40 gpm boric acid flow as indicated on FR-3-113. • WHEN T_{avg} begins to lower from the boration, THEN adjust FC-3-113A, Boric Acid Flow Controller, to load reduction value from Attachment 3. **Step 4**
	NOTE The crew may elect to reduce turbine load in manual by taking the Turbine Speed/Power switch to Lower instead of using TCS.	US: Determine Turbine Load Reduction in MW CNTRL **Step 5**
		BOP: Initiate Turbine Load Reduction in MW CNTRL • Select MW CNTRL • Set TARGET power level – MW VALUE from Attachment 3 • Set RAMP RATE – MW/M VALUE FROM Attachment 3. • Check T_{avg} has lowered 1° to 2°F from the initial value prior to boration. • Depress GO • Ensure FC-3-113A, Boric Acid Flow Controller, has been adjusted to the load reduction boration rate. Go to Step 10 **Step 6**

EVENT 4 – DOWNPOWER DUE TO ROD MISALIGNMENT		
3-GOP-100, FAST LOAD REDUCTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	<u>**LEAD EVAVLUATOR**</u> When reactor power has been reduced, or at Lead Evaluator discretion, proceed to the next event.	RCO/BOP: Monitor Load Reduction **Step 10**
		RCO: • Monitor Boration Rate • Monitor B8/1 Clear • Monitor B8/2 Clear **Steps 11-13**
		US: Notify SM to refer to 0-EPIP-20101 and 0-ADM-115 **Step 14**
		RCO: Energizer Pressurizer Backup Heaters **Step 15**
		BOP: Verify Turbine Load <675 MWe **Step 16**
		RCO: Restore Blender to AUTO • Place Reactor Makeup Selector Switch to AUTO • Set FC-3-113A as desired • Place the RCS Makeup Control Switch to START **Foldout Page**

EVENT 5 – FUEL FAILURE		
3-ONOP-067 – RADIOACTIVE EFFLUENT RELEASE		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 5 - FUEL FAILURE.**	RCO/BOP: Reports rising counts on R-20.
		BOP: Reviews ARP for H1/4, PRMS HI RAD • Check Countrate meter on each PRMS drawer • Determine R-20 is in alarm • Refer to 3-ONOP-067, Radioactive Effluent Release
	NOTE May go directly 3-ONOP-041.4.	US: Enters and directs actions of 3-ONOP-067, Radiactive Effluent Release.
		US: Reviews Foldout Page with crew. • Notify plant personal via page system. • If trip occurs and PRMS alarms actuate, manually align Control Room ventilation in Emergency Recirc Mode within 30 minutes of alarm. • If alarm occurs, verify applicable automatic actions occur. **Foldout Page**
		US: • Check High Alarm on R-20 • Check R-20 Alarm Setpoint Exceeded • Check R-20 High Alarm Off **(NO, Perform 3-ONOP-041.4 while continuing with this procedure)** **Steps 1-3**
		US: Enters and directs actions of 3-ONOP-041.4, Excessive RCS Activity.

EVENT 5 – FUEL FAILURE		
3-ONOP-041.4 – EXCESSIVE REACTOR COOLANT SYSTEM ACTIVITY		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
		US: Reviews Foldout Page with crew. • Control Room Ventilation Manual Isolation Criteria **Foldout Page**
	BOOTH OPERATOR When RP is requested to survey the letdown lines, wait 3-5 minutes and report that the letdown piping is the source of the high radiation levels. Report current R-20 value and trend using either the Simulator Panel or Schematic. Also report that the area has been posted as required. When Chemistry is requested to perform a radiochemical analysis of the RCS or fission product concentration and gross activity, wait 8-10 min and report gross activity is 6.4E-2 μCi/gm and slowly rising.	BOP: Confirm R-20 high alarm as follows: • Request RP perform a survey of the letdown line in various areas to confirm that the letdown piping is the source of the high radiation levels. **OR** • Request Chemistry perform a radiochemical analysis of the RCS for fission product concentration and gross activity, to determine if fission product concentration is rising OR a crud burst is occurring. **Step 1**
	NOTE The next two pages include the steps for swapping orifices in accordance with 3-OP-047. The steps for 3-ONOP-041.4 continue on page 25.	RCO: Check the following to maximize letdown • CV-3-200B/C Valves Open **(NO, Realign valves using 3-OP-047)** • At least two charging pumps **Step 2.A**
	BOOTH OPERATOR If dispatched to check Unit 3 Charging pumps, report that you are unable to access the area due to high radiation. However, on rounds earlier in the shift they were in SAT standby alignment and ready for start.	

EVENT 5 – FUEL FAILURE		
3-ONOP-041.4 – EXCESSIVE REACTOR COOLANT SYSTEM ACTIVITY		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
	NOTE The crew may decide to NOT remove this orifice from service, and instead add a second, for a total of 105 gpm letdown flow. The steps for placing CV-3-200C in service are listed on the next page.	RCO: Remove CV-3-200A from service: • Place TCV-3-143 in VCT Divert position • Verify two Charging pumps running • Take manual control of charging • Ensure PCV-3-145 in Manual • Adjust PCV-3-145 to obtain a letdown pressure of 300 psig • When stable, Close CV-3-200A • Place CV-3-200A switch in Auto • Adjust PCV-3-145 in Manual to maintain pressure >150 psig • Set TC-3-144A to 50% demand • When stable between 115-121°F, place TC-3-144A in Auto • Adjust PCV-3-145 in Manual to normal operating band • Place PCV-3-145 in Auto • Restore Charging to Auto • Adjust HCV-3-121 as desired • Verify TCV-3-143 is in Auto **3-OP-047 Sec 7.11**

EVENT 5 – FUEL FAILURE		
3-ONOP-041.4 – EXCESSIVE REACTOR COOLANT SYSTEM ACTIVITY		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
		RCO: Place CV-3-200C in service: • Place TCV-3-143 in VCT Divert position • Verify two Charging pumps running • Place TC-3-144A in Manual at 10% demand • Verify CV-3-204 Open • Verify LCV-3-460 Open • Adjust LC-3-459G in Manual to increase charging by 20-30 gpm • Verify TI-3-140 ≤310°F • Verify PCV-3-145 in Manual • Adjust PCV-3-145 to obtain a letdown pressure of 90-100 psig • When stable, Open CV-3-200C • Adjust PCV-3-145 in Manual to limit pressure spike to <400 psig • When stable between 115-121°F, place TC-3-144A in Auto • Adjust LC-3-459G in Manual to maintain PZR Level • Adjust PCV-3-145 in Manual to normal operating band • Place PCV-3-145 in Auto • Restore Charging to Auto • Adjust HCV-3-121 as desired • Verify TCV-3-143 is in Auto **3-OP-047 Sec 7.11**

EVENT 5 – FUEL FAILURE		
3-ONOP-041.4 – EXCESSIVE REACTOR COOLANT SYSTEM ACTIVITY		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR • When asked to determine the decontamination factor (DF) of the demineralizer(s), wait 5-10 minutes and report DF of all in service demins is 10. • Acknowledge request to raise RCS sampling frequency. • Acknowledge request to perform radiation surveys of the Auxiliary Building and post as necessary. • Acknowledge request to perform actions NF-AA-100-1001, Failed Fuel Action Plan.	BOP: • Request Chemistry to determine the decontamination factor of the demineralizer(s) in operation. • If DF is less than 1, then: • Direct Chemistry to raise RCS sampling frequency as necessary to determine activity trends and allow precise tracking of the incident. • Direct RP to perform radiation surveys of the Auxiliary Building and post as necessary. • Notify Reactor Engineering Supervisor or designee to perform actions NF-AA-100-1001, Failed Fuel Action Plan. **Step 2.B–F**
	BOOTH OPERATOR If asked: • Dose Equivalent I-131 is 0.1 μCi/gm • Dose Equivalent Xe-133 is 195 μCi/gm Acknowledge request to perform as Decay Tank sampling. **BOOTH OPERATOR** Acknowledge communications.	US: • Review Tech Spec 3.4.8. • Notify SM to consult 0-EPIP-20101, Duties of Emergency Coordinator, for classification. • Direct Chemistry to perform Gas Decay Tank sampling and analyses per T.S. 4.7.9. **Step 3**
		US: Continue purification and sampling until RCS activity levels return to acceptable levels. **Step 4**
	LEAD EVALUATOR When letdown has been maximized and charging balanced, or at Lead Evaluator discretion, proceed to the next event.	

EVENT 6 – 3C S/G FAULT OUTSIDE CTMT		
3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When directed by the Lead Evaluator, **trigger EVENT 6 – 3C S/G FAULT** and Verify **EVENT 8 – PORV DRIFTS OFF CLOSED SEAT triggers** (2 min delay)	RCO/BOP: Announce reactor trip.
		US: Directs the actions of 3-EOP-E-0, Reactor Trip or Safety Injection
	NOTE Steps 1 - 4 of 3-EOP-E-0 are Immediate Operator Actions (IOAs).	RCO: Verify Reactor Trip **Step 1**
		BOP: • Verify Turbine Trip • Verify Power to Emergency 4kV Buses **Step 2-3**
	BOOTH OPERATOR When AFW has auto started, verify **EVENT 6 – LOSS OF C AFW PP triggers** (with 30 sec delay).	RCO: Checks If SI Is Actuated **Step 4**

EVENT 6 – 3C S/G FAULT OUTSIDE CTMT		
3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
CT1 ________	**Isolate AFW To Faulted S/G** During MSLB, isolate AFW flow to faulted S/G prior to Orange Path on Integrity (Any RCS_{cold} Leg <280°F). **BOOTH OPERATOR** If directed to investigate steam lines, report large steam leak from 3C S/G Safety Valve.	US: Reviews Foldout Page with crew • Adverse CTMT • RCP Trip Criteria • Faulted S/G Isolation **(Yes, Isolate AFW flow to 3C S/G)** – Maintain total feed >400 gpm – When 3C S/G <9% WR [<27% NR], adjust intact S/G SDTA setpoints to match S/G pressure • Ruptured S/G Isolation Criteria • AFW Sys Operation Criteria • CST Makeup Water Criteria • RHR System Operation Criteria **(YES, RCO sets timer)** • Loss of Offsite Power or SI on the Other Unit • Loss of Charging Criteria **Foldout Page**
	NOTE ATTACHMENT 3, Prompt Action Verifications, start on page 35.	BOP: Continues with ATTACHMENT 3 to complete The Prompt Action Verifications. **Step 5**
	BOOTH OPERATOR • If asked, report that Unit 4 does NOT require AFW. • When directed to investigate loss of C AFW Pp, wait 3-5 minutes and report a large governor oil leak. • If asked for status of B AFW Pp, report that OOS until tomorrow. • If asked to place Standby Feed in service, report that DWDS-3-012 is stuck. Delay opening until 3-EOP-FR-H.1.	RCO: • Check AFW Pumps – AT LEAST TWO RUNNING **(NO)** • Verify AFW Valve Alignment – PROPER EMERGENCY ALIGNMENT **Steps 6-7**

EVENT 6 – 3C S/G FAULT OUTSIDE CTMT		
3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	NOTE If AFW flow hasn't yet reduced less than 400 gpm, the crew will continue and transition to 3-EOP-FR-H.1 later, just prior to transitioning to 3-EOP-E-2.	RCO: Check NR Level in at least one S/G – GREATER THAN 7%[27%] **(NO)** • Verify AFW flow > 400 gpm **(NO, Go to 3-EOP-FR-H.1)** **Step 8**
		RCO: Check All Thermal Barrier Alarms clear. **Step 9**
		RCO: • Checks RCS average temperature STABLE BETWEEN 545°F AND 547°F or trending down to 547ºF **(NO)** - Stop dumping steam. - Reduce total feed flow to 400 gpm until narrow range level greater than 7% [27%] in at least one S/G. – Close MSIV and bypass valves. **Step 10**
EVENT 8 – PORV DRIFTS OFF CLOSED SEAT		
		RCO: • Check PRZ PORVs, Spray Valves And Excess Letdown Isolated **(NO, Close MOV-3-536)** • Check If RCPs Should Be Stopped • Check If S/Gs Are Faulted **(YES, 3C)** **Steps 11-13**
END OF EVENT 8		
	NOTE S/G level may be >7% NR, which would NOT require a transition to 3-EOP-FR-H.1. However, level will decline until <7% NR, ultimately requiring the transition.	CREW: Monitor Critical Safety Functions using 3-EOP-F-0, Critical Safety Function Status Trees **(YES, RED Path on Heat Sink)**
	NOTE 3-EOP-E-2 begins on page 31.	US: Directs transition to 3-EOP-FR-H.1, Response to Loss of Secondary Heat Sink.

EVENT 6 – 3C S/G FAULT OUTSIDE CTMT		
3-EOP-FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: Enters and directs the actions of 3-EOP-FR-H.1, Response To Loss Of Secondary Heat Sink.
		RCO: Check If Secondary Heat Sink Is Required **(YES)** • RCS pressure – GREATER THAN ANY NON-FAULTED S/G PRESSURE • RCS Hot Leg Temp – GREATER THAN 350°F **Step 1**
		US: Reviews Foldout Page with crew • Adverse Containment Conditions **Foldout Page**
		RCO: Check If Bleed And Feed Is Required **(NO, Go to Step 3)** **Step 2**
		RCO: Try To Establish AFW Flow To At Least One S/G • Check S/G Sample Isolation Valves Closed • Check Control Room indications for cause of AFW failure • Try to restore AFW flow • Check total feed flow >400 gpm **(NO, Go to Step 4)** **Step 3**
	NOTE May have been previously stopped.	RCO: Stop All RCPs **Step 4**

EVENT 6 – 3C S/G FAULT OUTSIDE CTMT

3-EOP-FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK

TIME	EVALUATOR ACTIVITIES & NOTES	EXPECTED STUDENT RESPONSE
	BOOTH OPERATOR • When directed to throttle open DWDS-3-012, wait 3-5 minutes and **trigger LOA – THROTTLE DWDS-012.** • If directed to start B SSGFP, wait 2-3 minutes and report that the motor will not start. • When directed to open DWDS-3-012, **trigger LOA – OPEN DWDS-012.** Report when each is complete, as appropriate.	BOP: Try To Establish Standby Feedwater Flow To At Least One S/G • Verify SI – RESET • Check 3C 4KV Bus – ENERGIZED • Check Alarm E-2/6, HI-HI SG LVL TURB TRIP/FEEDWATER ISOLATION – CLEAR • Verify Feedwater Bypass Isolation valves POV-3-477/487/497– OPEN • Manually or locally open Feedwater Bypass Valve(s) between 20% and 25%
	CT3 (post-scenario CT) – Do not initiate feedwater flow to a dry, faulted Steam Generator (refer to Scenario 7, Form D-1, Page 3 for description)	• Check Condensate System dump flush and full flow recirc activities – **NOT** IN PROGRESS AT EVENT INITIATION • Check Feedwater pressure, PI-3-1616 – GREATER THAN 500 PSIG **(NO)** Locally throttle open DWDS-3-012, three turns.
CT2 __________	**Establish Standby Feedwater** During a loss of heat sink, establish feedwater flow to at least one Steam Generator prior reaching 9% WR S/G Level.	• Manually start one Standby SGFP • Locally open DWDS-012 • Adjust Feed Bypass Valves **Step 5**
	LEAD EVALUATOR This is the earliest possible opportunity to terminate the scenario. The terminating cue is on page 34.	BOP: Check S/G NR Levels in at least one S/G Greater Than 7%[27%] **(NO)** • If Standby Feed flow to at least one S/G can be verified by any of the following: - CTMT Conditions normal AND Wide Range S/G level increasing - CETs stable or decreasing - Flow indicated on flow instruments Then maintain flow and return to procedure and step in effect. **Step 6**
	NOTE 3-EOP-E-0 step 9 is on page 28. 3-EOP-E-2 continues on next page.	US: Direct transition back to 3-EOP-E-0. (If exited at step 13, will go to 3-EOP-E-2)

EVENT 6 – 3C S/G FAULT OUTSIDE CTMT		
3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: • Conducts EOP transition brief. • Directs 3-EOP-E-2 response.
		US: Reviews Foldout Page with the crew. • Containment Adverse **Foldout Page**
	<u>BOOTH OPERATOR</u> When directed to perform Attachment 1, wait 3-5 minutes and **trigger LOA – DEENERGIZE AND CLOSE MOV-1405.** and **LOA – ALIGN 3B S/G TO TRAIN 1.** Report when complete.	BOP: • Check MSIV and Bypass Valves on Faulted S/G Closed • Check if <u>Any</u> S/G is NOT Faulted • Identify Faulted S/G • Isolated Faulted S/G – Dispatch Operator to isolate steam supply from faulted S/G using Att 1 **Steps 1-4**
		RCO: Stabilize RCS Hot Leg Temperatures **Step 5**
	<u>BOOTH OPERATOR</u> Acknowledge the request for Chemistry and HP support. Wait 5-7 minutes and then report all readings are normal.	BOP: • Check CST Levels • Check Secondary Radiation **Steps 6-7**
		US: Go to 3-EOP-E-1, Loss Of Reactor Or Secondary Coolant, Step 1 **Step 8**

EVENT 6 – 3C S/G FAULT		
3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		US: • Conducts EOP transition brief. • Directs 3-EOP-E-1 response.
		US: Reviews Foldout Page with the crew. • Containment Adverse • RCP Trip Criteria • SI Termination Criteria • Secondary Integrity Criteria. • E-3 Transition Criteria • Cold Leg Recirc Switchover Criteria • Recirculation Sump Blockage • CST Makeup Water Criteria. • Loss of Offsite Power or Unit 4 SI • RHR System Operation Criteria **(YES)** • Loss Of Charging Criteria **Foldout Page**
		RCO: Check If RCPs Should Be Stopped **Step 1**
	<u>BOOTH OPERATOR</u> Acknowledge the request for Chemistry and HP support. Wait 10 minutes and report all readings normal.	BOP: • Check If S/Gs Are NOT Faulted • Check Intact S/G Levels • Check Secondary Radiation **Steps 2-4**
		RCO: • Checks PRZ PORVs And Block Valves • Check SI Reset • Reset Phase A and Phase B **Steps 5-7**
		RCO/BOP: Verify Instrument Air To Containment **Step 8**

EVENT 6 – 3C S/G FAULT		
3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO: Check Power Supply To All Charging Pumps - ALIGNED TO OFFSITE POWER **Step 9**
		RCO: Check If Charging Flow Has Been Established. • Charging pumps - AT LEAST ONE RUNNING • Establish desired charging by performing ATTACHMENT 2, steps 3 through 5. - Place RCS Makeup Control Switch in STOP - Start additional Charging pumps if needed. - Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow. - Verify charging pump suction auto transfers to RWST. - Notify Unit Supervisor That Attachment 2 Is Complete. **Step 10**
		US: Check if SI Flow Should Be Terminated **(NO)** **Step 11**
		RCO: Check if Containment Spray should be stopped. **Step 12**
		RCO: Check If RHR Pumps Should Be Stopped. **(YES, Stop both RHR Pumps)** **Step 13**

EVENT 6 – 3C S/G FAULT		
3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		RCO\BOP: Check RCS And S/G Pressures • Pressure in all S/Gs – STABLE OR INCREASING • RCS pressure STABLE OR DECREASING **Step 14**
	BOOTH OPERATOR If directed to Stop 4A and 4B EDG, acknowledge request. **BOOTH OPERATOR** If dispatched to place any stopped EDGs in standby, acknowledge request.	BOP: Check If Diesel Generators Should Be Stopped: • Stop 3A and 3B EDG by placing its switch in NORMAL STOP position. • Direct Unit 4 RCO to stop any unloaded EDG by placing its switch in NORMAL STOP position. • Dispatch Operator to place any stopped EDGs in standby **Step 15**
		US: Initiate Evaluation Of Plant Status **Step 16**
The scenario may be terminated after the crew transitions to 3-EOP-E-1 and secures RHR pumps, or at Lead Evaluator discretion once all critical tasks have been evaluated.		
***** END OF SCENARIO *****		

EVENT 7 – FW ISOLATION FAILS TO ACTUATE		
3-EOP-E-0 ATTACHMENT 3, PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Check Load Centers Associated With Energized 4 KV Buses – ENERGIZED **Step 1**
	<u>BOOTH OPERATOR</u> When asked, report that B SSGFP is Off.	BOP: Verify Feedwater Isolation **(NO)** • Place SGFP switches in Stop • FRVs Closed • FW Bypass Valves Closed • FW Bypass Isolation Valves Closed • FW Isolation MOVs Closed • Verify SSGFP Off **Step 2**
		BOP: Check If Main Steam Lines Should Be Isolated **Step 3**
		BOP: Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT **Step 4**
		BOP: Verify Pump Operation: a. At least two High-Head SI Pumps – RUNNING b. Both RHR Pumps – RUNNING **Step 5**

EVENT 7 – FW ISOLATION FAILS TO ACTUATE		
3-EOP-E-0 ATTACHMENT 3, PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Verify Proper CCW System Operation: • CCW Heat Exchangers – THREE IN SERVICE • CCW Pumps – ONLY TWO RUNNING • CCW Headers – TIED TOGETHER • MOV-3-626, RCP Thermal Barrier CCW Outlet – OPEN **Step 6**
		BOP: Verify Proper ICW System Operation: • Verify ICW Pumps – AT LEAST TWO RUNNING • Verify ICW To TPCW Heat Exchanger – ISOLATED: • Check ICW Headers – TIED TOGETHER **Step 7**
		BOP: Check Emergency Containment Coolers – ONLY TWO RUNNING **Step 8**
		BOP: Verify Unit 3 Containment Purge Exhaust And Supply Fans – OFF **Step 9**
		BOP: Verify Containment Spray and Phase B actuated. **Step 10**
		BOP: Verify SI – RESET **Step 11**

EVENT 7 – FW ISOLATION FAILS TO ACTUATE		
3-EOP-E-0 ATTACHMENT 3, PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
		BOP: Verify SI Valve Amber Lights On VPB – ALL BRIGHT **Step 12**
		BOP: Verify SI Flow: **Step 13**
	BOOTH OPERATOR When requested, wait 5-7 minutes and **trigger LOA – ALIGN U4 HHSI TO U3 RWST** Report when complete.	BOP: Realign SI System: • Check Procedure Entry Status – E-0 ENTERED FROM 3-ONOP-047.1, LOSS OF CHARGING FLOW IN MODES 1 THROUGH 4 **(NO)** • Verify Unit 3 High-Head SI Pumps – TWO RUNNING • Stop both Unit 4 High-Head SI • Pumps and place in standby • Direct Unit 4 Reactor Operator to align Unit 4 High-Head SI Pump suction to Unit 3 RWST using Attachment 1. **Step 14**
		BOP: Verify Containment Isolation Phase A – RESET **Step 15**
		BOP: Reestablish RCP Cooling: • Check RCPs At Least One Running • Open CCW to NCCs MOV-1417/18 • Reset and Start NCCs **Step 16**
		BOP: Verify Control Room Ventilation Isolation: **Step 17**

EVENT 7 – FW ISOLATION FAILS TO ACTUATE		
3-EOP-E-0 ATTACHMENT 3, PROMPT ACTION VERIFICATIONS		
TIME	**EVALUATOR ACTIVITIES & NOTES**	**EXPECTED STUDENT RESPONSE**
	BOOTH OPERATOR When requested, **trigger LOA – PLACE PAHMS IN SERVICE,** wait 3-5 minutes and report complete.	BOP: Place Hydrogen Monitors In Service Using 3-NOP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM **Step 18**
		BOP: Verify All Four EDGs – RUNNING **Step 19**
		BOP: Verify Power To Emergency 4 KV Buses: **Step 20**
		BOP: Notify Unit Supervisor Of The Following: • Attachment 3 is complete • Any safeguards equipment that is NOT running is in the required condition • Status of Containment pressure continuous action **Step 21**

Discussion Points are intentionally NOT included in evaluated scenarios. However, space is available below to document follow-up questions when further information is required to determine an evaluation outcome.

FOLLOW-UP QUESTIONS

QUESTION #1

ANSWER #1

QUESTION #2

ANSWER #2

SIMULATOR POST-SCENARIO RESTORATION:

_______ 1. Restore per Simulator Operator Checklist.

_______ 2. Once exams are complete, restore from SEI-19, Simulator Exam Security.

OPERATIONS SHIFT TURNOVER REPORT

UNIT 3 RISK: GREEN (ACCEPTABLE) PROTECTED TRAIN: B	UNIT 4 RISK: GREEN (ACCEPTABLE) PROTECTED TRAIN: B

ONCOMING CREW ASSIGNMENTS

Shift Mgr:			**Inside SNPO:**	
Field Supv.:			**Outside SNPO:**	
Admin RCO:			**ANPO:**	
Unit 3			**Unit 4**	
Unit Supv.:			**Unit Supv.:**	
RCO:			**RCO:**	
NPO:			**NPO:**	

PLANT STATUS

Unit 3			**Unit 4**	
Mode:	1		**Mode:**	1
Power:	100%		**Power:**	100%
MWe:	844		**MWe:**	842
Gross Leakrate:	0.11 gpm		**Gross Leakrate:**	0.09 gpm
RCS Boron Conc:	831 ppm		**RCS Boron Conc:**	642

Operational Concerns:

B AFW pump taken OOS 24 hours ago for an oil change, expected back by the end of tomorrow peak shift. Two trains verified operable.

3B Isophase Fan OOS for fan repair. Estimated completion time is one week. 3A Isophase Fan Guarded.

U3 Anticipated LCO Actions:

None

U4 Anticipated LCO Actions:

None

Results of Offgoing Focus Area:

UNIT 3 STATUS

REACTOR OPERATOR

UNIT RISK: GREEN (ACCEPTABLE)   PROTECTED TRAIN: B

Mode:	1
Power:	100%
MWe	844
Tavg:	580°F
RCS Pressure:	2235
RCS Boron Conc:	831 ppm

RCS Leakrate	
Gross:	0.11 GPM
Unidentified	0.04 GPM
Charging Pps:	0.00 GPM

Accumulator Ref Levels	
A	6700
B	6700
C	6700

Abnormal Annunciators:

Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	

Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items"

T.S.A.S / Component: Reason: Entry Date:	B AFW pump, 3.7.1.2 – Action 3 Oil Change 24 hours ago
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	

REACTOR OPERATOR (CONT'D)

UNIT RISK: GREEN (ACCEPTABLE)   PROTECTED TRAIN: B

Changes to Risk Significant Equipment:

No recent changes from last shift.

OLRM: GREEN

PROTECTED TRAIN: B

Upcoming Reactivity Management Activities:

Maintain current power level 99.85% - 99.99%
Xe is stable.

Upcoming Major POD Activities:

NONE

Upcoming ECOs to Hang and /or Release:

- Hang – None
- Release – None

Evolutions or Compensatory Actions in Progress:

NONE

General Information, Remarks, and Operator Work Around Status:

- Weather forecast is overcast skies with scattered pockets of severe rain.
- U3 supplying Aux Steam
- Air In-leakage = 0.0 SCFM

L-17-1 NRC Exam

JPM A

JPM TITLE: Withdraw Control Rods and Restore to Automatic Control

JPM NUMBER: 01028026300 **REV.** 0-1

TASK NUMBER(S) / TASK TITLE(S): 01028026300
Respond to Continuous Rod Insertion

K/A NUMBERS: 001 A2.11 **K/A VALUE:** RO 4.4 / SRO 4.7

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: ☐ Perform: X

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

Time for Completion: 10 Minutes Time Critical: No

Alternate Path [NRC]: Yes
Alternate Path [INPO]: Yes

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/01/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/02/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☒	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☐	☐	☒
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

N/A

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
0-0	New JPM	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
0-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17

SIMULATOR SET-UP:

SIMULATOR SETUP INSTRUCTIONS:

______	1.	Reset to **IC 1** or saved IC.
______	2.	Place simulator in RUN.
______	3.	Ensure applicable portions of Simulator Operator Checklist are complete.
______	4.	N/A if using saved IC • Place Control Rods in Manual • Insert Control Rods to 220 Steps on Control Bank D
______	5.	Open and execute NRC JPM A.lsn: • Verify **CONTINUOUS INSERTION** is in CONDITIONAL state
______	6.	Allow plant to stabilize.
______	7.	Acknowledge alarms and place simulator in FREEZE.
______	8.	Save as temporary IC, if JPM will be repeated.
______	9.	When ready to begin, then place Simulator in RUN.

SIMULATOR MALFUNCTIONS:

- A301_A1_S32_3, BANK SEL SW ON MAN
- TFL10202, L1-SC408 CONTI ROD INSERTION MAN/INDIV

SIMULATOR OVERRIDES:

- N/A

SIMULATOR REMOTE FUNCTIONS:

- N/A

Required Materials:	• None
General References:	• 3-EOP-E-0, Reactor Trip or Safety Injection • 3-ONOP-028, Reactor Control System Malfunction
Task Standards:	• Restore Control Rods to All Rods Out • Return Control Rods to Automatic Control • Manually Trip Reactor

HAND JPM BRIEFING SHEET TO EXAMINEE AT THIS TIME

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- Unit 3 is in Mode 1.
- The operating crew has recovered from a transient.
- Control Bank D is currently at 220 steps.
- All required reactivity briefings have been complete.

INITIATING CUE:

You have been directed by the Unit Supervisor to restore Control Rods to 229 steps in 3-step increments and then return Rod Control to Automatic.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically, cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Yes" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _Y_ (SEQ-1)**	**Restore Control Rods to All Rods Out.**
Standard:	Restore Control Bank D to All Rods Out, 229 steps.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Performance Step: **Critical _Y_ (SEQ-2)**	**Return Control Rods to Automatic Control.**
Standard:	Place Rod Motion Control Selector switch in Automatic.
Evaluator Note:	Upon placing the Rod Motion Control Selector switch in Automatic, control rods will begin to auto insert.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

THIS BEGINS THE ALTERNATE PATH PORTION OF THIS JPM

Performance Step: **Critical _N_ (SEQ-3)**	**Perform immediate operator actions of 3-ONOP-028, Reactor Control System Malfunction, Step 4.3.1.**
Standard:	Place Rod Motion Control Selector switch to Manual.
Evaluator Note:	Control Rod insertion will **NOT** stop when Rod Motion Control Selector switch is placed in Manual. Reactor Trip required.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-4)**	**Trip Reactor in accordance with 3-ONOP-028, Reactor Control System Malfunction, Step 4.3.2.**
Standard:	Manually trip reactor and verify reactor tripped.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Terminating Cue: **When the reactor is tripped and verified tripped, state “This completes the JPM.”**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ____________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- Unit 3 is in Mode 1.
- The operating crew has recovered from a transient.
- Control Bank D is currently at 220 steps.
- All required reactivity briefings have been complete.

INITIATING CUE:

You have been directed by the Unit Supervisor to restore Control Rods to 229 steps in 3-step increments and then return Rod Control to Automatic.

NOTE: Ensure the turnover sheet is returned to the evaluator when the JPM is complete.

L-17-1 NRC Exam

JPM B

JPM TITLE: Align Safety Injection for Hot Leg Recirc Alt Path

JPM NUMBER: 01062012500 **REV.** 2-0

TASK NUMBER(S) / TASK TITLE(S): 01062012500
Align Safety Injection for Hot Leg Recirc

K/A NUMBERS: 006 A4.02 **K/A VALUE:** RO 4.0 SRO 3.8

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [X]

EVALUATION LOCATION: In-Plant: [ ] Control Room: [ ]
Simulator: [X] Other: [ ]
Lab: [ ]

Time for Completion: 10 Minutes Time Critical: Yes

Alternate Path [NRC]: Yes
Alternate Path [INPO]: Yes

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/01/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**8/02/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☒	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☒	☐	☐
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

N/A

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
2-0	Formatting; Modifications	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
2-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17

SIMULATOR SET-UP:

SIMULATOR SETUP INSTRUCTIONS:

______	1.	Reset to **IC 23** or saved IC.
______	2.	Place simulator in RUN.
______	3.	Ensure applicable portions of Simulator Operator Checklist are complete.
	4.	Open and execute NRC JPM B.lsn: • Trigger **SETUP – MOV-843B FAILED OPEN** • Verify **CONDITIONAL** is in CONDITIONAL state
______	5.	Allow plant to stabilize.
______	6.	Acknowledge alarms and place simulator in FREEZE.
______	7.	Save as temporary IC, if JPM will be repeated.
______	8.	When ready to begin, then place simulator in RUN.

SIMULATOR MALFUNCTIONS:

- TFMVV02O, MH-MOV-843B FAIL OPEN
- TFM2Z05L, MH-MOV-866A THERMAL OVRLD FAIL

SIMULATOR OVERRIDES:

- N/A

SIMULATOR REMOTE FUNCTIONS:

- N/A

Required Materials:	• HANDOUT 3-EOP-ES-1.4
General References:	• 3-EOP-ES-1.4, Transfer To Hot Leg Recirculation
Task Standards:	• Attempt to establish HHSI flow to the RCS Hot Legs. • Core flow interruption time to swap from cold leg to hot leg recirc is less than or equal to 3 minutes 46 seconds. • Reestablish HHSI flow to the RCS Cold Legs.

HAND JPM BRIEFING SHEET TO EXAMINEE AT THIS TIME

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- UNIT 3 is in MODE 4
- Unit 4 is in MODE 1
- No equipment is OOS
- The plant is aligned for cold leg recirculation per 3-EOP-ES-1.3, Transfer to Cold Leg Recirculation.
- Cold Leg Recirculation has been in progress for 6 hours.

INITIATING CUES:

In accordance with 3-EOP-E-1, Step 23, the Unit Supervisor has directed you to transfer to Hot Leg Recirculation using 3-EOP-ES-1.4, Transfer to Hot Leg Recirculation.

Portions of this task are time critical.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically, cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Yes" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain a copy of 3-EOP-ES-1.4, Transfer To Hot Leg Recirculation.**
Standard:	Copy of 3-EOP-ES-1.4, Transfer To Hot Leg Recirculation is obtained.
Evaluator Note:	VCT Makeup is in progress for this JPM. If asked, tell examinee another RO will monitor the makeup.
Evaluator Cue:	Cue the Booth Operator to place the simulator in RUN. Provide a copy of 3-EOP-ES-1.4, Transfer To Hot Leg Recirculation
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-2)**	**3-EOP-ES-1.4, Transfer To Hot Leg Recirculation.**
Standard:	Reviews Foldout Page, Cautions, & Notes.
Evaluator Note:	**3-EOP-ES-1.4, Step 1 Caution:** Interruption of core flow when aligning for Hot Leg Recirculation shall **NOT** exceed three minutes.(Attachment 1 may be used as a reference)
Evaluator Cue:	If asked, acknowledge request to have operator standing by to operate valve 3-867 if required.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-3)**	**3-EOP-ES-1.4, Step 1** Check Status of Hot Leg Injection Isolation Valves: a. Check Loop Hot Leg Safety Injection Valves – BOTH CLOSED: • MOV-3-866A • MOV-3-866B
Standard:	Verifies Hot Leg Safety Injection Valves MOV-3-866A and MOV-3-866B **CLOSED** by visual observation of the valve green indicating light ON.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-4)**	**3-EOP-ES-1.4, Step 1 (cont'd)** Check Status of Hot Leg Injection Isolation Valves: b. Check MOV-3-869, Safety Injection To Hot Leg Isolation – OPENED DURING FIRST PERFORMANCE OF 3-EOP-ES-1.3
Standard:	Verifies MOV-3-869, Safety Injection to Hot Leg Isolation – **OPENED** by visual observation of the valve red indicating light ON.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-5)**	**3-EOP-ES-1.4, Step 2** Stop All Running High-Head SI Pumps
Standard:	Places 3A and 3B High-Head SI Pump control switches to **STOP**.
Evaluator Note:	Record the time when the **last** HHSI pump is stopped. This is the start time for the time critical portion of the JPM. Time: ____________
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-6)**	**3-EOP-ES-1.4, Step 3** Open Both Loop Hot Leg Safety Injection Valves • MOV-3-866A • MOV-3-866B
Standard:	Places Hot Leg Safety Injection Valves MOV-3-866A and MOV-3-866B control switches to **OPEN**, verifies both go open.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-7)**	**3-EOP-ES-1.4, Step 4** Establish Cold Leg Injection Isolation: Perform one of the following: ***** Close both SI To Cold Leg Isolation Valves: • MOV-3-843A • MOV-3-843B <u>OR</u> ***** Check status of 3-867 – CLOSED
Standard:	Places control switch for MOV-3-843A and MOV-3-843B to **CLOSE**.
Evaluator Cue:	If asked, report 3-867 is open. Upon attempting to close MOV-3-843A and 843B, MOV-3-843B does **NOT** close.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

THIS BEGINS THE ALTERNATE PATH PORTION OF THIS JPM

Performance Step: **Critical _N_ (SEQ-8)**	**3-EOP-ES-1.4, Step 4 RNO 1** IF either MOV-3-843A OR MOV-3-843B will **NOT** close, THEN perform the following: 1) Close MOV-3-866A and MOV-3-866B to isolate Hot Leg Injection flow path.
Standard:	Places control switch for MOV-3-866A and MOV-3-866B to **CLOSE**.
Evaluator Note:	Upon attempting to close MOV-3-866A and 866B, MOV-3-866A does **NOT** close and trips on motor overload.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-9)**	**3-EOP-ES-1.4, Step 4 RNO 2** 2) IF either MOV-3-866A OR MOV-3-866B will **NOT** close, THEN close MOV-3-869.
Standard:	Places control switch for MOV-3-869 to **CLOSE**.
Evaluator Note:	Verifies MOV-3-869 **CLOSED** by visual observation of the valve green indicating light ON.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_(SEQ-10)**	**3-EOP-ES-1.4, Step 4 RNO 3** 3) Start two High-Head SI Pumps to reestablish Cold Leg Recirculation Injection.
Standard:	Places 3A and 3B High-Head SI Pump hand switches to **START**.
Evaluator Note:	Record the time when the **first** HHSI pump is started. This is the stop time for the time critical portion of the JPM. Time:___________ Verify core flow interruption time to swap from cold leg to hot leg recirculation is less than or equal to 3 minutes 46 seconds.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_(SEQ-11)**	**3-EOP-ES-1.4, Step 4 RNO 4** 4) Verify Cold Leg Injection flow indicated on FI-3-943.
Standard:	Verifies flow to cold legs indicated on FI-3-943.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Terminating Cue: **Once cold leg injection flow is observed, state "This completes the JPM."**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- UNIT 3 is in MODE 4
- Unit 4 is in MODE 1
- No equipment is OOS
- The plant is aligned for cold leg recirculation per 3-EOP-ES-1.3, Transfer to Cold Leg Recirculation.
- Cold Leg Recirculation has been in progress for 6 hours.

INITIATING CUES:

In accordance with 3-EOP-E-1, step 23, the Unit Supervisor has directed you to transfer to Hot Leg Recirculation using 3-EOP-ES-1.4, Transfer to Hot Leg Recirculation.

Portions of this task are time critical.

NOTE: Ensure the turnover sheet is returned to the evaluator when the JPM is complete.

CAUTION

EMERGENCY OPERATING PROCEDURES

This EOP contains foldout pages.

Do not use copies of this procedure produced from this application in the performance of plant operations.

The last page of this document is a copy of the foldout page.

FPL	TURKEY POINT UNIT 3 EMERGENCY OPERATING PROCEDURE SAFETY RELATED **CONTINUOUS USE**	Procedure No. **3-EOP-ES-1.4** Revision No. **4**

Title:

TRANSFER TO HOT LEG RECIRCULATION

Responsible Department: OPERATIONS

Special Considerations:

Last page of this procedure contains fold out page

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED TODAY INITIAL &

Revision	Approved By	Approval Date
4	Mike Murphy	07/31/14

UNIT #	UNIT 3
DATE	
DOCT	PROCEDURE
DOCN	3-EOP-ES-1.4
SYS	
STATUS	COMPLETED
REV	4
# OF PGS	

REVISION SUMMARY	
Rev. No.	**Description**
4	**PCR 1926673, 07/31/14, G.T. Slaby** Changes are to incorporate revisions 2, 2+ and 3 of the Westinghouse Owners Group (WOG) Emergency Response Guideline (ERG). The changes consist of reformatting the procedure to better align with and reduce the number of exceptions to the ERG, and adding enhancements for usability. Specific changes include: Step 1 is new (WOG ERG change). Has operator check valve lineup for Hot Leg Recirculation. If Hot Leg Recirculation can **NOT** be established, TSC is notified and going to step 7. Added new bullet to 4a, which checks if 3-867 is closed. Added RNO 12 a, b, c, f, g, and h. Attachment 1 – Copied into body of procedure. Added Step to open both MOV-3-863A and MOV-3-863B

TABLE OF CONTENTS

1.0 PURPOSE

This procedure provides the necessary instructions for transferring the Safety Injection System to Hot Leg Recirculation.

2.0 SYMPTOMS AND ENTRY CONDITIONS

1) This procedure is entered from E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 23 and 26, when the specified time interval has elapsed.

2) When a decision is made, based upon the recommendation of the TSC Staff, that transfer to Hot-Leg Recirculation is required. Transfer to Hot-Leg Recirculation might be required, eventually, after transferring to Cold-Leg Recirculation while implementing:

- **a)** 3-EOP-ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION
- **b)** 3-EOP-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED
- **c)** 3-EOP-ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT – SATURATED RECOVERY DESIRED

STEP **ACTION/EXPECTED RESPONSE** **RESPONSE NOT OBTAINED**

3.0 OPERATOR ACTIONS

CAUTION

- If 3-867, Cold Leg SI Boundary Isolation Valve, is to be closed, time on the Auxiliary Building roof should be minimized because of potential high dose rates on the roof.
- Interruption of core flow when aligning for Hot Leg Recirculation shall **NOT** exceed three minutes.(Attachment 1 may be used as a reference)

NOTE

- This procedure is required to be performed without delay.
- Foldout page is required be monitored throughout this procedure.
- CSF Status Trees may be monitored for information only.
  FRPs shall **NOT** be implemented until completion of Step 12, or completion of Step 16, if Alternate Hot Leg Recirculation is required.
- Step 1 through Step 12, as applicable, including the contingency actions, should be reviewed prior to performance to ensure a timely transition to Hot Leg Recirculation.

1. Check Status of Hot Leg Injection Isolation Valves:

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
a. Check Loop Hot Leg Safety Injection Valves – BOTH CLOSED: • MOV-3-866A • MOV-3-866B	**a.** Go to Step 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	**(continued)**	
	b. Check MOV-3-869, Safety Injection To Hot Leg Isolation – OPENED DURING FIRST PERFORMANCE OF 3-EOP-ES-1.3	**b.** Check 3-990, MOV-3-869 Bypass Valve, was opened during first performance of 3-EOP-ES-1.3. **1)** IF **neither** MOV-3-869 **NOR** 3-990 were opened, THEN: **a)** Notify TSC staff that Hot Leg Recirculation can **NOT** be established and Alternate Hot Leg Injection may be required. **b)** IF Alternate Hot Leg Injection is recommended by the TSC staff, THEN observe NOTE prior to Step 16, and go to Step 16.
2.	**Stop All Running High-Head SI Pumps**	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.	**Open Both Loop Hot Leg Safety Injection Valves:** • MOV-3-866A • MOV-3-866B	Perform the following: **a.** IF one valve opened, THEN go to Step 4. **b.** IF both valves will **NOT** open, THEN perform the following: **1)** Start two High-Head SI Pumps to reestablish Cold Leg Recirculation Injection. **2)** Verify flow to Cold Legs indicated on FI-3-943. **3)** Notify TSC that Hot Leg Recirculation can **NOT** be established and Alternate Hot Leg Injection may be required. **4)** IF Alternate Hot Leg Injection is recommended by the TSC staff, THEN observe NOTE prior to Step 16, and go to Step 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Hand-wheel for 3-867, Cold leg SI Boundary Isolation Valve, requires approximately 12 to 15 turns to close.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.	**Establish Cold Leg Injection Isolation:** **a.** Perform one of the following: * Close both SI To Cold Leg Isolation Valves: • MOV-3-843A • MOV-3-843B OR * Check status of 3-867 – CLOSED	IF either MOV-3-843A OR MOV-3-843B will **NOT** close, THEN perform the following: **1)** Close MOV-3-866A and MOV-3-866B to isolate Hot Leg Injection flow path. **2)** IF either MOV-3-866A OR MOV-3-866B will **NOT** close, THEN close MOV-3-869. **3)** Start two High-Head SI Pumps to reestablish Cold Leg Recirculation Injection. **4)** Verify Cold Leg Injection flow indicated on FI-3-943. **5)** Dispatch an operator to Aux Building roof to manipulate 3-867, Cold Leg SI Boundary Isolation, when directed. **6)** IF MOV-3-869 is open, THEN perform the following: **a.** WHEN operator is in position to close 3-867, THEN: • Stop all running High-Head SI Pumps. • Simultaneously direct operator to unlock and close 3-867 and return to Step 3.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.	**a. (continued)**	**7)** <u>IF</u> MOV-3-869 is closed, <u>THEN</u> perform the following: **a.** <u>WHEN</u> operator is in position to close 3-867, <u>THEN</u>: • Stop <u>all</u> running High-Head SI Pumps • Simultaneously direct operator to unlock and close 3-867 <u>and</u> go to Step 8.
5.	**Start <u>Two</u> High-Head SI Pumps**	Use Unit 4 High-Head Pumps as necessary.
6.	**Go to Step 12**	
7.	**Stop <u>All</u> Running High-Head SI Pumps**	
8.	**Open MOV-3-869, Safety Injection To Hot Leg Isolation**	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9.	**Open Both Loop Hot Leg Safety Injection Valves:** • MOV-3-866A • MOV-3-866B	Perform the following: **a.** IF one valve opened, THEN go to Step 10. **b.** IF both valves will **NOT** open, THEN perform the following: **1)** Start two High-Head SI Pumps to reestablish Cold Leg Recirculation Injection. **2)** Verify flow to Cold Legs indicated on FI-3-943. **3)** Notify TSC that Hot Leg Recirculation can **NOT** be established and Alternate Hot Leg Injection may be required. **4)** IF Alternate Hot Leg Injection is recommended by the TSC staff, THEN observe NOTE prior to Step 16, and go to Step 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10.	**Establish Cold Leg Injection Isolation:** **a.** Perform one of the following: * Close both SI To Cold Leg Isolation valves: • MOV-3-843A • MOV-3-843B OR * Check status of 3-867 – CLOSED	IF MOV-3-843A OR MOV-3-843B will **NOT** close, THEN perform the following: **1)** Close MOV-3-869 to isolate Hot Leg Injection flow path. **2)** Start two High-Head SI Pumps to reestablish Cold Leg Recirculation Injection. **3)** Verify Cold Leg Injection flow indicated on FI-3-943. **4)** Dispatch operator to Auxiliary Building roof to manipulate 3-867, Cold Leg SI Boundary Isolation, when directed. **5)** WHEN the operator is in position to close 3-867, THEN: • Stop all running High-Head SI Pumps • Simultaneously direct operator to unlock and close 3-867 and return to Step 8.
11.	**Start Two High-Head SI Pumps**	Use Unit 4 High-Head Pumps as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12.	**Verify Flow To Hot Legs Indicated On FI-3-940**	Perform the following to re-establish Cold Leg Injection: **a.** IF 3-867 is closed, THEN perform the following: **1)** Dispatch an operator to the Auxiliary Building roof to manipulate 3-867, Cold Leg SI Boundary Isolation, when directed. **2)** Verify operator is in position to open 3-867. **b.** Stop all running High-Head SI Pumps. **c.** IF 3-867 is closed, THEN direct the operator to unlock and open 3-867. **d.** Open SI to Cold Leg Isolation valves MOV-3-843A and MOV-3-843B. **e.** Close MOV-3-869, Safety Injection to Hot Leg Isolation Valve. **f.** Verify 3-867 is open. **g.** Start two High-Head SI Pumps. **h.** Verify flow to Cold Legs indicated on FI-3-943. **i.** Notify TSC that Hot Leg Recirculation can **NOT** be established and Alternate Hot Leg Injection may be required. **j.** IF Alternate Hot Leg Injection is recommended by the TSC staff, THEN observe NOTE prior to Step 16, and go to Step 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

CSF status trees may now be implemented as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13.	**Verify Core Exit T/Cs – STABLE <u>OR</u> DECREASING**	Perform the following: **a.** Evaluate the Cold Leg and Hot Leg Recirculation alignment. **b.** Consult with TSC staff to determine appropriate recovery actions.
14.	**Check High Head SI Pump Requirement:**	
	a. Event initiation time – GREATER THAN OR EQUAL TO 14 HOURS	**a.** Go to Step 15.
	b. Stop all <u>but</u> <u>one</u> High-Head SI Pump	
15.	**Return To Procedure and Step In Effect**	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Alternate Hot Leg Injection does **NOT** provide adequate Hot Leg Injection flow to totally eliminate core boron precipitation and should only be used if normal Hot Leg Injection flowpath can **NOT** be established.

16. Align For Alternate Hot Leg Recirculation:

a. Check both Loop RHR Pump Suction Stop valves – ENERGIZED:

- MOV-3-750
- MOV-3-751

RNO: **a.** Notify TSC that Alternate Hot Leg Recirculation can **NOT** be established.

Return to procedure and step in effect.

b. Verify Cold Leg Injection valves – ALIGNED:

- MOV-3-843A – OPEN
- MOV-3-843B – OPEN

RNO: **b.** Open valves to establish Cold Leg Injection flow path.

c. Verify at least one RHR Suction From RWST Stop valve – CLOSED:

* MOV-3-862A

* MOV-3-862B

d. Isolate RHR Pump Suction from Hot Leg flow path via MOV-3-750 and MOV-3-751:

1) Check operating RHR Pump AND Containment Sump flow path aligned – BOTH IN THE SAME TRAIN

RNO: **1)** Notify TSC that Alternate Hot Leg Recirculation can **NOT** be established.

Return to procedure and step in effect.

2) Perform the following:

- Locally close 3-752A, Inlet Valve To RHR Pump A
- Locally close 3-752B, Inlet Valve To RHR Pump B

STEP **ACTION/EXPECTED RESPONSE** **RESPONSE NOT OBTAINED**

16. (continued)

e. Secure Containment Spray:

1) Place both Unit 3 Containment Spray pumps in PULL-TO-LOCK

2) Close Containment Spray Isolation valves:

- MOV-3-880A
- MOV-3-880B

CAUTION

The time that Injection flow to the core is interrupted shall be minimized during performance of subsequent steps. (Attachment 2 may be used as a reference)

NOTE

Step 16.f through Step 16.k and their RNOs should be reviewed prior to performance to minimize the time flow to the core is interrupted.

f. Place all Unit 3 and Unit 4 High-Head SI Pumps aligned in PULL-TO-LOCK

g. Place both RHR Alternate Discharge Isolation Valves switches in CLOSE position:

- MOV-3-863A
- MOV-3-863B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

16. (continued)

h. Verify RHR Alternate Discharge Isolation valves are closed:

- MOV-3-863A
- MOV-3-863B

h. WHEN MOV-3-863A AND MOV-3-863B are closed, THEN go to Step 16.i.

IF both valves can **NOT** be closed, THEN perform the following:

1) Start two High Head SI Pumps.

2) Verify flow to Cold Legs indicated on FI-3-943.

3) Start one Containment Spray Pump.

4) Open Containment Spray Isolation valve on operating Containment Spray Pump:

* MOV-3-880A
* MOV-3-880B

5) Notify TSC that Alternate Hot Leg Injection can **NOT** be established.

6) Go to Step 16.o.

STEP | **ACTION/EXPECTED RESPONSE** | **RESPONSE NOT OBTAINED**

16. (continued)

i. Establish Alternate Hot Leg flowpath:

1) Open both Loop RHR Pump Suction Stop valves:

- MOV-3-750
- MOV-3-751

Response Not Obtained:

1) IF MOV-3-750 AND MOV-3-751 can **NOT** be opened, THEN perform the following:

a) Open MOV-3-863A and MOV-3-863B.

b) Start two High Head SI Pumps.

c) Verify flow to Cold Legs indicated on FI-3-943.

d) Start one Containment Spray Pump.

e) Open Containment Spray Isolation valve on operating Containment Spray Pump:

* MOV-3-880A
* MOV-3-880B

f) Notify TSC that Alternate Hot Leg Injection can **NOT** be established.

g) Go to Step 16.o.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16.	**(continued)**	
j.	Re-establish High Head Cold Leg Injection Piggy-Back flowpath:	
	1) Open RHR Alternate Discharge Isolation valves: • MOV-3-863A • MOV-3-863B	**1)** IF **neither** valve can be opened, THEN perform the following: **a)** Notify TSC that SI System Piggy-Back Recirculation can **NOT** be re-established. **b)** Open MOV-3-744A and MOV-3-744B. **c)** Go to 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.
k.	Start one Unit 3 High-Head SI Pump	**k.** Start Unit 4 High-Head SI Pump as necessary to establish one pump running.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16.	**(continued)**	
	l. Check if Containment Spray should be restarted:	
	1) Time since event initiation – GREATER THAN OR EQUAL TO 30 DAYS	**1)** Go to Step 16.l.3) to initiate Containment Spray.
	2) Check Containment pressure – GREATER THAN OR EQUAL TO 17 PSIG	**2)** IF Containment Spray is **NOT** required, THEN go to Step 16.m.
	3) Open one Containment Spray Isolation valve for Containment Spray Pump to be started: * MOV-3-880A for 3A Containment Spray Pump * MOV-3-880B for 3B Containment Spray Pump	
	4) Start one Containment Spray Pump with open Discharge Isolation Valve: * 3A Containment Spray Pump for MOV-3-880A * 3B Containment Spray Pump for MOV-3-880B	
	m. Verify flow to Cold Legs on FI-3-943	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

16. (continued)

	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
n.	Locally open 3-741A, RHR Recirculation Isolation Valve, to establish Alternate Hot Leg Injection	**n.** IF 3-741A can **NOT** be opened, THEN perform the following: **1)** Close the following valves: • MOV-3-750 • MOV-3-751 **2)** Verify flow to Cold Legs indicated on FI-3-943. **3)** Notify TSC that Alternate Hot Leg Injection can **NOT** be established.
o.	Verify Core Exit TCs – STABLE OR DECREASING	**o.** Perform the following: **1)** Verify flow indicated on FI-3-943 or FI-3-605. **2)** Evaluate the Cold Leg and Hot Leg Recirculation alignment. **3)** Verify injection to core from RHR Pump or from High-Head SI Pump. **4)** Consult with TSC staff to determine appropriate recovery actions.

NOTE

CSF Status Trees may now be implemented as necessary.

p. Return to procedure and step in effect

End of Section 3.0

4.0 REFERENCES AND COMMITMENTS

4.1 <u>References</u>

4.1.1 Implementing

1. 3-EOP-ES-1.1, SI Termination
2. 3-EOP-ECA-1.1, Loss Of Emergency Coolant Recirculation
3. 3-NOP-018.01, Condensate Storage Tank (CST)
4. 3-NOP-030, Component Cooling Water System

4.1.2 Developmental

1. Technical Specifications for Turkey Point Unit 3 and Unit 4
2. Turkey Point Unit 3 and Unit 4 Final Safety Analysis Report
3. As-built plant drawings
4. 3-BD-EOP-ES-1.4, Transfer to Hot Leg Recirculation
5. Plant Change/Modifications:
    - **a.** PC/M 87-177, Containment Spray Pump Restricting Orifice
    - **b.** PC/M 87-354, RHR Mini Recirculation Lines
    - **c.** PC/M 89-568, Generic Letter 88-17, Loss of Decay Heat Removal Programmed Enhancements - Residual Heat Removal (RHR) Flow
    - **d.** PC/M 95-172, Unit 3 Boron Injection Tank Bypass Modification
    - **e.** PC/M 96-022, Thermal Power Uprate Implementation
    - **f.** PC/M 96-096, Plant Reliability Improvement Package
    - **g.** PC/M 06-030, Containment Recirculation Sump Debris GSI-191 Resolution
    - **h.** PC/M 09-139, EPU EC 247008, LAR Umbrella Mod
    - **i.** PC/M 09-143, EPU EC 247012, Modifications to Normal Hot Leg Recirc Flowpath for EPU - MOV-3-869 Containment Isolation Function Change

4.1.2 Developmental (continued)

6. Miscellaneous Documents (i.e., PC/Ms, Correspondence)

a. Generic Rev 3 Technical Guidelines developed by the Westinghouse Owners Group (WOG). This consists of the following documents:

1) Low pressure version of the WOG Optimal Recovery Guidelines, Status Trees, and Functional Restoration Guidelines

2) Background documents for each low pressure version Optimal Recovery Guidelines, Status Trees, and Functional Restoration Guidelines

3) WOG Emergency Response Guidelines Executive Volume

4) WOG Emergency Response Guidelines Maintenance Program Summary

b. Calculation 512.2, Turkey Point EOP Setpoints - Time (V Series)

c. Calculation 510.2, Turkey Point EOP Setpoints - Containment Parameters (T Series)

d. Calculation 507.2, Turkey Point EOP Setpoints - RCS Subcooling (R Series)

e. Calculation 509.2, Turkey Point EOP Setpoints - Flows (S Series)

f. Calculation 511.2, Turkey Point EOP Setpoints - Tank Levels (U Series)

g. Calculation 501.2, Turkey Point EOP Setpoints - RCS Pressure (B Series)

h. Calculation 504.2, Turkey Point EOP Setpoints - Pressurizer Level (D Series)

i. Calculation 505.3, Turkey Point EOP Setpoints - Steam Generator Level (M, N Series, X.1, X.2)

j. Condition Report 95-135 RHR Flow Requirements

k. PN-PTN-SENP-95-026, CCW Flow Balance and Post-Accident Alignment Requirements to Support Thermal Up-Rate

l. PTN-ENG-SEES-98-0049, Loading Considerations for EDGs and Safety Related Buses Due to Increase Power of Instrument Air Dryer Towers

m. PTN-ENG-BFSI-98-003, AFW Flow Uncertainty Determination

n. CR 02-2318, Response to NRC SBO SSDI Audit

o. CR 2009-15992, Three Post-LOCA ECCS Cold Leg Recirculation Flow Paths May Not Meet Established Performance Requirements

4.1.3 Management Directives

None

4.2 Commitments

1. LER 250/95-006, Analysis Shows CCW Heat Exchanger Incapable of Handling Full Accident CCW Flow

End of Section 4.0

ATTACHMENT 1
Align for Hot Leg Recirc
(Page 1 of 4)

STEP | **ACTION/EXPECTED RESPONSE** | **RESPONSE NOT OBTAINED**

NOTE

Step numbers in this attachment reflect the step numbers in Section 3.0.

Step 2, Stop All Running High-Head SI Pumps

Step 3, Open Both Loop Hot Leg Safety Injection Valves:

- MOV-3-866A
- MOV-3-866B

RESPONSE NOT OBTAINED:

Perform the following:

a. IF one valve opened, THEN go to Step 4.

b. IF both valves will **NOT** open, THEN perform the following:

1) Start two High-Head SI Pumps to reestablish Cold Leg Recirculation Injection.

2) Verify flow to Cold Legs indicated on FI-3-943.

3) Notify TSC that Hot Leg Recirculation can **NOT** be established and Alternate Hot Leg Injection may be required.

4) IF Alternate Hot Leg Injection is recommended by the TSC staff, THEN observe NOTE prior to Section 3.0, Step 16, and go to Step 16.

ATTACHMENT 1
Align for Hot Leg Recirc
(Page 2 of 4)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Step 4, Establish Cold Leg Injection Isolation:

Step 4.a, Perform one of the following:

* Close both SI To Cold Leg Isolation Valves:
  - MOV-3-843A
  - MOV-3-843B

  OR

* Check status of 3-867 – CLOSED

IF either MOV-3-843A OR MOV-3-843B will **NOT** close, THEN perform the following:

1) Close MOV-3-866A and MOV-3-866B to isolate Hot Leg Injection flow path.

2) IF either MOV-3-866A OR MOV-3-866B will **NOT** close, THEN close MOV-3-869.

3) Start two High-Head SI Pumps to reestablish Cold Leg Recirculation Injection.

4) Verify Cold Leg Injection flow indicated on FI-3-943.

5) Dispatch an operator to the Auxiliary Building roof to manipulate 3-867, Cold Leg SI Boundary Isolation, when directed.

6) IF MOV-3-869 is open, THEN perform the following:

a. WHEN the operator is in position to close 3-867, THEN:

- Stop all running High-Head SI Pumps.
- Simultaneously direct operator to unlock and close 3-867 and return to Step 3.

7) IF MOV-3-869 is closed, THEN perform the following:

a. WHEN operator is in position to close 3-867, THEN:

- Stop all running High-Head SI Pumps.
- Simultaneously direct operator to unlock and close 3-867 and go to Step 8.

ATTACHMENT 1
Align for Hot Leg Recirc
(Page 3 of 4)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	Step 5, Start Two High-Head SI Pumps	Use Unit 4 High-Head Pumps as necessary.
	Step 6, Go to Section 3.0, Step 12	
	Step 7, Stop All Running High-Head SI Pumps	
	Step 8, Open MOV-3-869, Safety Injection To Hot Leg Isolation	
	Step 9, Open Both Loop Hot Leg Safety Injection Valves: • MOV-3-866A • MOV-3-866B	Perform the following: **a.** IF one valve opened, THEN go to Step 10. **b.** IF both valves will **NOT** open, THEN perform the following: **1)** Start two High-Head SI Pumps to reestablish Cold Leg Recirculation Injection. **2)** Verify flow to Cold Legs indicated on FI-3-943. **3)** Notify TSC that Hot Leg Recirculation can **NOT** be established and Alternate Hot Leg Injection may be required. **4)** IF Alternate Hot Leg Injection is recommended by the TSC staff, THEN observe NOTE prior to Section 3.0, Step 16, and go to Step 16.

ATTACHMENT 1
Align for Hot Leg Recirc
(Page 4 of 4)

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Step 10, Establish Cold Leg Injection Isolation: Step 10.a, Perform one of the following: * Close both SI To Cold Leg Isolation Valves: • MOV-3-843A • MOV-3-843B OR * Check status of 3-867 – CLOSED	IF MOV-3-843A OR MOV-3-843B will **NOT** close, THEN perform the following: **1)** Close MOV-3-869 to isolate Hot Leg Injection Flow Path. **2)** Start two High-Head SI Pumps to reestablish Cold Leg Recirculation Injection. **3)** Verify Cold Leg Injection flow indicated on FI-3-943. **4)** Dispatch an operator to the Auxiliary Building roof to manipulate 3-867, Cold Leg SI Boundary Isolation, when directed. **5)** WHEN the operator is in position to close 3-867, THEN: • Stop all Running High-Head SI Pumps. • Simultaneously direct operator to unlock and close 3-867 and return to Step 8.
Step 11, Start Two High-Head SI Pumps	Use Unit 4 High-Head Pumps as necessary.

End of Attachment 1

ATTACHMENT 2
Align for Alternate Hot Leg Recirc
(Page 1 of 4)

STEP **ACTION/EXPECTED RESPONSE** **RESPONSE NOT OBTAINED**

NOTE

Step numbers in this attachment reflect step numbers in Section 3.0, Step 16.

Step 16.f, Place all Unit 3 and Unit 4 High-Head SI Pumps aligned in PULL-TO-LOCK

Step 16.g, Place both RHR Alternate Discharge Isolation Valves switches in CLOSE position:

- MOV-3-863A
- MOV-3-863B

ATTACHMENT 2
Align for Alternate Hot Leg Recirc
(Page 2 of 4)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	Step 16.h, Verify RHR Alternate Discharge Isolation valves are closed: • MOV-3-863A • MOV-3-863B	**h.** WHEN MOV-3-863A AND MOV-3-863B are closed, THEN go to Step 16.i. IF both valves can **NOT** be closed, THEN perform the following: **1)** Start two High Head SI Pumps. **2)** Verify flow to Cold Legs indicated on FI-3-943. **3)** Start one Containment Spray Pump. **4)** Open Containment Spray Isolation Valve on operating Containment Spray Pump: * MOV-3-880A * MOV-3-880B **5)** Notify TSC that Alternate Hot Leg Injection can **NOT** be established. **6)** Go to Section 3.0, Step 16.o.

ATTACHMENT 2
Align for Alternate Hot Leg Recirc
(Page 3 of 4)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	Step 16.i, Establish Alternate Hot Leg flowpath:	
	Step 16.i.1), Open both Loop RHR Pump Suction Stop valves: • MOV-3-750 • MOV-3-751	**1)** IF MOV-3-750 AND MOV-3-751 can **NOT** be opened, THEN perform the following: **a.** Open MOV-3-863A and MOV-3-863B. **b.** Start two High Head SI Pumps. **c.** Verify flow to Cold Legs indicated on FI-3-943. **d.** Start one Containment Spray Pump. **e.** Open Containment Spray Isolation valve on operating Containment Spray Pump: * MOV-3-880A * MOV-3-880B **f.** Notify TSC that Alternate Hot Leg Injection can **NOT** be established. **g.** Go to Section 3.0, Step 16.o.

ATTACHMENT 2
Align for Alternate Hot Leg Recirc
(Page 4 of 4)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	Step 16.j, Re-establish High Head Cold Leg Injection Piggy-Back flowpath:	
	Step 16.j.1), Open RHR Alternate Discharge Isolation valves: • MOV-3-863A • MOV-3-863B	**1)** IF **neither** valve can be opened, THEN perform the following: **a.** Notify TSC that SI System Piggy-Back Recirculation can **NOT** be re-established. **b.** Open MOV-3-744A and MOV-3-744B. **c.** Go to 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, step 1.
	Step 16.k, Start one Unit 3 High-Head SI Pump	**k.** Start Unit 4 High-Head SI Pump as necessary to establish one pump running.

End of Attachment 2

FOLDOUT PAGE
For Procedure 3-EOP-ES-1.4

1. ADVERSE CONTAINMENT CONDITIONS

a. IF either condition listed below occurs, THEN use [Adverse Containment Setpoints]:

* Containment atmosphere temperature ≥ 180°F

OR

* Containment radiation levels ≥ $1.3x10^5$ R/hr

b. WHEN Containment atmosphere temperature returns to less than 180°F, THEN Normal Setpoints can again be used.

c. WHEN Containment radiation levels return to less than $1.3x10^5$ R/hr, THEN Normal Setpoints can again be used if the TSC determines that Containment Integrated Dose has **NOT** exceeded 10^5 Rads.

2. SI TERMINATION CRITERIA

IF all conditions listed below occur, THEN go to 3-EOP-ES-1.1, SI TERMINATION, Step 1:

a. RCS subcooling based on Core Exit TCs – GREATER THAN 19°F[GREATER THAN ADVERSE VALUE IN TABLE BELOW]

SI TERMINATION ADVERSE SUBCOOLING VALUE	
RCS PRESSURE (PSIG)	**ADVERSE SUBCOOLING VALUE**
< 2485 AND ≥ 2000	> 35 °F
< 2000 AND ≥ 1500	> 45 °F
< 1500 AND ≥ 1000	> 55 °F
< 1000 AND ≥ 500	> 110 °F
< 500	> 160 °F

b. Total feed flow to intact S/Gs – GREATER THAN 400 GPM OR
Narrow Range Level in at least one intact S/G – GREATER THAN 7%[27%]

c. RCS pressure – GREATER THAN 1625 PSIG[1950 psig] AND STABLE OR INCREASING

d. PRZ level – GREATER THAN 7%[48%]

3. LOSS OF EMERGENCY COOLANT RECIRCULATION

IF emergency coolant recirculation is established AND subsequently is lost, THEN go to 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.

4. CST MAKEUP WATER CRITERIA

IF CST level decreases to less than 12%, THEN add makeup to CST using 3-NOP-018.01, CONDENSATE STORAGE TANK (CST).

5. LOSS OF OFFSITE POWER OR SI ON OTHER UNIT

IF SI has been reset AND subsequently, either offsite power is lost OR SI actuates on the other unit, THEN restore safeguards equipment and at least one Computer Room Chiller, to required configuration.

L-17-1 NRC Exam

JPM C

JPM TITLE: Terminate SI

JPM NUMBER: 01200035500 **REV.** 1-1

TASK NUMBER(S) / TASK TITLE(S): 01200035500 Terminate SI

K/A NUMBERS: W E02 EA1.1 **K/A VALUE:** RO 4.0 SRO 3.9

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [X]

EVALUATION LOCATION: In-Plant: [ ] Control Room: [ ]
Simulator: [X] Other: [ ]
Lab: [ ]

Time for Completion: 10 Minutes Time Critical: No

Alternate Path [NRC]: No
Alternate Path [INPO]: No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/01/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/02/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☒	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

<u>Protected Content:</u> (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

N/A

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
1-0	Formatting; Modifications	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
1-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17

SIMULATOR SET-UP:

SIMULATOR SETUP INSTRUCTIONS:

______	1.	Reset to **IC 1** or saved IC.
______	2.	Place simulator in RUN.
______	3.	Ensure applicable portions of Simulator Operator Checklist are complete.
______	4.	N/A if using saved IC Ensure 3B charging pump running. (Pump will be tripped off when SI is triggered.)
______	5.	N/A if using saved IC Open and execute NRC JPM C.lsn • Trigger **TRAIN B SPURIOUS SI**
______	6.	Allow plant to stabilize.
______	7.	Acknowledge alarms and place simulator in FREEZE.
______	8.	Save as temporary IC, if JPM will be repeated.
______	9.	When ready to begin, then place simulator in RUN.

SIMULATOR MALFUNCTIONS:

- TFL3SSA2, L3-SIA2 SPURIOUS ACTUATION

SIMULATOR OVERRIDES:

- N/A

SIMULATOR REMOTE FUNCTIONS:

- N/A

Required Materials:	• HANDOUT 3-EOP-ES-1.1
General References:	• 3-EOP-ES-1.1, SI Termination
Task Standards:	• Reset SI and Phase A • Start charging pump • Secure RHR and • HHSI Pumps

HAND JPM BRIEFING SHEET TO EXAMINEE AT THIS TIME

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- UNIT 3 has experienced a spurious Train B Safety Injection
- UNIT 4 is in MODE 1, 100% power
- The BOP has just started performing Attachment 3 of 3-EOP-E-0
- The crew has transitioned from 3-EOP-E-0, Reactor Trip or Safety Injection, to 3-EOP-ES-1.1, SI Termination.

INITIATING CUES:

You have been directed to terminate Safety Injection in accordance with 3-EOP-ES-1.1.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically, cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Yes" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required materials.**
Standard:	Obtain a copy of 3-EOP-ES-1.1.
Evaluator Cue:	Provide copy of HANDOUT 3-EOP-ES-1.1.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Performance Step: **Critical _N_ (SEQ-2)**	**3-EOP-ES-1.1 Foldout Page**
Standard:	Reviews Foldout Page, Cautions, & Notes.
Evaluator Cue:	If asked, Unit 4 does NOT have a loss of offsite power or Safety Injection.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Performance Step: **Critical _Y_(SEQ-3)**	**3-EOP-ES-1.1** 1. Verify SI – RESET
Standard:	Resets SI by pushing both pushbuttons.
Evaluator Note:	Only resetting B Train SI is critical.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_(SEQ-4)**	**3-EOP-ES-1.1** 2. Reset Containment Isolation Phase A And Phase B
Standard:	Resets Phase A lockouts and verifies Phase B reset.
Evaluator Note:	Only resetting of Phase A is critical.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_(SEQ-5)**	**3-EOP-ES-1.1** 3. Verify Instrument Air To Containment a. CV-3-2803, Instrument Air Containment Isolation – OPEN b. Instrument Air Pressure, PI-3-1444 – GREATER THAN 95 PSIG
Standard:	Verify CV-3-2803 is OPEN and IA pressure is > 95 psig.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_(SEQ-6)**	**3-EOP-ES-1.1** 4. Check If Charging Flow Has Been Established a. Charging Pumps – AT LEAST ONE RUNNING RNO 3) Start at least one Charging Pump.
Standard:	Start one charging pump.
Evaluator Note:	No charging pumps will be running. Any charging pump may be started.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_(SEQ-7)**	**3-EOP-ES-1.1** 4. Check If Charging Flow Has Been Established b. Establish desired Charging flow:
Standard:	Establish charging flow and seal injection flow.
Evaluator Note:	Normal band for seal injection is 5-13 gpm.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-8)**	**3-EOP-ES-1.1** 5. Stop The Following Pumps And Place In Standby • RHR Pumps • High-Head SI Pumps
Standard:	Secures 3B RHR Pump. Secures 3B, 4A, 4B HHSI Pumps.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	

Terminating Cue: **When all HHSI and RHR Pumps have been secured, state "This completes the JPM."**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: __________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- UNIT 3 has experienced a spurious Train B Safety Injection
- UNIT 4 is in MODE 1, 100% power
- The BOP has just started performing Attachment 3 of 3-EOP-E-0
- The crew has transitioned from 3-EOP-E-0, Reactor Trip or Safety Injection, to 3-EOP-ES-1.1, SI Termination.

INITIATING CUES:

You have been directed to terminate Safety Injection in accordance with 3-EOP-ES-1.1.

NOTE: Ensure the turnover sheet is returned to the evaluator when the JPM is complete.

CAUTION

EMERGENCY

OPERATING

PROCEDURES

This EOP contains foldout pages.

Do not use copies of this procedure produced from this application in the performance of plant operations.

The last page of this document is a copy of the foldout page.

FPL	**TURKEY POINT UNIT 3** **EMERGENCY OPERATING PROCEDURE** SAFETY RELATED **CONTINUOUS USE**	Procedure No. **3-EOP-ES-1.1** Revision No. **10A**

Title:

SI TERMINATION

Responsible Department: OPERATIONS

Special Considerations:

Last page of this procedure contains fold out page

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED TODAY INITIAL &

Revision	Approved By	Approval Date
8	Tom Wall	08/01/14
10A	Rich Tucker	07/06/16

UNIT #	UNIT 3
DATE	
DOCT	PROCEDURE
DOCN	3-EOP-ES-1.1
SYS	
STATUS	COMPLETED
REV	10A
# OF PGS	

REVISION SUMMARY	
Rev. No.	**Description**
10A	**PCR 2136518, 07/06/16, Rich Tucker** Editorial to revise step numbering on Page 4 in Symptoms and Entry Conditions due to revision to 3/4-EOP-FR-H.1.
10	**PCR 2089881, 02/15/16, GT Slaby** Revise Shutdown Margin per PCB-3-S3F07, where calculation PTN-3FJF-15-159 in **EC 282912**, Turkey Point Unit 3 Cycle 28 Reload Design, has shown that available shutdown margin is sufficient to cover a 10°F cooldown below 547°F following a reactor trip for cycle burnup ≤ 18,590 MWD/MTU. Previous cycle was at 18,000 MWD/MTU.
9	**PCR 1983220, 10/22/15, Terry White** Revise to address RCP Seal Replacement per **EC 280399** Specific changes include: ● #1 Seal ΔP replaced by RCS pressure ● #1 Seal Leak-Off flow replaced with Control Bleed Off (CBO) ● Revised RCP Start and Trip criteria based on manufacturer recommendations

TABLE OF CONTENTS

1.0 PURPOSE

This procedure provides the necessary instructions to terminate Safety Injection and stabilize plant conditions.

2.0 SYMPTOMS AND ENTRY CONDITIONS

This procedure is entered from:

1) E-0, Reactor Trip or Safety Injection, Step 16, and
E-1, Loss of Reactor or Secondary Coolant, Step 11, and
E-1, Loss of Reactor or Secondary Coolant, foldout item 3, and
ES-1.2, Post LOCA Cooldown and Depressurization, foldout item 2, and
ES-1.4, Transfer to Hot Leg Recirculation, foldout item 2,
<u>when</u> specified termination criteria are satisfied.

2) FR-H.1, Response to Loss of Secondary Heat Sink, Step 34,
<u>after</u> Secondary Heat Sink has been reestablished <u>AND</u> SI has been terminated.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.0	**OPERATOR ACTIONS**	

> **NOTE**
>
> Foldout Page is required to be monitored throughout this procedure.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	**Verify SI – RESET**	
2.	**Reset Containment Isolation Phase A And Phase B**	
3.	**Verify Instrument Air To Containment**	
	a. CV-3-2803, Instrument Air Containment Isolation – OPEN	
	b. Instrument Air Pressure, PI-3-1444 – GREATER THAN 95 PSIG	**b.** Restore Instrument Air pressure using 0-ONOP-013, LOSS OF INSTRUMENT AIR, <u>while</u> continuing with this procedure.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

4. Check If Charging Flow Has Been Established

a. Charging Pumps – AT LEAST ONE RUNNING

RESPONSE NOT OBTAINED:

a. Perform the following:

1) IF CCW flow to RCP(s) Thermal Barrier is lost, THEN locally isolate Seal Injection to affected RCP(s) before starting Charging Pumps.

* 3-297A for RCP A
* 3-297B for RCP B
* 3-297C for RCP C

2) IF offsite power is **NOT** available, THEN check diesel capacity adequate to run Charging Pumps.

IF adequate diesel capacity is **NOT** available, THEN shed non-essential loads. Refer to Attachment 3 for component KW load rating.

3) Start at least one Charging Pump.

4) IF Charging flow can **NOT** be established, THEN go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.

b. Establish desired Charging flow:

1) Start or stop Charging Pumps as necessary to establish desired Charging flow

2) Adjust Charging Pump speed controllers to establish desired Charging flow

3) Adjust HCV-3-121, Charging Flow To Regen Heat Exchanger, to maintain proper Seal Injection flow

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	**Stop The Following Pumps And Place In Standby** • RHR Pumps • High-Head SI Pumps	
6.	**Verify SI Flow NOT Required**	
	a. RCS subcooling based on Core Exit TCs – GREATER THAN 19°F[GREATER THAN ADVERSE VALUE IN Foldout Page ITEM #2 TABLE]	**a.** Manually start SI Pumps to restore subcooling and go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. PRZ level – GREATER THAN 7%[48%]	**b.** Control Charging flow to maintain PRZ level. IF PRZ level can **NOT** be maintained, THEN manually start SI Pumps to restore PRZ level and go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
➔ **7.**	**Check If Containment Spray Should Be Stopped**	
	a. Containment Spray Pumps – ANY RUNNING	**a.** Go to Step 8.
	b. Containment Spray – IN CONTINUOUS OPERATION FOR GREATER THAN OR EQUAL TO 30 DAYS	**b.** Perform the following: **1)** Check for indications of a LOCA: • Abnormal Containment radiation • Abnormal Containment pressure • Abnormal Containment Sump level **2)** IF a LOCA is indicated, THEN go to Step 8. **3)** IF a LOCA is **NOT** indicated, THEN perform Step 7.c.
	c. Containment pressure – LESS THAN 17 PSIG	**c.** WHEN Containment pressure is less than 17 psig, THEN perform Step 7.d, Step 7.e and Step 7.f. Continue with Step 8.
	d. Reset Containment Spray signal	
	e. Stop both Containment Spray Pumps and place in standby	
	f. Close Containment Spray Isolation valves: • MOV-3-880A • MOV-3-880B	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8.	**Verify All Control Rods – FULLY INSERTED**	IF any Control Rods **NOT** fully inserted, THEN Emergency Borate for stuck Control Rods using 3-ONOP-046.1, EMERGENCY BORATION.
9.	**Check If Letdown Can Be Established**	
	a. PRZ level – GREATER THAN 26%[50%]	**a.** WHEN PRZ level increases to greater than 26%[50%], THEN go to Step 9.b. Continue with Step 10.
	b. Establish Normal Letdown using Attachment 4	**b.** Establish Excess Letdown using Attachment 5. **1)** Continue efforts to establish Normal Letdown. WHEN Normal Letdown established, THEN stop Excess Letdown. Continue with Step 10.
10.	**Check VCT Makeup Control System**	
	a. Makeup – SET FOR GREATER THAN RCS BORON CONCENTRATION	**a.** Set RCS Makeup boron for greater than RCS concentration.
	b. Makeup – SET FOR AUTOMATIC CONTROL	**b.** Set Makeup for automatic control.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11.	**Check Charging Pump Suction – ALIGNED TO VCT**	Align suction to VCT as follows: **a.** Realign Makeup to VCT: **1)** Open FCV-3-114B. **2)** Close FCV-3-113B. **b.** WHEN VCT level is greater than 11%, THEN perform the following: **1)** Verify auto transfer of Charging Pump suction to VCT. **2)** Realign Makeup to Charging Pump suction: • Open FCV-3-113B. • Close FCV-3-114B.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12.	**Using Desired Method, Establish S/G Pressure Control**	
	* Set S/G Steam Dump to Atmosphere Valve controllers to maintain current S/G pressure. (1005 psig maximum)	
	* Set Steam Dump to Condenser to maintain current S/G pressure (1005 psig maximum)	
	1) Check Condenser – AVAILABLE	**1)** Use Steam Dump to Atmosphere valves
	2) IF BLOCK LOW SI TAVE S.I. status light is ON, THEN place Steam Dump to Condenser control switch in BYPASS.	
	3) Place Steam Dump to Condenser Mode selector switch in MANUAL.	
	4) Place Steam Dump to Condenser Pressure control in MANUAL.	
	* Adjust Steam Pressure controller as necessary to maintain current S/G pressure.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13.	**Check RCS Temperatures**	
	a. RCS Hot Leg temperature – STABLE	**a.** Perform the following: **1)** IF temperature is decreasing, THEN perform the following: **a)** Stop dumping steam. **b)** IF cooldown continues, THEN reduce total feed flow to 400 gpm until Narrow Range Level greater than 7%[27%] in at least one S/G. **c)** IF cooldown continues due to excessive steam flow, THEN close Main Steam Line Isolation and Bypass valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

13. a. (continued)

2) IF temperature is increasing, THEN perform either of the following:

* Dump steam using S/G Steam Dump to Atmosphere valves.

OR

* Dump steam to Condenser from intact S/Gs as follows:

(1) Check Condenser is available.

(2) IF Condenser **NOT** available, THEN use Steam Dump To Atmosphere valves.

(3) IF BLOCK LOW S.I. TAVE S.I. Status light is ON, THEN place Steam Dump To Condenser control switch in BYPASS.

(4) Place Steam Dump To Condenser Mode selector switch in MANUAL.

(5) Place Steam Dump To Condenser Pressure control in MANUAL.

(6) Adjust Steam Pressure Controller as necessary to stabilize temperature.

b. Check RCPs – ANY RUNNING

b. Go to Step 13.e.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13.	**(continued)**	
	c. Check if boration for RCS cooldown required: **1)** IF High-Head SI Pumps have **NOT** injected, AND any RCS T_{AVE} less than 537°F, THEN initiate and continue a boration of at least 20 gpm using Attachment 10 until Shutdown Margin can be verified using PLANT CURVE BOOK.	**c.** Go to Step 14.
	d. Go to Step 14	
	e. Check if boration for RCS cooldown required: **1)** IF High-Head SI Pumps have **NOT** injected, AND any RCS T_{COLD} less than 537°F, THEN initiate and continue a boration of at least 20 gpm using Attachment 10 until Shutdown Margin can be verified using PLANT CURVE BOOK	**e.** Go to Step 14.
14.	**Control PRZ Pressure**	
	a. Using Attachment 6, verify PRZ Backup Group Heater lockouts – RESET	
	b. Maintain pressure stable using heaters and normal spray as necessary	**b.** IF Normal Spray **NOT** available AND Letdown is in service, THEN establish Auxiliary Spray using Attachment 9. IF Letdown **NOT** in service, THEN use one PRZ PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
➔ 15.	**Check Intact S/G Levels**	
	a. Any Narrow Range Level – GREATER THAN 7%[27%]	**a.** Maintain total feed flow greater than 400 gpm until Narrow Range Level greater than 7%[27%] in at least one S/G.
	b. Control feed flow to maintain Narrow Range Level between 21%[27%] and 50%	
	c. Narrow Range Level – LESS THAN 50%	**c.** Stop feed flow to any S/G with Narrow Range Level greater than 50%.
16.	**Check RCP Cooling – NORMAL**	
	a. B CCW Header flow – NORMAL	**a.** Evaluate and correct cause of abnormal flow.
	b. MOV-3-716B, RCP CCW Inlet – OPEN	**b.** Manually or locally open valve.
	c. Check motor cooling – NORMAL:	
	1) MOV-3-730, RCP Bearing CCW Outlet – OPEN	**1)** Manually or locally open valve.
	2) Check RCPs – ANY RUNNING	**2)** Go to Step 16.d.
	3) Check RCP stator temperatures – LESS THAN 248°F	**3)** IF CCW to any RCP motor has been lost OR stator temperature is greater than or equal to 300°F, THEN stop affected RCP(s).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16. (continued)		
	d. Check Seal cooling – NORMAL: • Thermal Barrier D/P – GREATER THAN 0 INCHES OF WATER • MOV-3-626, RCP Thermal Barrier CCW Outlet – OPEN	**d.** Perform the following: **1)** IF RCP CBO temperature is less than 260°F, THEN establish normal cooling to RCPs: • Adjust Charging Pump speed and HCV-3-121, Charging Flow to Regen Heat Exchanger, as necessary to maintain proper Seal Injection flow. • IF Containment Isolation Phase B is **NOT** actuated AND CCW radiation levels are normal, THEN align valves as necessary to establish normal CCW flow to RCPs. **2)** IF RCP CBO temperature is greater than or equal to 260°F, THEN perform the following: **a)** Stop affected RCP(s). **b)** Locally close affected RCP Seal Injection Manual Isolation valves while continuing with this procedure: * 3-297A for 3A RCP * 3-297B for 3B RCP * 3-297C for 3C RCP **c)** Manually or locally close MOV-3-626, RCP Thermal Barrier CCW Outlet. **d)** Go to Step 18.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17.	**Check If RCP Seal Return Flow Should Be Established**	
	a. Verify adequate seal cooling: * CCW – ALIGNED TO THERMAL BARRIERS OR * RCP Thermal Barrier D/P – GREATER THAN 0 INCHES OF WATER	**a.** Try to establish adequate seal cooling. IF adequate seal cooling can **NOT** be established, THEN go to Step 18.
	b. Establish Seal Return flow: **1)** Open MOV-3-381, Excess Letdown And RCP Seal Return To VCT **2)** Open MOV-3-6386, Excess Letdown And RCP Seal Return	**b.** IF MOV-3-381 can **NOT** be manually opened, THEN locally open MOV-3-381. IF seal return flow can **NOT** be established, THEN go to Step 18.
	c. Check Excess Letdown – IN SERVICE	**c.** Go to Step 18.
	d. Place CV-3-389, Excess Letdown From Heat Exchanger To VCT Or RCDT, in VCT NORM position	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
➔ 18.	**Verify All 4KV Buses – ENERGIZED BY OFFSITE POWER** • A 4KV bus • B 4KV bus • D 4KV bus • C 4KV bus	Perform the following: **a.** Direct system dispatcher to restore offsite power to Unit 3 Startup Transformer and 3C Transformer. **b.** WHEN offsite power has been restored to Unit 3 Startup Transformer OR 3C Transformer, THEN restore offsite power to 4KV buses using 3-ONOP-004.1, SYSTEM RESTORATION FOLLOWING LOSS OF OFFSITE POWER. **c.** IF 3D 4KV Bus is de-energized, THEN restore power to 3D 4KV Bus using 3-ONOP-004.5, LOSS OF 3D 4KV BUS, as time permits.

STEP **ACTION/EXPECTED RESPONSE** **RESPONSE NOT OBTAINED**

CAUTION

- If RCP seal cooling from Seal Injection and Thermal Barrier CCW flow has previously been lost, affected RCPs SHALL **NOT** be started prior to a status evaluation.
- CCW System load requirements of 3-NOP-030, COMPONENT COOLING WATER SYSTEM, shall **NOT** be exceeded.

NOTE

RCPs should be run in order of priority (3B then 3C) to provide Normal PRZ Spray.

➔ **19. Check 3B RCP – RUNNING**

Perform one of the following:

* IF **NO** RCPs are running, THEN go to Step 19.b.

* IF any RCPs are running, THEN go to Step 19.u.

a. Go to Step 20

b. Check Startup Transformer – ENERGIZED

b. Perform the following:

1) Verify Natural Circulation using Attachment 1.

2) IF Natural Circulation can **NOT** be verified, THEN dump more steam.

3) Go to Step 20.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19.	**(continued)**	
	c. Check RVLMS (QSPDS) Head indication – GREATER THAN OR EQUAL TO 100%	**c.** Perform the following: • Raise PRZ level greater than 84%[90%]. • Raise RCS subcooling based on Core Exit TCs greater than 43°F[97°F]. • Use PRZ Heaters as necessary to saturate Pressurizer water. IF PRZ level and subcooling conditions can **NOT** be satisfied, THEN Perform the following: **1)** Verify Natural Circulation using Attachment 1. **2)** IF Natural Circulation can **NOT** be verified, THEN dump more steam. **3)** Go to Step 20.
	d. Establish RCP Support Conditions using Attachment 7	
	e. Check Auxiliary Spray – **NOT** IN SERVICE	**e.** Perform the following: **1)** Terminate Auxiliary Spray using Attachment 9. **2)** Close PCV-3-455B, Pressurizer Spray Loop B. **3)** Close PCV-3-455A, Pressurizer Spray Loop C.
	f. Check 3B RCP – SUPPORT CONDITIONS ESTABLISHED	**f.** Go to Step 19.k.
	g. Start 3B RCP to provide PRZ Spray	**g.** Go to Step 19.k.
	h. Check 3B RCP – RUNNING FOR AT LEAST ONE MINUTE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19.	**(continued)**	
i.	Stop any running RCP Oil Lift Pump(s)	
j.	Go to Step 20	
k.	Check 3C RCP – SUPPORT CONDITIONS ESTABLISHED	**k.** Go to Step 19.p.
l.	Start 3C RCP to provide PRZ Spray	**l.** Go to Step 19.p.
m.	Check 3C RCP – RUNNING FOR AT LEAST ONE MINUTE	
n.	Stop any running RCP Oil Lift Pump(s)	
o.	Go to Step 20	
p.	Check 3A RCP – SUPPORT CONDITIONS ESTABLISHED	**p.** Perform the following: **1)** Verify Natural Circulation using Attachment 1. **2)** IF Natural Circulation can **NOT** be verified, THEN dump more steam. **3)** Go to Step 19.s.
q.	Start 3A RCP to provide forced flow	**q.** Perform the following: **1)** Verify Natural Circulation using Attachment 1. **2)** IF Natural Circulation can **NOT** be verified, THEN dump more steam **3)** Go to Step 19.s.
r.	Check 3A RCP – RUNNING FOR AT LEAST ONE MINUTE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19.	**(continued)**	
s.	Stop any running RCP Oil Lift Pump(s)	
t.	Go to Step 20	
u.	Check 3B 4KV Bus – ENERGIZED FROM STARTUP TRANSFORMER	**u.** Go to Step 20.
v.	Check Auxiliary Spray – **NOT** IN SERVICE	**v.** Perform the following: **1)** Terminate Auxiliary Spray using Attachment 9. **2)** Close PCV-3-455B, Pressurizer Spray Loop B. **3)** Close PCV-3-455A, Pressurizer Spray Loop C.
w.	Start 3B RCP Oil Lift Pump	**w.** Go to Step 19.dd.
x.	Check 3B RCP Oil Lift Pump – RUNNING FOR AT LEAST TWO MINUTES	
y.	Check 3B RCP white PERMISS TO START light – ON	**y.** Perform the following: **1)** Stop 3B RCP Oil Lift Pump. **2)** Go to Step 19.dd.
z.	Start 3B RCP to provide PRZ Spray	**z.** Perform the following: **1)** Stop 3B RCP Oil Lift Pump. **2)** Go to Step 19.dd.
aa.	Check 3B RCP – RUNNING FOR AT LEAST ONE MINUTE	
bb.	Stop 3B RCP Oil Lift Pump	
cc.	Go to Step 20	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19.	**(continued)**	
	dd. Check 3C RCP – **NOT** RUNNING	**dd.** Go to Step 20.
	ee. Start 3C RCP Oil Lift Pump	**ee.** Go to Step 20.
	ff. Check 3C RCP Oil Lift Pump – RUNNING FOR AT LEAST TWO MINUTES	
	gg. Check 3C RCP white PERMISS TO START light – ON	**gg.** Perform the following: **1)** Stop 3C RCP Oil Lift Pump. **2)** Go to Step 20.
	hh. Start 3C RCP to provide PRZ Spray	**hh.** Perform the following: **1)** Stop 3C RCP Oil Lift Pump. **2)** Go to Step 20.
	ii. Check 3C RCP – RUNNING FOR AT LEAST ONE MINUTE	
	jj. Stop 3C RCP Oil Lift Pump	
20.	**Check If Source Range Detectors Should Be Energized**	
	a. Intermediate Range flux – LESS THAN $1X10^{-10}$ AMPS	**a.** WHEN flux less than $1x10^{-10}$ amps, THEN perform Step 20.b and Step 21.c. Continue with Step 21.
	b. Source Range Detectors – ENERGIZED	**b.** Manually energize Source Range Detectors.
	c. Transfer Nuclear Recorder to SOURCE RANGE scale	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21.	**Check If Diesel Generators Should Be Stopped**	
	a. A <u>AND</u> B 4KV Buses – ENERGIZED BY OFFSITE POWER	**a.** Perform the following: **1)** Direct System Dispatcher to restore offsite power to Unit 3 Startup Transformer and 3C Transformer. **2)** <u>WHEN</u> offsite power is restored to Unit 3 Startup Transformer <u>OR</u> 3C Transformer, <u>THEN</u> restore offsite power to 4KV buses using 3-ONOP-004.1, SYSTEM RESTORATION FOLLOWING LOSS OF OFFSITE POWER.
	b. Stop <u>any</u> unloaded diesel generator by placing its Normal Stop/Normal Start switch in NORMAL STOP * 3A EDG * 3B EDG * 4A EDG * 4B EDG	
	c. Direct personnel to place in standby any stopped EDG(s) using 3/4-OP-023, EMERGENCY DIESEL GENERATOR	
22.	**Shut Down Unnecessary Plant Equipment** • Verify <u>all</u> Heater Drain Pumps – STOPPED • Stop all <u>but</u> <u>one</u> Condensate Pump • Perform Attachment 8, as time permits <u>while</u> continuing with this procedure	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23.	**Maintain Plant Conditions – STABLE**	
a.	Maintain PRZ pressure – STABLE	
b.	Maintain PRZ level – STABLE	
c.	Maintain intact S/G Narrow Range Levels – STABLE	
d.	Maintain RCS average temperature – STABLE	
e.	Direct Nuclear Chemistry to perform required sampling	
f.	Check Boration in progress from Step 13 for Shutdown Margin considerations	**f.** Go to Step 23.i.
g.	Check RCPs – ANY RUNNING	**g.** Check PLANT CURVE BOOK Shutdown Margin acceptable for current Cold Leg temperature and boron concentration. WHEN Shutdown Margin requirements are verified acceptable, THEN perform Step 23.i. Continue with Step 24.
h.	Check PLANT CURVE BOOK Shutdown Margin acceptable for current T_{AVE} and boron concentration	**h.** WHEN Shutdown Margin requirements have been verified acceptable, THEN perform Step 23.i. Continue with Step 24.
i.	Verify reactor is to be maintained at Hot Standby	**i.** IF boration in progress, THEN stop boration as directed by the Unit Supervisor Go to Step 24.
j.	Borate to Hot Xenon Free Conditions as required by PLANT CURVE BOOK	
k.	Stop boration as directed by the Unit Supervisor	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24.	**Verify SI Flow NOT Required**	
	a. RCS Subcooling based on Core Exit TCs – GREATER THAN 19°F[GREATER THAN ADVERSE VALUE IN Foldout Page ITEM #2 TABLE]	**a.** Manually start SI Pumps as necessary, and go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. PRZ level – GREATER THAN 7%[48%]	**b.** Control Charging flow to maintain PRZ level. IF PRZ level can **NOT** be maintained, THEN manually start SI Pumps as necessary, and go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
25.	**Align Components Listed In Attachment 2 to Desired Position/Condition**	
26.	**Go To Appropriate Plant Procedure As Determined By The Shift Manager**	

End of Section 3.0

4.0 REFERENCES AND COMMITMENTS

4.1 References

4.1.1 Implementing

1. 0-ONOP-013, Loss Of Instrument Air
2. 3-EOP-E-1, Loss Of Reactor Or Secondary Coolant
3. 3-ONOP-046.1, Emergency Boration
4. Plant Curve Book
5. 3-ONOP-004.1, System Restoration Following Loss Of Offsite Power
6. 3-ONOP-004.5, Loss Of 3D 4KV Bus
7. 3-OP-023, Emergency Diesel Generator
8. 4-OP-023, Emergency Diesel Generator
9. 3-NOP-030, Component Cooling Water System
10. 3-NOP-071, Steam Generator Blowdown Recovery System
11. 3-NOP-041.01A, 3A Reactor Coolant Pump Operations
12. 3-NOP-041.01B, 3B Reactor Coolant Pump Operations
13. 3-NOP-041.01C, 3C Reactor Coolant Pump Operations
14. 3-NOP-087.3, Turbine Turning Gear Operation
15. 3-NOP-033, Spent Fuel Pit Cooling System
16. 3-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction
17. 3-ONOP-008, Turbine Plant Cooling Water Malfunction
18. 0-NOP-074.01, Standby Steam Generator Feedwater System
19. 3-NOP-074, Steam Generator Feedwater Pump
20. 3-NOP-075, Auxiliary Feedwater System
21. 3-NOP-094, Containment Post Accident Monitoring System
22. 0-NOP-025, Control Room Ventilation System

4.1.1 Implementing (continued)

23. 3-NOP-072.1, Moisture Separator Reheaters

24. 3-OSP-089, Main Turbine Valve Operability Test

25. 3-NOP-018.01, Condensate Storage Tank (CST)

4.1.2 Developmental

1. Technical Specifications for Turkey Point Unit 3 and Unit 4

2. Turkey Point Unit 3 and Unit 4 Final Safety Analysis Report

3. As built Plant Drawings

4. BD-EOP-ES-1.1, SI Termination

5. Plant Change/Modifications/Engineering Change

- **a.** PC/M 87-025, Replacement of Normal Containment Coolers
- **b.** PC/M 87-194, Containment Spray Pump Restricting Orifice
- **c.** PC/M 87-264, EDG 3B/4B EDG 3A/4A and New EDG Building Tie-Ins
- **d.** PC/M 88-345, Turbine Plant Cooling Water Isolation Valve Modification
- **e.** PC/M 89-168, Anticipated Transients Without Scram (ATWS) Modifications
- **f.** PC/M 90-440, Boric Acid Concentration Reduction
- **g.** PC/M 95-028, Replacement of Continuous Monitoring Equipment (SANGAMO Recorder)
- **h.** PC/M 95-126, Deletion of Indoor Electrical Raceway Fire Proofing Requirements
- **i.** PC/M 96-012, Unit 3 Boron Injection Tank Bypass Modification
- **j.** PC/M 96-022, Thermal Power Uprate Implementation
- **k.** PC/M 01-012, AFW Bus Stripping Reset
- **l.** PC/M 09-139, EPU EC 247008, LAR Umbrella Mod
- **m.** PC/M 08-181, EPU EC 246930, Unit 3 Emergency Containment Filters Removal/Abandonment
- **n.** EPU EC 250018, Replacement of CRDM Fan Motors and Cooling Coils

4.1.2 Developmental (continued)

5. **(continued)**

   o. EC 280399, Unit 3 RCP Seals Upgrade Project

   p. EC 282912, Turkey Point Unit 3 Cycle 28 Reload Design

6. Miscellaneous Documents:

   a. Generic Technical Guidelines Developed by the Westinghouse Owners Group (WOG), Rev 3. This Consists of the Following Documents:

      1) Low Pressure Version of the WOG Optimal Recovery Guidelines, Status Trees, and Functional Restoration Guidelines

      2) Background Documents for Each Low Pressure Version Optimal Recovery Guidelines, Status Trees, and Functional Restoration Guidelines

      3) WOG Emergency Response Guidelines Executive Volume

      4) WOG Emergency Response Guidelines Maintenance Program Summary

   b. PTN-BOSI-09-028 (Volian Calculation 514.2), Turkey Point EOP Setpoints - Miscellaneous (J, K, L, P, Q, X, Y Series)

   c. PTN-BOSI-09-021 (Volian Calculation 507.2), Turkey Point EOP Setpoints - RCS Subcooling (R Series)

   d. PTN-BOSI-09-018 (Volian Calculation 504.2), Turkey Point EOP Setpoints - Pressurizer Level (D Series)

   e. PTN-BOSI-09-025 (Volian Calculation 511.2), Turkey Point EOP Setpoints - Tank Levels (U Series)

   f. PTN-BOSI-09-019 (Volian Calculation 505.3), Turkey Point EOP Setpoints - Steam Generator Level (M, N Series, X.1, X.2)

   g. PTN-BOSI-09-023 (Volian Calculation 509.2), Turkey Point EOP Setpoints - Flows (S Series)

   h. PTN-BOSI-09-027 (Volian Calculation 513.6), Turkey Point EOP Setpoints - RCP (W Series)

   i. PTN-BOSI-09-026 (Volian Calculation 512.2), Turkey Point EOP Setpoints - Time (V Series)

4.1.2 Developmental (continued)

6. (continued)

j. PTN-BOSI-09-024 (Volian Calculation 510.2), Turkey Point EOP Setpoints - Containment Parameters (T Series)

k. PTN-BOSI-09-016 (Volian Calculation 502.2), Turkey Point EOP Setpoints - RCS Temperature (E Series, F Series, G Series, H Series, I Series)

l. JPN-PTN-SENP-95-026, CCW Flow Balance and Post Accident Alignment Requirements to Support Thermal Up Rate

m. Westinghouse Technical Bulletin ESBU TB 93 01, Revision 1

n. PTN-ENG-SEES-98-0024, EDG 3A Loading Consideration Due to Manual Loading of Electric Driven Fire Pump

o. PTN-ENG-BFSI-98-003, AFW Flow Uncertainty Determination

p. CR 02-2318, Response to NRC SBO SSDI Audit

q. CR 1645612, IER L1 11-2: Fukushima Daiichi Nuclear Station Spent Fuel Pool Loss of Cooling and Makeup

r. CR 01908959, Possible Error in Procedural Actions for Shutdown Margin

s. AR 01897246 requirement for NCCs running prior to starting RCPs

4.1.3 Management Directives

None

4.2 <u>Commitments</u>

1. LER 250/95 006, Analysis Shows CCW Heat Exchangers Incapable of Handling Full Accident CCW Flow.

End of Section 4.0

ATTACHMENT 1
Natural Circulation Indications
(Page 1 of 1)

The following conditions support or indicate natural circulation flow:

- RCS Subcooling based on Core Exit TCs –
  GREATER THAN 19°F[73°F]
- S/G pressures – STABLE OR DECREASING
- RCS Hot Leg temperatures – STABLE OR DECREASING
- Core Exit TCs – STABLE OR DECREASING
- RCS Cold Leg temperatures –
  WITHIN 30°F OF SATURATION TEMPERATURE FOR S/G PRESSURE

End of Attachment 1

ATTACHMENT 2
Components Affected by a Safety Injection Signal
(Page 1 of 4)

COMPONENT	NORMAL CONDITION	DESCRIPTION
	Off	Diesel Generators
	Throttled OR Closed	Feedwater Control Valves
	One Running	Feedwater Pumps
	Off OR Running per GOP-301	Heater Drain Pumps
	Off	Auxiliary Feedwater Pumps
	One Running	Charging Pumps
	Reset	PRZ Backup Group Heater Lockout Relays
R-11	In Service	Containment Air Particulate Monitor
R-12	In Service	Containment Air Gaseous Monitor
CV-3-2819	Open	Containment Instrument Air Bleed Isolation (IC)
CV-3-2826	Open	Containment Instrument Air Bleed Isolation (OC)
CV-3-2821	Open	Containment Sump Pump Discharge Isolation
CV-3-2822	Open	Containment Sump Pump Discharge Isolation
SV-3-2911	Open	Containment Air Monitoring Isolation
SV-3-2912	Open	Containment Air Monitoring Isolation
SV-3-2913	Open	Containment Air Monitoring Isolation
CV-3-516	Closed	PRZ Relief Tank to Gas Analyzer Isolation
CV-3-956A	Closed	PRZ Steam Sample isolation
CV-3-956B	Closed	PRZ Liquid Sample isolation
CV-3-6428	Closed	Loop A and B Sample isolation

ATTACHMENT 2
Components Affected by a Safety Injection Signal
(Page 2 of 4)

COMPONENT	NORMAL CONDITION	DESCRIPTION
CV-3-956D	Closed	Accumulator Sample isolation
CV-3-4659A	Automatic	Reactor Coolant Drain Tank to Gas Analyzer Isolation
CV-3-4659B	Automatic	Reactor Coolant Drain Tank to Gas Analyzer Isolation
CV-3-855	Closed	N_2 to Accum and Flux Mapper isolation
MOV-3-1427	Open	Steam Generator Liquid Sample (Keylock Bypass can be used)
MOV-3-1426	Open	Steam Generator Liquid Sample (Keylock Bypass can be used)
MOV-3-1425	Open	Steam Generator Liquid Sample (Keylock Bypass can be used)
Note 1: Blowdown shall be reestablished using 3-NOP-071, STEAM GENERATOR BLOWDOWN RECOVERY SYSTEM.		
CV-3-6275A	Open (Note 1)	Steam Generator Blowdown Isolation Valve
CV-3-6275B	Open (Note 1)	Steam Generator Blowdown Isolation Valve
CV-3-6275C	Open (Note 1)	Steam Generator Blowdown Isolation Valve
MOV-3-843A	Closed	SI to Cold Legs Isol
MOV-3-843B	Closed	SI to Cold Legs Isol
MOV-878A	Open	HHSI Pump Discharge Header Isolation
MOV-878B	Open	HHSI Pump Discharge Header Isolation
MOV-3-744A	Closed	RHR Discharge to Cold Leg Injection
MOV-3-744B	Closed	RHR Discharge to Cold Leg Injection
	Off in Auto	Emergency Containment Cooler Fans
MOV-3-1417	Open	CCW to Normal Containment Coolers

ATTACHMENT 2
Components Affected by a Safety Injection Signal
(Page 3 of 4)

COMPONENT	NORMAL CONDITION	DESCRIPTION
MOV-3-1418	Open	CCW From Normal Containment Coolers
	On	Normal Containment Cooling Fans
POV-3-2600	Closed	Containment Purge Supply Isol (OC)
POV-3-2601	Closed	Containment Purge Supply Isol (IC)
POV-3-2602	Closed	Containment Purge Exhaust Isol (OC)
POV-3-2603	Closed	Containment Purge Exhaust Isol (IC)
	Off	Residual Heat Removal Pumps
	One Running	CCW Pumps
CV-3-739	Open	Excess Letdown Hx CCW Outlet
SV-3-6385	Closed	PRZ Relief Tank to Gas Analyzer Isolation
MOV-3-6386	Open	Excess Letdown and RCP Seal Return
CV-3-204	Open	Letdown From RHR Isolation Valve
CV-3-200A	At Least One Orifice Isolation Valve Open	Orifice Letdown Isolation
CV-3-200B	At Least One Orifice Isolation Valve Open	Orifice Letdown Isolation
CV-3-200C	At Least One Orifice Isolation Valve Open	Orifice Letdown Isolation
MOV-3-381	Open	Excess letdown and RCP Seal Return To VCT
	Two Running	Intake Cooling Water Pumps
SV-3-519A	Closed	Primary Water Containment Isolation
POV-3-4882	Open	ICW To TPCW Heat Exchanger
POV-3-4883	Open	ICW To TPCW Heat Exchanger

ATTACHMENT 2

Components Affected by a Safety Injection Signal

(Page 4 of 4)

COMPONENT	NORMAL CONDITION	DESCRIPTION
CV-3-4658A	Open	Reactor Coolant Drain Tank to Vent Header (WB Panel)
CV-3-4658B	Open	Reactor Coolant Drain Tank to Vent Header (WB Panel)
SV-3-4668A	Open	Reactor Coolant Drain Tank PP Discharge (WB Panel)
SV-3-4668B	Open	Reactor Coolant Drain Tank PP Discharge (WB Panel)
	Auto	Containment Sump Pumps

End of Attachment 2

ATTACHMENT 3
Unit 3 Component KW Load Rating Chart
(Page 1 of 2)

CAUTION

Steady state loading on each Unit 3 Emergency Diesel Generator shall **NOT** exceed 2500 KW. When starting additional equipment, diesel load is required to be monitored to ensure the transient limit of 2750 KW is **NOT** exceeded.

NOTE

- One Computer Room Chiller is required to be restarted within 60 minutes of Loss of Offsite Power to maintain operability of DCS and QSPDS.
- Battery Charger load is dependent on the status of its parallel charger (i.e., in service or de-energized).

ESSENTIAL LOADS

COMPONENT	KW	COMPONENT	KW
CCW PUMP	380	BATTERY CHARGER 3B1	20/39
HIGH-HEAD SI PUMP	302	BATTERY CHARGER 4A2	20/39
INTAKE COOLING WATER PUMP	265	EMERGENCY LIGHTING	18
RHR PUMP	222	INSTRUMENT AIR DRYER	18
CONTAINMENT SPRAY PUMP	212	DG AUXILIARY EQUIPMENT	17
ED FIRE PUMP (P39)	203	SWITCHGEAR/LC 3A A/C AHU	17
NORMAL CONTAINMENT COOLER	77	SWITCHGEAR/LC 3B A/C AHU	17
CRDM COOLER FAN	48	DG AIR COMPRESSOR	13
COMPUTER ROOM CHILLER	43	EDG RM LIGHTING PANEL 3X87	11
AUXILIARY BLDG EXHAUST FAN	33	AUXILIARY BLDG SUPPLY FAN	9
BATTERY ROOM A/C	30	H2 ANALYZER HEAT TRACE	8
BATTERY CHARGER 3A1	29/56	CABLE SPREADING ROOM A/C	5
BATTERY CHARGER 4B2	29/56	DG VENT FAN	5
CONTROL ROOM A/C COMPR	27	PAGE SYSTEM	5
SWITCHGEAR/LC 3A A/C CHILLER	26	CONTROL ROOM FILTER FAN	3
SWITCHGEAR/LC 3B A/C CHILLER	26	COMPUTER ROOM AIR UNIT	3
ELECTRICAL EQUIP RM A/C	25	SWITCHGEAR 3D SUPPLY FAN	2
EMERGENCY CNTMT COOLER	23	DG FUEL OIL TRANSFER PUMP	1
		H2 ANALYZER PUMP	1

ATTACHMENT 3
Unit 3 Component KW Load Rating Chart
(Page 2 of 2)

NON-ESSENTIAL LOADS

COMPONENT	KW	COMPONENT	KW
TPCW PUMP	299	TURNING GEAR LUBE OIL PUMP	33
CHARGING PUMP	114	BEARING LIFT OIL PUMP	28
SPENT FUEL PIT PUMP	82	AIR SIDE SEAL OIL PUMP	21
PRESSURIZER HEATER (EACH)	50	BORIC ACID TRANSFER PUMP	13
TURNING GEAR DRIVE	41	HYDROGEN SIDE SEAL OIL PUMP	3

End of Attachment 3

ATTACHMENT 4
<u>Establishing Letdown</u>
(Page 1 of 1)

1. Align CCW System as necessary to establish normal flow on B CCW Header.

2. Close Letdown Orifice Isolation valves.

3. Open CV-3-204, Letdown From Regen Heat Exchanger Isolation.

4. Open LCV-3-460, High Pressure Letdown Isolation From Loop B Cold Leg.

5. Maintain adequate Charging flow to Regen Heat Exchanger:

- Start additional Charging Pump(s) and adjust speed controllers as necessary.
- Adjust HCV-3-121, Charging Flow to Regen Heat Exchanger, to maintain proper Seal Injection flow.

6. Manually control PCV-3-145, Low Pressure Letdown Controller, to limit pressure spike when opening Letdown Orifice Isolation valves.

7. Open Letdown Orifice Isolation valves to establish desired Letdown flow.

8. Place PCV-3-145, Low Pressure Letdown Controller, in AUTO.

End of Attachment 4

ATTACHMENT 5
Establishing Excess Letdown
(Page 1 of 2)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	**Open CV-3-739, Excess Letdown Heat Exchanger CCW Outlet**	
2.	**Close HCV-3-137, Excess Letdown Flow Controller**	
3.	**Place CV-3-389, Excess Letdown From Heat Exchanger To VCT Or RCDT, in RCDT-DIVERT Position**	
4.	**Check If Seal Return Flow – ESTABLISHED**	<u>WHEN</u> Seal Return flow is established, <u>THEN</u> CV-3-389, Excess Letdown from Heat Exchanger to VCT or RCDT, may be placed in VCT-NORMAL position if desired. Continue with Attachment 5, Step 6.
5.	**Place CV-3-389, Excess Letdown From Heat Exchanger To VCT Or RCDT, In VCT-NORMAL Position If Desired**	
6.	**Slowly Open HCV-3-137, Excess Letdown Flow Control Valve**	
7.	**Close HCV-3-137, Excess Letdown Flow Control Valve**	
8.	**Open CV-3-387, Excess Letdown Isolation Valve From Cold Leg To Excess Letdown Heat Exchanger**	

ATTACHMENT 5
<u>Establishing Excess Letdown</u>
(Page 2 of 2)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9.	**Open HCV-3-137, Excess Letdown Flow Controller**	
10.	**Maintain Excess Letdown Heat Exchanger Outlet Temperature, TI-3-139 – LESS THAN 195°F**	
11.	**Check If Normal Letdown – ESTABLISHED**	Perform the following: **a.** Continue efforts to establish Normal Letdown. **b.** <u>WHEN</u> Normal Letdown is established, <u>THEN</u> stop Excess Letdown. **c.** Return to procedure and step in effect.
12.	**Stop Excess Letdown**	

End of Attachment 5

ATTACHMENT 6
Verify PRZ Backup Group Heater Lockouts – Reset
(Page 1 of 2)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	**Verify A 4KV Bus – ENERGIZED**	WHEN A 4KV Bus is reenergized, THEN perform Attachment 6, Step 2, Attachment 6, Step 3 and Attachment 6, Step 4. Continue with Attachment 6, Step 5.
2.	**Verify SI – RESET**	
3.	**Place Group A PRZ Backup Group Heater Control switch in OFF**	
4.	**Direct Operator To Perform The Following:** **a.** Proceed to Unit 3 West Electrical Penetration Room **b.** Reset Group A Backup PRZ Heater Lockout Relay	
5.	**Verify Group B PRZ Backup Group Heaters – RESET** • B 4KV Bus – ENERGIZED FROM STARTUP TRANSFORMER • SI – RESET	Perform the following: **a.** Place Group B PRZ Backup Group Heater Control switch in OFF. **b.** Direct operator to perform the following: **1)** Obtain key 29 from Shift Manager key locker. **2)** Proceed to 3D Load Center Room. **3)** Place PRZ Backup Heater 3B key switch in EMERGENCY.

ATTACHMENT 6
Verify PRZ Backup Group Heater Lockouts – Reset
(Page 2 of 2)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	**Check A AND B 4KV Bus – BOTH ENERGIZED BY OFFSITE POWER**	Check diesel capacity adequate to energize Groups A AND B PRZ Heaters (450 KW per group). IF adequate diesel capacity is **NOT** available, THEN locally open individual Group Heater breakers until PRZ heater load is within diesel capacity. Refer to Attachment 3 for component KW load rating.

End of Attachment 6

ATTACHMENT 7
Establishing RCP Support Conditions After SI Actuation
(Page 1 of 5)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	**Check Adequate Power Available to Start RCPs** **a.** 3B 4KV Bus (3B RCP, 3C RCP) OR 3A 4KV Bus (3A RCP) – ENERGIZED FROM STARTUP TRANSFORMER	Notify Unit Supervisor RCP support conditions can **NOT** be established.
2.	**Verify RCS Cold Leg Temperature – GREATER THAN 275°F**	Perform the following: **a.** Locally obtain S/G secondary temperature measurements. Refer to any of the following for methods of obtaining S/G temperatures: * 3-NOP-041.01A, 3A REACTOR COOLANT PUMP OPERATIONS * 3-NOP-041.01B, 3B REACTOR COOLANT PUMP OPERATIONS * 3-NOP-041.01C, 3C REACTOR COOLANT PUMP OPERATIONS **b.** IF any S/G secondary water temperature is greater than 10°F above any RCS Cold Leg temperature, THEN notify Unit Supervisor that RCP support evolutions can **NOT** be established.

ATTACHMENT 7
Establishing RCP Support Conditions After SI Actuation
(Page 2 of 5)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.	**Establish Proper RCS Conditions For Starting Desired RCP**	Perform the following:
		1. Do **NOT** start affected RCP(s)
		2. Notify Unit Supervisor of affected RCP(s) that should **NOT** be started.
	a. RCP CBO Isolation valve - OPEN ∗ CV-3-303A for RCP 3A ∗ CV-3-303B for RCP 3B ∗ CV-3-303C for RCP 3C	
	b. RCS pressure – GREATER THAN 240 PSIG	
	c. Thermal Barrier D/P – GREATER THAN 0 INCHES OF WATER	
	d. RCP CBO flow – GREATER THAN 0.5 GPM	
	e. RCP CBO flow – LESS THAN 4.1 GPM	
	f. RCP CBO temperature – LESS THAN 260°F	
	g. Differential pressure across <u>each</u> RCP seal stage – GREATER THAN 65 PSID	

ATTACHMENT 7
Establishing RCP Support Conditions After SI Actuation
(Page 3 of 5)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.	**Establish Proper CCW System Alignment For RCP Operation**	
	a. CCW Heat Exchangers – THREE IN SERVICE	**a.** Perform the following: **1)** Start or stop CCW Pumps as necessary to establish only one running CCW Pump. **2)** Go to Attachment 7, Step 4.c.
	b. CCW Pumps – ONLY TWO RUNNING	**b.** Start or stop CCW Pumps as necessary to establish only two running CCW pumps.
	c. Verify B CCW Header flow – NORMAL	**c.** Notify Unit Supervisor that RCP support evolutions can **NOT** be established.

ATTACHMENT 7
Establishing RCP Support Conditions After SI Actuation
(Page 4 of 5)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	**Establish Proper CCW Valve Alignment For RCP Operation**	
	a. Check MOV-3-626, RCP Thermal Barrier CCW Outlet – OPEN	**a.** IF CCW radiation levels are normal AND RCP CBO temperature is less than 260°F, THEN manually open MOV-3-626. IF MOV-3-626 can **NOT** be manually opened, THEN direct the operator to open MOV-3-626 locally.
	b. Verify the following valves – OPEN • MOV-3-716A, RCP CCW Inlet • MOV-3-716B, RCP CCW Inlet • MOV-3-730, RCP Bearing CCW Outlet	**b.** Manually open valve(s). IF MOV(s) can **NOT** be manually opened, THEN direct operator to open MOV(s) locally.
	c. Open CCW To Normal Containment Cooler valves: • MOV-3-1417 • MOV-3-1418	**c.** Manually open valve(s). IF MOV(s) can **NOT** be manually opened, THEN direct operator to open MOV(s) locally.
	d. Reset and start Normal Containment Coolers	**d.** IF **NO** Normal Containment Coolers can be started, THEN notify Unit Supervisor that RCP support conditions can **NOT** be established. Return to Section 3.0 step in effect.

ATTACHMENT 7
Establishing RCP Support Conditions After SI Actuation
(Page 5 of 5)

STEP **ACTION/EXPECTED RESPONSE** **RESPONSE NOT OBTAINED**

6. Prepare RCP(s) For Start

a. Start available RCP Oil Lift Pump(s)

b. Operate Oil Lift Pump(s) for at least two minutes prior to starting any RCP(s)

c. Check white PERMISS TO START lights for Oil Lift Pump(s) started – ON

7. Notify Unit Supervisor of RCP(s) With Proper Conditions For Starting

End of Attachment 7

ATTACHMENT 8
Aligning Balance of Plant
(Page 1 of 6)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	**Place Rod Motion Control Selector Switch In – MANUAL**	
2.	**Restore ICW To TPCW Heat Exchangers**	
	a. Open both ICW To TPCW Heat Exchanger Isolation valves: • POV-3-4882 • POV-3-4883	**a.** IF valve(s) are locally isolated, THEN locally open associated isolation valve(s): * 3-50-319 for POV-3-4882 * 3-50-339 for POV-3-4883
	b. Verify TPCW Pumps – AT LEAST ONE RUNNING	**b.** Manually start at least one TPCW pump.

ATTACHMENT 8
Aligning Balance of Plant
(Page 2 of 6)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.	**Check Status Of Loads Supplied From 3A 4KV Bus**	
	a. 3A 4KV Bus – ENERGIZED	**a.** Perform the following: **1)** Manually start Emergency Bearing Oil Pump. **2)** Locally start DC Air Side Backup Seal Oil Pump. **3)** Go to Attachment 8, Step 3.e.
	b. Auxiliary Oil Pump – RUNNING	**b.** WHEN bearing oil pressure is less than 10 psig, THEN ensure Auxiliary Oil Pump is running.
	c. Bearing Oil Lift Pump – RUNNING	**c.** WHEN turbine speed lowers to less than 600 rpm, THEN ensure Bearing Oil Lift Pump is running.
	d. Turbine – ON TURNING GEAR	**d.** WHEN turbine speed lowers to zero, THEN place the turbine on Turning Gear using 3-NOP-087.3, TURBINE TURNING GEAR OPERATION.
	e. At least one Auxiliary Building Exhaust Fan – ON	**e.** Manually start at least one Auxiliary Building Exhaust Fan.
	f. Spent Fuel Pit Cooling – ONE PUMP OPERATING	**f.** Start Spent Fuel Pit Cooling Pump using 3-NOP-033, SPENT FUEL PIT COOLING SYSTEM.
	g. Spent Fuel Pit Exhaust Fan – ON	**g.** Manually start Spent Fuel Pit Exhaust Fan.

ATTACHMENT 8
Aligning Balance of Plant
(Page 3 of 6)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.	**(continued)**	
h.	Periodically check status of Spent Fuel Pool cooling	
1)	IF Spent Fuel Pit High Temperature Alarm OR Low Level Alarm is ON, THEN initiate action to establish cooling OR to restore level as appropriate using 3-ONOP-033.1, SPENT FUEL PIT (SFP) COOLING SYSTEM MALFUNCTION	
i.	Lube Oil Reservoir Vapor Extractor – ON	**i.** Manually start Vapor Extractor.
4.	**Align Miscellaneous Plant Equipment**	
a.	Maintain Turbine bearing oil temperature – LESS THAN 120°F	**a.** Perform 3-ONOP-008, TURBINE PLANT COOLING WATER MALFUNCTION.
b.	Check Exciter Field Breaker – OPEN	**b.** Manually open Exciter Field Breaker.
c.	Place Voltage Regulator to – OFF	
d.	Align Auxiliary Steam Supply from – ANY AVAILABLE UNIT	

ATTACHMENT 8
<u>Aligning Balance of Plant</u>
(Page 4 of 6)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	**Check If AFW Pumps Can Be Stopped**	
	a. AFW Pumps – <u>ANY</u> RUNNING	**a.** Go to Attachment 8, Step 6.
	b. Alternate source of feed – ESTABLISHED	**b.** Perform the following: **1)** Establish feedwater flow from <u>one</u> of the following: * Standby Feedwater using 0-NOP-074.01, STANDBY STEAM GENERATOR FEEDWATER SYSTEM. <u>OR</u> * One Main Feedwater Pump using 3-NOP-074, STEAM GENERATOR FEEDWATER PUMP **2)** <u>WHEN</u> alternate source of feed has been established, <u>THEN</u> perform Attachment 8, Step 5.c through Attachment 8, Step 5.f. **3)** Continue with Attachment 8, Step 6.
	c. Narrow Range level in <u>all</u> non-faulted S/Gs – GREATER THAN 21% [27%]	**c.** <u>WHEN</u> Narrow Range levels in <u>all</u> non-faulted S/Gs are greater than 21%[27%], <u>THEN</u> perform Attachment 8, Step 5.d through Attachment 8, Step 5.f.
	d. Reset AMSAC	

ATTACHMENT 8
Aligning Balance of Plant
(Page 5 of 6)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	**(continued)**	
e.	Verify AFW Actuation Signal – RESET: Both AFW auto start white lights – OFF (3QR50 AND 3QR51)	**e.** Perform the following: **1)** Ensure SI is reset. **2)** Ensure Main Feedwater Pump switch flags and indicating lights are matched. **3)** IF AFW Auto Start Lights (3QR50 AND 3QR51) are OFF, THEN go to Attachment 8, Step 5.f. **4)** IF either AFW Auto Start Light (3QR50 OR 3QR51) is LIT, THEN go to Attachment 8, Step 6.
f.	Stop AFW Pumps **NOT** required for Unit 4 using 3-NOP-075, AUXILIARY FEEDWATER SYSTEM	
6.	**Reset Isolation Signals**	
a.	Reset Containment Ventilation Isolation	
b.	Reset Control Room Ventilation Isolation	

ATTACHMENT 8
Aligning Balance of Plant
(Page 6 of 6)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.	**Restore Systems To Normal Lineup**	
	a. Align Hydrogen Monitors for normal operation using 3-NOP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM	
	b. Direct Chemistry to align PASS system for normal operation	
	c. Align Control Room Ventilation for normal operation using 0-NOP-025, CONTROL ROOM VENTILATION SYSTEM	
	d. Check CRDM Cooler Fans – AT LEAST ONE RUNNING	**d.** Manually start fan(s) as necessary.
8.	**Locally Shut Down Moisture Separator Reheaters Using 3-NOP-072.1, MOISTURE SEPARATOR REHEATERS**	
9.	**Perform 3-OSP-089, MAIN TURBINE VALVE OPERABILITY TEST**	
10.	**Notify The Unit Supervisor That Attachment 8 Is Complete And Discuss Any Plant Equipment That Is NOT In The Required Condition**	

End of Attachment 8

ATTACHMENT 9
Establish Auxiliary Pressurizer Spray
(Page 1 of 2)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	**Verify Pressurizer Spray valves – OPEN** • PCV-3-455A, Loop C • PCV-3-455B, Loop B	
2.	**Verify Aux Spray TI-3-123 AND PRZ Temperature TI-3-454 Temperature Difference – LESS THAN 320°F**	Perform the following: **a.** Record total time duration that Aux Spray is in service with temperature difference greater than or equal 320°F. **b.** Notify Engineering to perform Engineering Evaluation required by Technical Specifications
3.	**Open CV-3-311, Aux Spray Isolation**	
4.	**Close CV-3-310A, Loop A Charging Isolation**	
5.	**Verify CV-3-310B, Loop C Charging Isolation – CLOSED**	
6.	**Control Aux Spray As Follows:** * Increase Aux Spray flow by closing PCV-3-455A, Pressurizer Spray Loop C, and/or PCV-3-455B, Pressurizer Spray Loop B * Reduce Aux Spray flow by opening PCV-3-455A, Pressurizer Spray Loop C, and/or PCV-3-455B, Pressurizer Spray Loop B	

ATTACHMENT 9
Establish Auxiliary Pressurizer Spray
(Page 2 of 2)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.	**WHEN Auxiliary Spray NO Longer Required, THEN Terminate Auxiliary Spray As Follows** **a.** Open one of the following: * CV-3-310A, Loop A Charging Isolation * CV-3-310B, Loop C Charging Isolation **b.** Close CV-3-311, Auxiliary Spray valve	Perform the following: **1.** Reduce Charging Pump speed to minimum. **2.** Close HCV-3-121, Charging Flow to Regen Heat Exchanger. **3.** Adjust Charging Pump speed to maintain seal injection flow.

End of Attachment 9

ATTACHMENT 10
Borate for Shutdown Margin
(Page 1 of 1)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	**Set Boric Acid Totalizer To Highest Volume Of Boric Acid Possible**	
2.	**Set FC-3-113A, Boric Acid Flow Controller, To A Pot Setting Of 4.0**	
3.	**Place Reactor Makeup Selector switch to BORATE**	
4.	**Place RCS Makeup Control Switch To START**	
5.	**Check a Boric Acid Transfer Pump is RUNNING**	Start a Boric Acid Transfer Pump: * 3A Boric Acid Transfer Pump * 3B Boric Acid Transfer Pump
6.	**Inform Unit Supervisor Boration For Shutdown Margin Has Commenced**	

End of Attachment 10

ATTACHMENT 11
Continuous Action Summary
(Page 1 of 1)

Step 7, Check If Containment Spray Should Be Stopped

IF all of the following conditions exist:

- Containment Spray Pumps – ANY RUNNING, AND
- Time since event –
  - ∗ GREATER THAN OR EQUAL TO 30 DAYS WITH LOCA INDICATED

    OR
  - ∗ LESS THAN 30 DAYS WITH **NO** LOCA INDICATED, AND
- Containment pressure – LESS THAN 17 PSIG
- THEN stop Containment Spray Pumps per Section 3.0, Step 7.

Step 15, Check Intact S/G Levels

- Maintain total feed flow greater than 400 gpm until Narrow Range Level greater than 7%[27%] in at least one S/G.
- Control feed flow to maintain Narrow Range Level between 21% [27%] and 50%. Stop feed flow to any S/G with Narrow Range Level greater than 50%.

Step 18, Verify All 4KV Buses – ENERGIZED BY OFFSITE POWER

Monitor 4KV buses.

- IF any 4KV bus is de-energized, AND power subsequently becomes available, THEN restore power to the affected 4KV bus per Section 3.0, Step 18, RNO.

Step 19, Check 3B RCP – RUNNING

IF **NO** RCPs running, THEN monitor for support conditions to start RCPs.

IF support conditions subsequently established, THEN start RCPs per Section 3.0, Step 19.

IF any RCP running, but **NOT** 3B RCP, AND 3B RCP subsequently becomes available, THEN start 3B RCP per Section 3.0, Step 19.

End of Attachment 11

FOLDOUT PAGE
For Procedure 3-EOP-ES-1.1

1. ADVERSE CONTAINMENT CONDITIONS

a. IF either condition listed below occurs, THEN use [Adverse Containment Setpoints]:

* Containment atmosphere temperature ≥ 180°F

OR

* Containment radiation levels ≥ $1.3x10^5$ R/hr

b. WHEN Containment atmosphere temperature returns to less than 180°F,
THEN Normal Setpoints can again be used.

c. WHEN Containment radiation levels return to less than $1.3x10^5$ R/hr,
THEN Normal Setpoints can again be used if the TSC determines that Containment Integrated Dose has **NOT** exceeded 10^5 Rads.

2. SI RE-INITIATION CRITERIA

IF either condition listed below occurs following SI termination,
THEN manually start SI Pumps as necessary to restore RCS subcooling and PRZ level and
go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1:

* RCS subcooling based on core exit TCs – LESS THAN 19°F[LESS THAN ADVERSE VALUE IN TABLE BELOW]

SI ADVERSE SUBCOOLING VALUE	
RCS PRESSURE (PSIG)	**ADVERSE SUBCOOLING VALUE**
< 2485 AND ≥ 2000	35 °F
< 2000 AND ≥ 1500	45 °F
< 1500 AND ≥ 1000	55 °F
< 1000 AND ≥ 500	110 °F
< 500	160 °F

OR

* PRZ level – CAN **NOT** BE MAINTAINED GREATER THAN 7%[48%]

3. SECONDARY INTEGRITY CRITERIA

IF any S/G pressure decreasing in an uncontrolled manner OR any S/G completely depressurized,
THEN perform the following:

a. Maintain total feedwater flow greater than 400 gpm until Narrow Range Level in at least one S/G is greater than 7%[27%].

b. IF any S/G(s) are **NOT** faulted, THEN Isolate AFW flow to faulted S/G(s).

1) Stabilize RCS Hot Leg temperature using Steam Dumps when faulted S/G has blown down to less than 9% Wide Range [27% Narrow Range] by reducing intact S/G Steam Dump To Atmosphere valves AUTO setpoint to match current S/G pressure.

c. IF any faulted S/G **NOT** previously isolated, THEN manually start SI Pumps as necessary and go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION.

4. CST MAKEUP WATER CRITERIA

IF CST level decreases to less than 12%,
THEN add makeup to CST using 3-NOP-018.01, CONDENSATE STORAGE TANK (CST).

5. LOSS OF OFFSITE POWER OR SI ON OTHER UNIT

IF SI has been reset AND subsequently either offsite power is lost OR SI actuates on the other unit,
THEN restore safeguards equipment, and at least one Computer Room Chiller to required configuration.
Refer to Attachment 3 for essential loads.

6. LOSS OF CHARGING CRITERIA

IF Charging capability has been lost, AND High-Head SI Pumps are running at shutoff head, THEN rotate High-Head SI Pumps as necessary to maintain continuous run time of any pump less than 30 minutes while maintaining at least one High-Head SI Pump running

L-17-1 NRC Exam

JPM D

JPM TITLE: Start 3A RCP in Mode 3

JPM NUMBER: 01041038102 **REV.** 2-1

TASK NUMBER(S) / TASK TITLE(S): 01041038100 / Start A Reactor Coolant Pump

K/A NUMBERS: APE 015 AA1.23 **K/A VALUE:** RO 3.1 / SRO 3.2

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [X]

EVALUATION LOCATION:

In-Plant: [ ] Control Room: [ ]

Simulator: [X] Other: [ ]

Lab: [ ]

Time for Completion: 20 Minutes Time Critical: No

Alternate Path [NRC]: Yes

Alternate Path [INPO]: Yes

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/01/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/02/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☒	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

N/A

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
2-0	Formatting; Modifications	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
2-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17

SIMULATOR SET-UP:

SIMULATOR SETUP INSTRUCTIONS:

______	1.	Reset to **IC 3** or equivalent IC.
______	2.	Place simulator in RUN.
______	3.	Ensure applicable portions of Simulator Operator Checklist are complete.
______	4.	Open and execute NRC JPM D.lsn: a. If running, stop the 3A RCP b. Ensure RCP A MOTOR DETAIL is on DCS station on RO desk c. Ensure RCP A PUMP DETAIL is on DCS station on VPA d. Verify **3A RCP HIGH VIBRATION** is in CONDITION state
______	5.	Allow plant to stabilize.
______	6.	Acknowledge alarms and place simulator in FREEZE.
______	7.	Save as temporary IC, if JPM will be repeated.
______	8.	When ready to begin, then place Simulator in RUN.

SIMULATOR MALFUNCTIONS:

- TAHUVIBS, *HN-IDA RCP SHAFT VIBRATION LOOP A (MILS)
  - o Demanded Value: 25.0
  - o Delay Time: 170
  - o Ramp Time: 10

SIMULATOR OVERRIDES:

- N/A

SIMULATOR REMOTE FUNCTIONS:

- N/A

Required Materials:	• HANDOUT 3-NOP-041.01A • HANDOUT 3-ONOP-041.1 • Stopwatch
General References:	• 3-NOP-041.01A, 3A Reactor Coolant Pump Operations • 3-ONOP-041.1, Reactor Coolant Pump Off-Normal
Task Standards:	• Start the 3A RCP Oil Lift Pump • Start 3A RCP • Stop 3A RCP

HAND JPM BRIEFING SHEET TO EXAMINEE AT THIS TIME

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- Unit 3 is in Mode 3 with shutdown banks withdrawn, in preparation for a plant startup.
- The 3A RCP was shut down 20 minutes ago for maintenance.
- 3-NOP-041.01A, 3A Reactor Coolant Pump Operations, has been completed through Step 4.1.1.17.

INITIATING CUE:

- You have been directed to start the 3A RCP, beginning with Step 4.1.1.18 of 3-NOP-041.01A.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically, cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Yes" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required reference materials.**
Standard:	Obtain 3-NOP-041.01A, 3A Reactor Coolant Pump Operations.
Evaluator Note:	If a peer check is requested for any of the following steps, then acknowledge the request and allow the operator to continue.
Evaluator Cue:	• Provide examinee with a copy of HANDOUT 3-NOP-041.01A. • Provide a stopwatch if asked for at any point during this JPM.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Performance Step: **Critical _Y_(SEQ-2)**	**3-NOP-041.01A, Step 4.1.1.18:** **START** 3A RCP Oil Lift Pump as follows: A. **START** 3A RCP Oil Lift Pump. B. WHEN 3A RCP Oil Lift Pump has operated for at least 2 minutes AND prior to starting 3A RCP, THEN **CHECK** white permissive light ON.
Standard:	• Take the 3A RCP lift oil pump's control switch (VPA) to START. • After two minutes, ensure that the associated white permissive light is lit.
Evaluator Note:	Only the pump start is critical.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_(SEQ-3)**	**3-NOP-041.01A, Step 4.1.1.19:** **START** 3A RCP while monitoring both of the following: • Starting current as indicated on 3A RCP motor ammeter • RCS loop flow rate rise as indicated on FI-3-414, 415, or 416, A LOOP RCS FLOW
Standard:	• Take the 3A RCP's control switch (VPA) to START. • Monitor motor amps on the 3A RCP's ammeter. • Monitor RCS Loop A flow rate on FI-3-414/415/416.
Booth Operator Note:	When control switch is taken to start, verify **3A HIGH VIBRATION triggers**.
Evaluator Note:	Only the pump start is critical.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-4)**	**3-NOP-041.01A, Step 4.1.1.20:** IF any of the following occur: • RCS pressure decreases to less than 240 psig, indicated • RCP starting current is greater than 943 amps after 25 seconds • Seal stage differential pressure decreases to less than 25 psid, indicated, after 25 seconds, THEN **STOP** 3A RCP. (1) **DOCUMENT** condition in an AR.
Standard:	Monitor RCS pressure, RCP starting current, and seal stage differential pressure.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-5)**	**3-NOP-041.01A, Step 4.1.1.21:** WHEN 3A RCP has operated for at least 1 minute, THEN **STOP** 3A RCP Oil Lift Pump.
Standard:	• After one minute of RCP operation, take the 3A RCP lift oil pump's control switch to STOP. • Upon receipt of annunciator F 1/1, refer to the appropriate ARP.
Evaluator Note:	Approximately two minutes after the 3A RCP start, annunciator F 1/1, RCP MOTOR/ SHAFT HI VIB, will actuate.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

THIS BEGINS THE ALTERNATE-PATH PORTION OF THE JPM

Performance Step: **Critical _N_ (SEQ-6)**	**3-ARP-097.CR.F (F 1/1), ALARM CONFIRMATION:** Check RCP Vibration recorder R-3-369.
Standard:	Recognize that shaft vibrations on R-3-369 (VPB) for the 3A RCP are elevated.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-7)**	**3-ARP-097.CR.F (F 1/1), OPERATOR ACTIONS:** 1. **DISPATCH** operator to check vibration indications in Cable Spreading Room.
Standard:	Dispatch a field operator to the Cable Spreading Room to check 3A RCP vibrations.
Booth Operator Cue:	When contacted, acknowledge direction but do NOT take any action.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-8)**	**3-ARP-097.CR.F (F 1/1), OPERATOR ACTIONS:** 2. IF vibration is above alarm setpoint, THEN **GO TO** 3-ONOP-041.1, Reactor Coolant Pump Off-Normal.
Standard:	Recognize that 3A RCP shaft vibrations are above the alarm setpoint and identify the need to transition to 3-ONOP-041.1, Reactor Coolant Pump Off-Normal.
Evaluator Cue:	When the transition is recognized, provide examinee with a copy of HANDOUT 3-ONOP-041.1.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-9)**	**3-ONOP-041.1, Foldout Page:** **1. RCP STOPPING CRITERIA** IF **ANY** of the following RCP limits are reached, THEN **MANUALLY TRIP** the Reactor **AND** verify Reactor trip using the EOP network AND then stop the affected RCP AND close PCV-3-455A, PZR Spray Valve Loop C, or PCV-3-455B, PZR Spray Valve Loop B, if applicable. • RCP shaft vibration, R-3-369 (Points 3, 4, 7, 8, 11, 12) - GREATER THAN OR EQUAL TO **20 MILS**. Note exception in Foldout Page Item 4.
Standard:	• Recognize that the 3A RCP's shaft vibrations exceed 20 mils, manually trip the reactor and verify trip using 3-EOP-E-0. • Recognize that continued RCP operation is not authorized and stop 3A RCP.
Evaluator Note:	Only the pump stop is critical.
Evaluator Cue:	If asked, state that continued RCP operation is NOT authorized.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Terminating Cue: **Once the 3A RCP is tripped, state "This completes the JPM."**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ____________________ **Evaluator:** ____________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ____________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ____________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- Unit 3 is in Mode 3 with shutdown banks withdrawn, in preparation for a plant startup.
- The 3A RCP was shut down 20 minutes ago for maintenance.
- 3-NOP-041.01A, 3A Reactor Coolant Pump Operations, has been completed through Step 4.1.1.17.

INITIATING CUE:

- You have been directed to start the 3A RCP, beginning with Step 4.1.1.18 of 3-NOP-041.01A.

NOTE: Ensure the turnover sheet is returned to the evaluator when the JPM is complete.

FPL	# TURKEY POINT UNIT 3 **NORMAL OPERATING PROCEDURE** SAFETY RELATED **CONTINUOUS USE**	Procedure No. **3-NOP-041.01A** Revision No. **6**

Title:

3A REACTOR COOLANT PUMP OPERATIONS

Responsible Department: OPERATIONS

Special Considerations:

Performance of this procedure may affect core reactivity.

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED today INITIAL

Revision	Approved By	Approval Date
0	Frank Wurster	12/19/08
6	Brian Stamp	11/23/15

UNIT #	UNIT 3
DATE	
DOCT	PROCEDURE
DOCN	3-NOP-041.01A
SYS	
STATUS	COMPLETED
REV	6
# OF PGS	

REVISION SUMMARY	
Rev. No.	**Description**
6	**PCR 2093218, 11/23/15, Luis Sagion** Added bullets to Caution above Section 4.1.1 Step 19. Added Note and new Step 25 in Section 4.1.1.
5	**PCR 1983179, 11/01/15, Ross Frew** Changes made as result of **EC 280399**, Unit 3 RCP Seal Upgrade Project.
4	**PCR 1919406, 11/24/13, Ed Tremblay** 3A Reactor Coolant Pump Operations align CCW Flows to RCPs with 3-NOP-030.
3	**PCR 1856797, 03/18/13, Wayne Short** Enhanced guidance for adjusting CCW flow to RCPs.
2	**PCR 1609541, 12/09/11, John W Patterson** Made change per **EC 247008 and LAR 205**: Section 4.1.1 Caution prior to Step 17, updated to reflect reduced OMS setpoint for PORVs to 440 psig.
1	**PCR 10-1222, 08/02/10, David Dagitz** Removed unnecessary Caution about preceding Steps 4.1.1.10 and 5.1.4.

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1.0 PURPOSE

This procedure provides guidance for starting and stopping 3A Reactor Coolant Pump (RCP). This procedure also provides guidance for 3A RCP infrequent operations such as uncoupled pump operation, adjusting Seal Injection flow, and resetting an unresponsive 3A RCP Partial Discharge Monitor.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Precautions

1. Personnel entering 3A RCP area should wear ear protection during RCP operation.
2. Reactor shall be shutdown prior to restart of 3A RCP.
3. Tech Spec 3.4.1.1 requires all loops be in operation in MODES 1 and 2.
4. O-ring seals deteriorate rapidly as CBO temperature exceeds 260°F.

2.2 Limitations

1. 3A RCP shall **NOT** be started if Reactor Coolant Loops could potentially be at significantly lower boron concentration than the Reactor Vessel. 0-ONOP-041.9, Potential Dilution of Reactor Coolant Loop(s), provides instructions for ensuring required boron concentrations are achieved prior to RCP operation.
2. Unless 3A RCP oil reservoir level is checked locally, 3A RCP motor shall only be started when oil reservoir high/low level alarm is clear.
3. 3A RCP Oil Lift Pump should **NOT** be operated when CCW is isolated from oil coolers. Momentary operation of the Oil Lift Pump without CCW, such as for uncoupled motor bump for rotation check, is acceptable.
4. If Component Cooling Water (CCW) to 3A RCP is lost, 3A RCP shall be stopped before either upper or lower bearing temperature has risen to 195°F and the Oil Lift Pump shall be stopped.
5. 3A RCP shall **NOT** be started with <u>one</u> or more RCS cold leg temperatures less than or equal to 275°F unless secondary water temperature of each steam generator is less than 50°F above each RCS cold leg temperature. (Tech. Spec. 3/4.4.1.3)

2.2 Limitations (continued)

6. If Reactor Coolant System (RCS) is solid, both of the following apply:

- If all RCPs are stopped for 10 minutes, running Residual Heat Removal (RHR) pump outlet temperature should be determined and RHR Hx flow adjusted to maintain that temperature.
- If the two-pump RCS fill and vent method is used and SG U-tubes were drained, a pressurizer bubble should be formed before the last RCP is started to prevent an RCS pressure event.

7. RCP motor starting duty limits are:

- With the motor at ambient temperature, two successive starts are allowed. The motor shall be allowed to coast to rest between starts.
- With the motor at operating temperature, one start is allowed. Subsequent starts require the motor be allowed to cool by standing idle for 1 hour or by running for 1/2 hour.
- Starts are limited to three within a 2 hour period. Subsequent starts are allowed only after standing idle for 1 hour.

8. If any of the following limits are reached, then go to 3-ONOP-041.1, Reactor Coolant Off-Normal:

- Motor vibration 4 mils or shaft vibration 15 mils.
- Motor upper bearing or lower bearing temperature 195°F.
- Motor bearing oil reservoir high/low level alarm, unless level verified locally.

NOTE

Stator winding temperature limit may be exceeded for a short time during cold RCP operation.

- Stator winding temperature 248°F.
- Pump bearing temperature 225°F.
- CBO temperature 195°F.

2.2 Limitations (continued)

8. (continued)

- CBO flow on recorder FR-3-154A is less than the low limit of Attachment 3, Control Bleed Off (CBO) Normal Operating Range, at low pressure conditions.
- CBO flow greater than 3.0 gpm.
- Seal injection water is **NOT** required to a running RCP in either of the following conditions:
    - All CBO, RCP bearing and CCW temperatures are within limits specified in this procedure and RCS temperature less than 150°F.
    - CBO flow rate is less than 3 gpm and at least 25 gpm CCW flow at an inlet temperature of less than 105°F flowing through thermal barrier cooling coil.
- Seal injection water temperature 130°F as indicated on TI-3-116, VCT. Temperature may rise to 150°F if RCS temperature is less than 400°F.

3.0 PREREQUISITES

None

4.0 NORMAL OPERATIONS

4.1 Startup

4.1.1 Starting 3A Reactor Coolant Pump

NOTE

Section 4.1.1, Step 1 through Section 4.1.1, Step 12 may be performed in any order.

1. **CHECK** the following systems available or in operation as necessary to support RCP operation:
   - Component Cooling Water System
   - Chemical and Volume Control System
   - Primary Water System
   - Instrument Air System
   - Waste Disposal System
   - Reactor Coolant System
2. **CHECK** the following plant electrical systems energized to support RCP operation:
   - 3A 4160V Bus
   - 3A MCC
   - LP-34
3. **ENSURE** 3A RCP switch and breaker alignments per:
   - Attachment 1, 3A Reactor Coolant Pump and Oil Lift Pump Switch Alignment
   - Attachment 2, 3A Reactor Coolant Pump and Oil Lift Pump Breaker Alignment

4.1.1 Starting 3A Reactor Coolant Pump (continued)

N/A 4. IF starting the first RCP, THEN **CHECK** the following conditions have **NOT** occurred that would indicate a RCS loop or portion thereof may have been diluted during the time RCPs were secured:

- Steam Generator tube(s) ruptured.
- Large boration of the RCS occurred after the RCPs were shutdown.
- Reported or observed activity which may have diluted the water in the RCS.
- RCS Sample indicates a loop has been diluted.

N/A 5. IF a RCS loop or portion thereof was diluted, THEN **GO TO** 0-ONOP-041.9, Potential Dilution of Reactor Coolant Loop(s).

CAUTION

Starting 3A RCP may cause 3A Emergency Diesel Generator (EDG), if paralleled to 3A 4160V bus, to trip, and could damage 3A EDG.

6. **ENSURE** 3A EDG is **NOT** paralleled to 3A 4160V Bus.

7. **ENSURE** VCT pressure is controlled to maintain <u>one</u> of the following

- In the normal range of 16 to 25 psig
- As required to maintain RCP seal leak-off and as specified by Chemistry

N/A 8. IF FI-3-130, RCP A SEAL INJECTION FLOW INDICATOR, does **NOT** indicate 6 to 13 gpm, THEN **ADJUST** seal injection flow per Section 5.3.

4.1.1 Starting 3A Reactor Coolant Pump (continued)

N/A 9. IF thermal barrier differential pressure is less than zero inches of water, as indicated on PI-3-131A, A RCP THERMAL BARRIER D/P, THEN:

> **NOTE**
>
> A minimum of 6 gpm required for RCP Seal Injection.

A. While RCO monitors DCS RCP Detailed Data Summary display for flow changes, SNPO locally **ADJUST** 3-297A, 3A RCP SEAL WATER SUPPLY, to obtain 6 to 13 gpm.

B. IF 3-297A is full OPEN AND seal injection flow is less than 6 gpm, THEN, while SNPO monitors RCP seal injection flow locally, RCO **ADJUST** HCV-3-121, CHARGING FLOW TO REGEN HX, CLOSED to maximize seal injection flow.

> **NOTE**
>
> - Following initial verification of RCP CCW flows and S/G temperatures, re-verification is **N/A** for subsequent RCP starts if, at discretion of the Shift Manager, **NO** intervening activities occurred to adversely impact those flows or temperatures.
> - Some flow indicators are located in different locations. Two operators are needed in constant communication when adjustments are made.
> - Adjustments should be done in small increments, no more than 1/8 of a turn at a time.

10. **ADJUST** the following CCW flows to the 3A RCP are required:

- **ADJUST** 3-728A, ISO VLV FOR CCW RTN FROM THRML BARRIER COOLING COIL A, to maintain FI-3-630 between 21 to 28 gpm.
- **ADJUST** 3-723A, ISO VLV FOR CCW FROM LOWER BEARING OIL COOLING COIL A, to maintain FI-3-628 between 5 and 10 gpm.
- **ADJUST** 3-724A, ISO VLV FOR CCW FROM UPPER BEARING OIL COOLING COIL A, to maintain FI-3-629 between 155 and 170 gpm for Normal Operations OR between 138 and 145 gpm with RHR in service.

4.1.1 Starting 3A Reactor Coolant Pump (continued)

NOTE

DCS indications should be verified in addition to local indications to avoid future additional containment entries to comply with 3-GOP-301, Hot Standby to Power Operations Prerequisites.

11. WHEN CCW flows have been adjusted to all three RCPs, THEN ensure the following CCW flows to RCPs are within their specified range.
    A. FI-3-626, RCP Thermal Barrier Flow 63 - 84 gpm.
    B. FI-3-677, RCP Bearing CCW Flow 465 - 510 gpm for Normal Operations OR 414 - 435 gpm with RHR in service.

N/A 12. IF RCS cold leg temperature is less than or equal to 275°F AND **NO** RCPs are RUNNING, THEN **CHECK** Steam Generator secondary water temperature less than 10°F above RCS temperature in 3A, 3B, and 3C Steam Generators using Section 5.5.

NOTE

RCS pressure range is 325 to 350 psig for solid plant condition.

13. **ENSURE** RCS pressure is greater than or equal to 325 psig
14. **ENSURE** 3A RCP CBO isolation valve CV-3-303A is OPEN
15. **CHECK** 3A RCP CBO flow, as indicated on FR-3-154A, within limits shown in Attachment 3, Control Bleed Off (CBO) Normal Operating Range.
16. On DCS, **CHECK** each seal stage dP is approximately 1/3 of the total seal dP.
17. On DCS, **DETERMINE** if dP across each seal stage is greater than 40.5 psid
    N/A A. IF any seal stage dP is less than or equal to 40.5 psid, THEN **CONSULT** Engineering prior to continuing.

4.1.1 Starting 3A Reactor Coolant Pump (continued)

CAUTION

- 3A RCP Oil Lift Pump operation should be limited to 15 minutes during normal RCP starting evolutions. Exception may be taken during off-normal operation or troubleshooting.
- Prolonged operation of 3A RCP Oil Lift Pump may cause air entrainment in the oil resulting in the inability to achieve RCP prestart oil pressure.

18. **START** 3A RCP Oil Lift Pump as follows:

A. **START** 3A RCP Oil Lift Pump.

B. WHEN 3A RCP Oil Lift Pump has operated for at least 2 minutes AND prior to starting 3A RCP, THEN **CHECK** white permissive light ON.

NOTE

- All associated RCP instrumentation (i.e., CBO Flow, Seal Stage Differential Pressures) should be available and indicating properly for current plant conditions.
- If the RCS is **NOT** vented, 3A RCP should only be operated for as long as directed by 3-OP-041.8, Filling and Venting the Reactor Coolant System.

4.1.1 Starting 3A Reactor Coolant Pump (continued)

CAUTION

- When 3A RCP started with the Overpressure Mitigating System (OMS) is in Low Pressure Operation, RCS pressure should be closely monitored using highest indicating channel. RCS Loops without a RCP running have highest indicated pressure. There is only a 90 psig margin between the RCS operating pressure range of 325 to 350 psig and the PORV lift setpoint of 440 psig.
- RCS pressure should be monitored during RCP starts at low pressures. 3A RCP should be stopped if RCS pressure decreases to less than 240 psig
- 3A RCP Seal Stage Differential Pressures should be monitored during RCP starts at low pressure.
- RCP Seal Stage Differential pressure will drop on pump start in response to the RCS pressure transient.
- RCP seal injection flow indication may decrease on pump start and recover as the pump reaches operating speed. It will be necessary to balance seal injection flow once all three pumps are in operation. Seal inject flow should be adjusted to the high end of the band prior to pump start.
- Seal pressure instrument accuracies may be limited at low RCS pressure.
- Operation of the RCP(s) below 400 psig may result in indicated seal pressure breakdown of less than or equal to 40.5 psid.
- Operation of the seal with less than or equal to 40.5 psid will require additional monitoring to ensure the seal is **NOT** degraded.
- A decreasing seal differential pressure with **NO** decrease in RCS pressure may indicate seal degradation is occurring.
- On initial pump start, seal delta p trip criteria should be applied after the RCP is at steady operating conditions.
- Starting 3A RCP causes a voltage transient that could be enough to adversely affect Containment Air Gaseous/Particulate Monitors, R11/R12, sample skid operation.

19. **START** 3A RCP while monitoring both of the following:
    - Starting current as indicated on 3A RCP motor ammeter
    - RCS loop flow rate rise as indicated on FI-3-414, 415, or 416, A LOOP RCS FLOW

4.1.1 Starting 3A Reactor Coolant Pump (continued)

NOTE

Motor current will normally be 637 amps and shall be maintained less than 943 amps, except for starting current.

20. IF RCP starting current is greater than 943 amps after 25 seconds, THEN **STOP** 3A RCP.

21. WHEN 3A RCP has operated for at least 1 minute, THEN **STOP** 3A RCP Oil Lift Pump.

22. IF 3A RCPCBO flow, as indicated on FR-3-154A, is **NOT** within limits of Attachment 3, Control Bleed Off (CBO) Normal Operating Range, within 3 minutes of starting 3A RCP, THEN **STOP** 3A RCP.

23. IF indication on R11/R12 sample skid does **NOT** return, THEN **REQUEST** I&C start sample pumps in MANUAL MODE locally at skid.

24. **ENSURE** VCT pressure is controlled to maintain <u>one</u> of the following:

- In the normal range of 16 and 25 psig
- As required to maintain RCP seal leak-off and as specified by Chemistry

4.1.1 Starting 3A Reactor Coolant Pump (continued)

NOTE

Alternate RCS pressure indications may be used to evaluate the health of the seal.

25. IF the seal DP is less than or equal to 40.5 psid after 5 minutes of pump operation, THEN **PERFORM** the following:

A. **CONTACT** Engineering to evaluate the seal performance.

B. IF seal stage differential pressure decreases to less than 25 psid indicated, THEN **SECURE** the affected RCP(s).

(1) **DETERMINE** seal stage differential pressure as follows:

a. Seal one DP is the lowest RCS wide range pressure (P403, P404, P405, or P406) minus lower seal cavity pressure (P2)

b. Seal two DP is P2 lower seal cavity pressure minus middle seal cavity pressure P3

c. Seal three DP is middle seal cavity pressure minus VCT pressure (P-3-117)

4.1.1 Starting 3A Reactor Coolant Pump (continued)

26. WHEN 3A RCP has operated for more than 10 minutes, THEN **CHECK** conditions on DCS stabilized less than maximum values listed below:

> **NOTE**
>
> Stator Winding maximum temperature may be exceeded during RCP cold operation (i.e., first start attempt).

Table 1
RCP Startup Temperature Ranges

PARAMETER	MAX °F	NORM °F	STABLE	
			YES	NO
CBO	195	145-160		
Pump Bearing	225	160		
Upper Thrust Bearing	190	150		
Lower Thrust Bearing	190	150		
Upper Guide Bearing	190	150		
Lower Guide Bearing	190	125		
Stator Winding	248	200		

A. **CHECK** seal water injection flow on FI-3-130 between 6 and 13 gpm.

> **NOTE**
>
> RCP Vibration indicated on Recorder 369 and on DCS.

B. **CHECK** RCP shaft vibration less than 15 mils.

C. **CHECK** RCP motor vibration less than 4 mils.

D. **CHECK** RCP seal parameters listed below to be consistent with the current plant conditions.

4.1.1 Starting 3A Reactor Coolant Pump (continued)

26. D. (continued)

> **NOTE**
> Table 2 provides expected normal values for the listed parameters. The table should be referenced during mode changes to ensure proper operation of the RCP seals

Table 2
RCP Parameter Expected Normal Values

Item	Parameter	Full RCS pressure Normal Value	Hi/low alarms	RCP trip conditions	Low Pressure Conditions	Low Pressure RCP Trip condition
CBO	Flow	2.5 gpm	Hi Hi 3.0 gpm Hi 3.0 gpm* Lo 0.7 gpm*	4.1 gpm	As low as 0.5 gpm at 100 psid across seal. See Attachment 3	
	Temperature	145-160 deg	Hi Hi 195 deg Hi 195 deg*	260 deg		
Upper Stage #3 seal Pressure P3	Leakoff (to RCDT)	< 0.1 gpm	N/A		N/A	
	DP	745 psid	Hi 1117.5 psid* Lo372.5 psid*	2000 psid	Should be approx. 1/3 of total dP	< 25 psid
	Inlet pressure	745 psig	Hi Hi 975 psig Hi 925 psig* Lo 85 psig*		Should be approx. 1/3 of RCS pressure	
Middle Stage #2 seal Pressure P2	DP	745 psid	Hi 1117.5 psid* Lo372.5 psid*	2000 psid	Should be approx. 1/3 of total dP	< 25 psid
	Inlet pressure	1490 psig	Hi Hi 1741 psig Hi 1700 psig* Lo 200 psig*		Should be approx. 2/3 of RCS pressure	
Lower Stage #1 seal Charging pump discharge pressure	DP	745 psid	Hi 1192 psid* Lo298 psid*	2000 psid	Should be approx. 1/3 of total dP	< 25 psid
	Inlet pressure	2250 psig	N/A		Should be approx. RCS pressure	

* Actuates AN A 7/5, RCP trouble alarm

End of Section 4.1.1

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-ONOP-041.1

<u>Title</u>:

Reactor Coolant Pump Off-Normal

(Continuous Use)

<u>Safety Related Procedure</u>	
Responsible Department:	Operations
Revision Number:	11
Revision Approval Date:	5/3/16

PCRs *10-0780, 1602141, 1606356, 1615797, 563431, 1690264, 1696572, 1979097, 1983200, 2095504, 2125361, 2128171*
ECs *89-123, 89-581, 92-010, 95-057, 95-170, 04-112, 270573, 280399*

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(Rev. 11)

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4	05/03/16	29	05/03/16
5	05/03/16	30	05/03/16
6	05/03/16	Foldout	05/03/16
7	05/03/16		
8	05/03/16		
9	05/03/16		
10	05/03/16		
11	05/03/16		
12	05/03/16		
13	05/03/16		
14	05/03/16		
15	05/03/16		
16	05/03/16		
17	05/03/16		
18	05/03/16		
19	05/03/16		
20	05/03/16		
21	05/03/16		
22	05/03/16		
23	05/03/16		
24	05/03/16		
25	05/03/16		

1.0 PURPOSE

1.1 This procedure provides instructions to protect the Reactor Coolant Pumps from damage under the following abnormal operating conditions:

1.1.1 Abnormal Seal injection flow

1.1.2 Abnormal controlled bleed off (CBO) flow

1.1.3 Thermal barrier rupture

1.1.4 Abnormal CCW cooling flow to thermal barrier

1.1.5 High Seal water supply temperature

1.1.6 High/low RCP oil reservoir level

1.1.7 Inadequate cooling to RCP components

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 High RCP shaft or motor vibrations

2.2 High RCP component temperatures

2.3 High Seal injection temperature

2.4 No or low indicated RCP Seal injection flow locally or on DCS

2.5 High or low CBO flow

2.6 High CBO Temperature

2.7 High or low P2 or P3 pressures

2.8 Abnormal Seal Stage differential pressures on DCS

2.9 Annunciators

2.9.1 A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW

2.9.2 A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP

2.9.3 A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW

2.9.4 A 1/5, RCP CBO HI FLOW

2.9.5 A 1/6, RCP CBO HI TEMP

2.9.6 A 6/4, RCP P2 SEAL HI PRESS

2.9.7 A 6/5, RCP LABYRINTH SEAL LO ΔP

2.9.8 A 6/6, SEAL WATER INJ FILTER HI ΔP

2.9.9 A 7/4, RCP P3 SEAL HI PRESSURE

2.9.10 A 7/5, RCP TROUBLE

2.9.11 B 2/4, RCP A OIL RESERVOIR HI/LO LEVEL

2.9.12 B 2/5, RCP B OIL RESERVOIR HI/LO LEVEL

2.9.13 B 2/6, RCP C OIL RESERVOIR HI/LO LEVEL

2.9.14 F 1/1, RCP MOTOR/SHAFT HI VIB

2.9.15 H 9/1, RCP A MOTOR BEARING HI TEMP

2.9.16 H 9/2, RCP B MOTOR BEARING HI TEMP

2.9.17 H 9/3, RCP C MOTOR BEARING HI TEMP

2.9.18 H 9/4, RCP MOTOR BRG COOLING WATER HI TEMP

2.9.19 H 9/5, RCP MOTOR BRG COOLING WATER LO FLOW

2.9.20 H 9/6, RCP A/B/C PUMP/MOTOR HI TEMP

3.0 REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS

3.1 References

3.1.1 Technical Specifications

1. 3.4.1, Reactor Coolant Loops and Coolant Circulation
2. 3.6, Containment Systems

3.1.2 Procedures

1. 0-ADM-009, Containment Entries when Containment Integrity is Established
2. 0-ADM-115, Notification of Plant Events
3. 3-ARP-097.CR, Control Room Annunciator Response
4. 0-EPIP-20101, Duties of Emergency Coordinator
5. 3-GOP-100, Fast Load Reduction
6. 3-GOP-103, Power Operation to Hot Standby
7. 3-GOP-305, Hot Standby to Cold Shutdown
8. 3-NOP-030, Component Cooling Water System
9. 3-NOP-041.01A, 3A Reactor Coolant Pump Operations
10. 3-NOP-041.01B, 3B Reactor Coolant Pump Operations
11. 3-NOP-041.01C, 3C Reactor Coolant Pump Operations
12. 3-ONOP-030, Component Cooling Water Malfunction
13. 0-OP-046, CVCS – Boron Concentration Control
14. 3-OP-047, CVCS - Charging and Letdown
15. 3-OSP-041.1, Reactor Coolant System Leak Rate Calculation

3.1.3 Plant Changes and Modifications

1. PC/M 89-123, CCW Setpoint Changes
2. PC/M 89-581, Containment Isolation Features Design Basis Implementation (TS 3.6)
3. PC/M 92-010, Resetting of RCP Motors Lower Guide Bearing High Oil Temperatures Alarm Setpoint
4. PC/M 95-057, In Containment Primary Water Supply
5. PC/M 95-170, Thermal Power Uprate Setpoint/Scaling
6. PC/M 04-112, Emergency Response Data Acquisition and Display System (ERDADS) Replacement
7 EC 280399, Unit 3 RCP Seals Upgrade Project

3.1.4 Miscellaneous Documents (i.e., Correspondence, Vendor Manual)

1. Westinghouse Instruction Book 5710-73A, Controlled Leakage Seal Reactor Coolant Pump
2. JPN-PTN-SENS-92-044, Manual Override of MOV-*-626 During RCP Seal Failure
3. NSD-TB-93-01-RO, Revised Procedure for RCP Shutdown with No.1 Seal Leakage Outside Operating Limits
4. INPO SER 2-97, Reactor Coolant Pump Damage from a Separated Component
5 Flowserve Technical Manual

3.2 Records Required

3.2.1 None

3.3 Commitment Documents

3.3.1 JPES-PTP-87-1325, RCP ONOP-1108.3, (JPE Action Item List)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

C A U T I O N

Containment entries shall NOT be performed when there are indications of an RCP Seal package failure until the Reactor is shutdown, and RCS pressure/temperature is reduced to minimize leakage.

NOTES

- *Foldout Page is required to be monitored throughout this procedure.*
- *Off-normal RCP conditions that require shutdown of an RCP shall be verified by cross-checking all RCP parameters.*
- *If either 3B or 3C RCP is stopped by the performance of this procedure, then the associated RCS loop pressurizer spray valve should be closed to prevent backflow through the valve.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	**Check For Proper Seal Injection Flow**	Go to Step 11.
	• Thermal Barrier ΔP	
	• RCP 3A Thermal Barrier ΔP, PI-3-131A - GREATER THAN ZERO INCHES	
	• RCP 3B Thermal Barrier ΔP, PI-3-128A - GREATER THAN ZERO INCHES	
	• RCP 3C Thermal Barrier ΔP, PI-3-125A - GREATER THAN ZERO INCHES	
	• Seal Injection Flow	
	* DCS Seal Injection Flow Indication - GREATER THAN OR EQUAL TO 6 GPM ON ALL RCPs	
	* Local Seal Injection Flow Indication - GREATER THAN OR EQUAL TO 6 GPM ON ALL RCPs	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

ENCLOSURE 1 provides expected Controlled Bleed Off (CBO) flows for normal and off-normal conditions.

2	**Monitor CBO Flows**	
	a. Check RCS Pressure - GREATER THAN 2000 psig	a. Read NOTE prior to Step 4, and go to Step 4
	b. Check CBO flow - GREATER THAN 1.5 gpm	b. Go to Step 14

NOTE

A seal differential pressure of greater than 1490 psid is an indication that one seal stage has failed, and a second Seal Stage is degrading. RCP operation with only the #1 Seal or #2 Seal failed is acceptable.

3	**Monitor DCS To Determine RCP Seal Differential Pressures**	
	a. All RCPs – ALL stages less than 2000 psid	a. Go to Step 22
	b. All RCPs – ALL stages less than 1700 psid	b. Go to Step 24
	c. All RCPs – ALL stages less than 1490 psid	c. Go to Step 26
	d. Go to Step 5	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

A seal differential pressure of greater than 1/2 RCS pressure is an indication that one seal stage has failed, and a second seal stage is degrading.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	**<u>IF</u> RCS Pressure Is Less Than 2000 psig, <u>THEN</u> Monitor Differential Pressure Across All Seal Stages – LESS THAN HALF Of The Current RCS Pressure**	a. **<u>IF</u>** DP across any seal stage is greater than half of the current RCS pressure, **<u>THEN</u>** stop the affected RCP b. Close the affected RCP CBO isolation valves after the pumps have stopped: * CV-3-303A for RCP A * CV-3-303B for RCP B * CV-3-303C for RCP C c. Close the affected RCP PZR Spray Valve: * PCV-3-455A for RCP C * PCV-3-455B for RCP B
5	**Check Thermal Barriers Intact** • A 1/1 RCP THERMAL BARR COOLING WATER HI FLOW alarm - OFF • A 1/2 RCP THERMAL BARR COOLING WATER HI TEMP alarm - OFF • A 1/3 RCP THERMAL BARR COOLING WATER LO FLOW alarm - OFF	Go to Step 27.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	**Check For Proper Cooling To RCP Pump Bearing** • Check RCP pump bearing temperatures on DCS - LESS THAN 210°F • Check CBO temperature on DCS - LESS THAN 195°F	Observe CAUTION prior to Step 37, and go to Step 37.
7	**Check VCT Temperature, TI-3-116 - LESS THAN 160°F**	Go to Step 38.
8	**Check RCP OIL RESERVOIR HI/LO LEVEL Alarms - OFF** • B 2/4 for RCP A • B 2/5 for RCP B • B 2/6 for RCP C	Go to Step 41.
9	**Check For Proper RCP Motor Cooling** a. Verify the following alarms are OFF • H 9/1, RCP A MOTOR BEARING HI TEMP • H 9/2, RCP B MOTOR BEARING HI TEMP • H 9/3, RCP C MOTOR BEARING HI TEMP • H 9/4, RCP MOTOR BRG COOLING WATER HI TEMP • H 9/5, RCP MOTOR BRG COOLING WATER LO FLOW • H 9/6, RCP A/B/C PUMP/MOTOR HI TEMP b. Verify RCP motor bearing and stator temperatures on DCS – STABLE OR DECREASING	Go to Step 42.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

10 **Evaluate Plant Conditions And Continue Plant Operations**

a. Direct the Shift Manager to review

- 0-ADM-115, NOTIFICATION OF PLANT EVENTS, for applicability
- Applicable parts of Technical Specification 3.4.1 for compliance
- 0-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR, for applicability

b. Contact Engineering and continue monitoring pertinent Plant parameters affecting any RCP abnormalities addressed in this procedure.

c. **IF** one RCP Seal has failed **AND** a second RCP Seal is degraded **OR** has failed, **THEN** RCS cool down and depressurization is required. Shutdown to Mode 5, using 3-GOP-305, HOT STANDBY TO COLD SHUTDOWN.

d Go to appropriate Plant procedure as determined by the Shift Manager

11 **Check Proper Seal Injection Temperature**

Action/Expected Response	Response Not Obtained
a. Check all CBO temperatures on DCS - LESS THAN 160°F	a. Restore seal injection flow using ATTACHMENT 1 while continuing with procedure by observing NOTE prior to Step 13 and going to Step 13.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

C A U T I O N

Care must be exercised when throttling HCV-3-121 in the Closed direction. Throttling this valve completely Closed can cause the charging pump discharge relief valve to lift resulting in a possible loss of charging if the relief valve fails to reseat.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	**Check Proper Seal Injection Flow**	
	a. Verify at least one Charging pump - RUNNING	a. Start a Charging pump to establish seal injection.
	b. Check Annunciator A 6/6, SEAL WATER INJ FILTER HI ΔP - ALARM OFF	b. **IF** standby seal injection filter available for use, **THEN** place it In Service using 3-OP-047, CVCS - CHARGING AND LETDOWN
	c. Check seal injection flow between 6 and 13 gpm to each RCP	c. Perform the following: 1) Adjust Charging Flow to Regan Heat Exchanger, HCV-3-121, to establish seal injection flow of 6 to 13 gpm per RCP. 2) **IF** unable to establish 6 to 13 gpm using HCV-3-121, **THEN** locally Throttle Open affected RCP Seal injection throttle valves: * 3-297A for RCP A * 3-297B for RCP B * 3-297C for RCP C 3) **IF** Seal injection flow of 6 to 13 gpm to each RCP is established, **THEN** observe NOTE prior to Step 13, and go to Step 13. 4) **IF** unable to establish 6 to 13 gpm flow, **THEN** adjust Charging Flow to Regan Heat Exchanger, HCV-3-121, to provide proper charging flow. 5) Record time of loss seal injection: _________ 6) Notify Engineering of the loss of seal injection and request a monitoring plan be established 7) **WHEN** time since loss of seal injection equals 18 hours, **THEN** perform 3-GOP-103, POWER OPERATION TO HOT STANDBY, to shut down Unit 3, and stop the affected RCP within 24 hours. Return to Step 5.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

When Seal Injection is lost, increases in the CBO and lower pump guide bearing temperatures may be indicative of a loss of CCW cooling to the thermal barrier.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	**Maintain Thermal Barrier Cooling**	
	a. Monitor CBO and lower pump guide bearing temperatures	
	b. Maintain the following • RCP Thermal Barrier Return CCW Flow, FI-3-626 – GREATER THAN 75 gpm • CCW to RCP Oil Coolers and Thermal Barrier Temperature, TI-3-607B - LESS THAN 105°F	b. Go to step 27.
	c. Return to Step 2	
14	**Check CBO Flows On FR-3-154A**	
	a. Any RCP CBO flow – LESS THAN 1.5 gpm	a. Go to Step 21.
15	**Check RCP Upper Seal P3 Pressures – ALL RCPs GREATER THAN 700 psig**	a. Go to Step 17.
16	**Check RCP CBO Isolation Valves Open** • CV-3-303A for 3A RCP • CV-3-303B for 3B RCP • CV-3-303C for 3C RCP	a. Open any Closed CBO isolation valve, and return to Step 14. b. **IF** a CBO isolation valve is Closed **AND** can **NOT** be re-opened, **THEN** go to Step 22

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

17 **Check For Indications Of A Pressure Breakdown Device Blockage**

a. Check all of the following conditions exist on the same RCP

- RCP CBO flow – LESS THAN 1.5 gpm
- Any Seal Stage differential pressure – GREATER THAN 1300 psid
- RCDT level stable with no significant change in level trend

Response Not Obtained: Notify Engineering of low CBO flow, and Continue with Step 19.

18 **Go To Step 24**

NOTE

If any RCP #3 Seal has failed, CBO flow will reduce and may go to zero, Seal Leak Off flow will increase to the RCDT, and due to the limited flow capacity of the Seal Leak Off line, some flow may go out the top of the Seal Cartridge to Containment atmosphere and to the Containment Sump. The RCDT and the Containment Sump should be monitored when indications of a #3 Seal failure has occurred.

19 **Check For Indications Of A #3 Seal Failure**

a. Check if ALL of the following conditions exist on <u>any</u> RCP

- RCP CBO flow LESS THAN 0.5 gpm
- RCP CBO isolation valve Open
- P3 pressure LESS THAN 100 psig
- P2 pressure GREATER THAN 1000 psig

Response Not Obtained: a. Notify SM and Engineering of indications of a degrading #3 Seal.

b. Monitor RCDT level and Containment Sump level for increased leakage

Response Not Obtained:

b. Monitor the RCDT level and the Containment Sump level for potential increased leakage.

c. Return to Step 14.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	**Perform Step 24 To Commence Unit Shutdown Using 3-GOP-100, FAST LOAD REDUCTION While Continuing With Step 39**	
21	**Check Any RCP CBO Flow On FR-3-154A - GREATER THAN 4.1 gpm**	a. Go to Step 23.
22	**Perform The Following**	
	a. Manually Trip the Reactor, and perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION while continuing with this procedure	
	b. **<u>WHEN</u>** the Reactor verified Tripped, **<u>THEN</u>** stop the affected RCPs	
	c. Close affected RCP CBO valve after the pump has stopped * CV-3-303A for RCP A * CV-3-303B for RCP B * CV-3-303C for RCP C	
	d. Close affected RCP PZR Spray Valve: * PCV-3-455A for RCP C * PCV-3-455B for RCP B	
	e. Monitor RCDT level for indication of a #3 Seal failure.	
	f. Do **<u>NOT</u>** restart the affected RCP until the cause of the seal malfunction has been determined and corrected	
	g. Return to Step 10	
23	**Check Any RCP CBO Flow On FR-3-154A GREATER THAN 3.7 gpm And Increasing**	Go to Step 25.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	**Perform The Following** 1) Commence Unit shutdown using 3-GOP-100, FAST LOAD REDUCTION 2) **<u>WHEN</u>** the Reactor is Tripped, **<u>THEN</u>** stop affected RCPs 3) Close affected RCP CBO valve after the pump has stopped: * CV-3-303A for RCP A * CV-3-303B for RCP B * CV-3-303C for RCP C 4) Close affected RCP PZR Spray Valve: * PCV-3-455A for RCP C * PCV-3-455B for RCP B 5) Return to Step10	
25	**Check Any RCP CBO Flow On FR-3-154A - GREATER THAN 3.7 gpm**	Notify Engineering of seal degradation, and go to Step 3.
26	**Perform The Following** 1) Commence Unit shutdown using 3-GOP-103, POWER OPERATION TO HOT STANDBY 2) **<u>WHEN</u>** the Reactor is Tripped, **<u>THEN</u>** stop affected RCPs 3) Close affected RCP CBO valves after the pump has stopped * CV-3-303A for RCP A * CV-3-303B for RCP B * CV-3-303C for RCP C 4) Close affected RCP PZR Spray Valve * PCV-3-455A for RCP C * PCV-3-455B for RCP B 5) Go to Step 10	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	**Check Operability Of Thermal Barriers** • Containment phase B – **NOT** ACTUATED **AND** • RCP CBO temperature – LESS THAN 260°F	Perform the following: a. Ensure Reactor Trip, and perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure. b. **WHEN** Reactor verified Tripped, **THEN** stop the affected RCPs. c. Close affected RCP CBO isolation valves after the pumps have stopped: * CV-3-303A for RCP A * CV-3-303B for RCP B * CV-3-303C for RCP C d. Close affected RCP PZR Spray Valve: * PCV-3-455A for RCP C * PCV-3-455B for RCP B e. Follow actions of the EOP network, and do **NOT** attempt to restore cooling to the pump **OR** restart the pump prior to a status evaluation of the pumps being Tripped. f. Return to Step 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

C A U T I O N S

- ***MOV-3-626 may be de-energized Open to provide RCP cooling as long as a watch is stationed at 3B MCC to restore electric power to the valve upon receipt of a containment phase B signal or CCW System High Radiation alarm.***
- ***De-energizing MOV-3-626 in the Open position will place Unit 3 in action requirements of Technical Specifications 3.6.4.***

NOTE

Flashing of component cooling water in the RCP thermal barrier during a seal package failure may provide the same indications as a thermal barrier failure.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	**Check Operability Of Thermal Barriers**	
	a. CCW radiation level readings on R-3-17A and R-3-17B - NORMAL	a. Go to Step 36.
	b. RCP Seal Cooling Water Outlet, MOV-3-626 - CLOSED	b. Go to Step 33.
	c. RCP Seal injection has been maintained to all RCPs	c. Perform the following: 1) Open breaker 30638. 2) Locally Open MOV-3-626. 3) Station watch at 3B MCC to close breaker 30638 upon receipt of containment isolation phase B or CCW System high radiation levels. 4) Go to Step 29.
	d. Manually Open MOV-3-626 at VPB	d. Perform the following: 1) Open breaker 30638. 2) Locally Open MOV-3-626. 3) Station watch at 3B MCC to close breaker 30638 upon receipt of containment isolation phase B or CCW System high radiation levels.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29	**Check RCP Thermal Barrier Return Flow, FI-3-626 - GREATER THAN 75 gpm**	Perform the following: a. Start an additional CCW pump to increase flow. b. **<u>IF</u>** MOV-3-626 goes closed due to CCW pump start flow transient, **<u>THEN</u>** manually Re-Open MOV-3-626. c. Make containment entry, and adjust CCW flows to RCPs using 3-NOP-030, COMPONENT COOLING WATER SYSTEM.
30	**Check RCP Thermal Barrier Return Flow, FI-3-626 - LESS THAN 130 gpm**	Make containment entry using 0-ADM-009, CONTAINMENT ENTRIES WHEN CONTAINMENT INTEGRITY IS ESTABLISHED, to adjust CCW flows to RCPs using 3-NOP-030, COMPONENT COOLING WATER SYSTEM.
31	**Check RCP Thermal Barrier Return CCW Temperature, TIC-3-625 - LESS THAN 145°F**	Return to Step 6.
32	**Check CCW Supply To RCP Temperature, TI-3-675 - LESS THAN 105°F**	Go to 3-ONOP-030, COMPONENT COOLING WATER MALFUNCTION, to restore CCW System supply header temperature to normal.
33	**Verify Seal Injection Flows To Each RCP - 6 To 13 gpm** • FI-3-130 for RCP A • FI-3-127 for RCP B • FI-3-124 for RCP C	Adjust RCP Seal Injection Throttle Valve(s) to 6 to 13 gpm: • 3-297A for RCP A • 3-297B for RCP B • 3-297C for RCP C
34	**Make Containment Entry And Verify Proper CCW Flows To RCPs Using 3-NOP-030, COMPONENT COOLING WATER SYSTEM, While Continuing With This Procedure**	
35	**Return To Step 6**	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

C A U T I O N

If a thermal barrier has ruptured, the affected RCP is required to be shutdown within 24 hours.

36	**Isolate RCP Thermal Barriers From CCW System**	
	a. At VPB, manually Close RCP Thermal Barrier CCW Outlet, MOV-3-626	a. Perform the following: 1) Open breaker 30638. 2) Locally Close valve MOV-3-626. 3) **IF** MOV-3-626 can **NOT** be locally closed, **THEN** locally Close 3-736, Iso Vlv for CCW RTN from RCP Thermal Barrier Coolers.
	b. Record time of thermal barrier failure:________________________	
	c. Maintain affected RCP thermal barrier greater than 0 inches	c. Perform the following: 1) Manually Trip the Reactor, and perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure. 2) **WHEN** the Reactor is verified Tripped, **THEN** stop the affected RCPs. 3) Return to Step 6.
	d. Perform 3-GOP-103, POWER OPERATION TO HOT STANDBY, to shut down Unit 3, and stop affected RCP within 24 hours of time recorded in Step 31b	
	e. Continue shutdown to Mode 5, using 3-GOP-305, HOT STANDBY TO COLD SHUTDOWN	
	f. Return to Step 6	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

C A U T I O N

O-Ring seals will deteriorate rapidly as CBO temperature exceeds 260°F.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
37	**Establish Cooling To RCP Pump Bearings**	
	a. Adjust Seal injection flow to affected RCP(s) - 6 to 13 gpm * FI-3-130 for RCP A using valve 3-297A * FI-3-127 for RCP B using valve 3-297B * FI-3-124 for RCP C using valve 3-297C	
38	**Restore VCT Temperature To Normal**	
	a. Check RCS temperature – LESS THAN 400°F	a. Go to Step 38c.
	b. Check VCT temperature, TI-3-116 - GREATER THAN OR EQUAL TO 150°F	b. Return to Step 8.
	c. Check for adequate CCW flow to the Non-Regenerative Heat Exchanger and Seal Water Heat Exchanger using 3-NOP-030, COMPONENT COOLING WATER SYSTEM	c. Perform the following: 1) Increase CCW flow to the affected heat exchangers using 3-NOP-030, COMPONENT COOLING WATER SYSTEM, to cool down the VCT at rate less than 1°F per minute. 2) Return to Step 8.
	d. Use manual makeup and divert using 0-OP-046, CVCS-BORON CONCENTRATION CONTROL, to cool down VCT at rate less than 1°F per minute	
	e. Return to Step 8	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTES

- *RCP seal leakage is defined by Technical Specifications as controlled leakage and is NOT considered identified leakage.*
- *If any RCP #3 Seal has failed, CBO flow will reduce and may go to zero, Seal Leak Off flow will increase to the RCDT, and due to the limited flow capacity of the Seal Leak Off line, some flow may go out the top of the Seal Cartridge to Containment atmosphere and to the Containment Sump. The RCDT and the Containment Sump should be monitored when indications of a #3 Seal failure has occurred.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39	**Monitor RCDT Level To Verify RCDT Is Capable Of Handling The Increased Leakage** * RCDT level on DCS * RCDT level locally at the Waste Disposal/Boron Recovery Panel	**IF** the RCDT level can **NOT** be maintained by the RCDT pumps, **THEN** perform the following: a. Manually Trip Reactor, and perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure. b. Direct RCDT contents to the sump by opening CV-3-4674. c. Return to Step 8.
40	**Check RCS Leakage Rate Using 3-OSP-041.1, REACTOR COOLANT SYSTEM LEAK RATE CALCULATION - LESS THAN 30 gpm**	Perform the following: a. Cool down Unit using 3-GOP-305, HOT STANDBY TO COLD SHUTDOWN. b. Review 0-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR, for applicability. c. Return to Step 8.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

41 **Verify RCP Oil System - INTACT**

a. Initially monitor and plot the following parameters of affected RCP(s) on ATTACHMENT 2 every 15 minutes

- Thrust Bearing Upper Shoe temperature
- Thrust Bearing Lower Shoe temperature
- Upper Guide Bearing temperature
- Lower Guide Bearing temperature

b. Check that monitored RCP parameters have increased over the past 8 hours

Response Not Obtained:

b. Perform the following:

- **IF** one of the following two conditions have been met, **THEN** bearing temperature monitoring frequency may be reduced to once a shift:

  1) DCS alarm setpoint has been lowered for the affected bearing temperature,

  2) Actual oil level has been verified with a remote camera,

  OR

- **WHEN** directed by the SM or Plant Management, **THEN** subsequent bearing temperature monitoring frequency may be reduced, provided the frequency does **NOT** exceed once a shift.

c. Consult with Electrical Department and the AOM to determine appropriate corrective actions

d. Return to Step 9

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

42 **Verify Proper RCP Motor Cooling**

a. Verify CCW supply header temperature – LESS THAN 105°F

* TI-3-607A for A header
* TI-3-607B for B header

RESPONSE NOT OBTAINED: a. Perform 3-NOP-030, COMPONENT COOLING WATER SYSTEM, while continuing with this procedure.

b. Check normal containment cooler air outlet temperatures, R-3-1413 – STABLE OR DECREASING

RESPONSE NOT OBTAINED: b. Start standby normal containment coolers.

c. Monitor CCW flow from all RCP lube oil coolers on DCS

- Use RCP Detailed Data Summary screen

OR

- Use following screens for RCP Motor Details
  - RCP A Motor Details for FT629
  - RCP B Motor Details for FT632
  - RCP C Motor Details for FT635

RESPONSE NOT OBTAINED: c. Make containment entry using 0-ADM-009, CONTAINMENT ENTRIES WHEN CONTAINMENT INTEGRITY IS ESTABLISHED, to locally monitor CCW flows from RCP lube oil coolers:

- FI-3-629 and RCP A
- FI-3-632 and RCP B
- FI-3-635 and RCP C

d. Maintain CCW flow from RCP lube oil coolers – GREATER THAN 95 gpm

RESPONSE NOT OBTAINED: d. Refer to 3-ONOP-030, COMPONENT COOLING WATER MALFUNCTION, to restore motor bearing cooling water flow.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
43	**Check RCP Temperatures**	
	a. Maintain all RCP motor bearing temperatures - LESS THAN 195°F	a. Perform the following: 1) Manually Trip the Reactor, and perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure. 2) **<u>WHEN</u>** Reactor verified Tripped, **<u>THEN</u>** stop the affected RCP(s).
	b. Check RCP Motor Status • Any RCP stator temperature on DCS - GREATER THAN 210°F OR INCREASING **<u>OR</u>** • Any RCP motor bearing temperature on DCS - GREATER THAN 185°F OR INCREASING	b. Close affected RCP PZR Spray Valve: * PCV-3-455A for RCP C * PCV-3-455B for RCP B
	c. Verify 3A and 3B 4KV Bus voltages - BETWEEN 3740 AND 4580 VOLTS	c. Go to Step 10.
	d. Consult with System Engineer and Operations supervision to determine cause of high temperature(s) **<u>AND</u>** to determine if RCP operation should continue	d. Perform the following: 1) Manually Trip Reactor, and perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure. 2) **<u>WHEN</u>** the Reactor verified Tripped, **<u>THEN</u>** stop the affected RCP(s).

END OF TEXT

FOLDOUT PAGE FOR PROCEDURE 3-ONOP-041.1

1. **RCP STOPPING CRITERIA**

IF any of the following RCP limits are reached, **THEN** manually Trip the Reactor, and verify Reactor Trip using the EOP network, and then stop the affected RCP, and close PCV-3-455A, PZR Spray Valve Loop C, or PCV-3-455B, PZR Spray Valve Loop B, if applicable.

- RCP pump bearing temperature on DCS - GREATER THAN OR EQUAL TO **225°F.**
- RCP motor bearing temperature on DCS - GREATER THAN OR EQUAL TO **195°F.**
- RCP stator winding temperature on DCS - GREATER THAN OR EQUAL TO **248°F.** Note exception in Foldout Page Item 4.
- Motor frame vibration, R-3-369 (Points 1, 2, 5, 6, 9, 10) - GREATER THAN OR EQUAL TO **5 MILS**. Note exception in Foldout Page Item 4.
- RCP shaft vibration, R-3-369 (Points 3, 4, 7, 8, 11, 12) - GREATER THAN OR EQUAL TO **20 MILS**. Note exception in Foldout Page Item 4.

2. **RCP SEAL CRITERIA FOR STOPPING RCP**

IF any of the following RCP limits are reached, **THEN** manually Trip the Reactor, and verify the Reactor Tripped using the EOP network, and stop the affected RCP, Close the applicable RCP CBO Isolation Valve 303A, 303B, or 303C, and Close PCV-3-455A, PZR Spray Valve Loop C, or PCV-3-455B, PZR Spray Valve Loop B, if applicable.

- RCP CBO temperatures on DCS - GREATER THAN OR EQUAL TO **260°F**.
- RCP CBO flow exceeds **4.1 gpm**
- Any Seal Stage differential pressure exceeds **2000 psid AND** respective CBO Isolation valve (CV-3-303A, 303B or 303C) is Open

3. **FAST LOAD REDUCTION CRITERIA**

IF any of the following RCP limits are reached, **THEN** perform 3-GOP-100, Fast Load Reduction.

- RCP CBO Flow - GREATER THAN **3.7 gpm AND increasing**
- DP across any Seal Stage - GREATER THAN **1700 psid AND** respective CBO Isolation valve (CV-3-303A, 303B or 303C) is Open
- ALL of the following indications exist on the same RCP indicating a failed #3 Seal
  - RCP CBO Flow - LESS THAN **0.5 gpm**
  - RCP CBO isolation vale - OPEN
  - P3 pressure - LESS THAN **100 psig**
  - P2 pressure - GREATER THAN **1000 psig**

4. **EXCEEDING VIBRATION OR STATOR TEMPERATURE LIMITS**

- For the basis of obtaining data for startup, for balancing an RCP, or for shutdown operations; the Electrical Maintenance Supervisor or Component Engineering Supervisor may authorize continued RCP operations with vibration level or stator winding temperature above stopping criteria noted in Foldout Page Item 2. This authorization is required to be obtained prior to starting the RCP.

- When in EOP network, RCP stator winding temperature on DCS - GREATER THAN OR EQUAL TO 300°F.

5. **RCP VIBRATION ASSESSMENT CRITERIA**

IF motor frame vibration, R-3-369 (Points 1, 2, 5, 6, 9, 10), is greater than or equal to 3 mils, but less than 5 mils, **THEN** contact Engineering to evaluate the condition.

L-17-1 NRC Exam

JPM E

JPM TITLE: Shutdown of AFW Pumps from Spurious Actuation

JPM NUMBER: 01075004100 **REV.** 0-1

TASK NUMBER(S) / TASK TITLE(S): 01075004100
Stop Auxiliary Feedwater System from Control Room

K/A NUMBERS: 061 A2.05 **K/A VALUE:** RO 3.1 / SRO 3.4

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

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

EVALUATION LOCATION: In-Plant: ☐ Control Room: ☐

Simulator: ☒ Other: ☐

Lab: ☐

Time for Completion: 10 Minutes Time Critical: ☐ Yes ☒ No

Alternate Path [NRC]: ☐ Yes ☒ No
Alternate Path [INPO]: ☐ Yes ☒ No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/01/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/02/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☒	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

NONE

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
0-0	New JPM	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
0-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17

SIMULATOR SET-UP:

SIMULATOR SETUP INSTRUCTIONS:

______	1.	Reset to **IC 16** or saved IC.
______	2.	Place simulator in RUN.
______	3.	Ensure applicable portions of Simulator Operator Checklist are complete.
______	5.	N/A if using saved IC Open and execute NRC JPM E.lsn: • Trigger **AFW TRAIN A SPURIOUS ACTUATION**
______	6.	N/A if using saved IC Allow plant to stabilize. (Approximately 10 Minutes)
______	7.	Acknowledge alarms and place simulator in FREEZE.
______	8.	Save as temporary IC, if JPM will be repeated.
______	9.	When ready to begin, then place Simulator in RUN.

SIMULATOR MALFUNCTIONS:

- TFF5AFAS, *FF-IDA AFW TRAIN A SPURIOUS ACTUATION

SIMULATOR OVERRIDES:

- N/A

SIMULATOR REMOTE FUNCTIONS:

- N/A

Required Materials:	• HANDOUT 3-NOP-075
General References:	• 3-NOP-075, Auxiliary Feedwater System
Task Standards:	• Isolate Train 2 Steam Supply MOVs • Restore Train 2 FCVs to 135 GPM (135-140) and place in AUTO

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- Unit 3 is in MODE 1 at 75%
- The crew has experienced a Train A Auxiliary Feedwater spurious actuation

INITIATING CUES:

You have been directed to shutdown the Auxiliary Feedwater System in accordance with 3-NOP-075, Auxiliary Feedwater System, Section 4.3, Shutdown.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Y" below the performance step number. Only the actions formatted with bold print are required to meet the standard of the critical step. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required materials.**
Standard:	Obtain a copy of 3-NOP-075, Auxiliary Feedwater System, Section 4.3, Shutdown.
Evaluator Cue:	Provide examinee with a copy of HANDOUT 3-NOP-075
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Performance Step: **Critical _N_ (SEQ- 2)**	**3-NOP-075, Section 4.3** 1. **CHECK** the AFW System requires shutdown and restoration to its normal STANDBY mode. 2. **CHECK** the AFW System is NO longer required or auto start has been determined to have been inadvertent. 3. **DISPATCH** an operator to the AFW Pumps. 4. **MAINTAIN** communication between Control Room and local operator until all AFW Pumps have been reset for normal operations.
Standard:	Determines the AFW actuation to be spurious and ready for shutdown.
Booth Cue:	If called to be dispatched to AFW Pumps, confirm communication and inform that an Operator is already standing by. Acknowledge any future communications from local locations.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-3)**	**3-NOP-075, Section 4.3** 5. **REDUCE** feed flow on each of the following controllers to 0 gpm: • HIC-3-1401B, TRAIN 2 AFW FLOW TO 3A S/G (CV-3-2831) • HIC-3-1457B, TRAIN 2 AFW FLOW TO 3B S/G (CV-3-2832) • HIC-3-1458B, TRAIN 2 AFW FLOW TO 3C S/G (CV-3-2833)
Standard:	Sets HICs for Train 2 to 0 gpm.
Evaluator Note:	Uses thumbwheel or lever in MANUAL to reduce AFW flow.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_(SEQ-4)**	**3-NOP-075, Section 4.3** 6. IF MOV-3-1404, 3B STM SUPPLY TO AUX FEEDWATER PUMPS is **NOT** aligned to Train 1, THEN **CLOSE** MOV-3-1404.
Standard:	Recognizes MOV-3-1404 is aligned to Train 2 and **CLOSES** MOV-3-1404.
Booth Cue:	If called to confirm local indication, confirm MOV-3-1404 **CLOSED**.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_(SEQ-5)**	**3-NOP-075, Section 4.3** 7. **CLOSE** MOV-3-1403, 3A STM SUPPLY TO AUX FEEDWATER PUMPS.
Standard:	Recognizes MOV-3-1403 is already **CLOSED**.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_(SEQ-6)**	**3-NOP-075, Section 4.3** 8. **ENSURE** MOV-6459B, B AFW PUMP T&T VALVE is OPEN.
Standard:	Recognizes MOV-6459B is **OPEN**.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-7)**	**3-NOP-075, Section 4.3** 9. IF MOV-6459C, C AFW PUMP T&T VALVE is aligned to Train 2, THEN **ENSURE** MOV-6459C is OPEN.
Standard:	Recognizes MOV-6459C is aligned to Train 2 and is **OPEN**.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-8)**	**3-NOP-075, Section 4.3** **NOTE** In MODES 1, 2, 3, or 4, the Hand Indicating Controllers (HIC) for the Auxiliary Feedwater Regulating Valves are required to be energized and in AUTO mode of operation preset to 135 gpm. 10. **ADJUST** the following controllers setpoint to 135 gpm and **PLACE** controller in AUTO: • HIC-3-1401B, TRAIN 2 AFW FLOW TO 3A S/G • HIC-3-1457B, TRAIN 2 AFW FLOW TO 3B S/G • HIC-3-1458B, TRAIN 2 AFW FLOW TO 3C S/G
Standard:	Sets HICs for Train 2 to 135 gpm.
Evaluator Cue:	If Concurrent Verification requested, acknowledge request. Acceptable range is 135-140 gpm.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Terminating Cues:
Once Train 2 HICs are restored to 135 gpm, inform the examinee “Another operator will continue with the remaining steps of 3-NOP-075”

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ____________________ **Evaluator:** ____________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ____________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- Unit 3 is in MODE 1 at 75%
- The crew has experienced a Train A Auxiliary Feedwater spurious actuation

INITIATING CUES:

You have been directed to shutdown the Auxiliary Feedwater System in accordance with 3-NOP-075, Auxiliary Feedwater System, Section 4.3, Shutdown.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

CAUTION

Turkey Point
Nuclear Plant

REACTIVITY MANAGEMENT PROCEDURE

Performance of this procedure may affect core reactivity

FPL	# TURKEY POINT UNIT 3 ## NORMAL OPERATING PROCEDURE SAFETY RELATED **CONTINUOUS USE**	Procedure No. **3-NOP-075** Revision No. **14A**

Title:

AUXILIARY FEEDWATER SYSTEM

Responsible Department: OPERATIONS

Special Considerations:

Performance of this procedure may affect core reactivity.

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED TODAY INITIAL &

Revision	Approved By	Approval Date
0	Rich Wright	07/10/09
14A	David Houtz	09/28/16

UNIT #	UNIT 3
DATE	
DOCT	PROCEDURE
DOCN	3-NOP-075
SYS	
STATUS	COMPLETED
REV	14A
# OF PGS	

REVISION SUMMARY

Rev. No.	Description
14A	**PCR 2158406, 09/28/16, Mike Cabrera** Editorial: Correct 3B S/G to 3C S/G in Step 5.7.14, third bullet.
14	**PCR 2142575, 08/26/16 Michael Murphy** Removes Section 5.11, Auxiliary Feedwater Pump A Manual Operation with No High Pressure Feedwater Pumps Available.
13B	**PCR 2145464, 07/26/16, Mike Coen** Editorial - Special Instruction 16-003 reduced the administrative action from 30 days to 7 days for inoperable AFW steam supply MOV.
13A	**PCR 2043037, 06/20/16, Shaun Matthews** Lists sequential step numbers in Attachment 5 and Attachment 8 to preserve AFW train separation, reinforcing the existing NOTE.
13	**PCR 2120280, 05/05/16, Michael Murphy** Changes normal position of valves being restrained to support removal from the ICD list and monthly audit.
12	**PCR 2022906, 04/14/15, Terry White** Add new valve to Attachment 2 for “A” AFW FLEX connection per **EC 280631**.
11	**PCR 1941527, 02/13/15, Terry White** **EC 280631,** Added new valves for AFW FLEX connections.
10	**PCR 1974591, 09/15/14, Michael Hargis** Adds steps to ensure control rods are taken to manual prior to turbine load reductions and restored following completion of AFW operability tests.
9	**PCR 1984611, 08/29/14, Michael Hargis** Updates P&L with T.S. reference information regarding number of AFW MOVs required to meet Design Basis requirements.

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

SECTION PAGE

ATTACHMENTS (continued)

1.0 PURPOSE

This procedure provides instructions for the following:

- Aligning the Auxiliary Feedwater (AFW) System prior to a unit startup and removing various system components from service while maintaining dual train redundancy.
- Starting and operating the AFW Pumps including adjusting AFW flow.
- Shutting down AFW Pumps if required during the performance of EOPs and ONOPs to prevent pump damage.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Precautions

1. During AFW pump operation, inspection of each operating pump is required immediately after pump start, at 15-minute intervals during the first hour of operation, and at one-half hour intervals thereafter for the duration of pump operation.

2. Operating AFW pumps on recirculation for more than 60 minutes with cooling water from the pump discharge in service will cause the cooling water to become excessively hot from pump heat.

3. If the turbine sentinel valve lifts, personnel should evacuate the immediate area until the cause is determined.

4. The backup water supply to the AFW lube oil coolers is used only as directed by approved Maintenance procedures and **NOT** used during normal or off normal operating conditions.

5. Handwheels for the Feed Flow Control Valves CV-3-2816, CV-3-2817, CV-3-2818, CV-3-2831, CV-3-2832, and CV-3-2833 are required to be locked and sealed in the NEUTRAL position in accordance with Section 5.5.

6. Following maintenance that could introduce air into the flow element sensing lines, when AFW flow oscillations are approaching 20 gpm or as directed by the Unit Supervisor, venting the AFW flow transmitters during system operation is required using 3(4)-GMI-075.01, Venting AFW Flow Transmitters While the AFW System is Running.

2.2 Limitations

1. The Condensate Storage Tank Technical Specification minimum level is 210,000 gallons.

2. In order to provide at least 2 hours of automatic AFW flow control valve operation without N_2 bottle change out, three of the five AFW Backup N_2 bottles are required in service to the header per 3-NOP-075.02, AFW Backup Nitrogen System Alignment and Bottle Change Out.

3. Oscillation of AFW flow control indicators of up to 25 GPM, when the system is shutdown, is due to air coming out of solution. This does **NOT** affect the operability of the system.

4. During AFW pump shutdown, the following actions can prevent an overspeed trip of AFW pumps:

   A. Lowering AFW flow slowly.

   B. Lowering AFW pump speed on AFW Pump A to idle speed (3600 RPM) prior to shutdown.

5. Operation of the AFW steam supply valves upstream steam traps (ST-3(4)-1411, ST-3(4)-1412, and ST-3(4)-1413) is required to maintain AFW pump and system reliability.

6. Accumulation of a large amount of condensate upstream of the normally closed steam supply valves and improper operation of the steam trap could cause an AFW pump overspeed trip during pump start.

7. Because TS LCO 3.7.1.2 allows one of the three AFW steam admission valves to be inoperable for an indefinite period, Licensing has determined the allowance is inadequate to ensure safety. Therefore, the TS must be revised to establish an appropriate LCO and required action for one AFW steam admission valve out of service. As required by AL 98-10, the Operations Department instituted Special Instruction (SI) 16-003, AFW Steam Supply MOVs, on June 9, 2016. SI 16-003 establishes the administrative control to allow only 7 days for the inoperability of one of three AFW steam admission valves based on risk insights. This compensatory action will remain in place until TS 3.7.1.2 can be revised.

4.2 Operation

None

4.3 Shutdown

1. **CHECK** the AFW System requires shutdown and restoration to its normal STANDBY mode.

2. **CHECK** the AFW System is **NO** longer required or auto start has been determined to have been inadvertent.

3. **DISPATCH** an operator to the AFW Pumps.

4. **MAINTAIN** communication between Control Room and local operator until all AFW Pumps have been reset for normal operations.

5. **REDUCE** feed flow on each of the following controllers to 0 gpm:

   - HIC-3-1401B, TRAIN 2 AFW FLOW TO 3A S/G (CV-3-2831)
   - HIC-3-1457B, TRAIN 2 AFW FLOW TO 3B S/G (CV-3-2832)
   - HIC-3-1458B, TRAIN 2 AFW FLOW TO 3C S/G (CV-3-2833)

6. IF MOV-3-1404, 3B STM SUPPLY TO AUX FEEDWATER PUMPS is **NOT** aligned to Train 1, THEN **CLOSE** MOV-3-1404. ______

   ______ IV

7. **CLOSE** MOV-3-1403, 3A STM SUPPLY TO AUX FEEDWATER PUMPS. ______

   ______ IV

8. **ENSURE** MOV-6459B, B AFW PUMP T&T VALVE is OPEN. ______

   ______ IV

9. IF MOV-6459C, C AFW PUMP T&T VALVE is aligned to Train 2, THEN **ENSURE** MOV-6459C is OPEN. ______

   ______ IV

4.3 Shutdown (continued)

NOTE

In MODES 1, 2, 3, or 4, the Hand Indicating Controllers (HIC) for the Auxiliary Feedwater Regulating Valves are required to be energized and in AUTO mode of operation preset to 135 gpm.

Concurrent Verification

10. **ADJUST** the following controllers setpoint to 135 gpm and **PLACE** controller in AUTO:

- HIC-3-1401B, TRAIN 2 AFW FLOW TO 3A S/G ______

  ______ CV
- HIC-3-1457B, TRAIN 2 AFW FLOW TO 3B S/G ______

  ______ CV
- HIC-3-1458B, TRAIN 2 AFW FLOW TO 3C S/G ______

  ______ CV

11. **REDUCE** feed flow on each of the following controllers to 0 gpm:

- HIC-3-1401A, TRAIN 1 AFW FLOW TO 3A S/G (CV-3-2816)
- HIC-3-1457A, TRAIN 1 AFW FLOW TO 3B S/G (CV-3-2817)
- HIC-3-1458A, TRAIN 1 AFW FLOW TO 3C S/G (CV-3-2818)

12. **CLOSE** MOV-3-1405, 3C STM SUPPLY TO AUX FEEDWATER PUMPS. ______

    ______ IV

4.3 Shutdown (continued)

13. IF MOV-3-1404, 3B STM SUPPLY TO AUX FEEDWATER PUMPS is aligned to Train 1, THEN **CLOSE** MOV-3-1404. _______

_______ IV

14. **ENSURE** MOV-6459A, A AFW PUMP T&T VALVE is OPEN. _______

_______ IV

15. IF MOV-6459C, C AFW PUMP T&T VALVE is aligned to Train 1, THEN **ENSURE** MOV-6459C is OPEN. _______

_______ IV

> **NOTE**
>
> In MODES 1, 2, 3, or 4, the Hand Indicating Controllers (HIC) for the Auxiliary Feedwater Regulating Valves are required to be energized and in AUTO mode of operation preset to 135 gpm.

Concurrent Verification

16. **ADJUST** the following controllers setpoint to 135 gpm and **PLACE** controller in AUTO:

- HIC-3-1401A, TRAIN 1 AFW FLOW TO 3A S/G (CV-3-2816) _______

  _______ CV

- HIC-3-1457A, TRAIN 1 AFW FLOW TO 3B S/G (CV-3-2817) _______

  _______ CV

- HIC-3-1458A, TRAIN 1 AFW FLOW TO 3C S/G (CV-3-2818) _______

  _______ CV

4.3 Shutdown (continued)

CAUTION

To ensure the DCS Calorimetric Program does **NOT** indicate a non conservative power value during AFW operation, manual configuration of the data input is required with AFW flow above a nominal flow of 25 gpm at power.

17. IF AFW flow rate is being compensated for in the DCS calorimetric program, THEN **REMOVE** the compensation as follows:

A. **ENSURE** DCS workstation is in SUPERVISOR ENVIRONMENT.

B. **SELECT** <POWER> on DCS screen.

C. **SELECT** <INCLUDE AUXILIARY FEEDWATER FLOW> on Power Menu display.

D. **PERFORM** the following to remove AFW flow rates from the calorimetric program on the popup display:

(1) **SELECT** <REMOVE> for AFW Mass Flow Loop A and **CHECK** that Included Status changes to NO.

(2) **SELECT** <REMOVE> for AFW Mass Flow Loop B and **CHECK** that Included Status changes to NO.

(3) **SELECT** <REMOVE> for AFW Mass Flow Loop C and **CHECK** that Included Status changes to NO.

E. **SELECT** <CLOSE OVERLAY>.

NOTE

AFW pump rotating indicates that applicable steam supply MOV is leaking by.

18. Locally **CHECK** AFW Pumps have stopped rotating.

L-17-1 NRC Exam

JPM F

JPM TITLE:	Automatic Phase B Actuation Failure
JPM NUMBER:	01063001500 **REV.** 0-1
TASK NUMBER(S) / TASK TITLE(S):	01063001500 Manually Initiate Safety Injection
K/A NUMBERS:	APE 069 AA2.02 **K/A VALUE:** RO 3.9 / SRO 4.4

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

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

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

Time for Completion: 10 Minutes Time Critical: ☐ Yes ☒ No

Alternate Path [NRC]: ☐ Yes ☒ No
Alternate Path [INPO]: ☐ Yes ☒ No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/01/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/02/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☒	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

NONE

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
0-0	New JPM	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
0-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17

SIMULATOR SET-UP:

SIMULATOR SETUP INSTRUCTIONS:

NOTE: Do **NOT** snap IC. Run lesson each time to ensure trend available.

______	1.	Reset to **IC 1** or saved IC.
______	2.	Place simulator in RUN.
______	3.	Ensure applicable portions of Simulator Operator Checklist are complete.
______	4.	Open and execute NRC JPM F.lsn: • Trigger **SETUP – PH B FAILS TO AUTO ACTUATE** • Trigger **B SG FAULT I/S CTMNT**
______	5.	Allow plant to stabilize. (Approximately 2 minutes)
______	6.	Acknowledge alarms and place simulator in FREEZE until student is ready to begin.
______	7.	Save as temporary IC, if JPM will be repeated.
______	8.	When ready to begin, then place Simulator in RUN.

SIMULATOR MALFUNCTIONS:

- TFL3B11, L3-CIB11 CIB CIRC.2 FAILS TO ACTUATE
- TFL3B1, L3-CIB1 CIB CIRC.1 FAILS TO ACTUATE
- TVSBVL14, *SB-LV014 LEAK TO CTMT FROM S/G B NORM
  - o Demanded Value: 1.0

SIMULATOR OVERRIDES:

- N/A

SIMULATOR REMOTE FUNCTIONS:

- N/A

Required Materials:	• HANDOUT 3-EOP-E-0
General References:	• 3-EOP-E-0, Reactor Trip or Safety Injection
Task Standards:	• Verify Feedwater Isolation • Manually isolate Phase B valves • Stop all RCPs

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- Unit 3 has experienced a Steam Generator Fault inside containment.
- The crew has entered 3-EOP-E-0, Reactor Trip or Safety Injection

INITIATING CUES:

You have been directed to perform the Prompt Action Verifications in accordance with 3-EOP-E-0, Reactor Trip or Safety Injection, Attachment 3.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: __________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Y" below the performance step number. Only the actions formatted with bold print are required to meet the standard of the critical step. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required materials.**
Standard:	Obtain a copy of 3-EOP-E-0, Reactor Trip or Safety Injection, Attachment 3, Prompt Action Verification.
Evaluator Cue:	Provide copy of HANDOUT 3-EOP-E-0
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Performance Step: **Critical _N_ (SEQ- 2)**	**Attachment 3** 1. Check Load Centers Associated With Energized 4 KV Buses – ENERGIZED • 3A LC • 3B LC • 3C LC • 3D LC • 3H LC
Standard:	Recognizes Load Centers are **ENERGIZED**.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-3)**	**Attachment 3** **2. Verify Feedwater Isolation** a. Place Main Feedwater Pump switches in STOP b. Feedwater Control valves – CLOSED • FCV-3-478 • FCV-3-488 • FCV-3-498 c. Feedwater Bypass valves – CLOSED • FCV-3-479 • FCV-3-489 • FCV-3-499 d. Feedwater Bypass Isolation valves – CLOSED: • POV-3-477 • POV-3-487 • POV-3-497
Standard:	Places Main Feedwater Pump switches in **STOP** and recognizes Feedwater Isolation has occurred.
Booth Cue:	If asked for status of Standby Feed Pumps, confirm that Standby Feed Pumps are **OFF**.
Performance:	**SATISFACTORY** ______ **UNSATISFACTORY** ______
Comments:	

Performance Step: **Critical N (SEQ-3)** **(Continued)**	**Attachment 3** **2. (continued)** **e.** Feedwater Isolation MOVs – CLOSED • MOV-3-1407 • MOV-3-1408 • MOV-3-1409 **f.** Verify Standby Feedwater Pumps – OFF
Standard:	Places Main Feedwater Pump switches in **STOP** and recognizes Feedwater Isolation has occurred.
Booth Cue:	If asked for status of Standby Feed Pumps, confirm that Standby Feed Pumps are **OFF**.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical N (SEQ-4)**	**Attachment 3** **3. Check If Main Steam Lines Should Be Isolated** **a.** Check Main Steamline Isolation and Bypass valves – ANY OPEN — **a.** Go to Attachment 3, Step 4.
Standard:	Recognizes Main Steam Lines already isolated.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-5)**	**Attachment 3** 4. Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT
Standard:	Recognizes Containment Isolation Phase A Valve White Lights On VPB are **ALL BRIGHT**.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-6)**	**Attachment 3** **5. Verify Pump Operation** a. At least two High-Head SI Pumps – RUNNING b. Both RHR Pumps – RUNNING
Standard:	Recognizes all 4 HHSI Pumps and both RHR Pumps are running.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical N (SEQ-7)**	**Attachment 3** **6. Verify Proper CCW System Operation** a. CCW Heat Exchangers – THREE IN SERVICE b. CCW Pumps – ONLY TWO RUNNING c. CCW Headers – TIED TOGETHER d. MOV-3-626, RCP Thermal Barrier CCW Outlet – OPEN
Standard:	Recognizes proper CCW System operation.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-8)**	**Attachment 3** **7. Verify Proper ICW System Operation** a. Verify ICW Pumps – AT LEAST TWO RUNNING b. Verify ICW To TPCW Heat Exchanger – ISOLATED: • POV-3-4882 – CLOSED • POV-3-4883 – CLOSED c. Check ICW Headers – TIED TOGETHER
Standard:	Recognizes proper ICW System operation.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-9)**	**Attachment 3** **8. Verify Containment Cooling** a. Check Emergency Containment Coolers – ONLY TWO RUNNING
Standard:	Recognizes ONLY two Emergency Containment Coolers running.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_(SEQ-10)**	**Attachment 3** **9. Verify Containment Ventilation Isolation** a. Unit 3 Containment Purge Exhaust And Supply Fans – OFF
Standard:	Recognizes Unit 3 Containment Purge Exhaust and Supply Fans **OFF**.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_(SEQ-11)**	**Attachment 3** **10. Verify Containment Spray NOT Required** a. Containment pressure – HAS REMAINED LESS THAN 20 PSIG: • PR-3-6306A • PR-3-6306B
Standard:	Recognizes Containment Pressure has **NOT** remained less than 20 psig.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical N (SEQ-12)**	**Attachment 3, Step 10.a.RNO** **1)** IF Containment Spray **NOT** initiated, THEN manually initiate Containment Spray.
Standard:	Recognizes Containment Spray is initiated.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical N (SEQ-13)**	**Attachment 3, Step 10.a.RNO** **2)** Verify Containment Isolation Phase B has actuated.
Standard:	Recognizes Containment Isolation Phase B has **NOT** actuated and depresses Phase B Containment Isolation pushbuttons.
Evaluator Note:	With Phase B failure, pushbuttons will **NOT** work.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical N (SEQ-14)**	**Attachment 3, Step 10.a.RNO** **3)** Verify Containment Isolation Phase B Valve white lights on VPB are all bright.
Standard:	Recognizes Containment Isolation Phase B Valve white lights on VPB are NOT all bright.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-15)**	**Attachment 3, Step 10.a.RNO** 4) IF any Containment Isolation Phase B Valve did **NOT** close, THEN manually or locally isolate affected Containment Penetration.
Standard:	Closed the following valves: • MOV-3-626 • MOV-3-730 • MOV-3-716B
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Performance Step: **Critical _Y_ (SEQ-16)**	**Attachment 3, Step 10.a.RNO** 5) Stop all RCPs.
Standard:	Stops all RCPs.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Terminating Cues:
Once all RCPs are stopped, inform the examinee “Another operator will continue with the remaining steps of Attachment 3”

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- Unit 3 has experienced a Steam Generator Fault inside containment.
- The crew has entered 3-EOP-E-0, Reactor Trip or Safety Injection

INITIATING CUES:

You have been directed to perform the Prompt Action Verifications in accordance with 3-EOP-E-0, Reactor Trip or Safety Injection, Attachment 3.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

ATTACHMENT 3
<u>Prompt Action Verifications</u>
(Page 1 of 11)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	**Check Load Centers Associated With Energized 4 KV Buses – ENERGIZED** • 3A LC • 3B LC • 3C LC • 3D LC • 3H LC	Close the load center supply breakers.
2.	**Verify Feedwater Isolation**	
	a. Place Main Feedwater Pump switches in STOP	
	b. Feedwater Control valves – CLOSED • FCV-3-478 • FCV-3-488 • FCV-3-498	**b.** Manually close valves.
	c. Feedwater Bypass valves – CLOSED • FCV-3-479 • FCV-3-489 • FCV-3-499	**c.** Manually close valves.
	d. Feedwater Bypass Isolation valves – CLOSED: • POV-3-477 • POV-3-487 • POV-3-497	**d.** Locally close valves by turning manual override located below solenoid clockwise to the stop: (3 o'clock) • SV-3-477 • SV-3-487 • SV-3-497

ATTACHMENT 3
Prompt Action Verifications
(Page 2 of 11)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2.	**(continued)**	
	e. Feedwater Isolation MOVs – CLOSED • MOV-3-1407 • MOV-3-1408 • MOV-3-1409	**e.** Locally close valves.
	f. Verify Standby Feedwater Pumps – OFF	**f.** IF Standby Feedwater aligned to Unit 3, THEN stop Standby Feedwater pump(s).
3.	**Check If Main Steam Lines Should Be Isolated**	
	a. Check Main Steamline Isolation and Bypass valves – ANY OPEN	**a.** Go to Attachment 3, Step 4.
	b. Check if either Main Steam Isolation Signal has actuated: * High Steam Flow with either Low S/G Pressure 614 psig OR Low T_{AVE} 543°F OR * Hi-Hi Containment Pressure 20 psig	**b.** Go to Attachment 3, Step 4.
	c. Verify Main Steam Isolation and Bypass valves – CLOSED	**c.** Push Main Steamline Isolation pushbuttons on VPB or manually close valves.

ATTACHMENT 3
Prompt Action Verifications
(Page 3 of 11)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.	**Verify Containment Isolation Phase A Valve White Lights On VPB – <u>ALL</u> BRIGHT**	Perform the following: **a.** Manually actuate Containment Isolation Phase A. **b.** <u>IF</u> <u>any</u> Containment Isolation Phase A valve is **NOT** closed, <u>THEN</u> manually close valve. <u>IF</u> valve(s) can **NOT** be manually closed, <u>THEN</u> manually or locally isolate affected Containment penetration. **c.** <u>IF</u> <u>any</u> Containment Purge Valve can **NOT** be manually closed, <u>THEN</u> behind VPB, pull fuse for <u>any</u> open valve(s): * XEP for POV-3-2600 * XLAG for POV-3-2601 * XEQ for POV-3-2602 * XLAH for POV-3-2603
5.	**Verify Pump Operation**	
	a. At least <u>two</u> High-Head SI Pumps – RUNNING	**a.** Manually start High-Head Pump(s).
	b. <u>Both</u> RHR Pumps – RUNNING	**b.** Manually start RHR Pump(s).

ATTACHMENT 3
Prompt Action Verifications
(Page 4 of 11)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	**Verify Proper CCW System Operation**	
	a. CCW Heat Exchangers – THREE IN SERVICE	**a.** Perform the following: **1)** Start or stop CCW Pumps as necessary to establish only one running CCW Pump. **2)** Verify only two running Emergency Containment Coolers. **3)** Go to Attachment 3, Step 6.c.
	b. CCW Pumps – ONLY TWO RUNNING	**b.** Start or stop CCW Pumps as necessary to establish only two running CCW Pumps.
	c. CCW Headers – TIED TOGETHER	**c.** IF both CCW Headers are intact, THEN direct a field operator to tie the headers together.
	d. MOV-3-626, RCP Thermal Barrier CCW Outlet – OPEN	**d.** IF all the following conditions exist: • Containment Isolation Phase B **NOT** actuated • CCW radiation levels are normal • RCP CBO temperature is less than 260°F THEN manually open MOV-3-626. IF MOV-3-626 can **NOT** be manually opened, THEN direct operator to open MOV-3-626 locally.

ATTACHMENT 3
Prompt Action Verifications
(Page 5 of 11)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.	**Verify Proper ICW System Operation**	
	a. Verify ICW Pumps – AT LEAST TWO RUNNING	**a.** Start ICW Pump(s) to establish at least two running.
	b. Verify ICW To TPCW Heat Exchanger – ISOLATED: • POV-3-4882 – CLOSED • POV-3-4883 – CLOSED	**b.** Manually close valve(s). IF valve(s) can **NOT** be closed, THEN locally close the following valves: * 3-50-319 for POV-3-4882 * 3-50-339 for POV-3-4883
	c. Check ICW Headers – TIED TOGETHER	**c.** IF both ICW headers are intact, THEN direct operator to tie headers together.
8.	**Verify Containment Cooling**	
	a. Check Emergency Containment Coolers – ONLY TWO RUNNING	**a.** Manually start or stop Emergency Containment Coolers to establish only two running.
9.	**Verify Containment Ventilation Isolation**	
	a. Unit 3 Containment Purge Exhaust And Supply Fans – OFF	**a.** Manually stop fans.

ATTACHMENT 3
<u>Prompt Action Verifications</u>
(Page 6 of 11)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
➔ 10.	**Verify Containment Spray NOT Required**	
	a. Containment pressure – HAS REMAINED LESS THAN 20 PSIG: • PR-3-6306A • PR-3-6306B	**a.** Perform the following: **1)** <u>IF</u> Containment Spray **NOT** initiated, <u>THEN</u> manually initiate Containment Spray. **2)** Verify Containment Isolation Phase B has actuated. **3)** Verify Containment Isolation Phase B Valve white lights on VPB are <u>all</u> bright. **4)** <u>IF</u> <u>any</u> Containment Isolation Phase B Valve did **NOT** close, <u>THEN</u> manually or locally isolate affected Containment Penetration. **5)** Stop <u>all</u> RCPs.
11.	**Verify SI – RESET**	Reset SI.
12.	**Verify SI Valve Amber Lights On VPB – <u>ALL</u> BRIGHT**	Manually align valves to establish proper SI alignment for an injection flowpath.

ATTACHMENT 3
Prompt Action Verifications
(Page 7 of 11)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13.	**Verify SI Flow**	
	a. RCS pressure – LESS THAN 1625 PSIG[1950 PSIG]	**a.** Go to Attachment 3, Step 14.
	b. High-Head SI Pump flow indicator – CHECK FOR FLOW	**b.** Manually start pumps and align valves to establish an injection flowpath.
	c. RCS pressure – LESS THAN 275 PSIG[575 PSIG]	**c.** Go to Attachment 3, Step 14.
	d. RHR Pump flow indicator – CHECK FOR FLOW	**d.** Manually start pumps and align valves to establish an injection flowpath.

ATTACHMENT 3
Prompt Action Verifications
(Page 8 of 11)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14.	**Realign SI System**	
	a. Check Procedure Entry Status – E-0 ENTERED FROM 3-ONOP-047.1, LOSS OF CHARGING FLOW IN MODES 1 THROUGH 4	**a.** Go to Attachment 3, Step 14.e.
	b. Check High-Head SI Pump flow indicator – FLOW **NOT** INDICATED	**b.** Go to Attachment 3, Step 14.e.
	c. Establish only one High-Head SI Pump running	
	d. Go to Attachment 3, Step 14.g	
	e. Verify Unit 3 High-Head SI Pumps – TWO RUNNING	**e.** Perform the following: **1)** Operate Unit 3 and Unit 4 High-Head SI Pumps to establish injection to Unit 3 from two High-Head SI Pumps. **2)** Go to Attachment 3, Step 14.g.
	f. Stop both Unit 4 High-Head SI Pumps and place in standby	
	g. Direct Unit 4 Reactor Operator to align Unit 4 High-Head SI Pump suction to Unit 3 RWST using Attachment 1.	
15.	**Verify Containment Isolation Phase A – RESET**	Reset Phase A.

ATTACHMENT 3
Prompt Action Verifications
(Page 9 of 11)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16.	**Reestablish RCP Cooling**	
	a. Check RCPs – AT LEAST ONE RUNNING	**a.** Go to Attachment 3, Step 17.
	b. Open CCW To Normal Containment Cooler Valves • MOV-3-1417 • MOV-3-1418	**b.** Stop all RCPs.
	c. Reset and start Normal Containment Coolers	**c.** Stop all RCPs.
17.	**Verify Control Room Ventilation Isolation**	
	a. Verify Emergency Air Supply Fans – AT LEAST ONE RUNNING * SF-1A * SF-1B	**a.** Manually start one Emergency Air Supply Fan.
	b. Control Room Ventilation dampers – ALIGNED FOR RECIRC	**b.** Manually align dampers for Recirculation.
	c. Verify Normal Flow green indicating light (4QR82) – ON	**c.** Manually start a second Emergency Air Supply Fan.
	d. TS-0002, TSC Emergency Vent Auto Initiate Key Switch – IN ENABLE	**d.** Place switch in ENABLE.
18.	**Place Hydrogen Monitors In Service Using 3-NOP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM**	

ATTACHMENT 3
Prompt Action Verifications
(Page 10 of 11)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19.	**Verify All Four EDGs – RUNNING**	Emergency Start any available EDG **NOT** running.
20.	**Verify Power To Emergency 4 KV Buses**	
	a. Check 3A, 3B AND 3D 4 KV Buses – ALL ENERGIZED	**a.** Inform Unit Supervisor that Attachment 3 is complete with the exception of the de-energized bus or buses. IF Unit Supervisor decides **NOT** to energize de-energized bus or buses, THEN go to Attachment 3, Step 20.b. IF Unit Supervisor decides to energize 3A, 3B or 3D Bus, THEN perform the following: **1)** IF 3A 4 KV Bus de-energized, THEN restore power to bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS. **2)** IF 3B 4 KV Bus de-energized, THEN restore power to bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS. **3)** IF 3D 4 KV Bus de-energized, THEN restore power to bus using 3-ONOP-004.5, LOSS OF 3D 4KV BUS.

ATTACHMENT 3
<u>Prompt Action Verifications</u>
(Page 11 of 11)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20.	**(continued)**	
	b. Check 3A <u>AND</u> 3B 4 KV Buses – ALL ENERGIZED FROM OFFSITE POWER	**b.** Check at least <u>one</u> Computer Room Chiller running. <u>IF</u> **neither** Computer Room Chiller is running, <u>THEN</u> perform the following: **1)** Evaluate if diesel capacity adequate to run one train of Chilled Water for Computer Room. <u>IF</u> adequate diesel capacity is **NOT** available, <u>THEN</u> shed non-essential loads. Refer to Attachment 2 for component KW load rating. **2)** Start one train of Chilled Water.
21.	**Notify Unit Supervisor Of The Following** • Attachment 3 is complete • Any safeguards equipment that is **NOT** In the required condition • Status of Containment pressure continuous action	

End of Attachment 3

L-17-1 NRC Exam

JPM G

JPM TITLE: Perform 3A Emergency Diesel Generator Operability Test

JPM NUMBER: 01023006201 **REV.** 2-1

TASK NUMBER(S) / TASK TITLE(S): 01023006200
Perform The Emergency Diesel Generator Operability Test

K/A NUMBERS: 064 A4.06 **K/A VALUE:** RO 3.9 / SRO 3.9

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [X]

EVALUATION LOCATION:
In-Plant: [ ] Control Room: [ ]
Simulator: [X] Other: [ ]
Lab: [ ]

Time for Completion: 20 Minutes Time Critical: NO

Alternate Path [NRC]: YES
Alternate Path [INPO]: YES

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/01/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/02/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☒	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

None

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE
2-0	Formatting; Modifications	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
2-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17

SIMULATOR SET-UP:

SIMULATOR SETUP INSTRUCTIONS:

_____	1.	Reset to **IC 3** or saved IC.
_____	2.	Place simulator in RUN.
_____	3.	Ensure applicable portions of Simulator Operator Checklist are complete.
_____	4.	N/A if using saved IC • Ensure the 3A EDG is running
_____	5.	• Trigger **RUNAWAY EDG** and verify CONDITIONAL
_____	6.	Acknowledge alarms and place simulator in FREEZE until student is ready to begin.
_____	7.	Save as temporary IC, if JPM will be repeated.
_____	8.	When ready to begin, then place Simulator in RUN.

SIMULATOR MALFUNCTIONS:

- A302_A1_S40_3, EDG 3A HYD/ELEC RAISE (SPEED)
- IMQ5GCRA, EDG 3A HYD/ELEC RAISE (SPEED)
- A302_A1_S40_2, EDG 3A Speed Off A02

SIMULATOR OVERRIDES:

- N/A

SIMULATOR REMOTE FUNCTIONS:

- N/A

Required Materials:	• HANDOUT 3-OSP-023.1
General References:	• 3-OSP-023.1, Diesel Generator Operability Test
Task Standards:	• Synchronize the 3A EDG to the 3A Bus. • Emergency stop the 3A EDG or open the EDG output breaker, 3AA20, when 3A EDG load exceeds 2750 KW or 477 amps and the Diesel Gen Speed Changer proves to be unresponsive to manual control.

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- Unit 3 is in Mode 3, reactor start-up is planned for next shift.
- Unit was shut down 2 weeks ago to repair a leak inside containment on the letdown line.
- The 3A EDG is running unloaded for 3-OSP-023.1, Diesel Generator Operability Test Section 7.1.2 for the 3A EDG Monthly Surveillance.
- Another operator is performing Attachment 2 data.

INITIATING CUES:

- You are directed to continue with 3-OSP-023.1, Step 7.1.2.31.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ____________

NOTE: **When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).**

NOTE: **Critical steps are marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.**

Evaluator Cue:	Provide the student with a marked up copy of 3-OSP-023.1 Section 7.1.
Performance Step: **Critical _Y_(SEQ-1)**	**Prepare To Synchronize 3A EDG to 3A 4KV Bus.** (Step 7.1.2.31)
Standard:	Performs the following actions to match EDG output parameters to the system grid: a. **Places the EDG A Sync to 3A 4KV Bus 3AA20 switch to ON.** b. Checks the WHITE synchronizing lights to be cycling ON. c. Using the A EDG Volt Regulator, adjusts Incoming to match Running indicated voltage.(+ 200 Volts) d. Using the A EDG Speed Changer, adjusts engine speed so that synch scope is rotating slowly in FAST direction. e. Using the A EDG Volt Regulator, adjusts Incoming voltage slightly higher than Running voltage. (+ 200 volts) f. Using the A EDG kilovolt indicator and 3A 4KV Bus Voltmeter, verifies voltages are approximately equal on all 3 phases. (+ 100 Volts) g. Verifies 3A EDG frequency is between 59.4 and 60.6 Hz on the A Diesel Hertz indicator.
Evaluator Note:	The examinee will review the CAUTIONS prior to Step 7.1.2.31 Only **bold** steps are critical
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	

Performance Step: **Critical _Y_ (SEQ-2)**	**Synchronize 3A EDG to 3A 4KV Bus.** (Step 7.1.2.31.h.)
Standard:	h. **When the synch scope indicator is pointing to 12 o'clock, closes the 3A EDG Output breaker, 3AA20.** 1. Verifies the 3A EDG Output breaker is closed (GREEN light off, RED light on OR A Diesel Amps indicator reads greater than 0 amps) **2. Turn the A Diesel Gen Speed Changer in the RAISE direction AND increase diesel generator load to between 200 and 300 KW on the A Diesel Kilowatts indicator.** i. Places the EDG breaker 3AA20 Synch Switch to OFF. j. **Turns the A Diesel Gen Speed Changer in the RAISE direction and slowly increases load to approximately 1.0 MW (1000 kW).** k. **Using the 3A Diesel Gen Voltage Regulator, raise or lower voltage to adjust reactive load to between 300 to 1000 kVARS in LAG.**
Evaluator Note:	The examinee will review the CAUTIONS prior to Step 7.1.2.31.h. Only **bold** steps are critical.
Booth Operator Cue:	• When asked, respond as NSO and report 3A EDG kvar readings and Lead/Lag status as shown on Simulator Schematic. • When directed to inspect the 3A EDG for any leaks or abnormalities, report no leaks or abnormalities.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

THIS BEGINS THE ALTERNATE-PATH PORTION OF THE JPM

Performance Step: **Critical _Y(SEQ-3)**	**Raise load until it is between 2300 and 2500 KW.** (Step 7.1.2.34)
Standard:	a. Turn the A Diesel Gen Speed Changer in the RAISE direction AND increase diesel generator load until it is between 2300 and 2500 KW. When 3A EDG load exceeds 2750 KW or 477 amps: • Attempts to lower 3A EDG load by turning the A Diesel Gen Speed Changer in the LOWER direction. • **Emergency stops the 3A EDG OR opens the EDG output breaker, 3AA20, when the Diesel Gen Speed Changer proves to be unresponsive to manual control.**
Evaluator Note:	• The examinee will review the CAUTIONS prior to Step 7.1.2.34. • When load is greater than 1700 KW the governor will fail to approximately 3000 KW. • The normal stop control switch is failed. • Only **bold** steps are critical.
Booth Operator:	• When load is > 1700KW verify RUNAWAY EDG triggers • Acknowledge reports of uncontrolled load increase. • Acknowledge emergency stop.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Terminating Cues: **After the Examinee stops the 3A EDG state "Another RO will continue with the shutdown of the 3A EDG"**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ____________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- Unit 3 is in Mode 3, reactor start-up is planned for next shift.
- Unit was shut down 2 weeks ago to repair a leak inside containment on the letdown line.
- The 3A EDG is running unloaded for 3-OSP-023.1, Diesel Generator Operability Test Section 7.1.2 for the 3A EDG Monthly Surveillance.
- Another operator is performing Attachment 2 data.

INITIATING CUES:

- You are directed to continue with 3-OSP-023.1, Step 7.1.2.31.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

This procedure may be affected by a T.C. (Temporary Change) Verify information prior to use.
Date verified TODAY *Initials* X

3-OSP-023.1

Title:

Diesel Generator Operability Test

(Continuous Use)

Safety Related Procedure	
Responsible Department:	Operations
Revision Number:	12B
Revision Approval Date:	5/17/17

PCRs *08-1101, 08-4837, 08-4771, 09-1775, 10-1877, 10-1313,10-1315, 578075, 597850, 1621860, 1624325, 1609745, 1851611, 1863585, 1786692,1901455, 1774599, 1924363, 1975966, 1973230, 2000592, 2077027, 2097849, 2126137, 2205118*
PC/Ms *86-155, 87-264, 89-159, 89-542, 93-142, 96-064, 96-089, 98-004, 98-028, 01-004, 02-042, 02-065, 09-102, 10-060*
ECs *247008*

W2010:FRZ/ab/rr/cls

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141	01/08/14	171	01/27/15	201	01/16/16
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Section **Page**

1.0 **PURPOSE**

1.1 This procedure provides instructional guidance for testing the operability of the Unit 3 Emergency Diesel Generators (EDG) and various support components to satisfy the surveillance requirements of Reference Step 2.1.1.

2.0 **REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS**

2.1 References

2.1.1 Technical Specifications

1. 4.8.1.1.2.a
2. 4.8.1.1.2.b
3. 4.8.1.1.2.c
4. 4.8.1.2 (partial)

2.1.2 FSAR

1. Section 8, Electrical Systems

2.1.3 Plant Drawings

1. 5613-M-3022, Sh 1 (2), EDG Engine and Oil System DG 3A (3B) Air Starting System
2. 5613-M-3022, Sh 3 (4), EDG Engine and Oil System DG 3A (3B) Fuel Oil
3. 5613-M-3022, Sh 5 (6), EDG Engine and Oil System DG 3A (3B) LO and Cooling Water

2.1.4 Plant Procedures

1. 0-ADM-034, Oil and Hazardous Material Emergency Response Plan and Spill Prevention, Control and Countermeasure (SPCC) Plan
2. 3-NOP-022, Emergency Diesel Generator Fuel Oil System
3. 3-OP-023, Emergency Diesel Generator
4. 3-OSP-022.4, EDG Fuel Oil Transfer Pump and Valve Inservice Test
5. 3-OSP-023.2, Diesel Generator 24 Hour Full Load Test and Load Rejection
6. 0-OSP-023.3, Equipment Operability Verification with an Emergency Diesel Generator Inoperable
7. 3-PMM-022.25, EDG 3A Air Start System Quarterly Preventive Maintenance
8. 3-PMM-022.26, EDG 3B Air Start System Quarterly Preventive Maintenance

2.1.5 Vendor/Technical Manuals

1. Schoonmaker, Instruction Manual for 2800 KW, Emergency Diesel Electric Generator

2.1.6 Miscellaneous Documents (i.e., PC/M, Correspondence)

1. PC/M 87-264, EDG 3B/4B, EDG 3A/4A and New EDG Building Tie-ins
2. PC/M 86-155, Addition of EDG Air Start Motors
3. PC/M 89-159, Flood Protection for EDG Fuel Oil Transfer Pumps
4. Power Systems telecopy letter, 11/11/87, Harry W. Falter to William Bryan
5. Morrison-Knudsen Company, Inc., telecopy letter, 7/21/88, Ken Lewis to W. E. Raasch
6. S. T. Hale to A. T. Zielonka, letter JPNS-D/S-PTN-91-0806, Unit 3 EDG Oil Level
7. J. M. Donis to T. A. Finn, letter PTN-TECH-91-128, 6/14/91, Verifying the Lubricating Oil Inventory in Storage
8. NCR N-92-0194, 4B EDG Trip
9. PC/M 93-142, Replacement of Instrumentation Tubing Material from Copper to SS and the Replacement of the Low Prelube and Air Start Tank Pressure Switches on 3A and 3B EDGs
10. JPNS-PTN-94-0470, Turkey Point Units 3 and 4 Emergency Diesel Generator (EDG) Cooling Water System
11. JPN-CSI-93-445, Turkey Point Units 3 and 4 EDG Testing
12. JPN-PTN-SENS-95-052, Safety Evaluation for Revision of Unit 3 Diesel Fuel Oil Transfer System Technical Specification Bases
13. PC/M 96-064, Minor Drawing Enhancements, CRN E-15591 and CRN E-15604
14. E.A. Thompson to J.C. Trejo, letter PTN-ENG-97-0465, Use of Chromates in Emergency Diesel Generator Cooling Water Systems
15. PC/M 96-089, Piping Alteration for Makeup Water Source Change to Unit 3A and B EDG Cooling Water System
16. Turkey Point Units 3/4 - Issuance of amendments regarding diesel fuel oil storage and transfer (TAC Nos. M97376/377) PLA-135
17. PC/M 98-028, Replacement of U-3 Diesel Oil Transfer Pump Piping

2.1.6 (Cont'd)

18. PC/M 98-004, Emergency Diesel Generator Duplex Fuel Filter Replacement
19. PC/M 01-004, Unit 3 EDG Soakback Pump Modification
20. CR 00-1247, EDG Operability When Paralleled to Grid
21. PTN-BFSM-00-006, Unit 3 EDG Maximum Outdoor Temperature
22. PC/M 00-016, Generic Package for Minor Drawing Enhancements and Minor Modifications (CRN RC16), CRNs M-10522 and M-10577
23. 10 CFR 21-0085, Rev.0 Engine Driven Water Pumps (CR 02-1956)
24. PC/M 02-065, Generic Package for Minor Drawing Enhancements and Minor Modifications, CRN E-16417, Spared 3DP87-03
25. CR 02-0898, EDG Testing Results in Out-of-Spec Readings
26. CR 2004-4117, Cloudy Fuel Oil and Some Water Drained from Day Tank
27. CR 2006-34499, 3A EDG Low Oil Sump Level
28. FPL Calculation PTN-3-J-M-90-0013, Unit 3 EDG Lube Oil Supply
29. CR 2008-29507, Enhancement of EDG Room Ventilation Bases
30. PC/M 09-102, Unit 3 EDG Air Start Skid Replacement
31. EC 247008, PCM-09139, EPU LAR Umbrella Doc. Only PC/M
32. AR 1871389, RICE-PTN Title V Permit Renewal Air Requirements
33. AR 1986502 CNO Action Item Recommendations for ECC Comp Monitoring.

2.2 Records Required

2.2.1 The date, time, and section completed shall be entered in the Unit Narrative Log. Also, problems encountered while performing the procedure should be entered; i.e., malfunctioning equipment, delays due to changes in plant conditions, etc.

2.2.2 Completed copies of the QA Record Pages for the below listed items document compliance with Technical Specification surveillance requirements and shall be transmitted to QA Records for retention in accordance with Quality Assurance Records Program requirements:

1. Subsection 7.1
2. Subsection 7.2
3. Subsection 7.3

2.2.2 (Cont'd)

4. Subsection 7.4
5. Subsection 7.5
6. Subsection 7.6
7. Attachment 1
8. Attachment 2
9. Attachment 3
10. Attachment 4
11. Attachment 5
12. Attachment 6

2.2.3 Completed copies of the below listed items shall be transmitted to the Engineering Department EDG System Engineer and the IST Coordinator (Attachment 2 only) for data trending in accordance with applicable administrative programs:

1. Subsection 7.5, QA Record Page
2. Subsection 7.6, QA Record Page
3. Attachment 1
4. Attachment 2

2.2.4 Completed pages of the attachment listed below, that have the TAG column checked (√), shall be copied and transmitted to the Labeling Coordinator:

1. Attachment 5
2. Attachment 6

2.3 Commitment Documents

2.3.1 INPO Finding (OP 3-1) 1989, Plant Status Controls, Final Response

2.3.2 LER 250-88-022-0, Diesel Generators Inoperable due to Planned Maintenance and Fuel Filter Flow Restriction (CTRAC 88-2846)

3.0 **PREREQUISITES**

3.1 The Unit 3 EDG to be demonstrated operable is in the Normal Standby Condition using the applicable subsection of 3-OP-023, Emergency Diesel Generator.

3.2 Plant records and schedules have been consulted to determine the method by which the Unit 3 EDG is to be tested.

3.3 Communications are available between the Unit 3 EDG Building and the Control Room.

3.4 No other major operating evolutions are in progress or planned during the time required to test the EDG.

3.5 Ensure no maintenance activities are in progress on the Unit 3 main generator lockout circuit or either of the following breakers:

3.5.1 Unit 3 Mid Bus Generator Breaker 8W68

3.5.2 Unit 3 East Bus Generator Breaker 8W33

3.6 Ensure that adequate fluid exists in crankcase pressure (PI-3-6679A/B) manometer. (Enclosure 2 can be used to assist in this determination.)

4.0 **PRECAUTIONS/LIMITATIONS**

4.1 For test purposes, the generator load shall not exceed 2750 KW and generator current shall not exceed 477 amps, the basic overload rating.

4.2 Extreme caution should be used when adjusting grid voltage while the EDG is paralleled to the grid. The resulting voltage change could cause the EDG to become under or over excited resulting in a lockout of the EDG. Adjustments to grid voltage while the EDG is on the associated bus should be avoided. If it is necessary to adjust voltage during this time, do it using the guidance of Enclosure 3.

4.3 An electric motor driven soakback pump shall be in operation at all times when the engine is not running. This is necessary to provide turbocharger prestart lubrication and post shutdown bearing cooling.

4.4 Do not allow the engine to run unloaded at 900 rpm for periods in excess of 4.5 hours. The EDGs should not be operated at less than 25 percent load due to the accumulation of lube oil in the exhaust during light load operation (souping). Depending on the amount of souping that has taken place, an exhaust fire could result when the engine is suddenly loaded, raising exhaust temperatures quickly.

4.5 After 4.5 cumulative hours of operation at synchronous speed at loads between 0 and 20 percent (0-500 KW), the engine shall be run at a minimum of 40 percent load for at least 30 minutes to clean out the oil residual that accumulates in the exhaust stack.

4.6 After 8 hours of continuous operation at idle speed, the engine shall be run at a minimum of 50 percent load for at least 30 minutes to clean out the oil residual that accumulates in the exhaust stack.

4.7 During testing, only one of the Unit 3 EDGs shall be paralleled with the off-site transmission network at a time.

4.8 During testing, only one of the EDGs for each unit shall have its Master Control Switch in the LOCAL position with the Rapid Start/Auto Start Bypass Switch positioned to BYPASS. When the switches are in this configuration, the EDG will not automatically start upon loss of bus voltage or a Safety Injection signal.

4.9 When the EDGs are in Standby Mode, the Governor Control Switches and the Voltage Adjust Control Switches at the Local panels and the Diesel Gen Speed Changer switches and the Diesel Gen Volt Regulator switches at the Control Room panels shall not be operated. Actuation of these switches will alter the preset speed or voltage settings.

4.10 Technical Specification requirements shall be observed and any deviation from these requirements shall be reported immediately to the Shift Manager. Technical Specifications should be consulted for any change in system status.

4.11 Hearing protection shall be worn in the EDG Rooms when operating the Emergency Diesel Generator.

4.12 The Shift Manager shall be notified immediately if any acceptance criteria are not met or any malfunction or abnormal conditions occur. This information shall also be recorded under Remarks at the end of the applicable attachment.

4.13 The following will automatically start the Emergency Diesel Generators from a normal standby condition:

4.13.1 Safety Injection Signal

4.13.2 Loss of voltage on the diesels associated 4160V AC bus.

4.13.3 Sustained undervoltage on either of the diesels associated 480V AC Vital Load Centers.

4.14 The 3B Diesel Generator Alternate Shutdown Isolation Switches, XS-3DG (3B12B1) and Normal-Isolate (3C370D), shall be in the NORMAL position.

4.15 Maintenance activities on the main generator lockout circuits or on the Unit 3 main generator breaker can result in a trip of the diesel generator breakers.

4.16 The fuel oil duplex filter is to be operated in the single element mode. If the fuel oil pressure as read on PI-3-3670A(B), Diesel Generator Fuel Oil Pressure, reaches the Hi Alert Range, the filter control valve should be switched to the opposite side, placing a clean filter element in service. This can be performed with the engine running if necessary.

4.17 The EDGs may be restarted within 15 minutes after shutdown if the lube oil temperature is greater than 155°F. Routine starts should not be attempted for 15 minutes to 3 hours following a run or until the lube oil temperature decreases to 155°F or lower.

4.18 Automatic or manual starting of any of the following pumps while an EDG is paralleled to the bus can cause EDG trip and possible damage:

4.18.1 Reactor Coolant Pump

4.18.2 Circulating Water Pump

4.18.3 Steam Generator Feed Pump (3A EDG only)

4.18.4 Condensate Pump

4.18.5 Heater Drain Pump

4.19 Due to the possibility of inadvertently removing an Emergency Diesel Generator from service while performing maintenance on Starting Air Systems, the Shift Manager should perform an operability assessment on starting air. This assessment should take into account the last time the train that is to be left in service was tested.

4.20 A minimum of two Air Reservoirs are required to be available for each set of Air Start Motors as per design basis. One pair of Air Reservoirs cannot be used to provide air to both sets of Air Start Motors.

4.21 An EDG may be considered operable if the air start receivers have a pressure of less than 200 psig but greater than 160 psig. Air pressure to the air start receivers should be expeditiously restored to greater than 200 psig or the affected EDG shall be declared inoperable in accordance with TS 3.8.1 (CR 02-0153).

4.22 When a set of Air Start Motors is declared inoperable, the EDG can be considered operable if the remaining set of Air Start Motors started the EDG during its last surveillance (60 days ago). One of the following actions should be performed expeditiously:

4.22.1 Repair the Air Start Motors, and start the EDG with the repaired set of Air Start Motors, or

4.22.2 Start the EDG with the remaining operable set of Air Start Motors, or

4.22.3 Declare the EDG inoperable and test the remaining trains as directed by TS 3.8.1 for an inoperable EDG.

An inoperable EDG may be reportable using 0-ADM-115, Notification of Plant Events.

4.23 To assure that the Left Side and the Right Side starting air are tested on an alternating basis, an entry stating the side (Left or Right) used for a given start should be made in the STP notes and the Unit Narrative Log each time the <u>monthly</u> test (3A – STP-402 and 3B - STP-404) or the semi-annual (rapid start) test is performed. The side to use for a given test is determined from the specific STP record to be the <u>opposite</u> side as that tested the previous month. The Unit Narrative Log or the previously used procedure can be used for further verification if necessary. (CR 02-2069)

4.24 The EDG idling speed of 450 rpm is an optimum value. Idling speeds of 350 rpm to 550 rpm are acceptable. Specific values for EDG idling speed are not a part of EDG acceptance criteria for operation.

4.25 During a loss of Instrument Air or isolation of Instrument Air to the EDG day tanks, sufficient fuel is provided to allow approximately 15 hours of full load operation after a low day tank level alarm. The EDGs remain operable during this event and 3-ONOP-013, Loss of Instrument Air, provides instructions for hand loading open the day tank isolation valve if needed.

4.26 The EDG Cooling Water System contains chromium compounds, which are known carcinogens. Avoid inhalation or contact with skin and eyes. Notify Chemistry and the Shift Manager of Cooling System leakage. If leakage has the potential to enter a floor drain, affected floor drains should be plugged.

4.27 Any waste generated containing chromium is a hazardous waste and must be placed in the designated satellite accumulation drum.

4.28 Observe information identified on applicable Material Safety Data Sheets (MSDS) prior to handling and disposal of Hazardous Materials. Oil, cooling water, or other hazardous materials shall not be disposed of via the Contaminated Drain System. Contact the Hazardous Material Coordinator for disposal instructions.

4.29 The EDG is to be declared inoperable if the EDG Room Exhaust Fan fails to start. (CR 2008-29507)

~~4.30~~ An EDG is to be declared inoperable while parallel with the grid.

~~4.31~~ An EDG may be considered operable with the lube oil cooler outlet temperature (standby condition) less than 100°F, but greater than or equal to 85°F. Lube oil temperature shall be restored to greater than 100°F expeditiously by locally heating the room, idle starting the affected EDG, or troubleshooting the immersion heaters. If lube oil temperature is less than 85°F, the EDG shall be declared inoperable in accordance with Technical Specification 3.8.1 (CR 02-1240). An EDG shall NOT be rapid started for non-emergency purposes if the lube oil temperature is less than 100°F.

~~4.32~~ Engineering shall be notified to perform an evaluation when any oil leakage is evident from EDG safety related components.

~~4.33~~ For System Health Monitoring concerns, the time when the position of a EDG Master Control switch is changed should be entered in the Unit Narrative Log.

~~4.34~~ Alarm RA-2/5, Hot Engine, sensed by TS-3-1401A or B, is expected when an EDG is stopped. About 1 to 3 minutes after shutdown, the coolant heater cycles on and causes the cooling water flow in the engine to change from forward flow during operation to reverse flow during standby conditions. The alarm typically clears within one to five seconds after cooler water from the engine and piping begins flowing past the sensor. (CR 2008-29583)

~~4.35~~ During an attempted start of an EDG on a single side or train of starting air, an abutment could occur and prevent the diesel from starting. An abutment occurs when the Air Start Motor pinion gears, which normally engage the engine flywheel gear teeth during a cranking attempt, abut against the gear teeth instead of meshing in between the gear teeth. Abutments are an inherent part of the EMD diesel design and are random yet extraordinarily rare. Evidence of an abutment during an attempted start includes puffs of air and clicking heard from the Air Start Motors in use as their pinions disengage and re-engage the flywheel gear teeth. Multiple abutments may be heard prior to the start failure. By design, 3A and 3B EDGs have 5 recycle start attempts. (CR 2009-31817) During a diesel start, ensure someone (operator, System Engineer, etc.) is listening for evidence of an abutment. (ARs 406432 and 1668552)

~~4.36~~ If a loop event occurs while the EDG is being tested and paralleled to the grid, the EDG may trip. After the L/O relay is reset, the EDG will automatically start if the emergency signal is still present.

~~4.37~~ AR 1871389, RICE - PTN Title V Permit Renewal Air Requirements ensures recording individual diesel engines start and stop times performed in the procedure and documentation in the Narrative Logs.

~~4.38~~ Prior to recording data readings and after loading the engine during surveillance runs, allow EDG parameters to stabilize.

~~4.39~~ In the event that diesel run times are expected to exceed 8 hours of continuous operation, then Chemistry/Environmental needs to be contacted for Title V Air Compliance documentation.

5.0 **SPECIAL TOOLS/EQUIPMENT**

5.1 Calibrated Stopwatch (for Rapid Start)

5.2 Container suitable for collecting at least 1.5 gallons of fluid from the day tanks.

6.0 **ACCEPTANCE CRITERIA**

6.1 The fuel oil level in each Unit 3 Diesel Oil Day Tank and Skid Tank, combined, shall be greater than or equal to 2000 gallons.

6.2 The Unit 3 Diesel Oil Storage Tank (DOST) fuel oil usable volume shall be greater than or equal to 38,000 gallons (greater than or equal to 21 feet 10 inches). If using temporary fuel tank due to DOST cleaning, then use Technical Specification 3/4.8.1 for guidance.

6.3 During the quarterly scheduled EDG test runs, the fuel transfer pump shall be demonstrated to start automatically and transfer fuel from the diesel oil storage tank to the day tank. The fuel transfer pump shall not allow annunciation of the Hi/Lo day tank level alarm. Should this alarm annunciate, manually shut off the pump.

6.4 During the semi-annual rapid start test, the EDG shall start and reach a generator voltage of 3950 to 4350 volts and frequency of 59.4 to 60.6 Hz in 15 seconds or less.

6.5 The EDG shall be synchronized, loaded to between 2300 KW and 2500 KW, and operated for at least 60 minutes with the cooling water system operating within design limits during steady state operation.

6.6 The EDG flowpath systems (Fuel Oil, Air Start, etc.) shall be properly aligned for standby of the EDG.

6.7 Upon completion of testing, the EDG shall be left in standby state.

6.8 Each day tank and skid tank shall be checked for, and drained of, any accumulated water after operation of the EDG for greater than or equal to 1 hour.

6.9 The lubricating oil inventory in the engine sump shall be greater than or equal to 1/2 inch below the full dipstick mark at hot idle.

6.10 At least four drums of lubricating oil (reference 0-GMP-102.2, Equipment Lubrication Guide, for oil type) dedicated to each Emergency Diesel Generator and the capability to transfer the lube oil into the Unit 3 EDG (hand pump and hose in storage box) shall be in storage in the NMM oil storage facility.

6.11 The Air Start System check valve for the selected Air Start Motors shall open to allow the EDG to start.

6.12 EDG Room Exhaust Fan starts and operates during the duration of the EDG run.

INIT

Date/Time Started: TODAY / NOW

7.0 PROCEDURE

NOTE

Subsection 7.1 should be used for the monthly 3A EDG operability test except when using Subsection 7.3, 3A EDG Local Rapid Start Test.

7.1 3A EDG Normal Start Test

CAUTION

3A EDG is inoperable when parallel to the grid and during the starting air isolation and engine barring checks. B Train ESF equipment is required to be operable prior to testing 3A EDG.

7.1.1 Initial Conditions

X 1. All applicable prerequisites listed in Section 3.0 are satisfied.

NOTE

Performing the valve alignment verification may be waived if the EDG is NOT being tested for the Tech Spec periodic surveillance AND a previous verification is valid.

X 2. Verify 3A EDG systems flowpath alignment by performing Attachment 5, and record performance on Attachment 2, Section 1.

X 3. The Surveillance Tracking Program has identified the reason for testing to be:

_____ Quarterly Surveillance

✓ Monthly Surveillance

_____ Other (specify)_____________________

N/A 4. **IF** required to support Engineered Safeguard Integrated Testing, **THEN** verify the EDG Volts/Frequency Recorder is connected in preparation for Engineered Safeguards Integrated Testing.

X 5. Notify System of the intent to parallel an EDG to the grid and that changes to grid voltage should be avoided if possible. If grid voltage has to be adjusted, contact Unit 3 and 4 Control Room. Unit 3 and 4 will coordinate with Unit 1 and 2 to make the grid voltage adjustment.

X 6. If grid voltage adjustments have to be made while the EDG is paralleled to the grid, perform the adjustment in accordance with Enclosure 3.

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NOTE

Steps annotated with an asterisk are duplicated by 3-OP-023, Emergency Diesel Generator and 3-OSP-023.2, Diesel Generator 24-Hour Full Load Test and Load Rejection. At the discretion of the Shift Manager, these steps may be marked N/A if they have been completed.

7.1.2 Procedure Steps

X 1. Perform 0-OSP-023.3, Equipment Operability Verification, with an Emergency Diesel Generator Inoperable.

X 2. Establish communication between the Control Room and the Unit 3 Diesel Generator Building.

3. At the Unit 3 Fuel Oil Transfer Pump Area, perform the following:

X * a. Verify 3A Diesel Oil Transfer Pump 3P10A control switch is in Auto.

X b. Verify the Unit 3 Diesel Oil Storage Tank level is greater than or equal to 21 feet, 10 inches, and record level on Attachment 2, Section 1.

4. At the 3A Emergency Diesel Generator, perform the following:

NOTE

Makeup to EDG 3A Clg System Root Valve, 3-20-449A, is located on the lower northwest corner of the radiator grating and is operated by a reach rod from outside of the grating.

X * a. Check the Cooling Water Surge Tank level to be between the low and full marks for the STOP condition on the tank level gauge.

N/A * b. **IF** the water level is low, **THEN** add water to the radiator using the makeup to the EDG cooling water surge tank subsection of 3-OP-023, Emergency Diesel Generator.

NOTE

The skid tank gravity fills and stops filling automatically when full.

X c. Check LI-3-3402A, EDG 3A Fuel Oil Skid Tank Level Ind, on top of the skid tank to be greater than 150 gallons, and record volume on Attachment 2, Section 1.

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7.1.2.4 (Cont'd)

N/A *

d. **IF** necessary to fill the skid tank, **THEN** depress and hold the PUSH TO FILL pushbutton until at least 150 gallons are indicated on EDG 3A Fuel Oil Skid Tank Level Ind, LI-3-3402A.

NOTE

Normal lube oil cooler outlet oil temperature should be between 110°F and 120°F and the minimum temperature for EDG operation is 85°F.

X *

e. Check TI-3-442A, EDG 3A Lube Oil Clr Oil Temp Ind, to be greater than or equal to 100°F.

X *

f. Place the dual Fuel Filter Selector Valve to the opposite element.

X *

g. Verify governor oil level is 1/2 inch to 1 inch above the sightglass mark.

X *

h. Verify the Governor Speed Droop control knob is set to 0 percent.

X *

i. Verify the Governor Load Limit control knob is set to the Max Fuel position.

X *

j. Verify the 3A Diesel Generator Overspeed Trip Lever is reset (i.e., pulled down to latch).

X *

k. On panel 3C370A, verify the Governor Select switch is selected to Elect.

l. Test the Reflash Annunciator Panels on 3C370C as follows:

X *

1) Depress the Reset pushbutton on RA-1.

X *

2) Depress the Test (T) pushbutton on RA-1, and check that all alarm lights flash.

X *

3) Depress the Acknowledge (A) pushbutton on RA-1, and check that all alarm lights go OFF except those previously in alarm.

X *

4) Depress the Reset pushbutton on RA-2.

X *

5) Depress the Test (T) pushbutton on RA-2, and check that all alarm lights flash.

X *

6) Depress the Acknowledge (A) pushbutton on RA-2, and check that all alarm lights go Off except those previously in alarm.

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CK'D VERIF

7.1.2.4 (Cont'd)

NOTES

- The 3A and 3B EDG sump level dipsticks (center north side of EDGs) have several marks of importance: the FULL COLD mark, the FULL mark, and the LOW mark. Figure 1 provides clarification of these marks.
- Due to operability requirements, oil level should be maintained higher than 1/2 inch below the FULL mark.
- Engine oil level can be measured accurately only when the engine is hot and idling. The EDG shall NOT be declared inoperable based on oil level when the engine is stopped.
- Approximately 25 gallons of lube oil should be added to the sump if oil level is at or below the level indicated in Substeps (1) or (2).

* m. Check if engine oil needs to be added to 3A EDG as follows:

N/A N/A (1) **IF** 3A EDG is at idle speed and hot, **THEN** check oil level higher than 1/2 inch below the FULL mark.

X Y (2) **IF** 3A EDG is stopped, **THEN** check oil level higher than half the distance between the FULL mark and the FULL COLD mark.

N/A (3) **IF** 3A EDG engine oil level is at or below the required level, **THEN** initiate a PWR for Maintenance to add oil.

X * n. Verify 3A EDG Starting Air Compressor oil level is between the level marks on the dipstick.

o. Verify starting air pressure is between 225 psig and 238 psig on each of the following indicators, and record on Attachment 2, Section 2:

X (1) 3A EDG Air Reservoir Tanks A and B Press Ind, PI-3-3690A

X (2) 3A EDG Air Reservoir Tanks C and D Press Ind, PI-3-3693A

p. Open each of the following valves until the piping is clear of moisture, and then close the valve:

X Y * (1) 3A EDG Air Reservoir Tank A Drain, 3-70-267A

X Y * (2) 3A EDG Air Reservoir Tank B Drain, 3-70-268A

X Y * (3) 3A EDG Air Reservoir Tank C Drain, 3-70-270A

X Y * (4) 3A EDG Air Reservoir Tank D Drain, 3-70-271A

INIT 7.1.2.4 (Cont'd)

X * Verify oil level is at midpoint in the 3A Diesel Generator Oil Bath Air Filter sight glasses (nine).

X * Verify the air filter inlets are free of debris.

X * Verify 3A EDG Crankcase Air Box Drain, 3-70-255A, is open approximately 25 percent, and verify a container is in place to catch any effluents.

X * On the west side of the Engine Panel, verify the Emerg Fuel Cutoff, 3-70-131A, red trip handle is pushed in (not tripped).

5. At 3A EDG Electrical Control Panel 3C12A, perform the following:

X * Verify the Voltmeter Switch is **NOT** selected to Off.

X * Verify the Ammeter Switch is **NOT** selected to Off.

X * Verify the Rapid Start/Auto Start Bypass Switch is in Normal.

CAUTION

With 3A EDG stopped, the Governor Control Switch should NOT be actuated.

X * Check the Governor Control Switch to be in the Mid (neutral) position.

N/A * (1) **IF** the Governor Control Switch is **NOT** in the Mid position, **THEN** immediately notify the Shift Manager.

CAUTION

With 3A EDG stopped, the Voltage Adjust Control Switch should NOT be actuated.

X * Check the Voltage Adjust Control Switch to be in the Mid (neutral) position.

N/A * (1) **IF** the Voltage Adjust Control Switch is **NOT** in the Mid position, **THEN** immediately notify the Shift Manager.

X * Verify the Master Control Switch is in NORMAL.

X * Verify the EDG Bkr 3AA20 Control Switch is in the Mid (neutral) position with a green flag.

X * Verify the EDG Bkr 3AA20 Green light is On.

X * Verify the EDG Bkr 3AA20 Synchronizing Switch is in Off.

X * Verify the D/G Lockout Relay 186/DG (orange handle) is Reset.

INIT — 7.1.2.5 (Cont'd)

k. Verify the following relay targets are Clear:

X * (1) Loss Of Excitation Relay 140 (LFA)

X * (2) Voltage Relay

X * (3) Reverse Power Relay

X * (4) Generator Overcurrent Relay Phases A, B, and C (3 relays)

X * (5) Differential Relay Phases A, B, and C (3 relays)

6. At 3A EDG Engine Control Panel 3C13A, perform the following:

X * a. Verify the Immersion Heater Control and Pump Motor switch is On.

X * b. Verify the 3A EDG Starting Air Compressor control switch is in Auto.

X * c. Depress the Alarm Test and Horn Silence pushbuttons, and check that all alarm lights are operable.

X * d. **IF** air compressor is **NOT** running, **THEN** check the Air Compressor Off Green light to be On.

N/A * e. **IF** air compressor is running in Auto, **THEN** check the Air Compressor On Red light to be On.

X * f. Check the Skid Tank Level Hi Red light to be Off.

X * g. Check the Skid Tank Level Lo Red light to be Off.

X * h. Check the Local White light to be Off.

X * i. Check the Normal White light to be On.

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7.1.2.6 (Cont'd)

NOTE

If the following conditions are satisfied, the diesel generator Ready to Start WHITE light will be ON:

EDG Governor is selected to ELECT.
Lockout Relay is reset.
Skid Tank level is NOT low.
Starting air pressure is greater than 215 psig.
Engine prelube oil pressure is greater than 10 psig.
Engine prelube oil temperature is greater than 100 °F
EDG exciter field breaker is closed.
Control Power fuses are OK.
Emergency Stop Signal is NOT present.
Engine speed is less than 600 rpm.
Master Control Switch is NOT in OFF.

X * J. Check the Ready To Start WHITE light to be ON.

X * K. Check the Low Start Air Press RED light to be OFF.

X * L. Check the Control Power On GREEN light to be ON.

X * M. Check the Overspeed Trip WHITE light to be OFF.

X * N. Check the Hot Engine Alarm RED light to be OFF.

X * O. Check the Hi Crankcase Pressure AMBER light to be OFF.

X * P. Check the Low Water Pressure Trip AMBER light to be OFF.

X * Q. Check the Low Lube Oil Pressure AMBER light to be OFF.

X * R. Check the Low Lube Oil Temp WHITE light to be OFF.

X * S. Check the Start Failure WHITE light to be OFF.

CAUTION

With 3A EDG stopped, the Governor Control Switch should NOT be actuated.

X * T. Check the Governor Control Switch to be in the MID (neutral) position.

N/A * 1) **IF** the Governor Control Switch is **NOT** in the MID position, **THEN** immediately notify the Shift Manager.

X * U. Verify the Normal Stop/Start control switch is in the MID (neutral) position.

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7.1.2.6 (Cont'd)

x * 7. Verify the Idle Release/Start control switch is in the MID (neutral) position.

x * 8. Verify the Emerg Stop/Start control switch is in the MID (neutral) position.

9. Record the following prestart information on Attachment 2, Section 2:

x (1) 3A EDG Start counter reading (inside 3C13A).

x (2) EDG-A Total Hour Meter reading.

(3) Oil pressure indicated on 3A Diesel Gen Lube Oil Pp Afterfilter Pressure Ind, PI-3-207A, obtained as follows:

x (a) Open 3A EDG Lube Oil To Turbocharger and Gear Train PI-3-207A Isol, 3-70-288A.

x (b) Record indicated oil pressure.

x Y (c) Close 3A EDG Lube Oil To Turbocharger and Gear Train PI-3-207A Isol, 3-70-288A.

x * 10. Place the Rapid Start/Auto Start Bypass Switch to AUTO START BYPASS.

CAUTION

Placing the Master Control Switch to OFF disables ALL EDG Start Signals which renders the Diesel Generator inoperable.

NOTE

Placing the Master Control Switch to OFF or LOCAL will cause Control Room Annunciator F 8/5, EDG A MASTER CONTROL SW OFF-NORMAL to alarm.

11. Perform the following before taking the 3A EDG out of service:

x * a. Verify 0-OSP-023.3, Equipment Operability Verification with an Emergency Diesel Generator Inoperable, has been completed <u>within the last hour</u>.

x * b. Notify the Unit 3 RO that the Master Control Switch for the 3A EDG is being placed to OFF and to expect Annunciator F 8/5 to alarm.

x * 12. Place the Master Control Switch to OFF.

x 13. Record the time the Master Control Switch was placed to OFF in the Unit Narrative Log.

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7.1.2 (Cont'd)

11. Hand-bar 3A EDG as follows:

a. Unlock and close the following air start isolation valves:

X * (1) 3-70-257A, 3A EDG Right Side Cranking Motor Isolation Valve

X * (2) 3-70-305A, 3A EDG Left Side Cranking Motor Isolation Valve

X b. Notify maintenance to perform checks on the Starter Lubricator Reservoir using 3-PMM-022.25, EDG 3A Air Start System Quarterly Preventive Maintenance, if required.

NOTE

Caps may have been installed on engine cylinder test cocks with too much force. Counter torque should be used on the test cock body while removing each cap with the supplied open end wrench and pipe wrench (stored locally). The open end wrench is used to turn the cap while appropriate counter torque is applied to the test cock body to allow turning the cap without loosening the test cock.

N/A * c. **IF** there are any caps installed on the engine cylinder test cocks (20), **THEN** remove the cap and circle the associated cylinder to ensure they are replaced correctly.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

X * d. Open the engine cylinder test cocks (20).

X * e. Observe the state of the area around each test cock (e.g., oily, discolored, or evidence of pervious drainage).

X * f. Obtain the manual engine barring tool from the North wall of the 3B EDG Room.

X * g. Remove the North cover for access to the flywheel area of 3A EDG.

X * h. Manually bar-over 3A EDG at least one complete revolution.

X * i. Replace the North flywheel cover.

X * j. Inspect for fluids or other substances exhausted from any engine cylinder test cock (20) places.

N/A * k. **IF** any abnormal findings at the engine cylinder test cocks are identified, **THEN** notify the Shift Manager.

l. Perform the following:

X Y * (1) Close the engine cylinder test cocks (20).

X Y * (2) Refer to Step 7.1.2.11.c, and replace any caps removed using only hand-tight torque.

X * m. Return the barring tool to the North wall of the 3B EDG Room.

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CK'D VERIF

7.1.2 (Cont'd)

N/A

12. **IF** Start Lubricator Reservoir checks were requested, **THEN** verify with maintenance that the checks are complete.

NOTE

Left and Right air start sides are used on each surveillance run (monthly and semi-annual) on an alternating basis. To ensure that each side is tested alternately, the correct side is required to be determined and independently verified prior to starting 3A EDG. Information on the last side used can be obtained from STP-402 (or 406) for 3A EDG, from the Unit Narrative Log, or from the previously used procedure.

13. Align the proper starting air side for the 3A EDG as follows:

X Y — a. Record the date of and the starting air side used for the LAST 3A EDG monthly or semi-annual surveillance test:

Date of LAST run PREVIOUS Side used LAST run LEFT

X Y — b. Determine air start side to be used for THIS run (the **opposite** of the side used for the last run):

Air Start Side for THIS run: LEFT / RIGHT (circle one)

c. **IF** the LEFT side is to be used for this run, **THEN** perform the following:

N/A — (1) Lock open 3A EDG Left Side Cranking Motor Isolation Valve, 3-70-305A.

N/A — (2) Record Air to Pinion Engaging Air Motors, PI-3-3691A on Attachment 2, Section 2.

d. **IF** the RIGHT side is to be used for this run, **THEN** perform the following:

X — (1) Lock open 3A EDG Right Side Cranking Motor Isolation Valve, 3-70-257A.

X — (2) Record Air to Pinion Engaging Air Motors, PI-3-205A on Attachment 2, Section 2.

INITIALS
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7.1.2 (Cont'd)

X * 14. Perform a general inspection around the 3A Diesel Engine and its auxiliaries to identify any leaks; i.e., check for accumulations of water, diesel fuel, or lube oil.

N/A * a. **IF** significant leakage is found, **THEN** notify the Shift Manager.

b. **IF** cooling water leakage is found, **THEN** perform the following:

N/A * (1) **IF** the leakage has the potential to enter a floor drain, **THEN** plug affected floor drains.

N/A * (2) Notify the Shift Manager and Chemistry.

X c. Place clean white rags over the Air Start Motor exhausts (4).

NOTE

To prevent start failure of the 3A EDG, IVs in Substep 7.1.2.11 need to be completed prior to continuing with this subsection of the procedure.

X 15. Verify the independent verification requirements of Substep 7.1.2.11 are complete prior to proceeding.

NOTE

Returning the Master Control Switch to NORMAL will cause Control Room Annunciator F 8/5, EDG A MASTER CONTROL SW OFF-NORMAL, to clear.

X * 16. Notify the Unit 3 RO that the Master Control Switch for the 3A EDG is being returned to normal **AND** to expect Annunciator F 8/5 to Clear.

X * a. Place the Master Control Switch to Normal.

X * b. Place the Rapid Start/Auto Start Bypass Switch to Normal.

X c. At Panel 3C370C, reset alarms.

X 17. Record the time the Master Control Switch was placed to Normal in the Unit Narrative Log.

INITIALS
CK'D VERIF

7.1.2 (Cont'd)

8. In the EDG Radiator Room, perform the following for the 3A EDG:

x a. Verify the diesel generator radiator is free from debris.

CAUTION

Do NOT place hands on or near fan belt.

x b. Check the diesel fan belt is in good condition (i.e., not frayed, twisted, etc.) **AND** is positioned properly in the pulley grooves.

x 9. At the 3A EDG Day Tank (3T23A), verify the day tank level is between 4 feet 10 inches and 6 feet 2 inches on LG-3-1428A, A-Diesel Gen Day Tank Level Gauge, and record level on Attachment 2, Section 1.

x 10. At Unit 3 Control Room VPA, verify the 3A-EDG Lockout Reset BLUE light is ON.

11. At Unit 3 Control Room Console, perform the following:

x a. Verify the 3A Diesel Generator Emergency Stop/Emergency Start control switch is in the MID (neutral) position.

x b. Verify the 3A Diesel Generator Normal Stop/Normal Start control switch is in the MID (neutral) position.

x c. Check that 3A Diesel Generator Ready To Start RED light is ON.

x d. Check that 3A Diesel Generator Normal Control WHITE light is ON.

x e. Check that 3A Diesel Generator Engine Idling AMBER light is OFF.

x f. Verify A Diesel Gen Speed Changer is in the OFF position.

x g. Verify A Diesel Gen Volt Regulator is in the OFF position.

x h. Verify EDG A Sync to 3A 4KV Bus 3AA20 synchroscope switch is OFF.

x i. Check that A EDG to 3A 4KV Bus 3AA20 Breaker GREEN open light is ON **AND** that the control switch is in the Mid position **AND** has a green flag.

x j. Verify the 3A Steam Generator Feed Pump is Running **OR** is Racked Out **OR** both Steam Generator Feed Pumps are stopped.

x k. Verify the 3A Condensate Pump is Running **OR** is Racked Out **OR** all Condensate Pumps are stopped.

x l. Verify the 3A Heater Drain Pump is Running **OR** is Racked Out **OR** both Heater Drain Pumps are stopped.

INIT 7.1.2 (Cont'd)

22. Check that the following Control Room annunciators are Clear:

X a. F 8/2, EDG A TROUBLE

X b. F 8/3, EDG A BKR OVERCURRENT TRIP

X c. F 8/4, DIESEL OIL DAY TANK A HI/LO LEVEL

X d. F 8/5, EDG A MASTER CONTROL SW OFF-NORMAL

N/A 23. **IF** this is a quarterly scheduled run, **THEN** place 3A Diesel Oil Transfer Pump 3P10A control switch to Off.

NOTES

- *When the 3A Diesel Generator Normal Stop/Normal Start switch is placed to Normal Start (spring return to Mid position), the 3A EDG will start and accelerate to idle speed of 450 rpm and maintain for 60 seconds before releasing to accelerate to full speed of 900 rpm.*
- *When the 3A EDG accelerates to full speed, the following actions occur:*
  - a. *The DG 3A Ready to Start red light will go Off (600 rpm).*
  - b. *The generator field will flash (800 rpm).*
- *Substep 7.1.2.24.a will require an operator to be at the Electric Fuel Priming Pump or at the Fuel Oil Manifold Pressure Gauge.*
- *Electric Fuel Priming Pump will start when performing Substep 7.1.2.24 and stop in less than 4 seconds.*

X 24. Momentarily place the 3A Diesel Generator Normal Stop/Normal Start switch to Normal Start (spring return to Mid position).

X a. Verify the Electric Fuel Priming Pump started when 3A EDG was started by monitoring the Fuel Oil Pressure Gauge (PI-3-3670A) **OR** by watching the pump shaft.

X 25. Verify the 3A EDG starts and accelerates to idle speed, 450 rpm (the DG3A Engine Idling amber light will be On when the engine reaches idle speed).

X a. Record engine start date/time: TODAY / NOW

INITIALS
CK'D VERIF

7.1.2 (Cont'd)

NOTE

A lack of oil on the rags indicates a failure of the lubricators for the Air Start Motors. Foreign particles (rust, dirt, etc.) may indicate impending Air Start Motor failure.

X — 26. Remove and inspect the rags placed over the Air Start Motor exhausts for evidence of oil and foreign particles.

N/A — 27. **IF** NO oil is present **OR** there is evidence of foreign particles on the rags, **THEN** notify the Shift Manager of a possible air start malfunction.

CAUTION

Loss of crankcase vacuum in conjunction with a decrease of one or more cylinder exhaust pyrometer readings could be indicative of fuel oil line or fitting failure in the crankcase area and fuel oil intrusion of the lube oil. When fuel oil intrusion is substantiated by the smell of fuel oil at the lube oil dipstick opening, the EDG is required to be shut down and NOT restarted until lube oil quality (absence of fuel oil) is determined to be acceptable.

NOTE

Guidelines for determining EDG crankcase vacuum/pressure are provided in Enclosure 2.

X — 28. Slowly Open 3A EDG Crankcase Vacuum Gauge, PI-3-6679A, Isol, 3-70-283A.

X — 29. While the diesel is running, periodically monitor crankcase vacuum at PI-3-6679A.

N/A — a. **IF** the diesel crankcase vacuum is lost in conjunction with a decrease of one or more cylinder exhaust pyrometer readings, **THEN** notify the Shift Manager that the diesel should be shut down **AND** the lube oil quality checked.

30. **WHEN** 3A EDG reaches rated speed (900 rpm), **THEN** record the After Start data on the following attachments:

X — a. Attachment 1, Section 2

X — b. Attachment 2, Section 3

INITIALS
CK'D VERIF

7.1.2 (Cont'd)

CAUTIONS

- ***The Diesel Generator should NOT be operated at rated speed of 900 rpm AND unloaded for periods of time over 4.5 hours. A minimum of 25 percent of load should be applied in a timely manner to reduce the possibility of SOUPING which can result in an exhaust system fire.***

- ***The following guidelines are required to be followed to reduce the probability of EDG overload conditions without Main Generator Lockout protection:***

  a. If the 3A 4KV bus is NOT powered via the auxiliary transformer (3AA02 open), special attention is required to be given to the 3A EDG operating parameters during parallel operation to the system and the EDG is required to be tripped upon indication of impending overload.

  b. If the 3A 4KV bus is powered via the auxiliary transformer (3AA02 closed), no special precautions are required because protection is provided by the Main Generator Lockout.

  c. Starting any of the following pumps may cause an EDG paralleled to the affected 4160V bus to trip and may cause damage to the EDG:

  1) Reactor Coolant Pump

  2) Condensate Pump

  3) Steam Generator Feed Pump

  4) Heater Drain Pump

  5) Circulating Water Pump

- ***The diesel generator is inoperable while parallel to the grid.***

31. Match 3A EDG output parameters to the system grid as follows:

____ a. Place the EDG A Sync to 3A 4KV Bus 3AA20 synchroscope switch to ON.

____ b. Check that the WHITE synchronizing lights are cycling ON.

____ c. Using the A Diesel Gen Volt Regulator, adjust Incoming voltage to match Running indicated voltage.

____ d. Using the A Diesel Gen Speed Changer, adjust engine speed so that the pointer on the Synchroscope is rotating slowly in the FAST direction.

____ e. Using the A Diesel Gen Volt Regulator, adjust Incoming voltage slightly higher than Running voltage.

____ f. Using the A Diesel Kilovolts indicator and 3A 4KV Bus Voltmeter, verify voltages are approximately equal between the 3A Diesel Generator output and the 3A 4KV Bus for all three phases.

INITIALS
CK'D VERIF

7.1.2.31 (Cont'd)

____ g. Verify 3A Diesel Generator frequency is between 59.4 and 60.6 Hz on the A Diesel Hertz indicator.

CAUTION

While synchronizing the EDG to the grid, it is imperative to add load without delay after the EDG breaker is closed because NOT loading to at least 200 KW may result in a reverse power trip.

____ h. **WHEN** the Synchroscope pointer is at 12 o'clock position, **THEN** close the diesel generator breaker by placing the A EDG to 3A 4KV Bus 3AA20 switch to CLOSE (spring return to normal).

____ (1) Verify the Diesel Generator Breaker 3AA20 has closed (Breaker GREEN light is OFF and RED light is ON **OR** A Diesel Amps indicator reads greater than 0 amps).

____ (2) Turn the A Diesel Gen Speed Changer in the RAISE direction, and increase diesel generator load to between 200 and 300 KW on the A Diesel Kilowatts indicator.

____ i. Place the EDG A Sync to 3A 4KV Bus 3AA20 synchroscope switch to Off.

____ j. Turn the A Diesel Gen Speed Changer in the RAISE direction, and slowly increase diesel generator load to approximately 1000 KW on A Diesel Kilowatts indicator.

NOTES

- *The following voltage adjustment will place the generator reactive load in Lag.*
- *As the generator is loaded, reactive load should be maintained in Lag as observed on the local Varmeter. The desired reactive load (vars) should be maintained approximately 300 to 1000 kVars.*
- *Coordination with the local operator is required to adjust reactive load.*

k. Using the 3A Diesel Gen Volt Regulator, perform the following to adjust reactive load:

____ (1) **IF** the local Varmeter indicates Lag, **THEN** slowly adjust voltage until the reactive load (vars) is approximately 300 to 1000 kVars in Lag.

INITIALS
CK'D VERIF

7.1.2.31.k (Cont'd)

(2) **IF** the local Varmeter indicates Lead **OR** **IF** vars are zero, **THEN** perform the following:

____ (a) Slowly RAISE the voltage until the amps stop decreasing and start to increase (Varmeter indicates Lag).

____ (b) Adjust voltage until the ratio of load (watts) to reactive load (vars) is between 300 to 1000 kVars in Lag.

____ (3) Request the local Operator to periodically report Varmeter reading as generator load is increased.

____ 32. **IF** the EDG Volts/Frequency Recorder was connected in preparation for Engineered Safeguards Integrated Testing, **THEN** notify Engineering to verify proper operation.

____ 33. Inspect the 3A EDG for any leaks or abnormalities.

____ a. Inspect the bucket under the air box drain for any additional accumulation of fluids resulting from the start, and record results on Attachment 2, Section 2.

____ b. Inspect the tell-tale weep holes on each cooling water pump drive shaft housing for signs of leakage of cooling water or oil from the seal.

____ (1) **IF** leakage is detected from the cooling water pump, **THEN** notify the System Engineer.

c. **IF** cooling water leakage is found, **THEN** perform the following:

____ (1) **IF** the leakage has the potential to enter a floor drain, **THEN** plug affected floor drains.

____ (2) Notify the Shift Manager and Chemistry.

CAUTION

3A EDG load shall NOT exceed 2750 KW and amperage shall NOT exceed 477 amps.

34. In the Control Room, perform the following:

____ a. Turn the A Diesel Gen Speed Changer in the RAISE direction, and increase diesel generator load until it is between 2300 and 2500 KW.

INITIALS
CK'D VERIF

7.1.2.34 (Cont'd)

NOTES

- *The following voltage adjustment will place the generator reactive load in Lag.*
- *As the generator is loaded, reactive load should be maintained in Lag as observed on the local Varmeter. The desired reactive load (vars) should be maintained 300 to 1000 kVars).*
- *Coordination with the local operator is required to adjust reactive load.*

b. Using the 3A Diesel Gen Volt Regulator, perform the following to adjust reactive load:

____ (1) **IF** the local Varmeter indicates Lag, **THEN** slowly adjust voltage until the reactive load (vars) is approximately 300 to 1000 kVars in Lag.

(2) **IF** the local Varmeter indicates Lead **OR** **IF** vars are zero, **THEN** perform the following:

____ (a) Slowly RAISE the voltage until the amps stop decreasing and start to increase (Varmeter indicates Lag).

____ (b) Adjust voltage until the reactive load (vars) is between 300 to 1000 kVars, while maintaining vars in Lag.

____ (3) Request the local Operator to periodically report Varmeter reading as generator load is increased.

NOTE

A change in day tank level should occur during diesel operation. A failure of the day tank indicated level to change may be indicative of an isolated or malfunctioning level indicator.

35. At 3A EDG, verify day tank level is being maintained within the following limits (N/A for quarterly scheduled runs during the transfer pump check):

____ a. Day Tank, LG-3-1428A

(1) Minimum level: 4 feet 10 inches

(2) Maximum level: 6 feet 2 inches

INITIALS
CK'D VERIF

7.1.2 (Cont'd)

36. At 3A EDG, verify skid tank level is being maintained by Auto Transfer of fuel oil from Day Tank to Skid Tank as follows:

____ a. Skid Tank, LI-3-3402A

(1) Minimum level: 40 to 150 gal (EDG operating) 150 gal (EDG in standby)

(2) Maximum level: 210 gal (EDG in standby)

37. Ensure both air start isolation valves are locked open as follows:

____ ____ a. 3A EDG Right Side Cranking Motor Isolation Valve, 3-70-257A

____ ____ b. 3A EDG Left Side Cranking Motor Isolation Valve, 3-70-305A

38. Verify air pressure is approximately 190 psig on the following gauges, and record on Attachment 2, Section 2:

____ a. Air to Pinion Engaging Air Motors, PI-3-205A

____ b. Air to Pinion Engaging Air Motors, PI-3-3691A

NOTES

- *The test of the Diesel Oil Transfer Pump Auto Start Circuit is to be performed during the quarterly EDG Surveillance Test OR when directed to be performed by the IST Coordinator. Substep 7.1.2.39 may be marked N/A when NOT required.*
- *At full load, the EDG burns approximately 100 gallons/hour of fuel oil. An inch of Day Tank level is approximately 50 gallons of fuel oil.*

____ 39. Monitor the Diesel Oil Day Tank Level on LG-3-1428A, A Diesel Gen Day Tank Level Gauge during the 3A EDG run.

a. **WHEN** level is less than 5 feet 6 inches, **THEN** perform the following:

____ 1. **IF** level is greater than 5 feet 1 inch, perform Substep 7.1.2.39.b.

____ 2. **IF** level is 5 feet 1 inch or less, perform Substep 7.1.2.39.c and Substep 7.1.2.39.d.

INITIALS
CK'D VERIF

7.1.2.39.b (Cont'd)

CAUTION

Do NOT use Substep 7.1.2.39.b if the level of the Day Tank is above 5 feet 6 inches.

b. **IF** necessary to prevent a long run of the EDG to prove auto starting of its associated fuel oil transfer pump, **THEN** perform the following:

____ (1) Position the 3A Diesel Oil Transfer Pump 3P10A Control Switch to AUTO.

____ (2) Remove the drain cap on Valve 3-70-129A, Diesel oil day tank level tree drain.

____ (3) Close Valve 3-70-128A, Diesel oil day tank level tree lower isolation valve.

____ (4) Establish communications with a pump watch at 3P10A.

____ (5) Place a bucket under Valve, 3-70-129A, Diesel oil day tank level tree drain.

____ (6) Open Valve 3-70-129A, Diesel oil day tank level tree drain.

____ (7) **WHEN** the level on the level tree achieves approximately 5 feet 1 inch, **THEN** verify with the pump watch that the Transfer Pump 3P10A has started.

CAUTION

Do NOT overfill the day tank.

____ (8) **WHEN** the Transfer Pump 3P10A has started, **THEN** close Valve 3-70-129A, Diesel oil day tank level tree drain.

____ ____ (9) Open Valve 3-70-128A, Diesel oil day tank level tree lower isolation valve.

____ (10) Verify that the pump stops at approximately 5 feet 11 inches.

____ (11) Replace the drain cap on 3-70-129A, Diesel oil drain tank level tree drain.

____ (12) Verify the 3A Diesel Oil Transfer Pump starts and transfers fuel from the storage tank to the day tank, and record results on Attachment 2, Section 1.

____ (13) **IF** this method is used to verify the Diesel Oil Transfer Pump Auto start circuit, **THEN** N/A Substeps 7.1.2.39.c and 7.1.2.39.d.

____ (14) Dispose of fuel oil in the satellite drum located in the Waste Building.

INITIALS
CK'D VERIF

7.1.2.39 (Cont'd)

____ c. Position the 3A Diesel Oil Transfer Pump 3P10A Control Switch to AUTO.

NOTE

Verification that the 3A Diesel Oil Transfer Pump transfers fuel from the storage tank to the day tank satisfies the IST exercise-open test for Diesel Oil to Day Tank Control Valve, CV-2046A.

____ d. Verify the 3A Diesel Oil Transfer Pump starts and transfers fuel from the storage tank to the day tank, and record results on Attachment 2, Section 1.

NOTE

During the quarterly scheduled EDG run, an IST exercise closure test of the 3A Air Receiver Supply Check Valves is required to be performed. The 3A EDG does NOT need to be running to perform this closure test. (N/A this step if test is NOT a quarterly run.)

40. During the quarterly scheduled EDG run, verify closure of 3A Air Receiver Supply Check Valves, 3-70-274A and 3-70-276A, as follows:

____ a. Verify the 3A Air Compressor is **NOT** in operation.

____ b. At the 3A EDG Control Panel, place the 3A Air Compressor control switch in OFF.

____ c. Verify that the EDG 3A Air Compressor is **NOT** aligned to the EDG 3B Air Receiver Tanks.

____ d. Close or verify closed 3A Air Compressor Cross-Tie Valve, 3-70-279A.

____ e. Verify 3A EDG Starting Air Purifier Outlet Valve 3-70-410A, open.

____ f. Fully open 3A EDG Air Start Dryer Outlet PI-3-6456A Test Connection Isolation Valve, 3-70-433A.

____ g. Allow sufficient time for dryer skid and piping to fully depressurize.

____ h. Check for the absence of gross leakage at Test Connection Isolation Valve, 3-70-433A, to verify that 3-70-274A and 3-70-276A are fully closed, and record results on Attachment 2, Section 1.

INITIALS
CK'D VERIF

7.1.2.40 (Cont'd)

NOTE

If significant air leakage is noted (i.e., the dryer skid will NOT depressurize), the IST Coordinator is required to be notified for appropriate corrective action requirements.

i. **IF** significant air leakage is noted, **THEN** notify the IST Coordinator of the leakage.

j. Close 3A EDG Air Start Dryer Outlet PI-3-6456A Test Connection Isolation Valve, 3-70-433A.

k. Place the 3A Air Compressor control switch in AUTO.

41. Record 3A EDG operating parameters data on the following attachments for the time intervals specified:

a. Attachment 1, Section 2.

b. Attachment 2, Section 3.

42. Check the 3A Diesel Generator operating parameters to be within the normal ranges as listed on Attachment 2, Section 3.

a. Check the Cooling Water System is operating within limits, and record results on Attachment 2, Section 1.

NOTE

If this test is being performed for a quarterly scheduled EDG run while performing the diesel oil transfer pump auto start check, the EDG may need to be run longer than1 hour if necessary to verify fuel transfer pump operation.

43. While maintaining required 3A EDG output between 2300 and 2500 KW, operate the 3A Diesel Generator loaded for a minimum of one hour or as directed by the Shift Manager, and record on Attachment 1, Section 1.

a. Ensure the Operator at the 3A EDG Building frequently verifies indicated VARs are between 300 and 1000 kVars Lag.

b. **IF** necessary to maintain between 300 and 1000 kVars Lag, **THEN** adjust VARs using the Voltage Control switch.

44. Verify the following attachment sections are completed and have been reviewed by an operator **NOT** present during the test:

a. Attachment 1, Section 2

b. Attachment 2, Section 3

INITIALS
CK'D VERIF

7.1.2 (Cont'd)

45. **WHEN** at least one hour has elapsed **OR** longer if necessary for the transfer pump auto start check, **THEN** perform the following in the Control Room (3C02):

CAUTION

Diesel generator load should NOT be reduced to less than 200 KW.

____ a. Turn the A Diesel Gen Speed Changer in the LOWER direction, and decrease diesel generator load to approximately 200 KW indicated on A Diesel Gen Kilowatts.

____ b. Open the 3A Diesel Generator Breaker, 3AA20, by placing the EDG A to 3A 4KV Bus 3AA20 switch to the TRIP position (spring return to mid position).

____ (1) Verify EDG A to 3A 4KV Bus 3AA20, has opened (Breaker GREEN light is ON and RED light is OFF).

____ c. Using the A Diesel Gen Volt Regulator, adjust voltage to approximately 4.16 KV (4100 volts to 4250 volts) on all three phases.

____ d. Using the A Diesel Gen Speed Changer, adjust engine speed to 60 Hz (900 rpm).

NOTES

- *When the 3A Diesel Generator Normal Stop/Normal Start switch is placed to NORMAL STOP (spring return to mid position), 3A EDG will decelerate to idle speed of 450 rpm, idle for approximately 20 minutes in the cooldown cycle, and then shut down. During this interval, the DG3A Engine Idling AMBER light will be ON.*
- *The DG3A Ready To Start RED light will energize when engine speed decreases to less than 600 rpm.*

____ 46. Momentarily place the 3A Diesel Generator Normal Stop/Normal Start switch to NORMAL STOP (spring return to mid position).

____ a. Check that the DG3A Engine Idling AMBER light is ON.

____ b. Check that the DG3A Ready to Start RED light energizes as 3A Diesel Generator decelerates.

INITIALS
CK'D VERIF

7.1.2 (Cont'd)

____ 47. Using the Tachometer on 3A EDG Engine Control Panel 3C13A, verify 3A Diesel Generator decelerates to idle speed, 450 rpm.

NOTES

- *Accurate oil sump level readings can be taken only with the EDG hot and idling.*
- *Lube oil should be added if the sump level decreases to 1/2 inch below the full dipstick mark.*

____ 48. Direct an operator to verify the Diesel Engine Oil Sump level is equal to or less than to 1/2 inch below the full dipstick mark while 3A Diesel Generator is idling (Center North side of EDG).

____ a. Verified 3A Diesel Engine Oil Sump level is equal to or less than 1/2 inch below the full dipstick mark, and record results on Attachment 2, Section 1.

49. **WHEN** 3A Diesel Generator has stopped following the idle period of approximately 20 minutes, **THEN** perform the following in the Control Room:

____ a. Verify the DG3A Engine Idling Amber light is Off.

____ b. Record engine stop date/time: ________________

____ c. Verify Annunciator F 8/4, DIESEL OIL DAY TANK A HI/LO LEVEL, is Clear.

50. Direct an operator to perform the following at the Unit 3 Diesel Generator Building:

____ ____ a. Ensure the 3A Diesel Oil Transfer Pump 3P10A switch is in Auto.

____ b. At 3A EDG Engine Control Panel 3C13A, record the Total Hour Meter reading on Attachment 2, Section 2.

____ c. At the generator, check the generator bearings for excessive heat by touching the bearing housings (each end).

____ ____ d. Close 3A EDG Crankcase Vacuum Gauge PI-3-6679A Isol, 3-70-283A.

____ ____ e. On the West wall of 3A EDG Room, verify the 3A EDG Room Ventilation Fan, 3V34A, control switch is in Auto.

INITIALS
CK'D VERIF

7.1.2.50 (Cont'd)

NOTE

Contact status is verified by ensuring the relay stabs are visible and in the lower position.

____ f. At the 3E04A cabinet, verify that the FFC relay is in the open position by ensuring that the contactor indicator is flush with the body of the relay, as shown in Figure 2.

____ g. Direct the operator at 3A EDG to inspect for leaks or abnormalities.

h. **IF** cooling water leakage is found, **THEN** perform the following:

____ (1) **IF** the leakage has the potential to enter a floor drain, **THEN** plug affected floor drains.

____ (2) Notify the Shift Manager and Chemistry.

51. Check for and drain any accumulated water from the 3A Diesel Oil Day Tank, 3T23A, as follows:

____ a. Position a bucket or other suitable container under the day tank level tree drain.

____ b. Verify 3A Diesel Oil Day Tank Level Tree Drain, 3-70-129A, is closed.

____ c. Remove the pipe cap from the day tank level tree drain line.

NOTE

To prevent excessive drainage of diesel fuel oil in the following step, be prepared to observe the fluid to determine presence of water (if any).

____ d. Slowly open 3A Diesel Oil Day Tank Level Tree Drain, 3-70-129A.

____ e. Verify all water (if present) is drained from the 3A Diesel Oil Day Tank, 3T23A.

____ (1) Drain a minimum of 1.5 gallons of fluid into the container.

____ ____ f. Close 3A Diesel Oil Day Tank Level Tree Drain, 3-70-129A.

____ ____ g. Replace the pipe cap on the day tank level tree drain line.

____ h. Remove the drained liquid from the Day Tank Room.

INITIALS
CK'D VERIF

7.1.2.51 (Cont'd)

____ i. Document water removal from the 3A Diesel Oil Day Tank, 3T23A, in Attachment 2, Section 1.

____ j. Record 3A Diesel Oil Day Tank level from A Diesel Gen Day Tank Level Gauge, LG-3-1428A, on Attachment 2, Section 1.

52. Check for and drain any accumulated water from the 3A EDG Skid Tank as follows:

____ a. Remove the cap from the skid tank drain.

b. Position suitable container at the skid tank drain.

NOTES

- *To prevent excessive drainage of diesel fuel oil in the following step, be prepared to observe the fluid to determine presence of water (if any).*
- *A minimum of 12 ounces of liquid should be drained to ensure all accumulated water is removed.*

____ c. Slowly open 3A EDG Skid Tank Drn, 3-70-041A.

____ d. Verify all water (if present) is drained from the 3A EDG Skid Tank.

____ ____ e. Close 3A EDG Skid Tank Drn, 3-70-041A.

____ f. Replace the cap on the skid tank drain.

____ g. Document water removal from the 3A EDG Skid Tank on Attachment 2, Section 1.

____ h. Dispose of the collected fluid in the appropriate manner.

NOTE

Verification of an increase in the 3A EDG Skid Tank level upon actuating the PUSH-TO-FILL pushbutton satisfies the exercise-open inservice test requirement for 3A EDG Skid Tank Solenoid Valve, SV-3522A.

____ 53. Fill the 3A EDG Skid Tank to greater than 150 gallons by depressing and holding the PUSH-TO-FILL pushbutton until at least 150 gallons are indicated on EDG 3A Fuel Oil Skid Tank Level Ind, LI-3-3402A.

____ a. Record EDG 3A Fuel Oil Skid Tank Level Ind, LI-3-3402A, on Attachment 2, Section 1.

INIT 7.1.2 (Cont'd)

____ 54. Complete Attachment 3, to verify 3A EDG is returned to Standby condition, and record performance on Attachment 2, Section 1.

____ 55. Contact the Stores Warehouse to confirm four drums of lubricating oil (Reference 0-GMP-102.2, Equipment Lubrication Guide, for oil type) are dedicated to the 3A Diesel Generator, and to confirm the hand pump and hose storage box are in storage.

____ a. Record on Attachment 2, Section 1.

____ 56. Inform the Unit 3 RO of no further intent to test the Emergency Diesel Generator.

____ 57. Notify the Shift Manager of completion of this test.

____ 58. Enter in the Unit Narrative Log the side of Air Start Motors which was used during this EDG run.

____ 59. Ensure log entries specified in Subsection 2.2 are recorded.

____ a. Ensure engine start and stop times are recorded in Narrative Logs.

____ 60. Complete the QA Record Page and all appendices required for the performance of this test.

____ 61. Determine the need to receive Fuel Oil and/or transfer between tanks based on U3 DOST, 4 A/B Fuel Oil Storage Tank levels, and the next scheduled EDG surveillance.

QA RECORD PAGE

(Page 1 of 1)

7.1 3A EDG Normal Start Test

Test Completed Satisfactorily: YES ☐ NO* ☐

* Provide reason why test was not completed satisfactorily under REMARKS.

REMARKS:____

____

____

____

____

____

____

Date/Time Started ________/________ Date/Time Completed ________/________

PERFORMED BY (Print)	INITIALS	VERIFIED BY (Print)	INITIALS

I have reviewed the requirements of this procedure and it has been satisfactorily performed. All supporting data is contained in the attached data package. Any deviations or TCs used to perform this procedure are listed under Remarks.

REVIEWED BY: ______________________________ DATE: __________

Shift Manager or SRO Designee

L-17-1 NRC Exam

JPM H

JPM TITLE: Test Process Radiation Monitor R-11

JPM NUMBER: 01067004200 **REV.** 0-1

TASK NUMBER(S) / TASK TITLE(S): 01067004200
Test Process Radiation Monitors R-11/R-12

K/A NUMBERS: 073 A4.02 **K/A VALUE:** RO 3.7 / SRO 3.7

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

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

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

Time for Completion: 10 Minutes Time Critical: ☐ Yes ☒ No

Alternate Path [NRC]: ☐ Yes ☒ No
Alternate Path [INPO]: ☐ Yes ☒ No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/01/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/02/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☒	☐	☐
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

NONE

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
0-0	New JPM	L-17-1 NRC Exam	N/A	N/A / N/A	N/A / N/A
0-1	Validation Comments	NRC Prep Week	N/A	Miklausich / Wilson	10/3/17 / 10/5/17

SIMULATOR SET-UP:

SIMULATOR SETUP INSTRUCTIONS:

______	1.	Reset to **IC 1** or saved IC.
______	2.	Place simulator in RUN.
______	3.	Ensure applicable portions of Simulator Operator Checklist are complete.
______	4.	Verify R-11 selected
______	5.	Verify R-11 WARN setpoint matches value posted on drawer
______	6.	Obtain PRMS RI-3-11/12 Normal/Supervisory Key (KEY 90)
______	7.	Acknowledge alarms and place simulator in FREEZE.
______	8.	Save as temporary IC, if JPM will be repeated.
______	9.	When ready to begin, then place Simulator in RUN.

SIMULATOR MALFUNCTIONS:

- N/A

SIMULATOR OVERRIDES:

- N/A

SIMULATOR REMOTE FUNCTIONS:

- N/A

Required Materials:	• HANDOUT 3-OSP-067.1A
General References:	• 3-OSP-067.1A, R-3-11/12 Process Radiation Monitor Operational Test
Task Standards:	• Place R-11 in Supervisory mode. • Determine WARN setpoint • Insert appropriate value to initiate R-11 test conditions • Verify R-11 Functional Criteria • Restore R-11 to original WARN setpoint

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

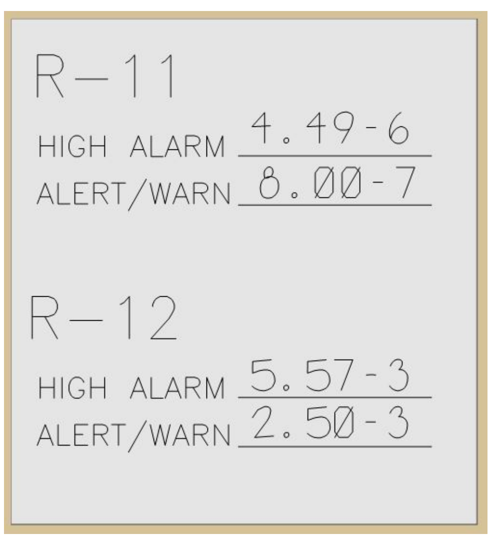
INITIAL CONDITIONS:

- Unit 3 is in Mode 1 100%
- No equipment is out of service

INITIATING CUES:

You have been directed to perform 3-OSP-067.1A, R-3-11/12 Process Radiation Monitor Operational Test, Section 4.2.2, Testing R-3-11 Alert/Warning Functions on RM-23A panel.

R-11/12 PLACARD SETPOINTS FOR REFERENCE:



NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Y" below the performance step number. Only the actions formatted with bold print are required to meet the standard of the critical step. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required materials.**
Standard:	Obtain a copy of 3-OSP-067.1A, R-3-11/12 Process Radiation Monitor Operational Test, Section 4.2.2, Testing R-3-11 Alert/Warning Functions, and the PRMS RI-3-11/12 Normal/Supervisory Key.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-2)**	**3-OSP-067.1A, 4.2.2.1** A. Using PRMS RI-3-11/12 Normal/Supervisory Key, **POSITION** NORM/SUPV switch in SUPV.
Standard:	Places NORM/SUPV switch in SUPV.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_(SEQ-3)**	**3-OSP-067.1A, 4.2.2.1** B. **CHECK** red SUPV MODE light, ON.
Standard:	Recognizes red SUPV MODE light is ON.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_(SEQ-4)**	**3-OSP-067.1A, 4.2.2.1** C. **CHECK** R11 PART pushbutton backlight, ON.
Standard:	ENSURES R11 PART pushbutton backlight is ON.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_(SEQ-5)**	**3-OSP-067.1A, 4.2.2.1** D. Using RM-23A keypad, **ENTER** the following:
Standard:	Enters <0> <1> <0> <ITEM> on the RM-23A keypad.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical __N__ (SEQ-6)**	**3-OSP-067.1A, 4.2.2.1** E. **RECORD** displayed WARN setpoint:
Standard:	Records the current WARN setpoint of 8.00-07.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical __N__ (SEQ-7)**	**3-OSP-067.1A, 4.2.2.1** F. **CHECK** setpoint recorded in Section 4.2.2, Step 1.E matches R-11 ALERT/WARN value posted on drawer.
Standard:	Checks setpoint value and drawer value match.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical __Y__ (SEQ-8)**	**3-OSP-067.1A, 4.2.2.1** G. Using RM-23A Keypad, **PERFORM** the following: (1) **ENTER** a number significantly less than current radiation level recorded in Section 4.2.1, Step 11.I. (2) **PRESS** <ENTER>.
Standard:	Enters a value on the RM-23A keypad that is significantly less than 3.47-09.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical N (SEQ-9)**	**3-OSP-067.1A, 4.2.2.1** H. **CHECK** R11 PART amber ALERT light, ON.
Standard:	Recognizes R11 PART amber ALERT light is ON.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical N (SEQ-10)**	**3-OSP-067.1A, 4.2.2.1** I. **COMPARE** results to Functional Criteria and **DOCUMENT**:
Standard:	Checks SAT on the Functional Criteria for R11 PART amber ALERT light, ON.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical N (SEQ-11)**	**3-OSP-067.1A, 4.2.2.1** J. **CHECK** R11 PART pushbutton FLASHING.
Standard:	Recognizes R11 PART pushbutton is FLASHING.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-12)**	**3-OSP-067.1A, 4.2.2.1** K. **COMPARE** results to Functional Criteria and **DOCUMENT**:
Standard:	Checks SAT on the Functional Criteria for R11 PART pushbutton FLASHING.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-13)**	**3-OSP-067.1A, 4.2.2.2** **CHECK** Annunciator H 3/6, PRMS R11/R12 BYPASSED/WARNING ACTIVATED, IN ALARM.
Standard:	Recognizes H 3/6, PRMS R11/R12 BYPASSED/WARNING ACTIVATED, is in ALARM.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-14)**	**3-OSP-067.1A, 4.2.2.3** **COMPARE** results to Functional Criteria and **DOCUMENT**:
Standard:	Checks SAT on the Functional Criteria for H 3/6 in ALARM.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-15)**	**3-OSP-067.1A, 4.2.2.4** CHECK RM-80, CNTMT AIR MONITOR R11/12 LOCAL MONITORING STATION, audible alarm ON (Auxiliary Building Hallway).
Standard:	Contacts field operator to verify audible alarm ON in aux building on RM-80.
Booth Cue:	When contacted, confirm audible alarm on RM-80 in aux building.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-16)**	**3-OSP-067.1A, 4.2.2.5** **COMPARE** results to Functional Criteria and **DOCUMENT**:
Standard:	Checks SAT on the Functional Criteria for RM-80 audible alarm is sounding.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-17)**	**3-OSP-067.1A, 4.2.2.6** At RM-80, CNTMT AIR MONITOR R11/12 LOCAL MONITORING STATION, momentarily PRESS local HORN ACK (alarm silence) pushbutton.
Standard:	Contacts field operator to press local HORN ACK pushbutton on RM-80.
Booth Cue:	When contacted, confirm HORN ACK pressed on RM-80 in aux building.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-18)**	**3-OSP-067.1A, 4.2.2.7** Momentarily **PRESS** R11 PART.
Standard:	Presses R11 PART.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-19)**	**3-OSP-067.1A, 4.2.2.8** A. Momentarily **PRESS** R11 PART.
Standard:	Presses R11 PART.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-20)**	**3-OSP-067.1A, 4.2.2.8** B. Using RM-23A Keypad, **ENTER** the following keystrokes:
Standard:	Enters <0> <1> <0> <ITEM> on the RM-23A keypad.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_(SEQ-21)**	**3-OSP-067.1A, 4.2.2.8** C. Using RM-23A Keypad, **ENTER** WARN setpoint recorded in Section 4.2.2, Step 1.E. D. **PRESS** <ENTER>.
Standard:	Enters <8> <0> <0> <-> <0> <7> <ITEM> on the RM-23A keypad.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_(SEQ-22)**	**3-OSP-067.1A, 4.2.2.8** E. Using RM-23A Keypad, **ENTER** the following keystrokes:
Standard:	Enters <0> <1> <0> <ITEM> on the RM-23A keypad.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_(SEQ-23)**	**3-OSP-067.1A, 4.2.2.8** F. CHECK number displayed is same as WARN setpoint recorded in Section 4.2.2, Step 1.E.
Standard:	Checks the WARN setpoint of 8.00-07.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Terminating Cues:
Once Section 4.2.2 complete, inform the examinee “This completes the JPM”

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ____________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

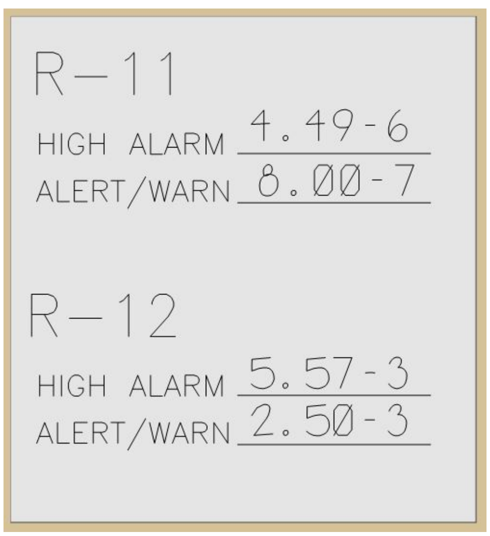
INITIAL CONDITIONS:

- Unit 3 is in Mode 1 100%
- No equipment is out of service

INITIATING CUES:

You have been directed to perform 3-OSP-067.1A, R-3-11/12 Process Radiation Monitor Operational Test, Section 4.2.2, Testing R-3-11 Alert/Warning Functions on RM-23A panel.

R-11/12 PLACARD SETPOINTS FOR REFERENCE:



NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

FPL	TURKEY POINT UNIT 3 OPERATIONS SURVEILLANCE PROCEDURE SAFETY RELATED **CONTINUOUS USE**	Procedure No. **3-OSP-067.1A** Revision No. **11**

Title:

R-3-11/12 PROCESS RADIATION MONITOR OPERATIONAL TEST

Responsible Department: OPERATIONS

Special Considerations:

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED TODAY INITIAL X

Revision	Approved By	Approval Date
1	Steve Murano	08/04/10
11	Keith Maestas	02/04/16

UNIT #	UNIT 3
DATE	
DOCT	PROCEDURE
DOCN	3-OSP-067.1A
SYS	
STATUS	COMPLETED
REV	11
# OF PGS	

REVISION SUMMARY	
Rev. No.	**Description**
11	**PCR 2082719, 02/04/16, Mark Formoso** Incorporate changes resulting from the implementation of **EC 284549** which is a CREVS modification of the High Flow Train B Trip amber light and Hi Flow Train B Reset pushbutton changed to a Normal Flow green light and test pushbutton. Also re-sequences "Record stop time of TSC Emergency Ventilation on recirc" step throughout the procedure.
10A	**PCR 2087509, 11/06/15, Shaun Mathews** Move "End of Section 4.4.1" to after step 12 on page 46.
10	**PCR 2074383, 10/26/15, Michael Hargis** Removes SF-1B, High Flow Trip Interlock and Installs Normal Flow Indicating Light via **EC 284549.**
9	**AR 1875452, 06/05/13, E. Tremblay** AR 1824554 failed to identify that 3-OSP-067.1A, needed to be revised to prevent placing TS-0002 and making the TSC Non-Functional.
8	**AR 1782484, 07/08/12, Don Haase** Corrected referenced steps from the previous change due to steps being deleted. Section 5.1: corrected referenced step numbers, corrected nomenclature for Alert/Warning setpoint, and deleted IVs on substeps where the whole step is an IV step.
7	**AR 1781315, 07/03/12, Joe Madison** Remove Fans EF-9 and EF-20 from procedure to reflect partial implementation of EC 249140.
6	**AR 1708632, 06/21/12, Paul Williams** Incorporated changes resulting from the implementation of EC 242497, Control Room Ventilation Intake Duct Modification. • Revised names of both Damper D-2 and Damper D-3, to EMERGENCY INLET DAMPER.
5	**AR 1692169, 11/23/11 Paul Williams** Revised to support implementation of EC 249145, TSC Emergency Ventilation System: • Included within Prerequisites a step to place new TSC EMER VENT AUTO INITIATE switch to INHIBIT. • Included step with section 5.1, Restoration a step to place new TSC EMER VENT AUTO INITIATE switch to ENABLE. • Included EC 249145 in references.

TABLE OF CONTENTS

1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions to perform ANALOG CHANNEL OPERATIONAL TESTS for R-3-11 and R-3-12 Process Radiation Monitors.

1.2 Scope

1.2.1 Frequency

- Monthly (MODES 1, 2, 3, 4 and during CORE ALTERATIONS or movement of irradiated fuel within the Containment)
- Quarterly (At all times)
- 100 hours prior to and at least once per 7 days during CORE ALTERATIONS
- Once per 18 months (MODE 5 and 6)

1.2.2 Applicability

At All Times

1.2.3 MODE Restrictions

None

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Precautions

If a Unit 4 Containment Purge fan is in operation in support of purge operations on Unit 3, it should be stopped within a short period of time of the isolation signal to prevent damage to the fan.

2.2 Limitations

1. If Containment Purge is **NOT** in progress, it need **NOT** be initiated to perform this test. A check of Containment Ventilation Isolation Lockout Relay on Panel 3QR50 Circuit 2 and 3QR51 Circuit 1 operation is sufficient.

2. Containment Purge Isolation is demonstrated by the isolation of the Purge Supply and Exhaust Valves.

3.0 PREREQUISITES

		INITIAL
3.1	**CHECK** R-3-11/12 in service per 3-NOP-067, Process Radiation Monitoring System.	X
3.2	**CHECK** Control Room HVAC in service.	X
3.3	**CHECK** RAI-6642, CONTROL ROOM NORMAL AIR INTAKE RAD MONITOR, CHANNEL B, **NOT** in ALARM.	X
3.4	**CHECK** RAI-6643, CONTROL ROOM NORMAL AIR INTAKE RAD MONITOR, CHANNEL A, **NOT** in ALARM.	X
3.5	**OBTAIN** PRMS RI-3-11/12 Normal/Supervisory Key.	X
3.6	**OBTAIN** permission from Shift Manager to perform this procedure.	X
3.7	**ENSURE** TS-0002, TSC EMER VENT AUTO INITIATE switch to ENABLE at 4QR82, INSTRUMENTATION RACK	X

End of Section 3.0

4.0 INSTRUCTIONS

4.1 General Requirements

1. IF during performance of this procedure <u>any</u> of the following occur:

   - Acceptance Criteria is UNSAT
   - A malfunction occurs
   - An abnormal condition is found

   THEN:

   - **NOTIFY** Unit Supervisor immediately. ______
   - **DOCUMENT** condition in Section 5.2, Documentation. ______

2. IF testing both R-3-11 and R-3-12, THEN **GO TO** Section 4.4, Functional Test of Both R-3-11, Containment Air Particulate, and R-3-12, Containment Air Gaseous Channels. N/A

End of Section 4.1

4.2 R-3-11, Containment Air Particulate Channel Functional Test

4.2.1 Establishing R-3-11 Initial Test Conditions

> **NOTE**
>
> - An operator at RM-80, CNTMT AIR MONITOR R11/12 LOCAL MONITORING STATION, is needed to silence the local alarm.
> - Automatic trip of Containment Purge Fans is **NOT** required to demonstrate OPERABILITY of Containment Ventilation Isolation function of PRMS Channels R11 and R12.

1. IF 4V9, U-4 CNTMT PURGE SUPPLY FAN, is in operation in support of purge on Unit 3, THEN **GO TO** Section 4.2.1, Step 2.C. N/A

2. IF Containment Purge is in progress, THEN:

   A. **PERFORM** one of the following:

      (1) **ENSURE** 3V9, U-3 CNTMT PURGE SUPPLY FAN, is in operation. N/A

      (2) **REQUEST** Electrical Department remove line starter contacts from breaker 30628, 3V9 CNTMNT PURGE SUPPLY FAN # 3 as follows: N/A

         a. **POSITION** 3V9, U-3 CNTMT PURGE SUPPLY FAN motor control switch in MID after STOP. N/A

         b. **REFER TO** 0-ADM-212.1, Operations In-Plant Equipment Clearance Orders, for Starter Main Contacts Removal Form requirements. N/A

         c. **PLACE** breaker 30628, 3V9 CNTMNT PURGE SUPPLY FAN # 3, in OFF. N/A

         d. **OPEN** breaker 30628, 3V9 CNTMNT PURGE SUPPLY FAN # 3 MCC bucket. N/A EM

         e. **PERFORM** a Live-Dead-Live voltage check to ensure Breaker 30628, 3V9 CNTMNT PURGE SUPPLY FAN # 3 Line Starter, DE-ENERGIZED. N/A EM

4.2.1 Establishing R-3-11 Initial Test Conditions (continued)

~~2.~~ **A. (2) (continued)**

f. **REMOVE** breaker 30628, 3V9 CNTMNT PURGE SUPPLY FAN # 3 line starter contacts. N/A EM

g. **CLOSE** breaker 30628, 3V9 CNTMNT PURGE SUPPLY FAN # 3 MCC bucket. N/A EM

h. **PLACE** breaker 30628, 3V9 CNTMNT PURGE SUPPLY FAN # 3, in ON. N/A

i. **POSITION** 3V9, U-3 CNTMT PURGE SUPPLY FAN motor control switch in MID after START. N/A

j. **CHECK** 3V9, U-3 CNTMT PURGE SUPPLY FAN red RUN light is ON. N/A

B. **ENSURE** 3V20, U-3 CNTMT PURGE EXHAUST FAN, in operation. N/A

C. **ENSURE** POV-3-2600, CONTAINMENT PURGE SUPPLY ISOLATION, OPEN. N/A

D. **ENSURE** POV-3-2601, CONTAINMENT PURGE SUPPLY ISOLATION, OPEN. N/A

E. **ENSURE** POV-3-2602, CONTAINMENT PURGE EXHAUST ISOLATION, OPEN. N/A

F. **ENSURE** POV-3-2603, CONTAINMENT PURGE EXHAUST ISOLATION, OPEN. N/A

~~3.~~ **ENSURE** CV-3-2819, CNTMT INSTRUMENT AIR BLEED ISOL, OPEN. X

~~4.~~ **ENSURE** CV-3-2826, CNTMT INSTRUMENT AIR BLEED ISOL, OPEN. X

~~5.~~ **CHECK** HS-3-R11, PRMS DRAWER R-11 BYPASS SWITCH, in NORMAL. X

~~6.~~ **CHECK** Annunciator H 3/6, PRMS R11/R12 BYPASSED/WARNING ACTUATED, is CLEAR. X

4.2.1 Establishing R-3-11 Initial Test Conditions (continued)

7. **CHECK** Annunciator H 1/4, PRMS HI RADIATION, is CLEAR. x

8. **CHECK** Annunciator H 5/2, CNTMT ISOLATION ACTIVATED, is CLEAR. x

9. At 4QR82, INSTRUMENTATION RACK, **PERFORM** the following:

   - **ENSURE** D-11B, CONTROL ROOM RECIRC DAMPER, CLOSED. x
   - **ENSURE** D-3, EMERGENCY INLET DAMPER, CLOSED. x
   - **ENSURE** D-22, KITCHEN EXHAUST DAMPER, OPEN. x
   - **ENSURE** D-1B, VENTILATION INLET DAMPER, OPEN. x
   - **ENSURE** SF-1B, EMERGENCY AIR SUPPLY FAN (V-29B), in AUTO after STOP. x
   - **CHECK** SF-1B, EMERGENCY AIR SUPPLY FAN (V-29B), OFF (green OFF light ON). x
   - **PUSH** the Normal Flow Light Test Pushbutton AND **CHECK** Normal Flow Indicating Light ON x
   - **ENSURE** D-14, TOILET EXHAUST DAMPER, OPEN. x

10. At 4QR81, INSTRUMENTATION RACK, **PERFORM** the following:

   - **ENSURE** D-11A, CONTROL ROOM RECIRC DAMPER, CLOSED. x
   - **ENSURE** D-2, EMERGENCYD-2, EMERGENCY INLET DAMPER, CLOSED. x
   - **ENSURE** D-1A, VENTILATION INLET DAMPER, OPEN. x
   - **ENSURE** SF-1A, EMERGENCY AIR SUPPLY FAN (V-29A), switch in AUTO after STOP. x
   - **CHECK** SF-1A, EMERGENCY AIR SUPPLY FAN (V-29A), OFF (green OFF light ON). x

INITIAL

4.2.1 Establishing R-3-11 Initial Test Conditions (continued)

> **CAUTION**
>
> Do **NOT** adjust the position of dampers D-20 and D-21, CNTL ROOM HVAC MANUAL DAMPER-RECIRC VOL CNTL. These dampers are throttled to obtain a balanced recirculation flow of 1000 cfm during emergency conditions.

11. At panel RM-23A, PRMS R-3-11/12 CNTMT AIR MONITOR 3V36, **PERFORM** the following:

		INITIAL
A.	**CHECK** R11 PART green OPER light, ON.	X
B.	**CHECK** R12 GAS green OPER light, ON.	X
C.	**CHECK** R11 PART amber ALERT light, OFF.	X
D.	**CHECK** R12 GAS amber ALERT light, OFF.	X
E.	**CHECK** R11 PART red HIGH light, OFF.	X
F.	**CHECK** R12 GAS red HIGH light, OFF.	X
G.	**PRESS** R11 PART.	X
H.	**CHECK** µCi/cc digital display indication present.	X
I.	**RECORD** current R-11 PART reading: 3.47 E -9 µCi/cc	X

End of Section 4.2.1

4.2.2 Testing R-3-11 Alert/Warning Functions

1. At panel RM-23A, PRMS R-3-11/12 CNTMT AIR MONITOR 3V36, **PERFORM** the following:

A. Using PRMS RI-3-11/12 Normal/Supervisory Key, **POSITION** NORM/SUPV switch in SUPV. _______

B. **CHECK** red SUPV MODE light, ON. _______

C. **CHECK** R11 PART pushbutton backlight, ON. _______

> **NOTE**
>
> The following keystrokes modify the WARN setpoint for the Radiation Monitor currently selected (R-3-11).

D. Using RM-23A keypad, **ENTER** the following:

<0> <1> <0> <ITEM> _______

E. **RECORD** displayed WARN setpoint:

_____ . _____ _____ _____ _____ _____
(+ or -) _______

F. **CHECK** setpoint recorded in Section 4.2.2, Step 1.E matches R-11 ALERT/WARN value posted on drawer. _______

> **NOTE**
>
> Numerical setpoints are entered in the form X.XX (+ or -) YY, where the decimal point is assumed (**NOT** entered), and YY represents the power of 10.

G. Using RM-23A Keypad, **PERFORM** the following:

(1) **ENTER** a number significantly less than current radiation level recorded in Section 4.2.1, Step 11.I. _______

> **EXAMPLE**
>
> If current R11 PART is 2.10-08, a setpoint of 1.00-10 may be used as follows:
>
> <1> <0> <0> <-> <1> <0> <ENTER>

(2) **PRESS** <ENTER>. _______

4.2.2 Testing R-3-11 Alert/Warning Functions (continued)

1. (continued)

H. **CHECK** R11 PART amber ALERT light, ON. ______

I. **COMPARE** results to Functional Criteria and **DOCUMENT**: ______

Functional Criteria	Results
R11 PART amber ALERT light, ON	❑ SAT ❑ UNSAT

J. **CHECK** R11 PART pushbutton FLASHING. ______

K. **COMPARE** results to Functional Criteria and **DOCUMENT**: ______

Functional Criteria	Results
R11 PART pushbutton FLASHING	❑ SAT ❑ UNSAT

2. **CHECK** Annunciator H 3/6, PRMS R11/R12 BYPASSED/WARNING ACTIVATED, IN ALARM. ______

3. **COMPARE** results to Functional Criteria and **DOCUMENT**: ______

Functional Criteria	Results
H 3/6 is IN ALARM	❑ SAT ❑ UNSAT

4. **CHECK** RM-80, CNTMT AIR MONITOR R11/12 LOCAL MONITORING STATION, audible alarm ON (Auxiliary Building Hallway). ______

5. **COMPARE** results to Functional Criteria and **DOCUMENT**: ______

Functional Criteria	Results
RM-80 audible alarm is sounding	❑ SAT ❑ UNSAT

6. At RM-80, CNTMT AIR MONITOR R11/12 LOCAL MONITORING STATION, momentarily **PRESS** local HORN ACK (alarm silence) pushbutton. ______

7. Momentarily **PRESS** R11 PART. ______

4.2.2 Testing R-3-11 Alert/Warning Functions (continued)

8. At panel RM-23A, PRMS R-3-11/12 CNTMT AIR MONITOR 3V36, **PERFORM** the following: ______

   A. Momentarily **PRESS** R11 PART. ______

   B. Using RM-23A Keypad, **ENTER** the following keystrokes:

      <0> <1> <0> <ITEM> ______

   C. Using RM-23A Keypad, **ENTER** WARN setpoint recorded in Section 4.2.2, Step 1.E. ______

   D. **PRESS** <ENTER>. ______

   E. Using RM-23A Keypad, **ENTER** the following keystrokes:

      <0> <1> <0> <ITEM> ______

   F. **CHECK** number displayed is same as WARN setpoint recorded in Section 4.2.2, Step 1.E. ______

End of Section 4.2.2

L-17-1 NRC Exam

JPM I

JPM TITLE: Startup a Rod Drive Motor Generator Set

JPM NUMBER: 14028003100 **REV.** 2-1

TASK NUMBER(S) / TASK TITLE(S): 14028003100/ Startup a Rod Drive Motor Generator Set

K/A NUMBERS: 001 A4.08 **K/A VALUE:** RO 3.7 / SRO 3.4

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: x Perform: ___

EVALUATION LOCATION:

In-Plant:	x	Control Room:	
Simulator:		Other:	
Lab:			

Time for Completion: 20 Minutes Time Critical: No

Alternate Path [NRC]: No
Alternate Path [INPO]: No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/01/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/02/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
A. Are all items on the signature page filled in correctly?	☒	☐	☐
B. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
C. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☒
D. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
E. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
F. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
G. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
H. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
I. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
J. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
K. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
L. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
M. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
N. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
O. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
P. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: None

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER SUPERVISOR	DATE DATE
2-0	Formatting; Modifications	L-17-1 NRC Exam	N/A	N/A N/A	N/A N/A
2-1	Validation Comments	NRC Prep Week	N/A	Miklausich Wilson	10/3/17 10/5/17

Required Materials:	• HANDOUT 3/4-NOP-028
General References:	• 3/4-NOP-028, Control Rod Drive MG Set Operation
Task Standards:	• Demonstrate ability to manually operate and/or monitor the operation of rod control MG sets and control panel • Start the 3/4A Control Rod Drive MG Set and operate at ~260 volts

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

Initial Conditions:

- No Control Rod Drive MG Sets are currently operating.
- 3/4A and 3/4B Control Rod Drive MG Set input and output breakers are racked in.
- All applicable prerequisites are satisfied for starting a Control Rod Drive MG Set.
- All power cabinet cooling fans are running.
- An I&C vibration specialist is ready to monitor Control Rod Drive MG Set vibration, when required.

Initiating Cue:

- The Unit 3/4 RO directs you to start the 3/4A Control Rod Drive MG Set, in accordance with 3/4-NOP-028, Section 4.1.2, Starting a MG Set, Step 4.1.2.3.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Evaluator Note:	Evaluator should decide which Unit to be performed on ahead of time and mark JPM accordingly.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required materials.**
Standard:	Obtain a copy of 3/4-NOP-028, Control Rod Drive MG Set Operation.
Evaluator Cue:	This JPM may be performed on either unit. Provide examinee with HANDOUT 3/4-NOP-028.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-2)**	**At 3/4A MG Set controls panel, ensure the following:** • **The AC ground relay is reset.** • **Voltmeter selector switch selected to A-B.** • **Generator 3/4A Voltage Adjust potentiometer fully counterclockwise.** • **Ammeter selector switch selected to A.** • **Synchronize Generator 3/4A selector switch is OFF.**
Standard:	Ensure that the 3/4A MG Set controls panel is properly set up for starting a MG Set.
Evaluator Cue:	When checked/simulated, tell examinee that the 3/4A MG Set controls are as follows: • AC ground relay is reset (i.e., target flags are black). • Voltmeter selector switch selected to A-B. • Generator 3/4A Voltage Adjust potentiometer is fully counterclockwise. • Ammeter selector switch is selected to A. • Synchronize Generator 3/4A selector switch is in OFF.
Performance:	**SATISFACTORY _______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-3)**	**At 3/4B MG Set controls panel, ensure the following:** • **Voltmeter selector switch selected to A-B.** • **Generator 3/4B Voltage Adjust potentiometer fully counterclockwise.** • **Ammeter selector switch selected to A.** • **Synchronize Generator 3/4B selector switch is OFF.**
Standard:	Ensure that the 3/4B MG Set controls panel is properly set up for starting a MG Set.
Evaluator Cue:	When checked/simulated, tell examinee that the 3/4B MG Set controls are as follows: • Voltmeter selector switch selected to A-B. • Generator 3/4B Voltage Adjust potentiometer is fully counterclockwise. • Ammeter selector switch is selected to A. • Synchronize Generator 3/4B selector switch is in OFF.
Performance:	**SATISFACTORY _______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-4)**	**Inside the 3/4B MG Set controls panel, ensure the following:** • **3-pole grounding switch, 1KS, is open.** • **Control power breaker, 1CB, is on.**
Standard:	Ensure that the 3/4B MG Set controls panel is properly set up for starting a MG Set.
Evaluator Note:	For safety purposes, do not allow the examinee to actually enter the 3/4B MG Set controls panel. Use picture for reference as examinee explains switch positioning.
Evaluator Cue:	• When examinee expresses the need to enter the 3/4B MG Set controls panel to open the 1KS grounding switch, indicate to examinee that the switch is open. • When checked/simulated, tell examinee that the 1CB control power breaker is in ON.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-5)**	**At MG Set controls panel for the MG Set selected to be started, take the motor input breaker control switch to CLOSE.**
Standard:	Push in the motor input breaker control switch for 3/4A MG Set and turn it to CLOSE.
Evaluator Cue:	When simulated, tell examinee that the motor input breaker control switch is in CLOSE, the red indicating light is on, and the green indicating light is off.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_(SEQ-6)**	**When 60 seconds has elapsed and the MG Set has reached operating speed, then press the field flash pushbutton <u>until</u> voltage stabilizes at approximately 260 VAC.**
Standard:	Depress field flash pushbutton until voltage stabilizes at ~260 VAC.
Evaluator Cue:	When field flash pushbutton simulated depressed, tell examinee that voltage is **240 VAC** and stable.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_(SEQ-7)**	**IF voltage is NOT between 210 and 260 VAC, THEN ADJUST the Voltage Adjust potentiometer until the VOLTMETER reads 260 VAC.**
Standard:	Recognize voltage is stable at **240 VAC**.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-8)**	**Ensure non-running MG Set output breaker is in one of the following positions:** • **Test** • **Racked in**
Standard:	Verify that the output breaker for 3/4B MG Set is racked in.
Evaluator Note:	This was stated in the initial conditions.
Evaluator Cue:	If asked, inform examinee that the output breaker for 3/4B MG Set is racked in.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-9)**	**Take the output breaker control switch to CLOSE.**
Standard:	Take the output breaker control switch for 3/4A MG Set to CLOSE.
Evaluator Cue:	When simulated, tell examinee that the output breaker control switch is in CLOSE.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-10)**	**Check the output breaker indicates closed.**
Standard:	Verify that the output breaker for 3/4A MG Set is closed.
Evaluator Cue:	If asked, tell examinee that the red indicating light is on and the green indicating light is off.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-11)**	**IF voltage is NOT between 255 and 265 VAC, THEN adjust the Voltage Adjust potentiometer until voltage is 255 to 265 VAC.**
Standard:	Adjust 3/4A MG Set Voltage Adjust potentiometer until voltage is >255 VAC and <265 VAC.
Evaluator Cue:	When simulated, tell examinee that voltage is 260 VAC and stable.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Terminating Cues: **When the examinee completes Sequence 11, state "This completes the JPM."**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

Initial Conditions:

- No Control Rod Drive MG Sets are currently operating.
- 3/4A and 3/4B Control Rod Drive MG Set input and output breakers are racked in.
- All applicable prerequisites are satisfied for starting a Control Rod Drive MG Set.
- All power cabinet cooling fans are running.
- An I&C vibration specialist is ready to monitor Control Rod Drive MG Set vibration, when required.

Initiating Cue:

- The Unit 3/4 RO directs you to start the 3/4A Control Rod Drive MG Set, in accordance with 3/4-NOP-028, Section 4.1.2, Starting a MG Set, Step 4.1.2.3.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.


2L
2H
21FU
23FU
1CB
22FU
3
A
25FU

FPL	**TURKEY POINT UNIT 3** **NORMAL OPERATING PROCEDURE** SAFETY RELATED **CONTINUOUS USE**	Procedure No. **3-NOP-028** Revision No. **3A**

Title:

CONTROL ROD DRIVE MG SET OPERATION

Responsible Department: OPERATIONS

Special Considerations:

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED TODAY INITIAL X

Revision	Approved By	Approval Date
0	Randy Flynn	05/28/10
3A	David Houtz	11/15/16

UNIT #	UNIT 3
DATE	
DOCT	PROCEDURE
DOCN	3-NOP-028
SYS	
STATUS	COMPLETED
REV	3A
# OF PGS	

REVISION SUMMARY	
Rev. No.	**Description**
3A	**PCR 2167624, 11/15/16, Enrique Socias** Add the words "for the MG Set selected to be started" to two steps.
3	**PCR 2106173, 05/19/16, Michael Coen** Adds guidance to determine if Rod Control Power Cabinet Group Light is out due to burned out bulb or blown fuse.
2	**PCR 582404, 5/21/15, Joseph Turek** Additional expected annunciator information to be added to the NOTE prior to Section 4.3.2, Step 5.F.
1	**PCR 1818873, 11/07/12, Gerard T Slaby** EC 246849, Turbine Digital Control System, replaced Turbine Trip Relay 20/AST and 20/ASB with 94/AST and 94/ASB. The power source that used to feed 20/AST was 3D01, the new power source to 94/AST is 3D23-13. Revised fuse on page 15. Revised reference Section 7.1.2, Developmental 7. Added Section 4.1.1, Step 2 thru Section 4.1.1, Step 4 to reinstall fuses.
0A	**PCR 564114, 12/16/10, Dennis VanLinder** Attachment 1, Page 2 of 4 - Corrected component locations on 120 VAC lighting Panel 34/34A by changing panel "34/34A in 3B 4KV Bus Room" to "34A in 3A 4KV Bus Room." Also corrected typo in component description of LP34A-60. Error was introduced during the last revision.

TABLE OF CONTENTS

1.0 PURPOSE

This procedure provides instructions for the operation of the Control Rod Drive MG Sets.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 <u>Precautions</u>

1. Both the main and the auxiliary 120 VAC power must be de-energized to completely de-energize the Logic Cabinet.

2. Placing the three disconnect switches on the three Plug-In Bus Duct Units, associated with each Power Cabinet, in OFF only disconnects the three phase primary power associated with the respective switch. Lethal voltages are present, however, from the main and auxiliary 120 VAC power and the 125 VDC and 70 VDC power.

3. To de-energize the DC Hold Cabinet, the Bus Disconnect DC Hold Power switch must be placed to OFF and the main AC must be de-energized.

4. The reactor protection racks provide power to the auxiliary feedwater auto start circuitry and must remain energized <u>until</u> RCS temperature is less than 350°F (MODE 4).

2.2 <u>Limitations</u>

None

3.0 PREREQUISITES

None

4.1.2 Starting a MG Set

> **NOTE**
>
> This section is for startup of an MG Set when none are running. Starting the second MG Set is performed per Section 4.2.1.

1. **ENSURE** the Rod Control System is energized per Section 4.1.1
2. **CHECK** both MG Sets are off.

> **NOTE**
>
> The MG Set Controls are located in the 3B MCC Room.

3. At 3A MG SET CONTROLS panel, **ENSURE** the following:

> **NOTE**
>
> The AC GROUND RELAY can be reset by pushing up on the small rod that extends from the bottom right hand side of the relay case.

- The AC GROUND RELAY is RESET.
- VOLTMETER selector switch selected to A-B.
- Generator 3A Voltage Adjust potentiometer fully COUNTERCLOCKWISE.
- AMMETER selector switch selected to A.
- SYNCHRONIZE GENERATOR 3A selector switch is OFF.

4. At 3B MG SET CONTROLS panel, **ENSURE** the following:

- VOLTMETER selector switch selected to A-B.
- Generator 3B Voltage Adjust potentiometer is fully COUNTERCLOCKWISE.
- AMMETER selector switch selected to A.
- SYNCHRONIZE GENERATOR 3B selector switch is OFF.

4.1.2 Starting a MG Set (continued)

5. Inside the 3B MG SET CONTROLS panel, **ENSURE** the following:
   - 3-pole Grounding Switch, 1KS, is OPEN.
   - Control Power Breaker, 1CB, is ON.
6. At MG SET CONTROLS panel for the MG Set selected to be started, **TAKE** MOTOR INPUT BREAKER control switch to CLOSE.
7. WHEN 60 seconds has elapsed AND the MG Set has reached operating speed, THEN **PRESS** the FIELD FLASH pushbutton <u>until</u> voltage stabilizes at approximately 260 VAC.
8. IF voltage is **NOT** between 210 and 260 VAC, THEN **ADJUST** the Voltage Adjust potentiometer until the VOLTMETER reads 260 VAC.

> **NOTE**
>
> - When the OUTPUT BREAKER is CLOSED, indicated voltage may drop slightly due to the load increase.
> - For single MG Set operation, the OUTPUT BREAKER for the other MG Set must be in either the TEST or RACKED IN to allow closure of the OUTPUT BREAKER for the first MG Set.

9. **ENSURE** non-running MG Set OUTPUT BREAKER is in <u>one</u> of the following positions:
   - TEST
   - RACKED IN
10. **TAKE** the OUTPUT BREAKER control switch to CLOSE for the MG Set selected to be started .
11. **CHECK** the OUTPUT BREAKER indicates CLOSED for the MG Set selected to be started . ________

____
IV

4.1.2 Starting a MG Set (continued)

12. IF voltage is **NOT** between 255 and 265 VAC, THEN **ADJUST** the Voltage Adjust potentiometer until voltage is 255 to 265 VAC. _______

____
IV

13. IF desired to reset the reactor trip, THEN **PERFORM** the following:

    A. **ENSURE** at least one CRDM cooling fan is running.

    B. **ENSURE** all reactor trip signals are CLEAR.

    C. **PRESS** the REACTOR TRIP RESET pushbutton.

End of Section 4.1.2

L-17-1 NRC Exam

JPM J

JPM TITLE: Realignment of Unit 4 HHSI Pump Suction to Unit 4 RWST

JPM NUMBER: 24200025500 **REV.** 0-0

TASK NUMBER(S) / TASK TITLE(S): 24200025500
Respond to Loss of Emergency Coolant Recirculation

K/A NUMBERS: EPE 011 EA1.13 **K/A VALUE:** RO 4.1 / SRO 4.2

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

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

EVALUATION LOCATION:

In-Plant:	☐	Control Room:	☐
Simulator:	☒	Other:	☐
Lab:	☐		

Time for Completion: 10 Minutes Time Critical: ☐ Yes ☒ No

Alternate Path [NRC]: ☐ Yes ☒ No
Alternate Path [INPO]: ☐ Yes ☒ No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/01/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/02/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☒
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

NONE

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER SUPERVISOR	DATE DATE
0-0	New JPM	L-17-1 NRC Exam	N/A	N/A N/A	N/A N/A

Required Materials:	• HANDOUT 3-EOP-ECA-1.1 • HANDOUT 870A • HANDOUT 870B • HANDOUT 892A • HANDOUT 892B • HANDOUT 864C
General References:	• 3-EOP-ECA-1.1, Loss of Emergency Coolant Recirculation
Task Standards:	• Realign Unit 4 HHSI Pump Suction to Unit 4 RWST

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- Unit 3 has experienced a Loss of Emergency Coolant Recirculation
- Unit 3 is preparing to establish Safety Injection from Unit 4 RWST

INITIATING CUES:

You have been directed to perform 3-EOP-ECA-1.1, Loss of Emergency Coolant Recirculation, Attachment 3, Realignment of Unit 4 HHSI Pump Suction to Unit 4 RWST.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Y" below the performance step number. Only the actions formatted with bold print are required to meet the standard of the critical step. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required materials.**
Standard:	Obtain a copy of 3-EOP-ECA-1.1, Loss of Emergency Coolant Recirculation, Attachment 3, Realignment of Unit 4 HHSI Pump Suction to Unit 4 RWST
Evaluator Cue:	Provide copy of HANDOUT 3-EOP-ECA-1.1
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-2)**	**Attachment 3, Step 1** a. Locally close SI pump Suction Inter-Tie valves: • 870A, High-Head SI Pump Suction Header Sectionalizing Valve • 870B, SI Pump Suction Cross Connect Valve
Standard:	Closes both valves 870A and 870B.
Evaluator Cue:	When operator demonstrates proper operation, inform them that the handwheel stops moving and the stem is fully inserted. (Provide copy of HANDOUT 870A and HANDOUT 870B as requested.)
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-3)**	**Attachment 3, Step 1** b. Locally close High-Head SI Pump Mini Flow Recirculation Cross Connect valves: • 892A • 892B
Standard:	Closes both 892A and 892B.
Evaluator Cue:	When operator demonstrates proper operation, inform them that the handwheel stops moving and the stem is fully inserted. (Provide copy of HANDOUT 892A and HANDOUT 892B as requested.)
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Performance Step: **Critical _Y_ (SEQ-4)**	**Attachment 3, Step 1** c. Open Unit 4 RWST Outlet valve: • 4-864C
Standard:	Opens valve 4-864C.
Evaluator Cue:	When operator demonstrates proper operation, inform them that the handwheel stops moving and the stem is fully withdrawn. (Provide copy of HANDOUT 864C as requested.)
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Terminating Cues:
Once valve 4-864C is verified OPEN, inform the examinee that “This completes the JPM”.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- Unit 3 has experienced a Loss of Emergency Coolant Recirculation
- Unit 3 is preparing to establish Safety Injection from Unit 4 RWST

INITIATING CUES:

You have been directed to perform 3-EOP-ECA-1.1, Loss of Emergency Coolant Recirculation, Attachment 3, Realignment of Unit 4 HHSI Pump Suction to Unit 4 RWST.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

ATTACHMENT 3
Realignment of Unit 4 High Head SI Pump Suction to Unit 4 RWST
(Page 1 of 1)

1. Align Unit 4 High-Head SI Pumps to Unit 4 RWST.

a. Locally close SI pump Suction Inter-Tie valves:

- 870A, High-Head SI Pump Suction Header Sectionalizing Valve
- 870B, SI Pump Suction Cross Connect Valve

b. Locally close High-Head SI Pump Mini Flow Recirculation Cross Connect valves:

- 892A
- 892B

c. Open Unit 4 RWST Outlet valve:

- 4-864C

d. Turn ON control power and open Unit 4 High-Head SI Pump Recirculation To RWST valves:

- MOV-4-856A
- MOV-4-856B

e. Turn OFF control power to Unit 4 High-Head SI Pump Recirculation To RWST valves:

- MOV-4-856A
- MOV-4-856B

2. Notify Unit Supervisor that Attachment 3 Is complete.

End of Attachment 3

L-17-1 NRC Exam

JPM K

JPM TITLE: Manually Control Steam to AFW Pump with T&T Valve

JPM NUMBER: 04075012301 **REV.** 2-1

TASK NUMBER(S) / TASK TITLE(S): 04075012300/ Manually Control Steam to AFW Pump with T&T Valve

K/A NUMBERS: APE 054 AA1.01 **K/A VALUE:** RO 4.5 / SRO 4.4

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: x Perform:

EVALUATION LOCATION: In-Plant: x Control Room:

Simulator: Other:

Lab:

Time for Completion: 20 Minutes Time Critical: No

Alternate Path [NRC]: Yes

Alternate Path [INPO]: Yes

Developed by:	**Val Miklausich**	**07/27/17**
	Instructor/Developer	Date
Reviewed by:	**Tim Hodge**	**08/01/17**
	Instructor (Instructional Review)	Date
Validated by:	**Mike Murphy**	**07/27/17**
	SME (Technical Review)	Date
Approved by:	**Mark Wilson**	**08/02/17**
	Training Supervision	Date
Approved by:	**Mike Murphy**	**07/27/17**
	Training Program Owner	Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	**YES**	**NO**	**N/A**
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☒
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

<u>**Protected Content:**</u> (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

N/A

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
2-0	Formatting; Modifications	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
2-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17

Required Materials:	• HANDOUT 3-ONOP-075
General References:	• 3-ONOP-075, Auxiliary Feedwater System Malfunction
Task Standards:	• Reset A AFW T&T valve overspeed trip. • Take local control of A AFW pump by manually operating A AFW T&T valve. • Trip A AFW pump due to abnormal operation.

HAND JPM BRIEFING SHEET TO EXAMINEE AT THIS TIME

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- Unit 3 trips from 100% power.
- C AFW pump is OOS for governor repairs.
- All remaining AFW pumps and valves were verified in their proper emergency alignment and the system has been verified intact; with a total flow of approximately 900 gpm being supplied to Unit 3.

Subsequently:

- The A AFW pump trips on overspeed.
- B AFW pump is supplying Train 2 feed flow at 450 gpm.
- CSTs are at 94%, slowly lowering.

INITIATING CUES:

You have been directed to restore the A AFW pump using Attachment 4 of 3-ONOP-075, Auxiliary Feedwater System Malfunction.

NOTE: Ensure the turnover sheet is returned to the evaluator when complete.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically, cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Yes" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required reference materials.**
Standard:	3-ONOP-075, Auxiliary Feedwater System Malfunction, obtained.
Evaluator Cue:	Provide examinee with a copy of HANDOUT 3-ONOP-075.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Performance Step: **Critical _N_ (SEQ-2)**	**3-ONOP-075, Step 3.2.3.c:** CHECK all AFW Pumps operating at approximately 6,000 rpm.
Standard:	Recognize A AFW pump not running.
Evaluator Cue:	• When each AFW pump is identified and checked, give status: A pump at 0 rpm, B pump at 5900 rpm, C pump at 0 rpm. • If examinee checks status of overspeed trip on A AFW T&T, respond as appropriate, the Overspeed Trip Light is ON, the A AFW T&T is tripped. • If valve position is checked, illustrate that the valve is closed, the green CLOSED light is ON, the red OPEN light is OFF.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-3)**	**3-ONOP-075, Step 3.2.3.c.RNO** PERFORM the following: IF AFW Pump tripped on mechanical overspeed, then direct personnel to perform Attachment 4, Resetting Mechanical Overspeed Trip Following an Auto Start Signal, while continuing with this procedure.
Standard:	Continues with Attachment 4.
Evaluator Note:	The intent is to have the examinee continue with Attachment 4. If they try to direct another operator continue with that while they continue with section 3.2, use cue to inform them to perform all steps as directed by the procedure.
Evaluator Cue:	If examinee attempts to continue with section 3.2 and they have recognized the need to perform Attachment 4, tell them that the Reactor Operator has directed them to continue with Attachment 4.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical N (SEQ-4)**	**3-ONOP-075, Attachment 4, Step 1** ENSURE adequate water supply greater than 10% in the CST(s) aligned to the AFW System.
Standard:	Ensure CST level is greater than 10%. **YES, 94% from turnover.**
Evaluator Cue:	If examinee contacts anyone to check level, tell examinee that the level in both CSTs is 94% and lowering.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical N (SEQ-5)**	**3-ONOP-075, Attachment 4, Step 2** ENSURE flow path from CST to pump suction by performing the following: A. ENSURE 3-20-400, AFW SUPPLY FROM CST, OPEN.
Standard:	Valve recognized as open.
Evaluator Note:	Examinee may consider initial conditions to be sufficient, or may want to physically verify, either is acceptable.
Evaluator Cue:	• If examinee chooses to physically verify, if at any time they demonstrate knowledge of the valve location inside the Unit 3 CST cage, tell examinee that the valve is OPEN. • When examinee identifies valve, tell examinee that stem is fully withdrawn.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-6)**	**3-ONOP-075, Attachment 4, Step 2** ENSURE flow path from CST to pump suction by performing the following: B. Ensure OPEN 3-20-144, AFW Pump A Suction Isol
Standard:	Valve recognized as open.
Evaluator Note:	Examinee may consider initial conditions to be sufficient, or may want to physically verify, either is acceptable.
Evaluator Cue:	When examinee identifies valve, tell examinee that stem is fully withdrawn.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-7)**	**3-ONOP-075, Attachment 4, Step 3** Check by visual inspection the governor valve linkage mechanism intact.
Standard:	Recognize linkage intact.
Evaluator Cue:	When examinee identifies A AFW T&T linkage and simulates checking it's intact, tell examinee the linkage is intact.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-8)**	**3-ONOP-075, Attachment 4, Step 4** CHECK correct oil level in the governor housing.
Standard:	Check governor oil level.
Evaluator Cue:	When examinee identifies sight glass for A AFW pump governor, illustrate to examinee that the oil level is just above the mid-level mark.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-9)**	**3-ONOP-075, Attachment 4, Step 5** Reset mechanical overspeed trip. (See Attachment 6, Mechanical Overspeed Latching Scribe Mark Location).
Standard:	Reset A AFW T&T valve overspeed trip.
Evaluator Note:	To ensure the valve is reset properly, the examinee can check the spoon is properly set, the roller ball is on the north side of the plate, and the trip pawl is engaged.
Evaluator Cue:	• When examinee identifies and simulates resetting the A AFW T&T overspeed trip, tell examinee that the linkage moves towards valve and does not spring back towards pump. • If examinee checks light indication, tell examinee that the amber overspeed trip light is OFF. • If asked for pump or valve status, tell examinee that the pump is starting but that there is a very large amount of steam coming from south side of AFW turbine that's directly impinging on the B AFW pump.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

THIS BEGINS THE ALTERNATE-PATH PORTION OF THE JPM

Performance Step: **Critical _Y_(SEQ-10)**	**0-ADM-211, EOP & ONOP Usage.** Secure A AFW pump.
Standard:	A AFW pump **SECURED**.
Evaluator Note:	• Examinee may secure pump by using the handwheel to close the T&T valve or by using mechanical trip lever, either is acceptable. • Examinee may attempt to call for assistance, use cue to tell examinee that there is no response from anyone contacted. • Guidance per 0-ADM-211, EOP & ONOP Usage, step 5.7.3.2.c/e.
Evaluator Cue:	• When examinee simulates securing correct pump, tell examinee that the steam leak has stopped and pump speed is lowering. • If examinee attempts to contact anyone for assistance, tell examinee that there is no response.
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Terminating Cue: **When examinee completes securing the A AFW pump, state "This completes the JPM."**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- Unit 3 trips from 100% power.
- C AFW pump is OOS for governor repairs.
- All remaining AFW pumps and valves were verified in their proper emergency alignment and the system has been verified intact; with a total flow of approximately 900 gpm being supplied to Unit 3.

Subsequently:

- The A AFW pump trips on overspeed.
- B AFW pump is supplying Train 2 feed flow at 450 gpm.
- CSTs are at 94%, slowly lowering.

INITIATING CUES:

You have been directed to restore the A AFW pump using Attachment 4 of 3-ONOP-075, Auxiliary Feedwater System Malfunction.

NOTE: Ensure the turnover sheet is returned to the evaluator when the JPM is complete.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

3.2 Subsequent Operator Actions (continued)

3. (continued)

B.	**CHECK** AFW regulating valves OPEN.	**PERFORM** the following: **1.** Manually **OPEN** the valves. **2.** IF valves will **NOT** OPEN, THEN **DIRECT** personnel to perform Attachment 3, Manual Control of AFW Regulating Valves, while continuing with this procedure. **3.** **CHECK** DC White Light ON for AFW regulating valves. **a.** IF DC White Light is **NOT** ON, THEN locally **RESET** AND **CLOSE** applicable breaker(s). • 3D01-14 for Train 1 • 3D23-6 for Train 2 • 3D23-20 for Train 2
C.	**CHECK** <u>all</u> AFW Pumps operating at approximately 6,000 rpm.	**PERFORM** the following: **1.** IF AFW Pump tripped on mechanical overspeed, THEN **DIRECT** personnel to perform Attachment 4, Resetting Mechanical Overspeed Trip Following an Auto Start Signal, while continuing with this procedure. **2.** IF malfunction of the AFW Pump Turbine Throttle and Trip Valve is suspected, THEN **DIRECT** personnel to perform Attachment 5, Manual Control of AFW Pump Turbine Throttle and Trip (T&T) Valve, while continuing with this procedure.

ATTACHMENT 4
Resetting Mechanical Overspeed Trip Following an Auto Start Signal
(Page 1 of 1)

1. **ENSURE** adequate water supply greater than 10% in the CST(s) aligned to the AFW System.

2. **ENSURE** flow path from CST to pump suction by performing the following:

   A. **ENSURE** 3-20-400, AFW SUPPLY FROM CST, OPEN.

   B. **ENSURE** OPEN, the following for the affected pump:

      * A Pump: 3-20-144, AFW PUMP A SUCTION ISOL
      * B Pump: 3-20-244, AFW PUMP B SUCTION ISOL
      * C Pump: 3-20-344, AFW PUMP C SUCTION ISOL

3. **CHECK** by visual inspection the governor valve linkage mechanism is intact.

> **NOTE**
> - Level should be at or above the mid-level mark of the sightglass when turbine is shut down.
> - Level should be visible in sightglass with turbine in operation.

4. **CHECK** correct oil level in the governor housing.

> **CAUTION**
> The AFW pump could start after the mechanical overspeed trip is RESET.

5. **RESET** mechanical overspeed trip (See Attachment 6, Mechanical Overspeed Latching Scribe Mark Location).

6. IF the AFW pump trips again on mechanical overspeed, THEN **NOTIFY** Mechanical Maintenance to determine operability of the governor.

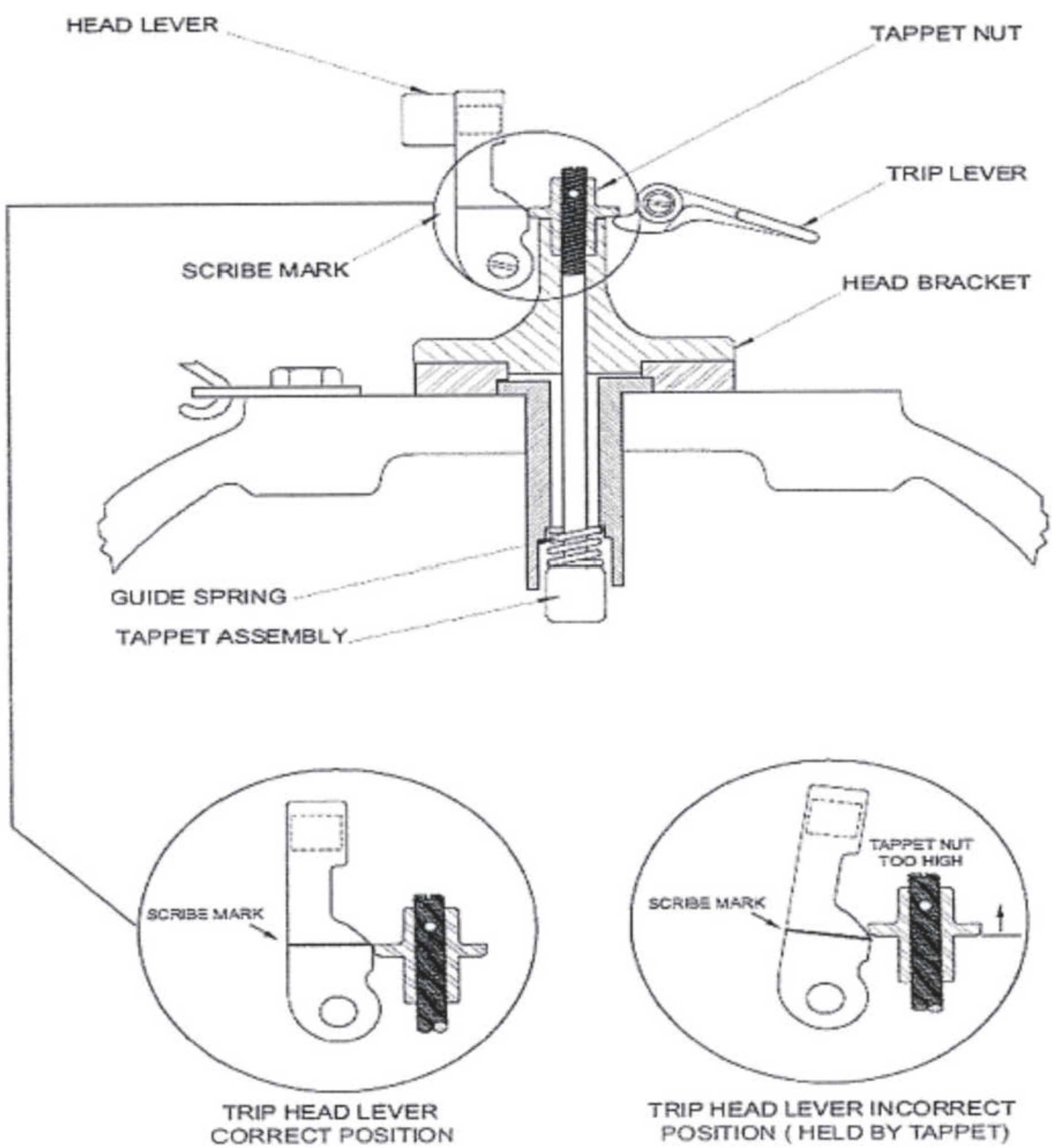
ATTACHMENT 5
Manual Control of AFW Pump Turbine Throttle and Trip (T&T) Valve
(Page 1 of 1)

1. **CHECK** pump steam pressure available by any of the following:
   - PI-1416, STEAM SUPPLY TO AUX FW TURBINE A
   - PI-1417, STEAM SUPPLY TO AUX FW TURBINE B
   - PI-1418, STEAM SUPPLY TO AUX FW TURBINE C
2. **ENSURE** T&T valve latched.
3. **OPEN** T&T valve by engaging the handwheel AND turning the handwheel counterclockwise.
4. **ADJUST** T&T valve to obtain a pump discharge pressure approximately 150 psig greater than steam supply pressure, as indicated on any of the following:
   - PI-1429, AUX FEEDWATER PUMP A DISCH
   - PI-1430, AUX FEEDWATER PUMP A DISCH
   - PI-1431, AUX FEEDWATER PUMP C DISCH
5. **INSPECT** pump for proper operation.

ATTACHMENT 6

Mechanical Overspeed Latching Scribe Mark Location

(Page 1 of 1)



L-17-1 NRC Exam

JPM RO A1a

JPM TITLE: Calculate Quadrant Power Tilt Ratio

JPM NUMBER: 01059006200 **REV.** 2-1

TASK NUMBER(S) / TASK TITLE(S): 01059006200/
Calculate Quadrant Power Tilt Ratio

K/A NUMBERS: 2.1.7 **K/A VALUE:** RO 4.4

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [x]

EVALUATION LOCATION: In-Plant: [ ] Control Room: [ ]
Simulator: [ ] Classroom: [x]
Lab: [ ] Other: [ ]

Time for Completion: 20 Minutes Time Critical: No

Alternate Path [NRC]: No
Alternate Path [INPO]: No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/02/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/02/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☒
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: None

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
2-0	Formatting	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
2-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17

Required Materials:	• HANDOUT 3-OSP-059.10 • Unit 3 Plant Curve Book • Calculator
General References:	• Unit 3 Plant Curve Book • 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio
Task Standards:	• Determine QPTR • Determine QPTR Acceptance Criteria

NOTE: Additional references available upon request.

L-17-1 NRC EXAM SECURE INFORMATION

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

Initial Conditions:

- Unit 3 is operating at 100% power.
- Excore detector currents (µA) for all in-service power-range nuclear instrument channels are as follows:
  - N-41 (top) – 225.7; N-41 (bottom) – 202.1
  - N-42 (top) – 171.2; N-42 (bottom) – 189.9
  - N-43 (top) – 213.4; N-43 (bottom) – 199.3
  - N-44 (top) – 228.1; N-44 (bottom) – 200.3

Initiating Cue:

You are directed by the Shift Manager to perform 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio, Section 4.2, Determination of NIS QPTR Using Detector Current Readings, and determine if adequacy of the data given is SAT/UNSAT.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required materials.**
Standard:	Obtain required materials.
Evaluator Cue:	Provide examinee with the following: • HANDOUT 3-OSP-059.10 • HANDOUT PCB-5-5 • Calculator
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-2)**	**3-OSP-059.10, Attachment 1** 1. RECORD Date/Time
Standard:	Record current date, current time, and initials on Attachment 1.
Evaluator Note:	Section 4.2 Step 1 directs performance of Attachment 1.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-3)**	**3-OSP-059.10, Attachment 1** 2. DETERMINE normalized detector currents.
Standard:	Record and calculate Upper and Lower Section Normalized Detector Currents on Attachment 1.
Evaluator Note:	Refer to KEY.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-4)**	**3-OSP-059.10, Attachment 1** 3. DETERMINE average normalized power.
Standard:	Record and calculate Average Upper and Lower Section Normalized Power on Attachment 1.
Evaluator Note:	Refer to KEY.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-5)**	**3-OSP-059.10, Attachment 1** 4. DETERMINE QPTR as follows.
Standard:	Calculate and determine highest QPTR = 1.033. (1.03-1.04)
Evaluator Note:	Refer to KEY.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-6)**	**3-OSP-059.10, Attachment 1** 5. DETERMINE NIS QPTR Acceptance Criteria below.
Standard:	Recognize that result 1.033 exceeds acceptance criteria 1.02 and mark UNSAT.
Evaluator Note:	Refer to KEY.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-7)**	**3-OSP-059.10, Attachment 1** 6. IF QPTR results are suspect or QPTR is greater than 1.0195 (1.95%), THEN REFER TO Section 4.2, Step 5 for additional guidance.
Standard:	Examinee determines that Section 4.3 needs to be performed.
Evaluator Note:	This step refers back to Section 4.2, Step 5.
Evaluator Cue:	When it is identified that Section 4.3 needs to be performed, state that another Operator will continue with Section 4.3.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Terminating Cues: **When the examinee completes Step 7, state "This completes the JPM."**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

KEY Page 1 of 2

REVISION NO.: 3	PROCEDURE TITLE:	PAGE:
PROCEDURE NO.: 3-OSP-059.10	DETERMINATION OF QUADRANT POWER TILT RATIO TURKEY POINT UNIT 3	23 of 28

ATTACHMENT 1
Determination of NIS QPTR Using Excore Detector Currents
(Page 1 of 2)

INITIAL

1. **RECORD** Date: TODAY Time NOW &

2. **DETERMINE** normalized detector currents. &

Upper Section Normalized Detector Currents			
N41 Top Current / 100% Top Current	=	225.7 micro amps / 215.9 micro amps	= 1.0454
N42 Top Current / 100% Top Current	=	171.2 micro amps / 168.9 micro amps	= 1.0136
N43 Top Current / 100% Top Current	=	213.4 micro amps / 215.7 micro amps	= 0.9893
N44 Top Current / 100% Top Current	=	228.1 micro amps / 214.8 micro amps	= 1.0619
Upper Section Normalized Current Total			= 4.1102

(4.09 - 4.13)

Lower Section Normalized Detector Currents			
N41 Bottom Current / 100% Bottom Current	=	202.1 micro amps / 199.3 micro amps	= 1.0140
N42 Bottom Current / 100% Bottom Current	=	189.9 micro amps / 186.6 micro amps	= 1.0177
N43 Bottom Current / 100% Bottom Current	=	199.3 micro amps / 191.9 micro amps	= 1.0386
N44 Bottom Current / 100% Bottom Current	=	200.3 micro amps / 204.5 micro amps	= 0.9795
Lower Section Normalized Current Total			= 4.0498

(4.02 - 4.06)

3. **DETERMINE** average normalized power: &

Average Upper Section Normalized Power			
Upper Section Normalized Current Total / Upper detectors used (3 or 4)	=	4.1102 / 4	= 1.0276

(1.02 - 1.04)

Average Lower Section Normalized Power			
Lower Section Normalized Current Total / Lower detectors used (3 or 4)	=	4.0498 / 4	= 1.0125

(1.00 - 1.02)

Key Page 2 of 2

REVISION NO.: 3	PROCEDURE TITLE: DETERMINATION OF QUADRANT POWER TILT RATIO	PAGE: 24 of 28
PROCEDURE NO.: 3-OSP-059.10	TURKEY POINT UNIT 3	INITIAL

ATTACHMENT 1
Determination of NIS QPTR Using Excore Detector Currents
(Page 2 of 2)

4. **DETERMINE** QPTR as follows:

Upper Section Tilt Ratio			
Largest Upper Section Normalized Detector Current / Average Upper Section Normalized Power	=	1.0619 / 1.0276	= 1.0334

(1.03 - 1.04)

Lower Section Tilt Ratio			
Largest Lower Section Normalized Detector Current / Average Lower Section Normalized Power	=	1.0386 / 1.0125	= 1.0258

(1.01 - 1.03)

NIS QPTR = highest Section QPTR = 1.0334 (1.03 - 1.04) &

5. **DETERMINE** NIS QPTR Acceptance Criteria below. &

Acceptance Criteria	Results
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☒ UNSAT

6. IF QPTR results are suspect or QPTR is greater than 1.0195 (1.95%), THEN **REFER TO** Section 4.2, Step 5 for additional guidance. ______

Performed By: ______________________ ________ ________
Print/Sign Initials Date

Reviewed By: ______________________ ________ ________
Print/Sign Initials Date

Approved By: ______________________ ________ ________
Print/Sign Initials Date

TURNOVER SHEET

Initial Conditions:

- Unit 3 is operating at 100% power.
- Excore detector currents (µA) for all in-service power-range nuclear instrument channels are as follows:
  - N-41 (top) – 225.7; N-41 (bottom) – 202.1
  - N-42 (top) – 171.2; N-42 (bottom) – 189.9
  - N-43 (top) – 213.4; N-43 (bottom) – 199.3
  - N-44 (top) – 228.1; N-44 (bottom) – 200.3

Initiating Cue:

You are directed by the Shift Manager to perform 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio, Section 4.2, Determination of NIS QPTR Using Detector Current Readings, and determine if adequacy of the data given is SAT/UNSAT.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

ATTACHMENT 1
Determination of NIS QPTR Using Excore Detector Currents
(Page 1 of 2)

1. **RECORD** Date: TODAY Time NOW &

2. **DETERMINE** normalized detector currents. &

Upper Section Normalized Detector Currents				
N41 Top Current / 100% Top Current	=	225.7 / 215.9	micro amps / micro amps	= 1.0454
N42 Top Current / 100% Top Current	=	171.2 / 168.9	micro amps / micro amps	= 1.0136
N43 Top Current / 100% Top Current	=	213.4 / 215.7	micro amps / micro amps	= 0.9893
N44 Top Current / 100% Top Current	=	228.1 / 214.8	micro amps / micro amps	= 1.0619
Upper Section Normalized Current Total				= 4.1102

(4.09 - 4.13)

Lower Section Normalized Detector Currents				
N41 Bottom Current / 100% Bottom Current	=	202.1 / 199.3	micro amps / micro amps	= 1.0140
N42 Bottom Current / 100% Bottom Current	=	189.9 / 186.6	micro amps / micro amps	= 1.0177
N43 Bottom Current / 100% Bottom Current	=	199.3 / 191.9	micro amps / micro amps	= 1.0386
N44 Bottom Current / 100% Bottom Current	=	200.3 / 204.5	micro amps / micro amps	= 0.9795
Lower Section Normalized Current Total				= 4.0498

(4.02 - 4.06)

3. **DETERMINE** average normalized power: &

Average Upper Section Normalized Power			
Upper Section Normalized Current Total / Upper detectors used (3 or 4)	=	4.1102 / 4	= 1.0276

(1.02 - 1.04)

Average Lower Section Normalized Power			
Lower Section Normalized Current Total / Lower detectors used (3 or 4)	=	4.0498 / 4	= 1.0125

(1.00 - 1.02)

ATTACHMENT 1
Determination of NIS QPTR Using Excore Detector Currents
(Page 2 of 2)

4. **DETERMINE** QPTR as follows:

Upper Section Tilt Ratio		
Largest Upper Section Normalized Detector Current / Average Upper Section Normalized Power	= 1.0619 / 1.0276	= 1.0334

(1.03 - 1.04)

Lower Section Tilt Ratio		
Largest Lower Section Normalized Detector Current / Average Lower Section Normalized Power	= 1.0386 / 1.0125	= 1.0258

(1.01 - 1.03)

NIS QPTR = highest Section QPTR = 1.0334 (1.03 - 1.04) &

5. **DETERMINE** NIS QPTR Acceptance Criteria below. &

Acceptance Criteria	Results
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☒ UNSAT

6. IF QPTR results are suspect or QPTR is greater than 1.0195 (1.95%), THEN **REFER TO** Section 4.2, Step 5 for additional guidance. ______

Performed By: ______________________ ______ ______
Print/Sign Initials Date

Reviewed By: ______________________ ______ ______
Print/Sign Initials Date

Approved By: ______________________ ______ ______
Print/Sign Initials Date

FPL	TURKEY POINT UNIT 3 OPERATIONS SURVEILLANCE PROCEDURE SAFETY RELATED **CONTINUOUS USE**	Procedure No. **3-OSP-059.10** Revision No. **3**

Title:

DETERMINATION OF QUADRANT POWER TILT RATIO

Responsible Department: OPERATIONS

Special Considerations:

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED_TODAY_ INITIAL_&_

Revision	Approved By	Approval Date
0	Mike Murphy	05/26/10
3	Mike Murphy	12/02/16

UNIT #	UNIT 3
DATE	
DOCT	PROCEDURE
DOCN	3-OSP-059.10
SYS	
STATUS	COMPLETED
REV	3
# OF PGS	

REVISION SUMMARY	
Rev. No.	**Description**
3	**PCR 2145991, 12/02/16, Samuel Muir** Enhances procedure with NOTE in Section 4.4 to contact Reactor Engineering if thermocouple QPTR calculation needs updating.
2A	**PCR 2145386, 07/25/16, Shaun Matthews** Remove negative sign on Attachment 1, Step 4.
2	**PCR 1956402, 03/30/16, Karl Frater** Removes reference to Attachment 2 in Section 4.1, Step 1. **PCR 2104285, Chris Boyd** Removes Engineering Supervisor signature in Section 5.2.
1A	**PCR 1925197, 01/08/14, John McGowen** Editorial Correction to Section 4.2, Step 5.
1	**PCR 1890793, 07/24/13, Chris Boyd** Enhance procedure to include an administrative limit for QPTR so as not to exceed Tech Spec limit.
0B	**PCR 1754169, 04/20/12, Joe McGuinness** Step 6 on Attachment 1 should align with Section 4.2, Step 5.
0A	**PCR 10-2172, 06/16/10, Mike Gilmore** Minor corrections (typos) in Section 4.3, Step 4.
0	**PCR 10-0462, 05/26/10, Mike Gilmore** Revision to **3-OSP-059.10,** approval date **07/01/2009**. Upgraded format to comply with AD-AA-100-1003 Rev 1, FPL Procedure Writer's guide. Revised wording to reflect the changes in the definition of "ensure" and "verify." Included **PCR 09-4028**, Add clarifications regarding actions to take for an out-of-compliance QPTR. Included **PCR 08-3551**, to revise procedure per CR 2008-16202, identification section regarding performance of a QPTR prior to removing A PR NI Channel from service when less than 50% power.

TABLE OF CONTENTS

1.0 PURPOSE AND SCOPE

1.1 Purpose

1. This procedure provides instructional guidance to determine actual QUADRANT POWER TILT RATIO (QPTR).
2. This surveillance satisfies the surveillance requirements of Technical Specifications 4.2.4.1 when RATED THERMAL POWER is above 50%.
3. This surveillance can satisfy surveillance requirements of Technical Specifications 4.2.4.2 when RATED THERMAL POWER is above 75% and one Power Range channel inoperable.

1.2 Scope

1.2.1 Frequency

7 Days

1.2.2 Applicability

MODE 1 >50% Power

1.2.3 MODE Restrictions

None

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Precautions

1. Anytime an Acceptance Criteria is determined to be UNSAT, the US / SM shall be notified immediately and shall take appropriate actions per Technical Specifications.

2. Any malfunction or abnormal condition requires documentation in Section 5.2, Documentation.

2.2 Limitations

1. A QPTR is **NOT** required with reactor power <50%.

2. The following annunciators are automatically defeated at power levels less than 50%:

   - B 2/2 - POWER RANGE UPPER DET HI FLUX DEV/AUTO DEFEAT

   - B 2/3 - POWER RANGE LOWER DET HI FLUX DEV/AUTO DEFEAT

3. With reactor power greater than 50%, QPTR determination using the excore NIS channels (Section 4.2 or Section 4.3) is required once per 7 days, except as noted below:

   A. With any of the below annunciators inoperable, QPTR determination using the NIS channels should be performed at least once per 8 hours and is required at least once per 12 hours (Tech Spec 4.2.4.1).

   - B 2/2 - POWER RANGE UPPER DET HI FLUX DEV/AUTO DEFEAT

   - B 2/3 - POWER RANGE LOWER DET HI FLUX DEV/AUTO DEFEAT

   B. With one Power Range NIS channel inoperable, QPTR determination using the remaining three NIS channels (Section 4.2 or Section 4.3) should be performed at least once per 8 hours and is required at least once per 12 hours (administrative requirement below 75%).

   C. With QPTR greater than 1.02 (2.0%), QPTR determination is required at least once per hour (Tech Spec 3/4.2.4).

2.2 Limitations (continued)

4. With reactor power greater than or equal to 75% and one Power Range NIS channel inoperable, a QPTR determination using the remaining three NIS channels (Section 4.2 or Section 4.3) and a QPTR determination using one of the following five methods (Section 4.4) shall be performed as follows:

- A QPTR determination should be completed within 8 hours after declaring the channel inoperable and shall be completed within 12 hours after declaring the channel inoperable to satisfy Tech Spec 4.2.4.2.
- Subsequent QPTR determinations should be started approximately 8 hours after completion of the previous QPTR determination and shall be completed within 12 hours after completion of the previous QPTR determination to satisfy Tech Spec 4.2.4.2.

A. An automatic core exit thermocouple QPTR calculation using Section 4.4.1 (preferred method).

B. A manual core exit thermocouple QPTR calculation using Section 4.4.2.

C. A flux map using two sets of four symmetric thimble locations (E11, H03, C08, L11, H13, E05, N08 and L05) using Section 4.4.3.

D. A flux map using at least 16 thimbles with a minimum of 2 thimbles per quadrant using Section 4.4.4.

E. A full-core flux map using Section 4.4.5.

5. Calculations may be performed without interim rounding on any attachment [Ref: Section 8.1.2, Developmental 3.D]. For example:

- Use rounded results from each individual calculation in the final calculations.
- Use the default number of significant digits in each individual calculation in the final calculation.

6. With reactor power greater than or equal to 75%, QPTR determination using thermocouples (Section 4.4.1 or Section 4.4.2) is required <u>once</u> per 7 days.

2.2 Limitations (continued)

7. Actual QPTR is determined from excore detectors.

3.0 PREREQUISITES

OBTAIN Shift Manager approval to perform this procedure. ____&____

End of Section 3.0

4.0 INSTRUCTIONS

4.1 General Instructions

> **NOTE**
> Four NIS channels satisfy Tech Spec Table 3.3-1, Item 2, Action Statement 2c.

1. IF taking a Power Range NIS channel out of service AND Reactor power level is above 50%, THEN **DETERMINE** QPTR as follows:

A. With one Power Range NIS channel out of service for 8 hours, **PERFORM** the following within the next 4 hours:

> **NOTE**
> A QPTR determination using thermocouples is **NOT** valid below 75% and is **NOT** required to satisfy Tech Spec 4.2.4 surveillance.

(1) **DETERMINE** QPTR using one of the following (Tech Spec 4.2.4.2 and Tech Spec 3.0.2 applies):

- Core Exit Thermocouples _______
- A flux map (**NOTIFY** Reactor Engineering) _______

(2) IF reactor power greater than or equal to 75% AND one power range NIS channel is inoperable, THEN **PERFORM** three drawer QPTR using either Section 4.2 or Section 4.3. _______

B. **COMPARE** results of Section 4.1, Step 1.A(1) and Section 4.1, Step 1.A(2) for Acceptance Criteria below. _______

Acceptance Criteria	Results
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

End of Section 4.1

4.2 Determination of NIS QPTR Using Detector Current Readings

1. **RECORD** on Attachment 1, Determination of NIS QPTR Using Excore Detector Currents, the top and bottom detector current for all in service Power Range Nuclear Instrumentation channels (meter face). _______

NOTE

Plant Curve Book Section 5 Figure 5, contains the Power Range currents for 100% power values.

2. **RECORD** the 100% power current values on Attachment 1, Determination of NIS QPTR Using Excore Detector Currents, for each in service Power Range Nuclear Instrumentation detector. _______

3. **COMPLETE** calculations on Attachment 1, Determination of NIS QPTR Using Excore Detector Currents,. _______

4. **COMPARE** results of Attachment 1, Determination of NIS QPTR Using Excore Detector Currents, to Acceptance Criteria below. _______

Acceptance Criteria	Results
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

5. IF QPTR is greater than 1.0195 (1.95%) OR Attachment 1, Determination of NIS QPTR Using Excore Detector Currents, yields suspect QPTR results, THEN **PERFORM** Section 4.3. _______

End of Section 4.2

4.3 Determination of NIS QPTR Using Detector Voltage Readings

CAUTION

NIS QPTR using detector volt readings may be performed provided rod exercise testing is **NOT** in progress.

1. **DIRECT** I&C to bring a Fluke 45 or equivalent digital volt meter to the Control Room. _______

NOTE

NIS QPTR using detector volt readings are taken on in service Power Range Nuclear Instrumentation channels only.

2. IF Nuclear Instrumentation UNIT -3 POWER RANGE N-41 is in service, THEN **OBTAIN** top and bottom detector voltages as follows:

   A. **PLACE** DROP ROD MODE switch for UNIT-3 POWER RANGE N-41 in BYPASS. _______

   B. **OPEN** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-41. _______

   C. **DIRECT** I&C to take voltage readings (in millivolts) from UNIT-3 POWER RANGE N-41 Drawer B test points located on back of the meters. _______

   D. **RECORD** channel N41 voltages on Attachment 2, Determination of NIS QPTR Using Excore Detector Volts. _______

   E. **CLOSE** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-41. _______

   F. **PLACE** DROP ROD MODE switch for the UNIT-3 POWER RANGE N-41 in NORMAL. _______

4.3 Determination of NIS QPTR Using Detector Voltage Readings (continued)

3. IF Nuclear Instrumentation UNIT -3 POWER RANGE N-42 is in service, THEN **OBTAIN** top and bottom detector voltages as follows:

A. **PLACE** DROP ROD MODE switch for UNIT-3 POWER RANGE N-42 in BYPASS. _______

B. **OPEN** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-42. _______

C. **DIRECT** I&C to take voltage readings (in millivolts) from UNIT-3 POWER RANGE N-42 Drawer B test points located on back of the meters. _______

D. **RECORD** channel N42 voltages on Attachment 2, Determination of NIS QPTR Using Excore Detector Volts. _______

E. **CLOSE** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-42. _______

F. **PLACE** DROP ROD MODE switch for the UNIT-3 POWER RANGE N-42 in NORMAL. _______

4. IF Nuclear Instrumentation UNIT-3 POWER RANGE N-43 is in service, THEN **OBTAIN** top and bottom detector voltages as follows:

A. **PLACE** DROP ROD MODE switch for UNIT-3 POWER RANGE N-43 in BYPASS. _______

B. **OPEN** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-43. _______

C. **DIRECT** I&C to take voltage readings (in millivolts) from UNIT-3 POWER RANGE N-43 Drawer B test points located on back of the meters. _______

D. **RECORD** channel N43 voltages on Attachment 2, Determination of NIS QPTR Using Excore Detector Volts. _______

E. **CLOSE** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-43. _______

4.3 Determination of NIS QPTR Using Detector Voltage Readings (continued)

4. (continued)

F. **PLACE** DROP ROD MODE switch for the UNIT-3 POWER RANGE N-43 in NORMAL. _______

5. IF Nuclear Instrumentation UNIT -3 POWER RANGE N-44 is in service, THEN **OBTAIN** top and bottom detector voltages as follows:

A. **PLACE** DROP ROD MODE switch for UNIT-3 POWER RANGE N-44 in BYPASS. _______

B. **OPEN** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-44. _______

C. **DIRECT** I&C to take voltage readings (in millivolts) from UNIT-3 POWER RANGE N-44 Drawer B test points located on back of the meters. _______

D. **RECORD** channel N44 voltages on Attachment 2, Determination of NIS QPTR Using Excore Detector Volts. _______

E. **CLOSE** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-44. _______

F. **PLACE** DROP ROD MODE switch for the UNIT-3 POWER RANGE N-44 in NORMAL. _______

NOTE

Plant Curve Book Section 5 Figure 5, contains the Power Range currents for 100% power values.

6. **RECORD** the 100% power current values for each in service Power Range Nuclear Instrumentation detector. _______

7. **COMPLETE** calculations on Attachment 2, Determination of NIS QPTR Using Excore Detector Volts. _______

4.3 Determination of NIS QPTR Using Detector Voltage Readings (continued)

8. **DETERMINE** results for Nuclear Instrument Power Range channel QPTR Acceptance Criteria below. _______

Acceptance Criteria	Results
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

9. IF QPTR is greater than 1.02 (2.0%), THEN **REFER TO** Section 4.5 for additional actions. _______

End of Section 4.3

4.4 Determining QPTR Using at Least One of Five Methods

NOTE

- A thermocouple QPTR may be performed anytime all 16 core exit thermocouples listed in Plant Curve Book, Section 5, Figure 11, Thermocouple QPTR Calculation, are in service. If necessary, consider revising the Plant Curve Book to support a thermocouple QPTR by using 16 operable thermocouples.
- Due to core burnup and changes in radial power, thermocouple QPTR requires periodic updates throughout the cycle. Reactor Engineering should be contacted to update the thermocouple QPTR calculation when needed.
- A thermocouple QPTR determination is **NOT** valid below 75% power.
- The methods used in Section 4.4 can **NOT** ensure Technical Specification compliance and are only used to corroborate QPTR from excore detectors.

4.4.1 Core Exit Thermocouple QPTR Using the Automated Method

1. **CHECK** 3A QSPDS OPERABLE. _______
2. **CHECK** 3B QSPDS OPERABLE. _______

4.4.1 Core Exit Thermocouple QPTR Using the Automated Method (continued)

3. Using DCS, **NAVIGATE** to the THERMOCOUPLE QPTR CALCULATION display and print screen to generate a computer printout similar to Plant Curve Book, Section 5, Figure 11. _______

Acceptance Criteria	Results
QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

4. IF QPTR is greater than 1.02 (2.0%), THEN **REFER TO** Section 4.5 for additional actions. _______

End of Section 4.4.1

4.4.2 Thermocouple QPTR Using Manual Method

1. **CHECK** 3A QSPDS OPERABLE. _______

2. **CHECK** 3B QSPDS OPERABLE. _______

3. On a form similar to Plant Curve Book, Section 5, Figure 11, Thermocouple QPTR Calculation for Unit 3, **PERFORM** the following:

   A. Using QSPDS or DCS display, **RECORD** temperatures for <u>all</u> 16 Core Exit Thermocouple locations specified on THERMOCOUPLE QPTR CALCULATION. _______

   B. **COMPLETE** QPTR calculations. _______

4. **DETERMINE** results for QPTR Acceptance Criteria below. _______

Acceptance Criteria	Results
QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

5. IF QPTR is greater than 1.02 (2.0%), THEN **REFER TO** Section 4.5 for additional actions. _______

End of Section 4.4.2

NOTE

At least 16 detector thimbles with a minimum of 2 detector thimbles per core quadrant are required to be OPERABLE to calculate QPTR using the Movable Incore Detection System, except when using the following two sets of 4 symmetric thimbles:

- C8, N8, E5, L5, E11, L11, H3 AND H13 (Tech Spec 3.3.3.2).

4.4.3 Core Flux Map - Two Sets of Four Symmetric Thimble Locations Method

1. Using 0-OSP-059.13, Core Map Analysis and Peaking Factor Verification, **COMPLETE** Attachment 3, Determination of QPTR Using Movable Incore Detector System. _______

2. **DETERMINE** Acceptance Criteria results below. _______

Acceptance Criteria	Results
QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

3. IF QPTR is greater than 1.02 (2.0%), THEN **REFER TO** Section 4.5 for additional actions. _______

End of Section 4.4.3

4.4.4 Core Flux Map Using at Least 16 Thimbles with a Minimum of 2 Thimbles per Quadrant Method

1. Using 0-OSP-059.13, Core Map Analysis and Peaking Factor Verification, **COMPLETE** Attachment 3, Determination of QPTR Using Movable Incore Detector System. _______

2. **DETERMINE** Acceptance Criteria results below. _______

Acceptance Criteria	Results
QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

3. IF QPTR is greater than 1.02 (2.0%), THEN **REFER TO** Section 4.5 for additional actions. _______

End of Section 4.4.4

4.4.5 Full-Core Flux Map Method

1. Using 0-OSP-059.13, Core Map Analysis and Peaking Factor Verification, **COMPLETE** Attachment 3, Determination of QPTR Using Movable Incore Detector System. _______

2. **DETERMINE** QPTR Acceptance Criteria results below. _______

Acceptance Criteria	Results
QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

3. IF QPTR is greater than 1.02 (2.0%), THEN **REFER TO** Section 4.5 for additional actions. _______

End of Section 4.4.5

4.5 Excessive Quadrant Power Tilt Ratio

1. IF actual QPTR is greater than 1.02 (2.0%) OR one power range monitor is out of service AND Section 4.4 can **NOT** be performed within 12 hours, THEN:

   A. **GO TO** 3-ONOP-059.9, Excessive Quadrant Power Tilt Ratio. _______

   B. **NOTIFY** Rx Engineering. _______

2. **NOTIFY** the Unit Supervisor of the results of this procedure. _______

End of Section 4.5

5.0 RESTORATION AND DOCUMENTATION

5.1 Restoration

1. None

5.2 Documentation

1. Acceptance Criteria in Section 6.1.

☐ SAT ☐ UNSAT ______

Remarks: ________________________________

____

____

____

____

Performed By:

________	________	____	____
________	________	____	____
________	________	____	____
(Signature)	(Print)	(Init)	(Date)

Reviewed By:

________	________	____
(Supervisor)	(Print)	(Date)

Approved By:

________	________	____
(Shift Manager or SRO Designee)	(Print)	(Date)
________	________	____

6.0 ACCEPTANCE AND FUNCTIONAL CRITERIA

6.1 Acceptance Criteria

1. The actual QPTR is less than or equal to 1.02 (2.0%).

6.2 Functional Criteria

None

7.0 RECORDS

1. The date, time, and section completed shall be entered in the Unit Narrative Log.
2. Problems encountered while performing the procedure (i.e., malfunctioning equipment, delays due to change in plant conditions, etc.) should be entered in the Unit Narrative Log.
3. Completed copies of the below listed items constitute Quality Assurance Records and shall be routed to Reactor Engineering for review prior to being transmitted to QA Records.
   - Section 5.2, Documentation
   - Attachment 1, Determination of NIS QPTR Using Excore Detector Currents
   - Attachment 2, Determination of NIS QPTR Using Excore Detector Volts
   - Attachment 3, Determination of QPTR Using Movable Incore Detector System
   - Plant Curve Book, Section 5, Figure 11, Thermocouple QPTR Calculation or equivalent

7.0 RECORDS (continued)

4. Completed copies of the documents listed below shall be filed in the Shift Manager file:

- Section 5.2, Documentation
- Attachment 1, Determination of NIS QPTR Using Excore Detector Currents
- Attachment 2, Determination of NIS QPTR Using Excore Detector Volts
- Attachment 3, Determination of QPTR Using Movable Incore Detector System
- Plant Curve Book, Section 5, Figure 11, Thermocouple QPTR Calculation or equivalent

8.0 REFERENCES AND COMMITMENTS

8.1 References

8.1.1 Implementing

1. Procedures

- **A.** 0-ADM-554, Plant Curve Book Unit 3 Section 5
- **B.** 3-ONOP-059.9, Excessive Quadrant Power Tilt Ratio
- **C.** 0-OSP-059.13, Core Map Analysis and Peaking Factor Verification

8.1.2 Developmental

1. Technical Specifications

- **A.** Section 3.2.4
- **B.** Section 4.2.4.1
- **C.** Section 4.2.4.2
- **D.** Section 4.3.3.2
- **E.** Section 3.02
- **F.** Table 3.3-1

2. Procedures

- **A.** 0-NOP-059.04, Operation of the Movable Incore Detectors
- **B.** 3-OSP-059.5, Power Range Nuclear Instrumentation Shift Checks and Daily Calibration
- **C.** 3-OSP-059.16, Thermocouple Quadrant Power Tilt Ratio Derivation

8.1.2 Developmental (continued)

3. Miscellaneous Documents

A. Rx-25, Program Thermdat Documentation

B. CR 2009-6056, Using CETs of Flux map only could result in missed Technical Specification requirement.

C. CR 2008-16202, QPTR requirements prior to removing a PR NIS Channel from service apply at reduced power levels (<50% power)

D. CR 99-0993, Use of Calculator and Rounding for QPTR Values

E. PC/M 04-112, Emergency Response Data Acquisition and Display System (ERDADS) Replacement

8.1.3 Management Directives

None

8.2 <u>Commitments</u>

None

ATTACHMENT 1
Determination of NIS QPTR Using Excore Detector Currents
(Page 1 of 2)

1. **RECORD** Date: _______________ Time________________ _______

2. **DETERMINE** normalized detector currents. _______

Upper Section Normalized Detector Currents			
N41 Top Current / 100% Top Current	=	______ micro amps / micro amps	=
N42 Top Current / 100% Top Current	=	______ micro amps / micro amps	=
N43 Top Current / 100% Top Current	=	______ micro amps / micro amps	=
N44 Top Current / 100% Top Current	=	______ micro amps / micro amps	=
Upper Section Normalized Current Total			=

Lower Section Normalized Detector Currents			
N41 Bottom Current / 100% Bottom Current	=	______ micro amps / micro amps	=
N42 Bottom Current / 100% Bottom Current	=	______ micro amps / micro amps	=
N43 Bottom Current / 100% Bottom Current	=	______ micro amps / micro amps	=
N44 Bottom Current / 100% Bottom Current	=	______ micro amps / micro amps	=
Lower Section Normalized Current Total			=

3. **DETERMINE** average normalized power: _______

Average Upper Section Normalized Power			
Upper Section Normalized Current Total / Upper detectors used (3 or 4)	=	______	=

Average Lower Section Normalized Power			
Lower Section Normalized Current Total / Lower detectors used (3 or 4)	=	______	=

ATTACHMENT 1
Determination of NIS QPTR Using Excore Detector Currents
(Page 2 of 2)

4. **DETERMINE** QPTR as follows:

Upper Section Tilt Ratio			
Largest Upper Section Normalized Detector Current / Average Upper Section Normalized Power	=	________________	=

Lower Section Tilt Ratio			
Largest Lower Section Normalized Detector Current / Average Lower Section Normalized Power	=	________________	=

NIS QPTR = highest Section QPTR = ________ ________

5. **DETERMINE** NIS QPTR Acceptance Criteria below. ________

Acceptance Criteria	Results
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

6. IF QPTR results are suspect or QPTR is greater than 1.0195 (1.95%), THEN **REFER TO** Section 4.2, Step 5 for additional guidance. ________

Performed By: ______________________ ________ ________
Print/Sign Initials Date

Reviewed By: ______________________ ________ ________
Print/Sign Initials Date

Approved By: ______________________ ________ ________
Print/Sign Initials Date

ATTACHMENT 2
Determination of NIS QPTR Using Excore Detector Volts
(Page 1 of 2)

1. **RECORD** Date: ______________ Time________________ _______

2. **DETERMINE** Normalized Detector Currents below:

Upper Section Normalized Detector Volts			
N41 Top Volts / 100% Top Current	=	________ millivolts / micro amps	=
N42 Top Volts / 100% Top Current	=	________ millivolts / micro amps	=
N43 Top Volts / 100% Top Current	=	________ millivolts / micro amps	=
N44 Top Volts / 100% Top Current	=	________ millivolts / micro amps	=
Upper Section Normalized Current Total			=

Lower Section Normalized Detector Volts			
N41 Bottom Volts / 100% Bottom Current	=	________ millivolts / micro amps	=
N42 Bottom Volts / 100% Bottom Current	=	________ millivolts / micro amps	=
N43 Bottom Volts / 100% Bottom Current	=	________ millivolts / micro amps	=
N44 Bottom Volts / 100% Bottom Current	=	________ millivolts / micro amps	=
Lower Section Normalized Volts Total			=

3. **DETERMINE** average normalized power. _______

Average Upper Section Normalized Power			
Upper Section Normalized Current Total / Upper detectors used (3 or 4)	=	________________	=

Average Lower Section Normalized Power			
Lower Section Normalized Current Total / Lower detectors used (3 or 4)	=	________________	=

ATTACHMENT 2
Determination of NIS QPTR Using Excore Detector Volts
(Page 2 of 2)

4. **DETERMINE** QPTR. _______

Upper Section Tilt Ratio				
Largest Upper Section Normalized Detector Current / Average Upper Section Normalized Power	=	____________	=	

Lower Section Tilt Ratio				
Largest Lower Section Normalized Detector Current / Average Lower Section Normalized Power	=	____________	=	

NIS QPTR = highest Section QPTR = __________ _______

5. **DETERMINE** NIS QPTR Acceptance Criteria below. _______

Acceptance Criteria	Results
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

6. IF QPTR Acceptance Criteria is UNSAT, THEN **RETURN TO** Section 4.5 for additional guidance. _______

Performed By: ______________________ ________ ________
Print/Sign Initials Date

Reviewed By: ______________________ ________ ________
Print/Sign Initials Date

Approved By: ______________________ ________ ________
Print/Sign Initials Date

ATTACHMENT 3
Determination of QPTR Using Movable Incore Detector System
(Page 1 of 2)

1.0 FULL CORE FLUX MAP OR CORE FLUX MAP

1. IF performing Full Core Flux Map OR Core Flux Map using at least 16 thimbles with a minimum of two thimbles per quadrant, THEN:

   A. **RECORD** Map No. ______________

   B. **RECORD** the largest Power Tilt (QPTR) from the Incore Tilt Summary Edits in the Axis Centered Sector using data from the BEACON output file below. _______

   Largest Incore QPTR = _____________

2. **DETERMINE** QPTR Acceptance Criteria results below. _______

Acceptance Criteria	Results
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

2.0 TWO SETS OF FOUR SYMMETRIC THIMBLES FLUX MAP

1. IF using Two Sets Of Four Symmetric Thimbles Flux Map THEN:

   A. **LOCATE** last performed STRIPPED FLUX MAP (Reference Map). _______

   B. **LOCATE** last performed QPTR FLUX MAP (Surveillance Map). _______

ATTACHMENT 3
Determination of QPTR Using Movable Incore Detector System
(Page 2 of 2)

2.0 TWO SETS OF FOUR SYMMETRIC THIMBLES FLUX MAP (continued)

2. **COMPLETE** Attachment 3 Section 2.0 Step 3 through Attachment 3 Section 2.0 Step 7 using Power Tilt values from BEACON output in edit titled Incore Tilt Summary Edits in the Axis Centered Sector. _______

3. Reference Core Quadrant	**Surveillance** Map No: Q___________ (Flux Tilt)	**Reference** Map No: S___________ (Flux Tilt)	Incore QPTR = **Surveillance – Reference +1** (Incore QPTR)
4. Northeast (N41)			
5. Southeast (N42)			
6. Southwest (N43)			
7. Northwest (N44)			

10. **RECORD** largest Incore QPTR = from results of Attachment 3 Section 2.0 Step 3 through Attachment 3 Section 2.0 Step 7 below. _______

    Largest Incore QPTR = _________________

11. **DETERMINE** NIS QPTR Acceptance Criteria results. _______

Acceptance Criteria	**Results**
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

Performed By: ______________________ ________ ________
Print/Sign Initials Date

Reviewed By: ______________________ ________ ________
Print/Sign Initials Date

Approved By: ______________________ ________ ________
Print/Sign Initials Date

L-17-1 NRC Exam

JPM RO A1b

JPM TITLE: Calculate a Manual Makeup to the VCT

JPM NUMBER: 01046046101 **REV.** 2-2

TASK NUMBER(S) / TASK TITLE(S): 01046046100/
Calculate a Manual Makeup to the VCT

K/A NUMBERS: 2.1.25 **K/A VALUE:** RO 3.9

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [X]

EVALUATION LOCATION: In-Plant: [ ] Control Room: [ ]
Simulator: [ ] Other: [X]
Lab: [ ]

Time for Completion: 20 Minutes Time Critical: No

Alternate Path [NRC]: No
Alternate Path [INPO]: No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/02/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/02/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☒
4. Do the performance steps accurately reflect trainee’s actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered “YES” or “N/A” or the JPM is not valid for use. If all questions/statements are answered “YES” or “N/A,” then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

N/A

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
2-0	Formatting	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
2-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17
2-2	Editorial	NRC Exam	N/A	Miklausich	10/20/17
				Wilson	10/20/17

Required Materials:	• HANDOUT 0-OP-046 • Unit 3 Plant Curve Book • Calculator
General References:	• 0-OP-046, CVCS – Boron Concentration Control • Unit 3 Plant Curve Book
Task Standards:	• Calculate the boric acid and primary water flow rates, volumes, and controller settings as required to makeup to the VCT, using Method 2 of the Plant Curve Book (Section III)

NOTE: Additional references available upon request.

HAND JPM BRIEFING SHEET TO EXAMINEE AT THIS TIME

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

INITIAL CONDITIONS:

- Unit 3 is at 100% steady-state power.
- VCT level is 20%.
- Boron concentrations in the RCS and BAST are 874 ppm and 5687 ppm, respectively.
- A manual makeup to the VCT is to be performed, with a desired boric acid flow rate of 11.0 gpm.

INITIATING CUES:

- VCT level is to be raised to 37%, while maintaining a constant VCT/RCS boron concentration.
- You are directed to perform Section 5.4.2 Step 1 of 0-OP-046, CVCS – Boron Concentration Control, to calculate the following parameters:
  - Primary water flow rate: ___________________ (to the nearest tenth of a gpm)
  - Primary water volume: ___________________ (to the nearest gallon)
  - Boric acid volume: ___________________ (to the nearest gallon)
- Based on the available information, determine the potentiometer settings for the following controllers:
  - Boric Acid Flow Controller (FC-3-113A): ___________________
  - Primary Water Flow Controller (FC-3-114A): ___________________

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: **When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically, cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).**

NOTE: **Critical steps are marked with a "Yes" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.**

Performance Step: Critical N (SEQ-1)	**Obtain required reference materials.**
Standard:	Obtain 0-OP-046, CVCS – Boron Concentration Control.
Evaluator Cue:	Provide examinee with HANDOUT 0-OP-046
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: Critical N (SEQ-2)	**0-OP-046, Step 5.4.1.1:** Applicable Prerequisites in Section 3.0 are satisfied.
Standard:	Recognize, from the Initial Conditions, that all relevant prerequisites have been addressed.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-3)**	**0-OP-046, prior to Step 5.4.2.1:** CAUTION *Instrument uncertainties for the Boric Acid and Primary Water flow transmitters can result in the actual amount of Boric Acid or Primary Water added to be either more or less than the amount calculated. Thus, care is needed to ensure that excessive reduction in RCS boron concentration does NOT occur due to the uncertainties.* NOTE *VCT level is 14.15 gallons per percent level indication.*
Standard:	Read CAUTION/NOTE and recognize that it is safe to proceed.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_ (SEQ-4)**	**0-OP-046, Step 5.4.2.1:** Determine the approximate boric acid and primary water flows and volumes needed to obtain the desired blend concentration from the boron change tables in Section III of the Plant Curve Book. The primary water flow rate should be determined in order to ensure all primary water is injected prior to completion of the manual make-up.
Standard:	Obtain Section III of the Plant Curve Book and locate Figure 4 (Blended Flow), Method 2 (Calculation).
Evaluator Cue:	Provide examinee with Unit 3 Plant Curve Book
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_(SEQ-5)**	**Determine the appropriate primary water flow needed to obtain the desired blend, using the blended flow calculation in Section III of the Plant Curve Book.**
Standard:	Determine the primary water flow rate and record the value on the Turnover Sheet. • Primary water flow rate: 60.6 gpm (60 to 61 gpm)
Evaluator Note:	• From Section III of Plant Curve Book: o $Boron_{ppm} = (Acid_{gpm})(BAST_{ppm})/(Acid_{gpm} + Water_{gpm})$, where $Boron_{ppm}$ is the desired blended boron concentration • Therefore, $Water_{gpm} = [(Acid_{gpm})(BAST_{ppm})/(Boron_{ppm})] - (Acid_{gpm})$: o $Water_{gpm} = [(11.0)(5687)/(874)] - (11.0) =$ 60.6 gpm
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-6)**	**Determine the appropriate boric acid and primary water volumes to raise VCT level from 20% to 37%.**
Standard:	Determine the required boric acid and primary water volumes and record the values on Turnover Sheet. • Primary water volume: <u>204 (200 to 216) gallons</u> • Boric acid volume: <u>37 (36 to 40) gallons</u>
Evaluator Note:	• From NOTE prior to Step 5.4.2.1 of 0-OP-046 (i.e., 14.15 gallons/%): o (37% - 20%)(14.15 gallons/%) = 240.55 (240 to 255) gallons • Therefore, with 11.0 gpm of boric acid and 60.6 gpm of primary water: o (240.55 gallons)[(11.0)/(11.0 + 60.6)] = <u>37.0 (36 to 38) gallons of boric acid</u> o (240.55 gallons)[(60.6)/(11.0 + 60.6)] = <u>203.6 (200 to 204) gallons of primary water</u> • Various methods may be used to determine the fluid volumes • Answer bands are based on potential rounding error (e.g., 14.15 gallons/% rounded up to 15 gallons/% would yield 216 gallons of primary water)
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_(SEQ-7)**	**Based on the available information, determine the potentiometer settings for the following controllers:** • **Boric Acid Flow Controller (FC-3-113A)** • **Primary Water Flow Controller (FC-3-114A)**
Standard:	Determine the associated potentiometer settings and record the values on Turnover Sheet. • Boric Acid Flow Controller (FC-3-113A): 2.2 • Primary Water Flow Controller (FC-3-114A): 4.0 (4.0 to 4.1)
Evaluator Note:	• From Step 4.23 of 0-OP-046 (ratio of 5 gpm to 1; i.e., 50 gpm maximum), a boric acid flow rate of 11.0 gpm is equivalent to a controller setting of 2.2 on the ten-turn potentiometer. • From Step 4.24 of 0-OP-046 (ratio of 15 gpm to 1; i.e., 150 gpm maximum), a primary water flow rate of 60.6 gpm is equivalent to a controller setting of 4.0 on the ten-turn potentiometer.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Terminating Cue: **When the examinee completes Manual Makeup calculations, state "This completes the JPM."**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ______________________________ **Evaluator:** ______________________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- Unit 3 is at 100% steady-state power.
- VCT level is 20%.
- Boron concentrations in the RCS and BAST are 874 ppm and 5687 ppm, respectively.
- A manual makeup to the VCT is to be performed, with a desired boric acid flow rate of 11.0 gpm.

INITIATING CUES:

- VCT level is to be raised to 37%, while maintaining a constant VCT/RCS boron concentration.
- You are directed to perform Section 5.4.2 Step 1 of 0-OP-046, CVCS – Boron Concentration Control, to calculate the following parameters:
  - Primary water flow rate: ____________________ (to the nearest tenth of a gpm)
  - Primary water volume: ____________________ (to the nearest gallon)
  - Boric acid volume: ____________________ (to the nearest gallon)
- Based on the available information, determine the potentiometer settings for the following controllers:
  - Boric Acid Flow Controller (FC-3-113A): ____________________
  - Primary Water Flow Controller (FC-3-114A): ____________________

NOTE: Ensure the turnover sheet is returned to the evaluator when the JPM is complete.

CAUTION

REACTIVITY MANAGEMENT PROCEDURE

Performance of this procedure may affect core reactivity

Florida Power & Light Company

Turkey Point Nuclear Plant

This procedure may be affected by a T.C. (Temporary Change) verify information prior to use
Date verified________ Initials________

0-OP-046

C A U T I O N

Performance of this procedure may affect core reactivity.

Title:

CVCS – Boron Concentration Control

(Continuous Use)

Safety Related Procedure

Responsible Department:	Operations
Revision Number:	25
Revision Approval Date:	5/22/17

PCRs *1609494, 1667204, 1648086, 1793596, 1854397, 1863967, 1717296, 1921045, 1917872, 1958264, 1976490, 1995673, 2008178, 1993871, 2021158, 2052606, 2067359, 2082848,2089825, 2068385, 2078506, 2129937, 2106488, 2133809, 2176707, 2180482, 2171921, 2194923, 2206321*
ECs *87-257, 87-258, 89-494, 90-440, 91-068, 90-423, 90-424, 91-092, 94-141, 95-040, 95-102, 95-140, 95-172, 95-081, 00-016, 10-010, 09-137, 09-139, 242547, 247006, 247008, 249292*

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1.0 PURPOSE

1.1 This procedure provides instructions for the startup, normal operation, and infrequent operation of the CVCS Boron Concentration Control System.

2.0 REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS

2.1 References

2.1.1 Technical Specifications

1. Section 3/4.1.1, Boration Control
2. Section 3/4.1.2, Boration Systems
3. Section 3/4.5.4, Refueling Water Storage Tank

2.1.2 FSAR

1. Section 9.2, Chemical and Volume Control
2. FSAR Table 4.2-2, Reactor Coolant Water Chemistry Specifications

2.1.3 Plant Drawings

1. 5610-E-25, Sh 6 - Primary Water Makeup Pump
2. 5610-E-25, Sh 10 - Boric Acid Transfer Pump
3. 5610-E-25, Sh 46 - Boric Acid Tank Heaters A and C
4. 5610-E-25, Sh 46A - Boric Acid Tank Heaters B
5. 5610-E-25, Sh 82 - Boric Acid Flow to Blender, FCV-113A
6. 5610-E-25, Sh 83 - Demin Water Flow to Blender, FCV-114A
7. 5610-E-25, Sh 84 - Diluted Flow to VCT, FCV-114B
8. 5610-E-25, Sh 85 - Blender Flow to CHP Suction Header, FCV-113B
9. 5610-E-25, Sh D - Control Switch Development
10. 5610-E-855, Breaker List
11. 5610-M-3046, Sh 1, CVCS - Boric Acid Systems
12. 5610-M-3061, Sh 1, Waste Disposal System - Liquid Waste Holdup and Transfer
13. 5610-T-D-19 - Boron Concentration Control System

2.1.3 (Cont'd)

14. 5610-T-L1, Sh 24B - Boric Acid Transfer Pumps 3A, 3B
15. 5610-T-L1, Sh 24 - Primary System Pumps, Containment Sump and Safety Injection
16. 5613-M-3014, Sh 1 and 2, Condenser System
17. 5613-M-3020, Sh 1 and 2, Primary Water Makeup System
18. 5613-M-3036, Sh 1, Sample System - NSSS
19. 5613-M-3047, Sh 1, CVCS - Charging and Letdown System
20. 5613-M-3084, Sh 1, Auxiliary Steam System
21. 5614-M-3014, Sh 1 and 2, Condenser System
22. 5614-M-3020, Sh 1 and 2, Primary Water Makeup System
23. 5614-M-3036, Sh 1, Sample System - NSSS
24. 5614-M-3047, Sh 1, CVCS - Charging and Letdown System
25. 5614-M-3084, Sh 1, Auxiliary Steam System

2.1.4 Plant Procedures/Fleet Procedures

1. 0-ADM-215, Plant Surveillance Tracking Program
2. 0-NCOP-041, Chemical Adjustments to the Reactor Coolant System and Pressurizer
3. 3/4-NOP-020, Primary Water System
4. 3/4-NOP-041.02, Pressurizer Operation
5. 0-NOP-061.13, Waste Disposal System - Transferring Water to the Portable Demineralizer Skid for Processing
6. 0-NOP-065.03, Nitrogen Gas Supply System
7. 3/4-ONOP-046.4, CVCS - Malfunction of Boron Concentration Control System
8. 3/4-OP-047, CVCS-Charging and Letdown
9. 3/4-OSP-041.1, Reactor Coolant System Leak Rate Calculation
10. 3/4-OSP-046.3, CVCS Boration Systems Flowpath Verification
11. AD-AA-100-1004, Preparation, Revision, Review and Approval of Site Specific Procedures

2.1.4 (Cont'd)

12. AD-AA-100-1005, Temporary Changes to Procedures
13. MA-AA-101-1000, Foreign Material Exclusion Procedure
14. OP-AA-1000, Conduct Of Infrequently Performed Tests Or Evolutions
15. OP-AA-101-1000, Clearance and Tagging

2.1.5 Vendor/Technical Manuals

1. Westinghouse Operating Procedure, Coolant Chemistry Addition and Control S-3.3, Parts II and III

2.1.6 Miscellaneous Documents (i.e., PC/Ms, ECs, Correspondence)

1. NRC IE Bulletin 88-04, Potential for Safety Related Pump Loss
2. JPE-PTN-SELJ-88-027, Response to NRC IE Bulletin 88-04 on Potential for Safety Related Pump Loss, Dated July 8, 1988
3. PC/M 87-257, Load Center 4H, MCC 4D and Transfer of Loads
4. PC/M 87-258, Load Center 3H, and Repowering of MCC 3D
5. PC/M 89-494, Boric Acid Storage Tank Alarm Setpoint Change
6. PC/M 90-423, Boric Acid Transfer Pump Seal Replacement
7. PC/M 90-424, Boric Acid Transfer Pump Seal Replacement
8. PC/M 90-440, Boric Acid Concentration Reduction
9. PC/M 91-092, Removal of Boric Acid Tank Header
10. PC/M 91-068, Removal of BIT Recirculation Header for the BAS Tank
11. PC/M 94-141, Boric Acid Evaporators and Gas Strippers Abandonment
12. PC/M 95-140, Abandonment of Boric Acid Recirculation Pumps and Related Piping
13. PC/M 95-172, Unit 4 BIT Bypass
14. PC/M 95-081, Abandonment of Auxiliary Steam System Desuperheater Stations, Condensate Recovery Transfer Pumps and Auxiliary Steam Components Inside of the Auxiliary and Radwaste Buildings
15. NRC Information Notice 96-69: Operator Actions Affecting Reactivity
16. PC/M 95-040, Abandonment of Various Boron Recycle System and Liquid Waste Disposal System Components

2.1.6 (Cont'd)

17. Plant Curve Book, Section 3, CVCS
18. PTN-ENG-SEMS-00-0008, Use of PRC-01 Resin for Removal of Cobalt-58 Contaminants in the Letdown Stream
19. PC/M 00-016, CRN M-10278, Reconfigure Primary Water Hose Connections in Unit 3 Cask Wash Area
20. CR 2006-34989, Hydrazine Potential to Create a Crud Burst in the RCS
21. EC 247006, PCM 09-137, Unit 3 EPU Instrument Setpoint/Indication Changes
22. EC 247008, PCM 09-139, EPU LAR Umbrella Doc only PC/M

2.2 Records Required

2.2.1 The date, time, and section completed shall be entered in the Unit Narrative Log. Also, problems encountered while performing the procedure should be entered; i.e., malfunctioning equipment, delays due to changes in plant conditions, etc.

2.2.2 Completed copies of the QA Record Pages for the below listed items are Quality Assurance Records and shall be transmitted to QA Records for retention in accordance with Quality Assurance Records Program requirements:

1. Subsections 5.1 through 5.4
2. Subsections 7.1 through 7.23
3. Attachments 1, 2, 3, 4, and 6

2.2.3 Completed copies of the below listed items shall be retained in the Shift Manager file until the next performance of that attachment:

1. Attachment 1, CVCS - Boric Acid System Valve Alignment
2. Attachment 2, CVCS - Boric Acid Batch Tank Valve Alignment
3. Attachment 3, CVCS - Boric Acid System Breaker Alignment
4. Attachment 4, CVCS - Units 3 and 4 Boric Acid Evaporators and Gas Strippers System Boundary Valves

2.2.4 Completed attachments listed below, that have the Tag column checked (√), shall be copied and transmitted to the labeling Coordinator:

1. Attachment 1, CVCS - Boric Acid System Valve Alignment
2. Attachment 2, CVCS - Boric Acid Batch Tank Valve Alignment
3. Attachment 3, CVCS - Boric Acid System Breaker Alignment
4. Attachment 4, CVCS - Units 3 and 4 Boric Acid Evaporators and Gas Strippers System Boundary Valves

2.3 <u>Commitment Documents</u>

2.3.1 Memorandum L-88-295, Response to NRC IE Bulletin 88-04, Potential for Safety Related Pump Loss, Dated July 11, 1988

2.3.2 INPO SOER 94-2, Boron Dilution Events in PWRs

2.3.3 CR-99-0603, Incorrect Boron Concentration Used for Dilution Calculation

2.3.4 AR 1695469, RCS Activity Increase Following Hydrazine Addition - CAPR

3.0 PREREQUISITES

3.1 The following systems are Operable or in operation to support the CVCS - Boron Concentration Control System operation:

3.1.1 Instrument Air

3.1.2 Primary Water System

3.1.3 Chemical Volume Control System

3.1.4 Primary Sampling System

3.1.5 Nitrogen Gas Supply System

3.2 All plant electrical systems are Operable to supply power and control functions to support the CVCS - Boron Concentration Control System operation.

3.3 All instruments and control devices are In Service for the CVCS - Boron Concentration Control System operation with no surveillances required and no outstanding PWOs, clearances, or Temporary System Alterations **that affect system operability** as per the following:

3.3.1 0-ADM-215, Plant Surveillance Tracking Program. (No surveillances have exceeded the date required on the missed surveillance sheet.)

3.3.2 Temporary System Alteration (TSA) Log

3.3.3 Clearance Log

3.3.4 Out-of-Service Log

3.4 The CVCS - Boron Concentration Control System valve and breaker alignments have been verified by the completion of the following attachments, as applicable:

3.4.1 Attachment 1, CVCS - Boric Acid System Valve Alignment

3.4.2 Attachment 2, CVCS - Boric Acid Batch Tank Valve Alignment

3.4.3 Attachment 3, CVCS - Boric Acid System Breaker Alignment

3.4.4 Attachment 4, CVCS - Units 3 and 4 Boric Acid Evaporators and Gas Strippers System Boundary Valves

3.5 For the use of the Temporary Boric Acid Tank:

3.5.1 Temporary Power Supply for Temporary Boric Acid Pumps is Operable.

3.5.2 The CVCS - Temporary Boric Acid Tank valve alignment has been verified by completing Attachment 6.

4.0 PRECAUTIONS/LIMITATIONS

4.1 Before changing system status, Technical Specifications should be consulted for system requirements for that plant mode.

4.2 During normal makeup operation, the BAST levels shall not be reduced below Technical Specifications Figure 3.1-2 for Operational Modes 1 through 4.
[Commitment - Step 2.3.1]

4.3 Technical Specifications require a flow path for boration to be maintained at all times when fuel is in the Reactor Vessel.

4.4 Except during RCS dilution or boration, the Reactor Makeup Selector switch should always be set on Auto with the RCS Makeup Control switch placed to the Start position to obtain a red start light.

4.5 Due to the inherent inaccuracies of the primary water and boric acid totalizers, the Pressurizer and the Reactor Coolant Loops should be sampled to determine if the desired boron concentrations have been achieved after boric acid or primary water additions.

4.6 To ensure effective blending, major boration changes shall be made with an RCP (preferably B or C) operating or RHR flow greater than 3,000 gpm.

4.7 Boron dilution shall not be used to bring the reactor critical except for low power physics or initial criticality after refueling.

4.8 The proper personnel protective equipment (PPE) should be worn while handling boric acid.

4.9 All work performed in the Radiation Controlled Area shall be performed in accordance with a Radiation Work Permit and the ALARA program.

4.10 Boric Acid pumps should not be run simultaneously in the Recirculation mode to the same BAST due to having a common recirc line and the possibility of dead heading one of the pumps. [Commitment - Step 2.3.1]

4.11 If a Boric Acid spill occurs, then the drains should be flushed as soon as possible with plain water.

4.12 With the BASTs in their normal configuration (all tied together), pumping any solution into a BAST will eventually equalize with the remaining BASTs.

4.13 If a BAST boron concentration or volume does not meet the requirements of Tech Spec Figure 3.1-2, then increase boron concentration or volume until requirements of Figure 3.1-2 are satisfied.

4.14 The Batching Tank or Temporary Boric Acid Tank boron concentration shall not exceed the concentration shown on Enclosure 5, 10°F margin line, based on the batching tank or Temporary Boric Acid Tank water temperature, as applicable.

4.15 Lithium concentration in the RCS must be maintained in accordance with 0-NCOP-041, Chemical Adjustments to the Reactor Coolant System and Pressurizer.

4.16 Anticipate changes in reactivity whenever the reactor coolant boron concentration is altered. Observe T_{AVG} or subcritical count rate to ensure that the desired change in RCS boron concentration has been achieved. If T_{AVG} increases or decreases 1.5°F from T_{REF} or subcritical count doubles, then the change in boron concentration shall be stopped and cause found. [Commitment Step 2.3.2]

4.17 Verify that all chemicals to be added to the RCS have been approved by Chemistry Department.

4.18 Always open the chemical addition mix tank drain valve prior to opening the chemical fill valve to avoid blowing chemicals on the operator.

4.19 Boric acid concentration should be between 5682 ppm and 6993 ppm prior to transferring the Temporary Boric Acid Tank contents to the BA Batch Tank.

4.20 Fluoride and Chloride concentration shall be less than 150 ppb prior to transferring the Temporary Boric Acid Tank contents to the BA Batch Tank or Decontamination Tank.

4.21 The Temporary Boric Acid Tank has a maximum volume of 19,749 gallons.

4.22 Valves TBA-5 and TBA-6, TBA Pumps suction valves, fail closed on loss of hydraulic pressure.

4.23 The ratio of boric acid flow to setpoint on Boric Acid Flow Controller FC-*-113A is 5 gpm to 1. (i.e., 10 gpm is equal to a setpoint of 2)

4.24 The ratio of primary water flow to setpoint on the Primary Water Flow Controller, FC-*-114A, is 15 gpm to 1, i.e., 30 gpm is equal to a setpoint of 2.

4.25 The ratio of primary water flow to setpoint on the Primary Water Auto Setpoint, HIC-*-114, is 15 gpm to 1, i.e., 30 gpm is equal to a setpoint of 2.

4.26 During large dilutions or borations, monitor VCT level, and ensure that level is maintained between 20 and 70% by reducing the dilution/boration flow rate or increasing charging pump flow rate, as required.

4.27 Accuracy of boron analysis (plus or minus 1%) and accuracy of the primary water and boric acid totalizers will typically result in some variation between actual and expected results.

4.28 Following large borations or dilutions of the RCS, intended boron concentration shall be compared to the sample results obtained by chemistry. If a significant deviation exists, the Shift Manager shall be notified.

4.29 The access manway cover of the Temporary Boric Acid Tank needs to be maintained closed or funnel covered to minimize the potential for introducing foreign material into the system, except for adding chemicals or for performing inspections.

4.30 Make-up to the RCS or Reactor Cavity with fuel in the reactor vessel is a positive reactivity addition if the make-up boron concentration is less than the RCS or the Reactor Cavity, i.e., the make-up boron concentration is 2100 ppm and RCS boron concentration is 2200 ppm. Applicable Technical Specifications apply.

4.31 An Independent Verification of boron reduction change calculations should be performed when below the point of adding heat. This allows an extra verification to ensure SDM requirements are not challenged.

4.32 The Chemical Mixing Tank capacity is 6 gallons. The tank should be flushed with 30 gallons of primary water.

4.33 The primary water supply orifice (RO-*-6692) to the Chemical Mixing Tank will deliver approximately 3.1 gpm of flow.

4.34 If FIT-*-114 fails high, an erroneous high primary water flow on FR-*-113 will cause the Primary Water Totalizer to count up continuously.

4.35 Unit 3 primary water flow indication is less accurate at lower flow rates, i.e., at 20 gpm flow rate, there could be a 4.5% error which could result in 0.9 gpm variation in actual flow.

4.36 No demineralizer bypass is required for hydrazine addition if using PRC-01 resin.

4.37 Due to valve and positioner characteristics, there is no direct correlation between demand meter setting and actual flowrate for FC-*-113A/114A, i.e., setting demand to 20% with the controller in manual on FC-*-114A will not result in a flowrate of exactly 20% of scale or 30 gpm. When performing manual makeups or blends, the need to adjust the controller manually to achieve the desired flowrate after the system is started should be anticipated.

4.38 For normal steady state full power operations, Enclosure 6 may be used to maintain T_{AVE} and reactor power. Enclosure 6 should be referenced during the dilution evolutions. A laminated copy of Enclosure 6 may be used for place keeping and maintained in the Unit 3 and Unit 4 Information Book.

4.39 Addition of hydrogen peroxide or hydrazine could cause crud bursts in the RCS resulting in a short-term increase in radiation levels in the RCS.

4.40 Borations and dilutions to the VCT outlet via FCV-*-113B have a more immediate reactivity effect than borations and dilutions to the VCT gas space via FCV-*-114B.

4.41 Boration headers to the charging pump suction headers (i.e., MOV-*-350, FCV-*-113B, and *-356 headers) have high point vents to facilitate venting which is required using the guidance of 0-ADM-222, Drain and Vent Rig Controls, following maintenance activities that drain the charging pump suction header. Boration headers are higher than the charging pump suction header and will drain when the charging pump suction header is drained.

4.42 Boric Acid Make Up Flow Deviation Alarm, Annunciator A 2/5, and Primary Water Make Up Flow Deviation Alarm, Annunciator A 2/6 are blocked for 22 seconds after start of make up to the VCT to avoid spurious initiation.

4.43 Minimum required PPE when handling boric acid is gloves, long sleeves, steel or composite shoes, and a dust mask. The use of the dust mask can be waved by Safety Department if BA concentration in the air is less than $5 mg/m^3$.

4.44 Chemical addition Pre-Job Briefing shall be face to face briefings with required personnel. No designees or telecom use permitted. [Commitment - Step 2.3.4]

4.45 BAST boric acid concentration range will be administratively controlled between 3.25 wt% (5682 ppm) and 4.0 wt% (6993 ppm). A boric acid concentration below 3.25 wt% invalidates the BAST inventory and alarm setpoint calculations, and may result in a locked-in alarm condition.

4.46 With one boric acid tank Out-Of-Service for maintenance, the minimum boron concentration in the other two boric acid tanks is 3.6 wt%.

4.47 The chemical addition funnel cover needs to be maintained Closed to minimize the potential for introducing foreign material into the system, except during chemical additions or for performing inspections.

4.48 Proper foreign material controls are required for boric acid drums and other chemical addition equipment. Refer to MA-AA-101-1000, Foreign Material Exclusion Procedure.

4.49 Boric Acid filters may be bypassed using 3/4-375, BA PMP 3/4A & 3/4B Disch Cross Connect Iso Vlv, to provide a Boric Acid flow path.

4.50 To accomplish a goal of more precise control at BOL with post-EPU core and post CBO RCPs, the preferred methods of calorimetric power control during this required time of small borations to the core are listed in order below. Plant operating conditions may require different actions. The methods listed below are for 100% steady state plant operation.
<u>1rst preferred method</u> - Borate small amounts to maintain calorimetric power less than 100% and Tave in band. Then force an Auto Makeup to refill the VCT, when appropriate for VCT level, calorimetric power, and Tave. This accomplishes the goal of raising boron concentration in the reactor plant, and minimizes the swing of calorimetric power.
<u>2nd preferred method</u> - Allow Auto makeups to refill the VCT and then borate as needed to maintain calorimetric power less than 100% and Tave in band. This may require borations be larger and the Auto Makeup often lowers calorimetric power more than needed. This accomplishes the goal of raising boron concentration in the reactor plant, but does not minimize the swing of calorimetric power.

INIT Date/Time Started: ____________________/________________

5.4 Manual Makeup

5.4.1 Initial Conditions

____ 1. Applicable Prerequisites in Section 3.0 are satisfied.

5.4.2 Procedure Steps

CAUTION

Instrument uncertainties for the Boric Acid and Primary Water flow transmitters can result in the actual amount of Boric Acid or Primary Water added to be either more or less than the amount calculated. Thus, care is needed to ensure that excessive reduction in RCS boron concentration does NOT occur due to the uncertainties.

NOTE

VCT level is 14.15 gallons per percent level indication.

____ 1. Determine the approximate boric acid and primary water flows and volumes needed to obtain the desired blend concentration from the boron change tables in Section III of the Plant Curve Book. The primary water flow rate should be determined in order to ensure all primary water is injected prior to completion of the manual make-up.

____ 2. Adjust Boric Acid Flow Controller, FC-*-113A, Auto Setpoint to the value determined in Substep 5.4.2.1.

____ 3. Place Primary Water Flow Controller, FC-*-114A, in manual, and adjust the output on the demand meter zero.

____ 4. Place Reactor Makeup Selector switch to Borate.

____ 5. Ensure the control switch for Boric Acid to Blender, FCV-*-113A, in Auto.

____ 6. Place the control switch for Primary Water to Blender, FCV-*-114A, to Open.

INIT 5.4.2 (Cont'd)

7. Set the Boric Acid Batch Totalizer to the volume determined in Substep 5.4.2.1 by performing the following:

____ a. Press LIMIT 1.

____ b. Press CLR.

____ c. Enter desired amount using numeric keypad.

____ d. Press ENT.

____ e. Press COUNT A.

____ f. Press LIMIT 1, and verify desired amount was properly entered.

____ g. Press COUNT A.

____ 8. Ensure a Boric Acid Pump in Auto.

____ 9. Turn the RCS Makeup Control switch to Start.

____ 10. **IF** FCV-*-113B, Blender to Charging Pump Suction, closes due to flow deviation, **THEN** place the control switch for FCV-*-113B to Open.

NOTE

Minor adjustments to the primary water flow rate may be necessary to ensure all of the required primary water is injected prior to the completion of the manual make-up.

____ 11. Adjust as necessary Primary Water Flow Controller, FC-*-114A, to obtain the primary water flow rate determined in Substep 5.4.2.1.

____ 12. **WHEN** the Primary Water to Blender Totalizer indicates the volume determined in Substep 5.4.2.1, **THEN** place the control switch for Primary Water to Blender, FCV-*-114A to Auto **AND** verify the valve closes.

NOTE

Reactor Power and T_{AVG} should be monitored for approximately 20 minutes to verify blended flow was accurate.

13. **WHEN** manual makeup is complete, **THEN** perform the following:

____ a. Turn the RCS Makeup Control Switch to Stop.

____ b. Ensure FCV-*-113B, Blender to Charging Pump Suction control switch is in Auto, and verify the valve is Closed.

____ c. Place Primary Water Flow Controller, FC-*-114A, to Auto.

INIT 5.4.2 (Cont'd)

14. Verify the following valve control switches are in Auto **AND** the valves are Closed:

____ a. Boric Acid to Blender, FCV-*-113A

____ b. Primary Water to Blender, FCV-*-114A

____ c. Blender to VCT, FCV-*-114B

____ 15. Place the Reactor Makeup Selecter switch to Auto.

16. Perform the following:

____ a. Turn the RCS Makeup Control switch to the Start position.

____ b. Verify Red Start light is Energized.

17. **IF** it is desired to conserve RCS inventory, **THEN** perform the following:

____ a. **WHEN** VCT level is in the range of 37 to 42%, **THEN** place VCT Level Controller, LC-*-112, to Manual.

____ b. Manually drive the demand on VCT Level Controller, LC–*–112, to zero.

____ c. Place VCT Level Controller, LC-*-112, to Auto.

NOTE

In addition to the effect on boron concentration, large make-ups can have an adverse effect on other RCS Chemistry parameters. Chemistry Department should be notified if approximately more than 2,000 gallons of (total) makeup has been added to the RCS since the previous Chemistry sample.

____ 18. Direct Chemistry Department to sample the RCS, as necessary, to verify the desired blend has been achieved.

19. Verify that Automatic Makeup is set to the most recent RCS boron concentration in the Unit Narrative Log using Section III of the Plant Curve Book using the following:

____ a. Boric Acid Flow Controller, FC-*-113A

AND

____ b. Primary Water Auto Setpoint, HIC-*-114

____ 20. Verify Boric Acid Flow Controller, FC-*-113A, is in Auto.

____ 21. Ensure log entries specified in Subsection 2.2 are recorded.

____ 22. Complete the QA Record Page for this subsection.

QA RECORD PAGE

(Page 1 of 1)

Procedure Revision Date ________/________/________

5.4 Manual Makeup Unit # _________

Total Amount of Primary Water Added: _________ gallons

Total Amount of Boraic Acid Added: _________ gallons

REMARKS:____

____

____

____

____

____

____

Date/Time Started ___________/__________ Date/Time Completed ___________/__________

PERFORMED BY (Print)	INITIALS
________________________	________
________________________	________
________________________	________

I have reviewed this subsection and it has been satisfactorily performed. Deviations or TCs used to perform this procedure are listed under Remarks.

REVIEWED BY:____ Date:________________

Shift Manager or SRO Designee

L-17-1 NRC Exam

JPM RO A2

JPM TITLE: Perform Accident Monitoring Instrument Channel Checks

JPM NUMBER: 01094010200 **REV.** 1-0

TASK NUMBER(S) / TASK TITLE(S): 01094010200
Perform Accident Monitoring Instrument Channel Checks

K/A NUMBERS: 2.2.12 **K/A VALUE:** RO 3.7

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [x]

EVALUATION LOCATION:

In-Plant:	[ ]	Control Room:	[ ]
Simulator:	[ ]	Classroom:	[x]
Lab:	[ ]	Other:	[ ]

Time for Completion: 20 Minutes Time Critical: No

Alternate Path [NRC]: No
Alternate Path [INPO]: No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/02/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/03/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☒
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: None

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER SUPERVISOR	DATE DATE
1-0	Formatting	L-17-1 NRC Exam	N/A	N/A N/A	N/A N/A

Required Materials:	• HANDOUT 3-OSP-204 • HANDOUT QSPDS DATA • Calculator
General References:	• 3-OSP-204, Accident Monitoring Instrumentation Channel Checks • Calculator
Task Standards:	• The operator will determine that the Functional Criteria is NOT met for all Quadrant 2 and 3 CETs, and that the Acceptance Criteria is NOT met for Quadrant 2 CETs. The operator will identify that LCO 3.3.3.3 Functional Unit 14, Total Number of Channels is NOT met, because the Total Number of Channels is NOT met for Quadrant 2.

NOTE: Additional references available upon request.

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

Initial Conditions:

- Unit 3 is in Mode 1, 100% power
- No equipment is Out of Service
- All prerequisites of 3-OSP-204, Accident Monitoring Instrumentation Channel Checks, have been met.

Initiating Cue:

You have been directed to perform the monthly check of the Core Exit Thermocouples by completing Section 4.10 of 3-OSP-204, Accident Monitoring Instrumentation Channel Checks, and determine any additional procedural action(s), if applicable.

List additional procedural action(s), if applicable:

____

____

____

____

____

____

____

____

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required materials.**
Standard:	Obtain required materials.
Evaluator Cue:	Provide examinee with the following: • HANDOUT 3-OSP-204 • HANDOUT QSPDS DATA
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-2)**	**3-OSP-204, Section 4.10** 1. IF reactor power is less than or equal to 2%, THEN CALCULATE Avg Thot for Channels A and B as follows:
Standard:	Recognize that reactor power is 100% and mark Step 1 N/A.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical N (SEQ-3)**	**3-OSP-204, Section 4.10** 2. RECORD Quadrant One CET Temperatures in Table 3:
Standard:	Records data from the data sheet onto the table.
Performance:	**SATISFACTORY** _______ **UNSATISFACTORY** _______
Comments:	

Performance Step: **Critical Y (SEQ-4)**	**3-OSP-204, Section 4.10** 2. (Continued) Functional Criteria • If Reactor Power is ≤ 2%, then the CET reading is ± 15F of its Channel Average T_{hot} calculated in Section 4.10, Step 1. • If Reactor Power is > 2%, then the CET readings are 545F to 650F.
Standard:	Recognizes reactor power is > 2%. Evaluates data and determines no readings are outside of 545F and 650F and marks **SAT** on Results.
Performance:	**SATISFACTORY** _______ **UNSATISFACTORY** _______
Comments:	

Performance Step: **Critical Y (SEQ-5)**	**3-OSP-204, Section 4.10** 2. (Continued) Acceptance Criteria At least 4 CETs in Quadrant 1 were determined to be functional.
Standard:	Evaluates data and determines all CETs in Quadrant 1 were determined to be functional and marks **SAT** on Results.
Performance:	**SATISFACTORY** _______ **UNSATISFACTORY** _______
Comments:	

Performance Step: **Critical _N_ (SEQ-6)**	**3-OSP-204, Section 4.10** 3. RECORD Quadrant Two CET Temperatures in Table 3:
Standard:	Records data from the data sheet onto the table.
Performance:	**SATISFACTORY** _______ **UNSATISFACTORY** _______
Comments:	

Performance Step: **Critical _Y_ (SEQ-7)**	**3-OSP-204, Section 4.10** 3. (Continued) Functional Criteria • If Reactor Power is ≤ 2%, then the CET reading is ± 15F of its Channel Average T_{hot} calculated in Section 4.10, Step 1. • If Reactor Power is > 2%, then the CET readings are 545F to 650F.
Standard:	Recognizes reactor power is > 2%. Evaluates data and determines **9** readings are outside of 545F and 650F and marks **UNSAT** on Results.
Evaluator Note:	The following are out of band: Channel A: M3, H3, G2, E4, D3 Channel B: K5, G6, F5, F3
Performance:	**SATISFACTORY** _______ **UNSATISFACTORY** _______
Comments:	

Performance Step: **Critical _Y_ (SEQ-8)**	**3-OSP-204, Section 4.10** 3. (Continued) Acceptance Criteria At least 4 CETs in Quadrant 2 were determined to be functional.
Standard:	Evaluates data and determines **3** CETs in Quadrant 2 were determined to be functional and marks **UNSAT** on Results.
Performance:	**SATISFACTORY** _______ **UNSATISFACTORY** _______
Comments:	

Performance Step: **Critical N (SEQ-9)**	**3-OSP-204, Section 4.10** 4. RECORD Quadrant Three CET Temperatures in Table 3:
Standard:	Records data from the data sheet onto the table.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical Y (SEQ-10)**	**3-OSP-204, Section 4.10** 4. (Continued) Functional Criteria • If Reactor Power is ≤ 2%, then the CET reading is ± 15F of its Channel Average T_{hot} calculated in Section 4.10, Step 1. • If Reactor Power is > 2%, then the CET readings are 545F to 650F.
Standard:	Recognizes reactor power is > 2%. Evaluates data and determines **2** readings are outside of 545F and 650F and marks **UNSAT** on Results.
Evaluator Note:	The following are out of band: Channel A: None Channel B: H8, B5
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical Y (SEQ-11)**	**3-OSP-204, Section 4.10** 4. (Continued) Acceptance Criteria At least 4 CETs in Quadrant 3 were determined to be functional.
Standard:	Evaluates data and determines **7** CETs in Quadrant 3 were determined to be functional and marks **SAT** on Results.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-12)**	**3-OSP-204, Section 4.10** 5. RECORD Quadrant Four CET Temperatures in Table 3:
Standard:	Records data from the data sheet onto the table.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-13)**	**3-OSP-204, Section 4.10** 5. (Continued) Functional Criteria • If Reactor Power is ≤ 2%, then the CET reading is ± 15F of its Channel Average T_{hot} calculated in Section 4.10, Step 1. • If Reactor Power is > 2%, then the CET readings are 545F to 650F.
Standard:	Recognizes reactor power is > 2%. Evaluates data and determines no readings are outside of 545F and 650F and marks **SAT** on Results.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-14)**	**3-OSP-204, Section 4.10** 5. (Continued) Acceptance Criteria At least 4 CETs in Quadrant 4 were determined to be functional.
Standard:	Evaluates data and determines all CETs in Quadrant 4 were determined to be functional and marks **SAT** on Results.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-15)**	**3-OSP-204, Section 4.10** 6. ENSURE all out of service CETs are documented per Attachment 1, QSPDS CET/RVLIS Sensors Out-of-Service.
Standard:	Record the following on the turnover sheet: 1. When a CET or RVLIS indication is identified as failed: • INITIATE a trouble and breakdown PWO assigned to I&C. • PLACE a Control Room green tag on the QSPDS display per ODI-CO-016, Operations Department Instruction.
Evaluator Note:	May only reference the performance of Attachment 1.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-16)**	**3-OSP-204, Section 4.10** 7. IF Reactor Power is greater than 2%, THEN RECORD the following representative CET temperatures:
Standard:	Records Channel A and Channel B representative CET temperatures from Data Sheet.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-17)**	**3-OSP-204, Section 4.10** 7. (Continued) Acceptance Criteria If Reactor Power is greater than 2%, representative CET temperatures are between 545F and 650F.
Standard:	Recognizes that reactor power is > 2%. Evaluates data and determines representative CET temperatures for both Channel A and B are between 545F and 650F and marks **SAT** on Results.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-18)**	**3-OSP-204, Section 4.10** 8. RECORD the following CET Subcooling temperatures:
Standard:	Records Channel A and Channel B CET subcooling temperatures from Data Sheet. Also records reactor power.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-19)**	**3-OSP-204, Section 4.10** 8. (Continued) Acceptance Criteria CET Subcooling Temperatures are within the temperature range below for the current reactor power: 100% steady state: 0F - 30F > 50% - < 100%: 0F - 60F > 2 % - 50 %: 45F - 115F ≤ 2%: N/A
Standard:	Recognizes that reactor power is 100% steady state. Evaluates data and determines CET subcooling temperatures for both Channel A and B are between 0F and 30F and marks **SAT** on Results for both.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

100% steady state	0F - 30F
> 50% - < 100%	0F - 60F
> 2 % - 50 %	45F - 115F
≤ 2%	N/A

Terminating Cues: **When the examinee completes Section 4.10, state "This completes the JPM."**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

Initial Conditions:

- Unit 3 is in Mode 1, 100% power
- No equipment is Out of Service
- All prerequisites of 3-OSP-204, Accident Monitoring Instrumentation Channel Checks, have been met.

Initiating Cue:

You have been directed to perform the monthly check of the Core Exit Thermocouples by completing Section 4.10 of 3-OSP-204, Accident Monitoring Instrumentation Channel Checks, and determine any additional procedural action(s), if applicable.

List additional procedural action(s), if applicable:

____

____

____

____

____

____

____

____

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

PTN

UNIT 3

QSPDS CET/HJTC
CHANNEL A

QSPDS MENU

HEATED JUNCTION THERMOCOUPLES

HEATER POWER

HEATER	%
1	80
2	80
3	80
4	80
5	80
6	80
7	80
8	80

THERMOCOUPLE TEMPERATURES

SENSOR	HEATED °F	UNHEATED °F	DIFFERENTIAL °F
1	650	607	43
2	656	611	45
3	651	608	43
4	651	610	41
5	663	610	53
6	663	612	51
7	663	612	51
8	681	612	69

CALCULATED CET DATA

HIGHEST TEMPERATURE

QUAD	ID	°F
1	2	615
2	2	610
3	3	622
4	2	615

NEXT HIGHEST TEMPERATURE

QUAD	ID	°F
1	3	613
2	3	659
3	4	618
4	7	615

FIVE HIGHEST CET TEMPERATURES

	QUAD	ID	°F
1	2	3	659
2	2	5	653
3	3	3	622
4	3	4	618
5	1	2	615

CORE EXIT THERMOCOUPLES

QUADRANT 1

CET	LOC	°F
1	P7	609
2	N10	615
3	N8	613
4	L6	608
5	K8	605

QUADRANT 2

CET	LOC	°F
1	M3	542
2	H5	610
3	H3	659
4	G2	541
5	E4	653
6	D3	538

QUADRANT 4

CET	LOC	°F
1	L14	574
2	L12	615
3	J12	610
4	J10	604
5	H11	610
6	G15	571
7	F13	615
8	F11	608

QUADRANT 3

CET	LOC	°F
1	G8	608
2	E10	608
3	E7	622
4	D5	618
5	C12	576
6	C8	613
7	A8	575

PTN UNIT 3

QSPDS CET/HJTC CHANNEL B

QSPDS MENU

HEATED JUNCTION THERMOCOUPLES

HEATER POWER		THERMOCOUPLE TEMPERATURES			
HEATER	%	SENSOR	HEATED °F	UNHEATED °F	DIFFERENTIAL °F
1	80	1	650	607	43
2	80	2	656	611	45
3	80	3	651	609	43
4	80	4	658	610	48
5	80	5	663	610	53
6	80	6	669	611	58
7	80	7	676	612	64
8	80	8	681	613	69

CALCULATED CET DATA

HIGHEST TEMPERATURE			NEXT HIGHEST TEMPERATURE		
QUAD	ID	°F	QUAD	ID	°F
1	3	615	1	5	615
2	5	622	2	2	615
3	3	610	3	2	607
4	6	618	4	3	613

FIVE HIGHEST CET TEMPERATURES

	QUAD	ID	°F
1	3	1	662
2	2	4	652
3	2	7	651
4	2	5	622
5	6	4	618

CORE EXIT THERMOCOUPLES

QUADRANT 1

CET	LOC	°F
1	R7	571
2	P8	610
3	N6	615
4	N4	576
5	M11	615
6	M9	610
7	L8	610

QUADRANT 2

CET	LOC	°F
1	K5	542
2	K3	615
3	J2	609
4	G6	652
5	G1	622
6	F5	537
7	F3	651

QUADRANT 4

CET	LOC	°F
1	K11	608
2	H15	575
3	H13	613
4	H9	608
5	E14	574
6	E12	618

QUADRANT 3

CET	LOC	°F
1	H8	662
2	F9	607
3	E8	610
4	B10	606
5	B5	538

PTN
UNIT 3

QSPDS MAIN DATA CHANNEL A

QSPDS MENU

TEMPERATURES

HOT LOOP A	610	°F	COLD LOOP A	549	°F
HOT LOOP B	611	°F	COLD LOOP B	549	°F
HOT LOOP C	611	°F	COLD LOOP C	549	°F
UPPER HEAD	611	°F			
CET	641	°F			

PRESSURE

RCS PRESSURE	2246	PSIG

LEVEL

HEAD LEVEL	100	%	PLENUM	100	%

TEMPERATURE SUBCOOLING MARGINS

RCS	43	°F
UPPER HEAD	42	°F
CET	12	°F
RCS/UPPER HEAD	42	°F
RCS LOOP A	43	°F
RCS LOOP B	43	°F
RCS LOOP C	43	°F

PRESSURE SUBCOOLING MARGINS

RCS	590	PSIG
UPPER HEAD	585	PSIG
CET	181	PSIG
RCS/UPPER HEAD	585	PSIG
RCS LOOP A	598	PSIG
RCS LOOP B	592	PSIG
RCS LOOP C	590	PSIG

TRICON HARDWARE STATUS

POWER	NORMAL	TRICON COMM BOARDS	NORMAL
IA COMM	NORMAL	TRICON IO BOARDS	NORMAL
PROCESSORS	NORMAL	CABINET TEMPS	NORMAL

WESTINGHOUSE FPD STATUS

TRICON COMM SERIAL BOARDS	NORMAL

PTN
UNIT 3

QSPDS MAIN DATA CHANNEL B

QSPDS MENU

TEMPERATURES

HOT LOOP A	610	°F	COLD LOOP A	549	°F
HOT LOOP B	611	°F	COLD LOOP B	549	°F
HOT LOOP C	611	°F	COLD LOOP C	549	°F
UPPER HEAD	611	°F			
CET	642	°F			

PRESSURE

RCS PRESSURE	2246	PSIG

LEVEL

HEAD LEVEL	100	%	PLENUM	100	%

TEMPERATURE SUBCOOLING MARGINS

RCS	43	°F
UPPER HEAD	42	°F
CET	12	°F
RCS/UPPER HEAD	42	°F
RCS LOOP A	43	°F
RCS LOOP B	43	°F
RCS LOOP C	43	°F

PRESSURE SUBCOOLING MARGINS

RCS	590	PSIG
UPPER HEAD	585	PSIG
CET	176	PSIG
RCS/UPPER HEAD	585	PSIG
RCS LOOP A	598	PSIG
RCS LOOP B	592	PSIG
RCS LOOP C	590	PSIG

TRICON HARDWARE STATUS

POWER	NORMAL	TRICON COMM BOARDS	NORMAL
IA COMM	NORMAL	TRICON IO BOARDS	NORMAL
PROCESSORS	NORMAL	CABINET TEMPS	NORMAL

WESTINGHOUSE FPD STATUS

TRICON SERIAL COMM BOARDS	NORMAL

FPL

TURKEY POINT UNIT 3

OPERATIONS SURVEILLANCE PROCEDURE

SAFETY RELATED

CONTINUOUS USE

Procedure No.

3-OSP-204

Revision No.

12

Title:

ACCIDENT MONITORING INSTRUMENTATION CHANNEL CHECKS

Responsible Department: OPERATIONS

Special Considerations:

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED TODAY INITIAL X

Revision	Approved By	Approval Date
3	Brian Stamp	12/08/10
12	Mike Murphy	03/30/17

UNIT #	UNIT 3
DATE	
DOCT	PROCEDURE
DOCN	3-OSP-204
SYS	
STATUS	COMPLETED
REV	12
# OF PGS	

REVISION SUMMARY

Rev. No.	Description
12	**PCR 2183647, 03/30/17, Juan Garcia** Removes **EC-TMD 285664** restoring TE-3-6495 (#3 PL).
11A	**PCR 2176597, 12/27/16, Christopher Mitschelen** Added **EC 276866** reference from PCR 1785540 to the References section.
11	**PCR 2094102, 02/18/16, Jonathan Lubert** **PCR 2094102, Leonardo Capera** TE-3-6504 and TE-3-6506 restored (**NOT** grayed out) due to replacement of RVLS probe during PT3-28 RFO. **PCR 1959033, Robert Waller** Revised TE-3-6495 to show as BYPASSED (grayed out). **PCR 2110702, Ruben Montalvo Martinez** Sensor #3 has failed and can **NOT** be bypassed since it is the uppermost sensor in the plenum level. EC-TMD 285664 disables the 3A QSPDS Health Check alarm input to Annunciator G9/6. Misc. - Revised Functional Criteria in Section 6.2 to match the body of the procedure.
10	**PCR 2066653, 09/08/15, Michael Hargis** Enhancement made to acceptance criteria in Section 4.3, to include status of the Annunciator A 4/1.
9	**PCR 1996913, 10/13/14, Jonathan Lubert** Revised to show #6 Unheated Thermocouple TE-3-6506 B input to QSPDS failed. Input is bypassed. **PCR 1979583, 10/07/14, Michael Hargis** Enhancement to correct mismatch between bypassed 3B RVLMS Thermocouples and the 3B QSPDS Flat Panel Display.
8	**PCR 1973009, 07/08/14, Michael Hargis** Edits shaded fields since instruments have been repaired and are no longer bypassed. TE-3-50E, TE-3-6507.
7	**PCR 1883958, 06/24/13, Angel Ramirez** Revise Acceptance Criteria for CET channel check AR 1878683.

TABLE OF CONTENTS

1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for performing channel checks on the Accident Monitoring Instrumentation System. This surveillance procedure satisfies the requirements of T.S. 4.3.3.3 and Table 4.3-4 items 1-5, 8-14, and 16.

1.2 Scope

1.2.1 Frequency

M

1.2.2 Applicability

1, 2, and 3

1.2.3 MODE Restrictions

This surveillance may be performed in any MODE.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Precautions

None

2.2 Limitations

None

3.0 PREREQUISITES

OBTAIN Shift Manager's permission to perform this procedure. X

End of Section 3.0

4.10 Core Exit Thermocouples Channel Check

1. IF reactor power is less than or equal to 2%, THEN **CALCULATE** Avg T_{hot} for Channels A and B as follows:

A. **CALCULATE** Channel A Average T_{hot}. ______

______	+	______	+	______	=	______
CH A Hot Leg A Temp Table 2		CH A Hot Leg B Temp Table 2		CH A Hot Leg C Temp Table 2		Sum CH A Temp

______	÷	______	=	______
Sum CH A Temp		Number of Loops		Avg CH A T_{hot} Temp

B. **CALCULATE** Channel B Average T_{hot}. ______

______	+	______	+	______	=	______
CH B Hot Leg A Temp Table 2		CH B Hot Leg B Temp Table 2		CH B Hot Leg C Temp Table 2		Sum CH B Temp

______	÷	______	=	______
Sum CH B Temp		Number of Loops		Avg CH B T_{hot} Temp

4.10 Core Exit Thermocouples Channel Check (continued)

NOTE

Those CETs that have XXXX entered into their data field below have been bypassed by the QSPDS software in accordance with procedure, 3-OP-042.1, QSPDS - Inadequate Core Cooling Monitor Infrequent Operations, Subsection 7.1.

2. **RECORD** Quadrant One CET Temperatures in Table 3: ______

Table 3
CET Quadrant 1 Temperatures

Channel A		**Channel B**	
P7		R7	
N10		P8	XXXX
N8		N6	
L6		N4	
K8		M11	XXXX
		M9	XXXX
		L8	

Functional Criteria	Results
• If Reactor Power is ≤ 2%, then the CET reading is ± 15°F of its Channel Average T_{hot} calculated in Section 4.10, Step 1. • If Reactor Power is > 2%, then the CET readings are 545°F to 650°F.	☐ SAT ☐ UNSAT

Acceptance Criteria	Results
At least 4 CETs in Quadrant 1 were determined to be functional.	☐ SAT ☐ UNSAT

4.10 Core Exit Thermocouples Channel Check (continued)

NOTE

Those CETs that have XXXX entered into their data field below have been bypassed by the QSPDS software in accordance with procedure, 3-OP-042.1, QSPDS - Inadequate Core Cooling Monitor Infrequent Operations, Subsection 7.1.

3. **RECORD** Quadrant Two CET Temperatures in Table 4: ______

Table 4
CET Quadrant 2 Temperatures

Channel A		**Channel B**	
M3		K5	
H5		K3	XXXX
H3		J2	
G2		G6	
E4		G1	
D3		F5	
		F3	

Functional Criteria	**Results**
• If Reactor Power is ≤ 2%, then the CET reading is ± 15°F of its Channel Average T_{hot} calculated in Section 4.10, Step 1. • If Reactor Power is > 2%, then the CET readings are 545°F to 650°F.	☐ SAT ☐ UNSAT

Acceptance Criteria	**Results**
At least 4 CETs in Quadrant 2 were determined to be functional.	☐ SAT ☐ UNSAT

4.10 Core Exit Thermocouples Channel Check (continued)

NOTE

Those CETs that have XXXX entered into their data field below have been bypassed by the QSPDS software in accordance with procedure, 3-OP-042.1, QSPDS - Inadequate Core Cooling Monitor Infrequent Operations, Subsection 7.1.

4. **RECORD** Quadrant Three CET Temperatures in Table 5: ______

Table 5
CET Quadrant 3 Temperatures

Channel A		**Channel B**	
G8		H8	
E10		F9	XXXX
E7		E8	
D5	XXXX	B10	
C12		B5	
C8			
A8	XXXX		

Functional Criteria	**Results**
• If Reactor Power is ≤ 2%, then the CET reading is ± 15°F of its Channel Average T_{hot} calculated in Section 4.10, Step 1. • If Reactor Power is > 2%, then the CET readings are 545°F to 650°F.	☐ SAT ☐ UNSAT

Acceptance Criteria	**Results**
At least 4 CETs in Quadrant 3 were determined to be functional.	☐ SAT ☐ UNSAT

4.10 Core Exit Thermocouples Channel Check (continued)

5. **RECORD** Quadrant Four CET Temperatures in Table 6: ______

Table 6
CET Quadrant 4 Temperatures

Channel A		Channel B	
L14		K11	
L12		H15	
J12		H13	
J10		H9	
H11		E14	
G15		E12	
F13			
F11			

Functional Criteria	Results
• If Reactor Power is ≤ 2%, then the CET reading is ± 15°F of its Channel Average T_{hot} calculated in Section 4.10, Step 1. • If Reactor Power is > 2%, then the CET readings are 545°F to 650°F.	☐ SAT ☐ UNSAT

Acceptance Criteria	Results
At least 4 CETs in Quadrant 4 were determined to be functional.	☐ SAT ☐ UNSAT

4.10 Core Exit Thermocouples Channel Check (continued)

> **NOTE**
>
> Attachment 2, Temperature Element Descriptions and Locations A Train QSPDS and Attachment 3, Temperature Element Descriptions and Locations B Train QSPDS provide a cross reference from temperature element core location to the specific temperature element designation. The temperature element designation is required to properly identify the component on any PWOs generated to address their failure.

6. **ENSURE** all out of service CETs are documented per Attachment 1, QSPDS CET/RVLIS Sensors Out-of-Service. ______

7. IF Reactor Power is greater than 2%, THEN **RECORD** the following representative CET temperatures: ______

   Channel A ____________ °F

   Channel B ____________ °F

Acceptance Criteria	**Results**
If Reactor Power is greater than 2%, representative CET temperatures are between 545°F and 650°F.	Channel A ☐ SAT ☐ UNSAT
	Channel B ☐ SAT ☐ UNSAT

8. **RECORD** the following CET Subcooling temperatures: ______

   Channel A ________ °F

   Channel B ________ °F

   Reactor Power ________ %

4.10 Core Exit Thermocouples Channel Check (continued)

8. (continued)

Acceptance Criteria		Results
CET Subcooling Temperatures are within the temperature range below for the current reactor power:		Channel A ☐ SAT ☐ UNSAT
100% steady state	0°F - 30°F	Channel B ☐ SAT ☐ UNSAT
> 50% - < 100%	0°F - 60°F	
>2 % - 50 %	45°F - 115°F	
≤ 2%	N/A	

End of Section 4.10

ATTACHMENT 1
QSPDS CET/RVLIS Sensors Out-of-Service
(Page 1 of 1)

1. When a CET or RVLIS indication is identified as failed:

- **INITIATE** a trouble and breakdown PWO assigned to I&C.
- **PLACE** a Control Room green tag on the QSPDS display per ODI-CO-016, Operations Department Instruction.

2. IF the problem appears to be inside containment, THEN:

- **PLACE** the PWO in the SNO file.
- **MOVE** the green tag to the QSPDS cabinet in the Computer Room.
- **CHANGE** the Control Room green tag designation per ODI-CO-016.
- **LIST** the component in the Out-of-Service Logbook as an outage item.

3. IF it is determined that the point will **NOT** be repaired, THEN:

- **CLOSE** the PWO.
- **PERFORM** 3-OP-042.1, QSPDS - Inadequate Core Cooling Monitor Infrequent Operations, Subsection 7.1 to bypass the point.
- **REMOVE** the point from the OOS Logbook.
- **DOCUMENT** bypassed points in 3-OSP-204, Accident Monitoring Instrumentation Channel Checks, under an AR-PCR.

4. WHEN it is determined that points need to be restored, THEN:

- **INITIATE** a PWO.
- **SCHEDULE** this PWO for the next refueling outage.

L-17-1 NRC Exam

JPM RO A3

JPM TITLE: Perform Steam Generator Tube Leak Estimation

JPM NUMBER: 01200006301 **REV.** 2-0

TASK NUMBER(S) / TASK TITLE(S): 01200006300/ Investigate And Control Steam Generator Tube Leak

K/A NUMBERS: 2.3.14 **K/A VALUE:** RO 3.4

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☒ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [x]

EVALUATION LOCATION:

In-Plant:	[ ]	Control Room:	[ ]
Simulator:	[ ]	Classroom:	[x]
Lab:	[ ]	Other:	[ ]

Time for Completion: 15 Minutes Time Critical: No

Alternate Path [NRC]: No

Alternate Path [INPO]: No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/02/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/03/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☒
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: None

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER SUPERVISOR	DATE DATE
2-0	Formatting	L-17-1 NRC Exam	N/A	N/A N/A	N/A N/A

Required Materials:	• HANDOUT DCS RAD • Unit 3 Plant Curve Book • Calculator
General References:	• Unit 3 Plant Curve Book • DCS Plant Computer • 3-ONOP-071.2, Steam Generator Tube Leakage
Task Standards:	• Demonstrate ability to determine and interpret Steam Generator tube-leak flow rate • Use DCS Plant Computer screen shot (i.e., R-15 and SPING data) to estimate Steam Generator tube leakage of 176 gpd (165 gpd to 192.5 gpd)

NOTE: Additional references available upon request.

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

Initial Conditions:

- Unit 3 is at 100% power.
- Annunciator H-1/4, PRMS HI RADIATION, has alarmed due to a high radiation level on R-15, Condenser Air Ejector Monitor.
- The Unit Supervisor is directing the performance of 3-ONOP-071.2, Steam Generator Tube Leakage.
- Unit 3 Steam Jet Air Ejector (SJAE) air in-leakage is 5.5 scfm.

Initiating Cue:

- You are directed by the Unit Supervisor to estimate primary-to-secondary leakage using SJAE SPING/R-15 readings on DCS and the associated leak-rate graphs in the Plant Curve Book.
- Record the estimated leak-rate information below:
  - From the SJAE SPING leak-rate graph: ___________ gpd
  - From the R-15 leak-rate graph: ___________ gpd

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ____________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required materials.**
Standard:	Obtain required materials.
Evaluator Cue:	Provide examinee with the following: • HANDOUT DCS RAD • HANDOUT PCB-5-14-15
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-2)**	**Use DCS data for the SJAE SPING to estimate the primary-to-secondary leak rate.**
Standard:	• Obtain post-event SJAE SPING reading from DCS: <u>2.19×10^{-4} µCi/cc</u>. • Determine corresponding leak rate from Plant Curve Book, Section 5, Figure 14: <u>32 gpd</u> (30 gpd to 35 gpd) • Multiply leak-rate value (in gpd) by air-in-leakage value (in scfm), per Plant Curve Book, Section 5, Figure 14: **<u>176 gpd</u>** (165 gpd to 192.5 gpd)
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_(SEQ-3)**	**Use DCS data for R-15 to estimate the primary-to-secondary leak rate.**
Standard:	• Obtain post-event R-15 reading from DCS: 1328.1 cpm. • Determine corresponding leak rate from Plant Curve Book, Section 5, Figure 15: 32 gpd (30 gpd to 35 gpd) • Multiply leak-rate value (in gpd) by air-in-leakage value (in scfm), per Plant Curve Book, Section 5, Figure 15: **176 gpd** (165 gpd to 192.5 gpd)
Performance:	**SATISFACTORY _______ UNSATISFACTORY ______**
Comments:	

Terminating Cues: **When the examinee completes Step 3, state “This completes the JPM.”**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ____________________ **Evaluator:** ____________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ____________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

Initial Conditions:

- Unit 3 is at 100% power.
- Annunciator H-1/4, PRMS HI RADIATION, has alarmed due to a high radiation level on R-15, Condenser Air Ejector Monitor.
- The Unit Supervisor is directing the performance of 3-ONOP-071.2, Steam Generator Tube Leakage.
- Unit 3 Steam Jet Air Ejector (SJAE) air in-leakage is 5.5 scfm.

Initiating Cue:

- You are directed by the Unit Supervisor to estimate primary-to-secondary leakage using SJAE SPING/R-15 readings on DCS and the associated leak-rate graphs in the Plant Curve Book.
- Record the estimated leak-rate information below:
  - From the SJAE SPING leak-rate graph: ___________ gpd
  - From the R-15 leak-rate graph: ___________ gpd

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

PTN UNIT 3 — METEOROLOGICAL AND RAD DATA

EMERGENCY RESPONSE MENU

AIR EJECTOR SPING (RAD6417)

LOW RANGE GAS	2.19e-004	UCI/CC
MID RANGE GAS	2.19e-004	UCI/CC
HIGH RANGE GAS	3.00e-001	UCI/CC
SPING AREA RAD	1.00e-002	MR/HR

MAIN STEAM LINE MONITORS RAD-3-6426 (DAM1)

MSL 3A (RAD-3-6426A)	0.00e+000	UCI/CC
MSL 3B (RAD-3-6426B)	0.00e+000	UCI/CC
MSL 3C (RAD-3-6426C)	0.00e+000	UCI/CC

Navigate to MSL Monitor Detail

SPENT FUEL PIT SPING (RAD6418)

LOW RANGE GAS	1.00e-008	UCI/CC
MID RANGE GAS	1.00e-004	UCI/CC
HIGH RANGE GAS	3.00e-001	UCI/CC
SPING AREA RAD	1.00e-001	MR/HR

CONTAINMENT

AVG CNTMT TEMP	99.9	DEG F
WR CNTMT PRESS	0.0	PSIG
CH A CHRRMS	1.0	R/HR
CH B CHRRMS	1.0	R/HR

METEOROLOGICAL DATA

* 10M TWR WIND DIR	134.9	DEG
* 10M TWR WIND SPD	10.2	MPH
60M TWR TEMP A	85.1	DEG F
60M TWR TEMP B	85.1	DEG F
* 60M TWR A DELTA T	-0.5	DEG F
60M TWR B DELTA T	-0.5	DEG F
60M TWR/10M DIR	134.9	DEG
60M TWR/60M DIR	134.9	DEG
60M TWR/10M SPD	10.2	MPH
60M TWR/60M SPD	10.1	MPH
* 10M TWR/10M S/T	7.1	DEG

* THESE ARE PRIMARY DATA SOURCES

PLANT VENT SPING (RAD6304)

PLANT VENT FLOW	60901	CFM
LOW RANGE GAS	1.00e-008	UCI/CC
MID RANGE GAS	1.00e-004	UCI/CC
HIGH RANGE GAS	3.00e-001	UCI/CC
SPING AREA RAD	1.00e+000	MR/HR

PROCESS RAD MONITORS

R11 - CNTMT PART	8.52e-009	UCI/CC
R12 - CNTMT GAS	2.47e-005	UCI/CC
R14 - PLANT VENT	291.7	CPM
R15 - SJAE	1328.1	CPM
R17A - CCW HDR A	43.8	CPM
R17B - CCW HDR B	104.9	CPM
R19 - SG BLOWDOWN	383.9	CPM
R20 - RCS LETDOWN	29.9	MR/HR

AREA RAD MONITORS

RD1401 - CTMT PERS HATCH	2.9	MR/HR
RD1402 - CTMT 58' FLOOR	67.4	MR/HR
RD1403 - CTMT INCORE DR	5.3	MR/HR
RD1407 - U3 SFP XFR CNAL	12.6	MR/HR
RD1409 - AUX BLDG TK&PMP	0.3	MR/HR
RD1410 - AUX BLD CHEM	0.3	MR/HR
RD1412 - U3 CASK WASH	0.2	MR/HR
RD1413 - O/S U3 SAMP RM	0.2	MR/HR
RD1415 - N. END NS HALL	0.1	MR/HR
RD1419 - U3 SFP EXH VNT	0.3	MR/HR
RD1421 - U3 SFP N. WALL	0.3	MR/HR
RD1423 - U3 NEW FUEL RM	0.2	MR/HR

L-17-1 NRC Exam

JPM SRO A1a

JPM TITLE: Calculate Quadrant Power Tilt Ratio

JPM NUMBER: 02059006201 **REV.** 3-0

TASK NUMBER(S) / TASK TITLE(S): 02059006200/ Calculate Quadrant Power Tilt Ratio

K/A NUMBERS: 2.1.7 **K/A VALUE:** SRO 4.7

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☐ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [x]

EVALUATION LOCATION:

In-Plant:	[ ]	Control Room:	[ ]
Simulator:	[ ]	Classroom:	[x]
Lab:	[ ]	Other:	[ ]

Time for Completion: 20 Minutes Time Critical: No

Alternate Path [NRC]: No

Alternate Path [INPO]: No

Developed by:	**Val Miklausich** Instructor/Developer	**10/03/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**10/04/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**10/05/17** Date
Approved by:	**Mark Wilson** Training Supervision	**10/05/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**10/05/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☒
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: None

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
2-0	Formatting	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
3-0	Validation Comments	NRC Prep Week	N/A	N/A	N/A
				N/A	N/A

Required Materials:	• HANDOUT 3-OSP-059.10 • Unit 3 Plant Curve Book • Technical Specifications • Calculator
General References:	• Unit 3 Plant Curve Book • 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio • Technical Specifications
Task Standards:	• Determine QPTR • Determine QPTR Acceptance Criteria • Determines if QPTR exceeds Technical Specifications

NOTE: Additional references available upon request.

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

Initial Conditions:

- Unit 3 is operating at 100% power.
- All Power Range channels are operable.
- 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio, Section 4.2, Determination of NIS QPTR Using Detector Current Readings, has been completed yielding suspect QPTR results.

Initiating Cue:

You are directed by the Shift Manager to continue with 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio, Section 4.3, Determination of NIS QPTR Using Detector Voltage Readings, Step 4.3.6 and determine if the associated Acceptance Criterion is SAT/UNSAT.

List any Technical Specifications actions that may apply. If there are none, then write "none".

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NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required materials.**
Standard:	Obtain required materials.
Evaluator Cue:	Provide examinee with the following: • HANDOUT 3-OSP-059.10 • Plant Curve Book • Technical Specifications • Calculator
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-2)**	**3-OSP-059.10, Attachment 2** 2. DETERMINE normalized detector currents.
Standard:	Calculate Upper and Lower Section Normalized Detector Volts on Attachment 2.
Evaluator Note:	Refer to KEY.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-3)**	**3-OSP-059.10, Attachment 2** 3. DETERMINE average normalized power.
Standard:	Calculate and Record Average Upper and Lower Section Normalized Power on Attachment 2.
Evaluator Note:	Refer to KEY.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-4)**	**3-OSP-059.10, Attachment 2** 4. DETERMINE QPTR as follows.
Standard:	Calculate and determine highest QPTR = 1.0334. (1.03-1.04)
Evaluator Note:	Refer to KEY.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-5)**	**3-OSP-059.10, Attachment 2** 5. DETERMINE NIS QPTR Acceptance Criteria below.
Standard:	Recognize that result 1.0334 exceeds acceptance criteria 1.02 and mark UNSAT.
Evaluator Note:	Refer to KEY.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_(SEQ-6)**	**3-OSP-059.10, Attachment 2** 6. IF QPTR Acceptance Criteria is UNSAT, THEN RETURN TO Section 4.5 for additional guidance.
Standard:	Examinee determines that Section 4.5 needs to be performed.
Evaluator Note:	This step refers back to Section 4.5.
Evaluator Cue:	
Performance:	**SATISFACTORY _______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_(SEQ-7)**	**Determine required Technical Specification actions.**
Standard:	Determines that Tech Spec 3.2.4 Action a. applies.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Terminating Cues: **When the examinee completes Sequence 7, state "This completes the JPM."**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

KEY Page 1 of 2

REVISION NO.: 3	PROCEDURE TITLE: DETERMINATION OF QUADRANT POWER TILT RATIO	PAGE: 25 of 28
PROCEDURE NO.: 3-OSP-059.10	TURKEY POINT UNIT 3	INITIAL

ATTACHMENT 2
Determination of NIS QPTR Using Excore Detector Volts
(Page 1 of 2)

1. RECORD Date: TODAY Time NOW &

2. DETERMINE Normalized Detector Currents below:

Upper Section Normalized Detector Volts					
N41 Top Volts / 100% Top Current	=	225.7 / 215.9	millivolts / micro amps	=	1.0454
N42 Top Volts / 100% Top Current	=	171.2 / 168.9	millivolts / micro amps	=	1.0136
N43 Top Volts / 100% Top Current	=	213.4 / 215.7	millivolts / micro amps	=	0.9893
N44 Top Volts / 100% Top Current	=	228.1 / 214.8	millivolts / micro amps	=	1.0619
Upper Section Normalized Current Total				=	4.1102

(4.09 - 4.13)

Lower Section Normalized Detector Volts					
N41 Bottom Volts / 100% Bottom Current	=	202.1 / 199.3	millivolts / micro amps	=	1.0140
N42 Bottom Volts / 100% Bottom Current	=	189.9 / 186.6	millivolts / micro amps	=	1.0177
N43 Bottom Volts / 100% Bottom Current	=	199.3 / 191.9	millivolts / micro amps	=	1.0386
N44 Bottom Volts / 100% Bottom Current	=	200.3 / 204.5	millivolts / micro amps	=	0.9795
Lower Section Normalized Volts Total				=	4.0498

(4.02 - 4.06)

3. DETERMINE average normalized power. &

Average Upper Section Normalized Power				
Upper Section Normalized Current Total / Upper detectors used (3 or 4)	=	4.1102 / 4	=	1.0276

(1.02 - 1.04)

Average Lower Section Normalized Power				
Lower Section Normalized Current Total / Lower detectors used (3 or 4)	=	4.0498 / 4	=	1.0125

(1.00 - 1.02)

Key Page 2 of 2

REVISION NO.: 3	PROCEDURE TITLE: DETERMINATION OF QUADRANT POWER TILT RATIO	PAGE: 26 of 28
PROCEDURE NO.: 3-OSP-059.10	TURKEY POINT UNIT 3	INITIAL

ATTACHMENT 2
Determination of NIS QPTR Using Excore Detector Volts
(Page 2 of 2)

4. DETERMINE QPTR. ____&____

Upper Section Tilt Ratio				
Largest Upper Section Normalized Detector Current / Average Upper Section Normalized Power	=	1.0619 / 1.0276	=	1.0334

(1.03 - 1.04)

Lower Section Tilt Ratio				
Largest Lower Section Normalized Detector Current / Average Lower Section Normalized Power	=	1.0386 / 1.0125	=	1.0258

(1.01 - 1.03)

NIS QPTR = highest Section QPTR = 1.0334 (1.03 - 1.04) ____&____

5. DETERMINE NIS QPTR Acceptance Criteria below. ____&____

Acceptance Criteria	Results
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☒ UNSAT

6. IF QPTR Acceptance Criteria is UNSAT, THEN RETURN TO Section 4.5 for additional guidance. ________

Performed By: ______________________ ________ ________
Print/Sign Initials Date

Reviewed By: ______________________ ________ ________
Print/Sign Initials Date

Approved By: ______________________ ________ ________
Print/Sign Initials Date

TURNOVER SHEET

Initial Conditions:

- Unit 3 is operating at 100% power.
- All Power Range channels are operable.
- 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio, Section 4.2, Determination of NIS QPTR Using Detector Current Readings, has been completed yielding suspect QPTR results.

Initiating Cue:

You are directed by the Shift Manager to continue with 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio, Section 4.3, Determination of NIS QPTR Using Detector Voltage Readings, Step 4.3.6 and determine if the associated Acceptance Criterion is SAT/UNSAT.

List any Technical Specifications actions that may apply. If there are none, then write "none".

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

ATTACHMENT 2
Determination of NIS QPTR Using Excore Detector Volts
(Page 1 of 2)

1. **RECORD** Date: TODAY Time NOW &

2. **DETERMINE** Normalized Detector Currents below:

Upper Section Normalized Detector Volts				
N41 Top Volts / 100% Top Current	=	225.7 millivolts / 215.9 micro amps	=	1.0454
N42 Top Volts / 100% Top Current	=	171.2 millivolts / 168.9 micro amps	=	1.0136
N43 Top Volts / 100% Top Current	=	213.4 millivolts / 215.7 micro amps	=	0.9893
N44 Top Volts / 100% Top Current	=	228.1 millivolts / 214.8 micro amps	=	1.0619
Upper Section Normalized Current Total			=	4.1102

(4.09 - 4.13)

Lower Section Normalized Detector Volts				
N41 Bottom Volts / 100% Bottom Current	=	202.1 millivolts / 199.3 micro amps	=	1.0140
N42 Bottom Volts / 100% Bottom Current	=	189.9 millivolts / 186.6 micro amps	=	1.0177
N43 Bottom Volts / 100% Bottom Current	=	199.3 millivolts / 191.9 micro amps	=	1.0386
N44 Bottom Volts / 100% Bottom Current	=	200.3 millivolts / 204.5 micro amps	=	0.9795
Lower Section Normalized Volts Total			=	4.0498

(4.02 - 4.06)

3. **DETERMINE** average normalized power. &

Average Upper Section Normalized Power				
Upper Section Normalized Current Total / Upper detectors used (3 or 4)	=	4.1102 / 4	=	1.0276

(1.02 - 1.04)

Average Lower Section Normalized Power				
Lower Section Normalized Current Total / Lower detectors used (3 or 4)	=	4.0498 / 4	=	1.0125

(1.00 - 1.02)

ATTACHMENT 2
Determination of NIS QPTR Using Excore Detector Volts
(Page 2 of 2)

4. **DETERMINE** QPTR. &

Upper Section Tilt Ratio				
Largest Upper Section Normalized Detector Current / Average Upper Section Normalized Power	=	1.0619 / 1.0276	=	1.0334

(1.03 - 1.04)

Lower Section Tilt Ratio				
Largest Lower Section Normalized Detector Current / Average Lower Section Normalized Power	=	1.0386 / 1.0125	=	1.0258

(1.01 - 1.03)

NIS QPTR = highest Section QPTR = 1.0334 &

(1.03 - 1.04)

5. **DETERMINE** NIS QPTR Acceptance Criteria below. &

Acceptance Criteria	**Results**
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☒ UNSAT

6. IF QPTR Acceptance Criteria is UNSAT, THEN **RETURN TO** Section 4.5 for additional guidance. ______

Performed By: ______________________ ______ ______
Print/Sign Initials Date

Reviewed By: ______________________ ______ ______
Print/Sign Initials Date

Approved By: ______________________ ______ ______
Print/Sign Initials Date

FPL	**TURKEY POINT UNIT 3** **OPERATIONS SURVEILLANCE PROCEDURE** SAFETY RELATED **CONTINUOUS USE**	Procedure No. **3-OSP-059.10** Revision No. **3**

Title:

DETERMINATION OF QUADRANT POWER TILT RATIO

Responsible Department: OPERATIONS

Special Considerations:

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED TODAY INITIAL X

Revision	Approved By	Approval Date
0	Mike Murphy	05/26/10
3	Mike Murphy	12/02/16

UNIT #	UNIT 3
DATE	
DOCT	PROCEDURE
DOCN	3-OSP-059.10
SYS	
STATUS	COMPLETED
REV	3
# OF PGS	

REVISION SUMMARY	
Rev. No.	**Description**
3	**PCR 2145991, 12/02/16, Samuel Muir** Enhances procedure with NOTE in Section 4.4 to contact Reactor Engineering if thermocouple QPTR calculation needs updating.
2A	**PCR 2145386, 07/25/16, Shaun Matthews** Remove negative sign on Attachment 1, Step 4.
2	**PCR 1956402, 03/30/16, Karl Frater** Removes reference to Attachment 2 in Section 4.1, Step 1. **PCR 2104285, Chris Boyd** Removes Engineering Supervisor signature in Section 5.2.
1A	**PCR 1925197, 01/08/14, John McGowen** Editorial Correction to Section 4.2, Step 5.
1	**PCR 1890793, 07/24/13, Chris Boyd** Enhance procedure to include an administrative limit for QPTR so as not to exceed Tech Spec limit.
0B	**PCR 1754169, 04/20/12, Joe McGuinness** Step 6 on Attachment 1 should align with Section 4.2, Step 5.
0A	**PCR 10-2172, 06/16/10, Mike Gilmore** Minor corrections (typos) in Section 4.3, Step 4.
0	**PCR 10-0462, 05/26/10, Mike Gilmore** Revision to **3-OSP-059.10,** approval date **07/01/2009**. Upgraded format to comply with AD-AA-100-1003 Rev 1, FPL Procedure Writer's guide. Revised wording to reflect the changes in the definition of "ensure" and "verify." Included **PCR 09-4028**, Add clarifications regarding actions to take for an out-of-compliance QPTR. Included **PCR 08-3551**, to revise procedure per CR 2008-16202, identification section regarding performance of a QPTR prior to removing A PR NI Channel from service when less than 50% power.

TABLE OF CONTENTS

1.0 PURPOSE AND SCOPE

1.1 Purpose

1. This procedure provides instructional guidance to determine actual QUADRANT POWER TILT RATIO (QPTR).

2. This surveillance satisfies the surveillance requirements of Technical Specifications 4.2.4.1 when RATED THERMAL POWER is above 50%.

3. This surveillance can satisfy surveillance requirements of Technical Specifications 4.2.4.2 when RATED THERMAL POWER is above 75% and one Power Range channel inoperable.

1.2 Scope

1.2.1 Frequency

7 Days

1.2.2 Applicability

MODE 1 >50% Power

1.2.3 MODE Restrictions

None

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Precautions

1. Anytime an Acceptance Criteria is determined to be UNSAT, the US / SM shall be notified immediately and shall take appropriate actions per Technical Specifications.

2. Any malfunction or abnormal condition requires documentation in Section 5.2, Documentation.

2.2 Limitations

1. A QPTR is **NOT** required with reactor power <50%.

2. The following annunciators are automatically defeated at power levels less than 50%:

   - B 2/2 - POWER RANGE UPPER DET HI FLUX DEV/AUTO DEFEAT
   - B 2/3 - POWER RANGE LOWER DET HI FLUX DEV/AUTO DEFEAT

3. With reactor power greater than 50%, QPTR determination using the excore NIS channels (Section 4.2 or Section 4.3) is required once per 7 days, except as noted below:

   A. With any of the below annunciators inoperable, QPTR determination using the NIS channels should be performed at least once per 8 hours and is required at least once per 12 hours (Tech Spec 4.2.4.1).

      - B 2/2 - POWER RANGE UPPER DET HI FLUX DEV/AUTO DEFEAT
      - B 2/3 - POWER RANGE LOWER DET HI FLUX DEV/AUTO DEFEAT

   B. With one Power Range NIS channel inoperable, QPTR determination using the remaining three NIS channels (Section 4.2 or Section 4.3) should be performed at least once per 8 hours and is required at least once per 12 hours (administrative requirement below 75%).

   C. With QPTR greater than 1.02 (2.0%), QPTR determination is required at least once per hour (Tech Spec 3/4.2.4).

2.2 Limitations (continued)

4. With reactor power greater than or equal to 75% and one Power Range NIS channel inoperable, a QPTR determination using the remaining three NIS channels (Section 4.2 or Section 4.3) and a QPTR determination using one of the following five methods (Section 4.4) shall be performed as follows:

   - A QPTR determination should be completed within 8 hours after declaring the channel inoperable and shall be completed within 12 hours after declaring the channel inoperable to satisfy Tech Spec 4.2.4.2.

   - Subsequent QPTR determinations should be started approximately 8 hours after completion of the previous QPTR determination and shall be completed within 12 hours after completion of the previous QPTR determination to satisfy Tech Spec 4.2.4.2.

   A. An automatic core exit thermocouple QPTR calculation using Section 4.4.1 (preferred method).

   B. A manual core exit thermocouple QPTR calculation using Section 4.4.2.

   C. A flux map using two sets of four symmetric thimble locations (E11, H03, C08, L11, H13, E05, N08 and L05) using Section 4.4.3.

   D. A flux map using at least 16 thimbles with a minimum of 2 thimbles per quadrant using Section 4.4.4.

   E. A full-core flux map using Section 4.4.5.

5. Calculations may be performed without interim rounding on any attachment [Ref: Section 8.1.2, Developmental 3.D]. For example:

   - Use rounded results from each individual calculation in the final calculations.

   - Use the default number of significant digits in each individual calculation in the final calculation.

6. With reactor power greater than or equal to 75%, QPTR determination using thermocouples (Section 4.4.1 or Section 4.4.2) is required <u>once</u> per 7 days.

2.2 Limitations (continued)

7. Actual QPTR is determined from excore detectors.

3.0 PREREQUISITES

OBTAIN Shift Manager approval to perform this procedure. x ____

End of Section 3.0

4.3 **Determination of NIS QPTR Using Detector Voltage Readings**

CAUTION

NIS QPTR using detector volt readings may be performed provided rod exercise testing is **NOT** in progress.

1. **DIRECT** I&C to bring a Fluke 45 or equivalent digital volt meter to the Control Room. X

NOTE

NIS QPTR using detector volt readings are taken on in service Power Range Nuclear Instrumentation channels only.

2. IF Nuclear Instrumentation UNIT -3 POWER RANGE N-41 is in service, THEN **OBTAIN** top and bottom detector voltages as follows:

   A. **PLACE** DROP ROD MODE switch for UNIT-3 POWER RANGE N-41 in BYPASS. X

   B. **OPEN** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-41. X

   C. **DIRECT** I&C to take voltage readings (in millivolts) from UNIT-3 POWER RANGE N-41 Drawer B test points located on back of the meters. X

   D. **RECORD** channel N41 voltages on Attachment 2, Determination of NIS QPTR Using Excore Detector Volts. X

   E. **CLOSE** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-41. X

   F. **PLACE** DROP ROD MODE switch for the UNIT-3 POWER RANGE N-41 in NORMAL. X

INITIAL

4.3 Determination of NIS QPTR Using Detector Voltage Readings (continued)

3. IF Nuclear Instrumentation UNIT -3 POWER RANGE N-42 is in service, THEN **OBTAIN** top and bottom detector voltages as follows:

   A. **PLACE** DROP ROD MODE switch for UNIT-3 POWER RANGE N-42 in BYPASS. X

   B. **OPEN** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-42. X

   C. **DIRECT** I&C to take voltage readings (in millivolts) from UNIT-3 POWER RANGE N-42 Drawer B test points located on back of the meters. X

   D. **RECORD** channel N42 voltages on Attachment 2, Determination of NIS QPTR Using Excore Detector Volts. X

   E. **CLOSE** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-42. X

   F. **PLACE** DROP ROD MODE switch for the UNIT-3 POWER RANGE N-42 in NORMAL. X

4. IF Nuclear Instrumentation UNIT-3 POWER RANGE N-43 is in service, THEN **OBTAIN** top and bottom detector voltages as follows:

   A. **PLACE** DROP ROD MODE switch for UNIT-3 POWER RANGE N-43 in BYPASS. X

   B. **OPEN** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-43. X

   C. **DIRECT** I&C to take voltage readings (in millivolts) from UNIT-3 POWER RANGE N-43 Drawer B test points located on back of the meters. X

   D. **RECORD** channel N43 voltages on Attachment 2, Determination of NIS QPTR Using Excore Detector Volts. X

   E. **CLOSE** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-43. X

INITIAL

4.3 Determination of NIS QPTR Using Detector Voltage Readings (continued)

4. **(continued)**

   F. **PLACE** DROP ROD MODE switch for the UNIT-3 POWER RANGE N-43 in NORMAL. X

5. IF Nuclear Instrumentation UNIT -3 POWER RANGE N-44 is in service, THEN **OBTAIN** top and bottom detector voltages as follows:

   A. **PLACE** DROP ROD MODE switch for UNIT-3 POWER RANGE N-44 in BYPASS. X

   B. **OPEN** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-44. X

   C. **DIRECT** I&C to take voltage readings (in millivolts) from UNIT-3 POWER RANGE N-44 Drawer B test points located on back of the meters. X

   D. **RECORD** channel N44 voltages on Attachment 2, Determination of NIS QPTR Using Excore Detector Volts. X

   E. **CLOSE** POWER RANGE DRAWER B for UNIT-3 POWER RANGE N-44. X

   F. **PLACE** DROP ROD MODE switch for the UNIT-3 POWER RANGE N-44 in NORMAL. X

NOTE

Plant Curve Book Section 5 Figure 5, contains the Power Range currents for 100% power values.

6. **RECORD** the 100% power current values for each in service Power Range Nuclear Instrumentation detector. ______

7. **COMPLETE** calculations on Attachment 2, Determination of NIS QPTR Using Excore Detector Volts. ______

4.3 Determination of NIS QPTR Using Detector Voltage Readings (continued)

8. **DETERMINE** results for Nuclear Instrument Power Range channel QPTR Acceptance Criteria below. _______

Acceptance Criteria	Results
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

9. IF QPTR is greater than 1.02 (2.0%), THEN **REFER TO** Section 4.5 for additional actions. _______

End of Section 4.3

4.4 Determining QPTR Using at Least One of Five Methods

NOTE

- A thermocouple QPTR may be performed anytime all 16 core exit thermocouples listed in Plant Curve Book, Section 5, Figure 11, Thermocouple QPTR Calculation, are in service. If necessary, consider revising the Plant Curve Book to support a thermocouple QPTR by using 16 operable thermocouples.
- Due to core burnup and changes in radial power, thermocouple QPTR requires periodic updates throughout the cycle. Reactor Engineering should be contacted to update the thermocouple QPTR calculation when needed.
- A thermocouple QPTR determination is **NOT** valid below 75% power.
- The methods used in Section 4.4 can **NOT** ensure Technical Specification compliance and are only used to corroborate QPTR from excore detectors.

4.4.1 Core Exit Thermocouple QPTR Using the Automated Method

1. **CHECK** 3A QSPDS OPERABLE. _______

2. **CHECK** 3B QSPDS OPERABLE. _______

4.4.1 Core Exit Thermocouple QPTR Using the Automated Method (continued)

3. Using DCS, **NAVIGATE** to the THERMOCOUPLE QPTR CALCULATION display and print screen to generate a computer printout similar to Plant Curve Book, Section 5, Figure 11. ______

Acceptance Criteria	Results
QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

4. IF QPTR is greater than 1.02 (2.0%), THEN **REFER TO** Section 4.5 for additional actions. ______

End of Section 4.4.1

4.4.2 Thermocouple QPTR Using Manual Method

1. **CHECK** 3A QSPDS OPERABLE. _______

2. **CHECK** 3B QSPDS OPERABLE. _______

3. On a form similar to Plant Curve Book, Section 5, Figure 11, Thermocouple QPTR Calculation for Unit 3, **PERFORM** the following:

   A. Using QSPDS or DCS display, **RECORD** temperatures for <u>all</u> 16 Core Exit Thermocouple locations specified on THERMOCOUPLE QPTR CALCULATION. _______

   B. **COMPLETE** QPTR calculations. _______

4. **DETERMINE** results for QPTR Acceptance Criteria below. _______

Acceptance Criteria	Results
QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

5. IF QPTR is greater than 1.02 (2.0%), THEN **REFER TO** Section 4.5 for additional actions. _______

End of Section 4.4.2

NOTE

At least 16 detector thimbles with a minimum of 2 detector thimbles per core quadrant are required to be OPERABLE to calculate QPTR using the Movable Incore Detection System, except when using the following two sets of 4 symmetric thimbles:

- C8, N8, E5, L5, E11, L11, H3 AND H13 (Tech Spec 3.3.3.2).

4.4.3 Core Flux Map - Two Sets of Four Symmetric Thimble Locations Method

1. Using 0-OSP-059.13, Core Map Analysis and Peaking Factor Verification, **COMPLETE** Attachment 3, Determination of QPTR Using Movable Incore Detector System. ______

2. **DETERMINE** Acceptance Criteria results below. ______

Acceptance Criteria	Results
QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

3. IF QPTR is greater than 1.02 (2.0%), THEN **REFER TO** Section 4.5 for additional actions. ______

End of Section 4.4.3

4.4.4 Core Flux Map Using at Least 16 Thimbles with a Minimum of 2 Thimbles per Quadrant Method

1. Using 0-OSP-059.13, Core Map Analysis and Peaking Factor Verification, **COMPLETE** Attachment 3, Determination of QPTR Using Movable Incore Detector System. ______

2. **DETERMINE** Acceptance Criteria results below. ______

Acceptance Criteria	Results
QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

3. IF QPTR is greater than 1.02 (2.0%), THEN **REFER TO** Section 4.5 for additional actions. ______

End of Section 4.4.4

4.4.5 Full-Core Flux Map Method

1. Using 0-OSP-059.13, Core Map Analysis and Peaking Factor Verification, **COMPLETE** Attachment 3, Determination of QPTR Using Movable Incore Detector System. ______

2. **DETERMINE** QPTR Acceptance Criteria results below. ______

Acceptance Criteria	Results
QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

3. IF QPTR is greater than 1.02 (2.0%), THEN **REFER TO** Section 4.5 for additional actions. ______

End of Section 4.4.5

4.5 <u>Excessive Quadrant Power Tilt Ratio</u>

1. IF actual QPTR is greater than 1.02 (2.0%) OR <u>one</u> power range monitor is out of service AND Section 4.4 can **NOT** be performed within 12 hours, THEN:

   A. **GO TO** 3-ONOP-059.9, Excessive Quadrant Power Tilt Ratio. ______

   B. **NOTIFY** Rx Engineering. ______

2. **NOTIFY** the Unit Supervisor of the results of this procedure. ______

End of Section 4.5

5.0 RESTORATION AND DOCUMENTATION

5.1 Restoration

1. None

5.2 Documentation

1. Acceptance Criteria in Section 6.1.

☐ SAT ☐ UNSAT ______

Remarks: ______________________________

____

____

____

____

Performed By:

______	______	______	______
______	______	______	______
______	______	______	______
(Signature)	(Print)	(Init)	(Date)

Reviewed By:

______	______	______
(Supervisor)	(Print)	(Date)

Approved By:

______	______	______
(Shift Manager or SRO Designee)	(Print)	(Date)
______	______	______

6.0 ACCEPTANCE AND FUNCTIONAL CRITERIA

6.1 Acceptance Criteria

1. The actual QPTR is less than or equal to 1.02 (2.0%).

6.2 Functional Criteria

None

7.0 RECORDS

1. The date, time, and section completed shall be entered in the Unit Narrative Log.

2. Problems encountered while performing the procedure (i.e., malfunctioning equipment, delays due to change in plant conditions, etc.) should be entered in the Unit Narrative Log.

3. Completed copies of the below listed items constitute Quality Assurance Records and shall be routed to Reactor Engineering for review prior to being transmitted to QA Records.

   - Section 5.2, Documentation
   - Attachment 1, Determination of NIS QPTR Using Excore Detector Currents
   - Attachment 2, Determination of NIS QPTR Using Excore Detector Volts
   - Attachment 3, Determination of QPTR Using Movable Incore Detector System
   - Plant Curve Book, Section 5, Figure 11, Thermocouple QPTR Calculation or equivalent

7.0 RECORDS (continued)

4. Completed copies of the documents listed below shall be filed in the Shift Manager file:

- Section 5.2, Documentation
- Attachment 1, Determination of NIS QPTR Using Excore Detector Currents
- Attachment 2, Determination of NIS QPTR Using Excore Detector Volts
- Attachment 3, Determination of QPTR Using Movable Incore Detector System
- Plant Curve Book, Section 5, Figure 11, Thermocouple QPTR Calculation or equivalent

8.0 REFERENCES AND COMMITMENTS

8.1 <u>References</u>

8.1.1 Implementing

1. Procedures

   A. 0-ADM-554, Plant Curve Book Unit 3 Section 5

   B. 3-ONOP-059.9, Excessive Quadrant Power Tilt Ratio

   C. 0-OSP-059.13, Core Map Analysis and Peaking Factor Verification

8.1.2 Developmental

1. Technical Specifications

   A. Section 3.2.4

   B. Section 4.2.4.1

   C. Section 4.2.4.2

   D. Section 4.3.3.2

   E. Section 3.02

   F. Table 3.3-1

2. Procedures

   A. 0-NOP-059.04, Operation of the Movable Incore Detectors

   B. 3-OSP-059.5, Power Range Nuclear Instrumentation Shift Checks and Daily Calibration

   C. 3-OSP-059.16, Thermocouple Quadrant Power Tilt Ratio Derivation

8.1.2 Developmental (continued)

3. Miscellaneous Documents

A. Rx-25, Program Thermdat Documentation

B. CR 2009-6056, Using CETs of Flux map only could result in missed Technical Specification requirement.

C. CR 2008-16202, QPTR requirements prior to removing a PR NIS Channel from service apply at reduced power levels (<50% power)

D. CR 99-0993, Use of Calculator and Rounding for QPTR Values

E. PC/M 04-112, Emergency Response Data Acquisition and Display System (ERDADS) Replacement

8.1.3 Management Directives

None

8.2 <u>Commitments</u>

None

ATTACHMENT 2
Determination of NIS QPTR Using Excore Detector Volts
(Page 1 of 2)

1. **RECORD** Date: TODAY Time NOW x

2. **DETERMINE** Normalized Detector Currents below:

Upper Section Normalized Detector Volts			
N41 Top Volts / 100% Top Current	=	225.7 millivolts / micro amps	=
N42 Top Volts / 100% Top Current	=	171.2 millivolts / micro amps	=
N43 Top Volts / 100% Top Current	=	213.4 millivolts / micro amps	=
N44 Top Volts / 100% Top Current	=	228.1 millivolts / micro amps	=
Upper Section Normalized Current Total			=

Lower Section Normalized Detector Volts			
N41 Bottom Volts / 100% Bottom Current	=	202.1 millivolts / micro amps	=
N42 Bottom Volts / 100% Bottom Current	=	189.9 millivolts / micro amps	=
N43 Bottom Volts / 100% Bottom Current	=	199.3 millivolts / micro amps	=
N44 Bottom Volts / 100% Bottom Current	=	200.3 millivolts / micro amps	=
Lower Section Normalized Volts Total			=

3. **DETERMINE** average normalized power. ______

Average Upper Section Normalized Power			
Upper Section Normalized Current Total / Upper detectors used (3 or 4)	=	______	=

Average Lower Section Normalized Power			
Lower Section Normalized Current Total / Lower detectors used (3 or 4)	=	______	=

ATTACHMENT 2
Determination of NIS QPTR Using Excore Detector Volts
(Page 2 of 2)

4. **DETERMINE** QPTR. ______

Upper Section Tilt Ratio
Largest Upper Section Normalized Detector Current / Average Upper Section Normalized Power = ____________ =

Lower Section Tilt Ratio
Largest Lower Section Normalized Detector Current / Average Lower Section Normalized Power = ____________ =

NIS QPTR = highest Section QPTR = ________ ______

5. **DETERMINE** NIS QPTR Acceptance Criteria below. ______

Acceptance Criteria	Results
NIS QPTR is less than or equal to 1.02 (2.0%)	☐ SAT ☐ UNSAT

6. IF QPTR Acceptance Criteria is UNSAT, THEN **RETURN TO** Section 4.5 for additional guidance. ______

Performed By: ____________________ ______ ______
Print/Sign Initials Date

Reviewed By: ____________________ ______ ______
Print/Sign Initials Date

Approved By: ____________________ ______ ______
Print/Sign Initials Date

L-17-1 NRC Exam

JPM SRO A1b

JPM TITLE:	Determine Contingency Actions per 0-ADM-051
JPM NUMBER:	02023013300 **REV.** 2-1
TASK NUMBER(S) / TASK TITLE(S):	02023013300/ Identify and Direct Tech Spec Actions Required due to EDG/System Failures
K/A NUMBERS:	2.1.20 **K/A VALUE:** SRO 4.6

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☐ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [x]

EVALUATION LOCATION:

In-Plant:		Control Room:	
Simulator:		Classroom:	x
Lab:		Other:	

Time for Completion: 20 Minutes Time Critical: No

Alternate Path [NRC]: No

Alternate Path [INPO]: No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/02/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**07/27/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/03/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**07/27/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☒
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: None

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
2-0	Formatting; Updating	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
2-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17

Required Materials:	• 0-ADM-051 • Unit 3 Plant Curve Book
General References:	• 0-ADM-051, Outage Risk Assessment and Control • Unit 3 Plant Curve Book
Task Standards:	• Demonstrate knowledge of operator responsibilities during all modes of plant operation • Correctly identify the minimum required contingency actions and Safe Shutdown Function Color Code, using 0-ADM-051

NOTE: Additional references available upon request.

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

Initial Conditions:

- Unit 3 was shut down 11 days ago.
- The RCS is depressurized with a temperature of 105°F.
- RCS level is 35%, as indicated on LIS-3-6421 and LIS-3-6423 (RCS drain-down level indicators).
- Fuel remains loaded in the core.
- Unit 3 is in the normal electrical alignment for shutdown conditions.
- A governor failure was discovered on the 3A EDG and it was declared inoperable and unavailable.
- Plant conditions do not allow for the realignment of electrical buses.

Initiating Cue:

- Perform an Outage Risk Assessment in accordance with 0-ADM-051, Outage Risk Assessment and Control, for the loss of the 3A EDG:
    - Identify the Safe Shutdown Function Color Code.
    - Identify the minimum required contingency action(s), if applicable.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: **When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).**

NOTE: **Critical steps are marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.**

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required materials.**
Standard:	Obtain required materials.
Evaluator Cue:	Provide examinee with copy of HANDOUT 0-ADM-051 and HANDOUT PCB-5.
Performance:	**SATISFACTORY _______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_(SEQ-2)**	**Based on plant conditions, identify the correct enclosure of 0-ADM-051 to be implemented.**
Standard:	Examinee identifies applicability of Enclosure 5, based on initial conditions: • Phase II, based on time since shutdown (i.e., 11 days; >240 hours) • RCS temperature <200°F (i.e., 105°F) • RCS loops not available (i.e., RCS depressurized).
Evaluator Note:	Phase II (Section 4.14) defined as: • The later stages of an outage in which the decay heat load is reduced and relaxations of Functional equipment requirements are allowed. It is defined as greater than 240 hours following unit shutdown, or start of fuel reload to the reactor vessel as part of a full core offload, whichever occurs first.
Performance:	**SATISFACTORY _______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _N_(SEQ-3)**	**Identify that the RCS inventory is lower than 3 feet below the Reactor Vessel Flange.**
Standard:	Examinee identifies that RCS inventory is ~4.25 feet below the Reactor Vessel Flange, based on initial conditions, as follows: • 35% on LIS-3-6421 is ~28.25 feet in containment (Plant Curve Book, Section 5, Figure 12A) • Reactor Vessel Flange is at 32.5 feet in containment (Plant Curve Book, Section 5, Figure 9)
Evaluator Note:	This step may be performed in conjunction with the following step.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_(SEQ-4)**	**Based on plant conditions, recognize that two EDGs are required.**
Standard:	Examinee determines the following, from Page 5 of Enclosure 5: • One EDG is required on the associated unit, and • A second EDG is required if RCS level is lower than 3 feet below the Reactor Vessel Flange.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-5)**	**Determine the required contingency actions.**
Standard:	Examinee determines the following, from Page 5 of Enclosure 5: • Take action to restore the unavailable EDG to service. • Suspend activities that may risk the off-site power sources. • Verify availability of the station blackout tie. • Verify the ability to power A or B from one C Bus transformer.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-6)**	**Determine the Safe Shutdown Function Color Code.**
Standard:	Examinee determines the following, from Page 5 of Enclosure 5: • Safe Shutdown Function Color Code is ORANGE.
Evaluator Note:	May also determine ORANGE using Page 3 of Enclosure 5 due to one charging pump available with available EDG power source.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Terminating Cues: **When the examinee hands in their work, state "This completes the JPM."**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ______________________________________

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

Initial Conditions:

- Unit 3 was shut down 11 days ago.
- The RCS is depressurized with a temperature of 105°F.
- RCS level is 35%, as indicated on LIS-3-6421 and LIS-3-6423 (RCS drain-down level indicators).
- Fuel remains loaded in the core.
- Unit 3 is in the normal electrical alignment for shutdown conditions.
- A governor failure was discovered on the 3A EDG and it was declared inoperable and unavailable.
- Plant conditions do not allow for the realignment of electrical buses.

Initiating Cue:

- Perform an Outage Risk Assessment in accordance with 0-ADM-051, Outage Risk Assessment and Control, for the loss of the 3A EDG:
    - Identify the Safe Shutdown Function Color Code.
    - Identify the minimum required contingency action(s), if applicable.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Florida Power & Light Company

This procedure may be affected by a T.C. (Temporary Change) Verify information prior to use.
Date verified__________ Initials__________

Turkey Point Nuclear Plant

0-ADM-051

Title:

Outage Risk Assessment and Control

(Information Use)

Responsible Department:	Operations
Revision Number:	22
Revision Approval Date:	4/5/17

PCRs *09-0220, 09-0231, 08-3909, 09-0660, 09-0664, 09-2314, 09-3139, 09-3321, 09-3334, 09-3412, 10-0718, 10-1220, 565731, 589071, 591906, 1668955, 1640253, 1709966, 1701068, 1756169, 1770740, 1769489, 1816588, 183887, 1843598, 1817646, 1845674, 1853185, 1817646, 1950650, 1970769, 1992975, 2005967, 1998648, 1991906, 2084177, 2084666, 2096187, 2115529, 2045629, 2103602, 2194906*
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19	05/03/16	54	05/03/16	89	05/03/16	124	05/03/16	159	05/03/16
20	05/03/16	55	05/03/16	90	05/03/16	125	05/03/16	160	05/03/16
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1.0 PURPOSE

1.1 This procedure provides the recommended equipment to be maintained when in Modes 5, 6, and Defueled. The objective is to maintain the following Key Safe Shutdown Functions: Decay Heat Removal, Inventory Control, Power Availability, Reactivity Control, Containment Integrity Control, and Instrumentation.

1.2 This procedure provides a Defense-In-Depth approach for those planned situations and equipment outages that are identified as high risk to maintaining the Key Safe Shutdown Functions. Emergency response by the Operations staff on shift does not require the use of this procedure.

1.3 This procedure provides the method of and direction for notification to the Operations staff on changes to the plant configuration that would affect the Key Safe Shutdown Functions.

1.4 This procedure provides the shutdown risk assessments which shall be performed when planning and conducting shutdown activities. The goal of these reviews and planning is to minimize undue risk and to maintain Key Safe Shutdown Functions thereby enhancing shutdown safety.

1.5 This procedure provides for qualitative assessments to balance unavailability of equipment against reliability of the key Safe Shutdown Functions to meet Maintenance Rule requirements.

1.6 While in Mode 4, Site-Specific Shutdown Safety Management Program requirements are implemented by 0-ADM-225, On Line Risk Assessment and Management.

2.0 REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS

2.1 References:

2.1.1 FSAR

1. Section 9.3, Appendix 14D, High Density Spent Fuel Storage Racks

2.1.2 Plant Procedures

1. 0-ADM-225, On Line Risk Assessment and Management
2. 0-ADM-566, Diverse and Flexible Coping Strategies (FLEX) Program
3. 0-GMM-051.02, Containment Equipment Hatch
4. 3/4-GOP-305, Hot Standby to Cold Shutdown
5. 3/4-GOP-503, Cold Shutdown to Hot Standby
6. 3/4-NOP-041.09, Reduced Inventory Operations
7. 3/4-NOP-092.01, Main/Auxiliary Transformer Backfeed
8. 3/4-ONOP-004, Loss of Off-Site Power
9. 3/4-ONOP-004.2, Loss of A 4 kV Bus
10. 3/4-ONOP-004.3, Loss of B 4 kV Bus
11. 3/4-ONOP-004.4, Loss of C 4 kV Bus
12. 3/4-ONOP-004.5, Loss of D 4 kV Bus
13. 3/4-ONOP-004.10, Loss of Offsite Power While On Backfeed
14. 3/4-ONOP-004.11, System Restoration Following Loss of Offsite Power While On Backfeed
15. 3/4-ONOP-004.12, Loss of *A 4 kV Bus While On Backfeed
16. 3/4-ONOP-004.13, Loss of *B 4 kV Bus While On Backfeed
17. 3/4-ONOP-004.14, Loss Of All AC Power While In Modes 5, 6, Or Defueled
18. 3/4-ONOP-019, Intake Cooling Water Malfunction
19. 3/4-ONOP-030, Component Cooling Water Malfunction
20. 3/4-ONOP-033.1, Spent Fuel Pit Cooling System Malfunction
21. 3/4-ONOP-092.3, Startup Transformer Malfunction

2.1.2 (Cont'd)

22. 3/4-ONOP-092.4, C Bus Transformer Malfunction
23. 0-ONOP-105, Control Room Evacuation
24. 3/4-OP-038.9, Refueling Activities Checkoff List
25. 3/4-OP-041.8, Filling and Venting the Reactor Coolant System
26. 3/4-OP-050, Residual Heat Removal System
27. 3/4-OSP-201.1, RO Daily Logs
28. AD-AA-101-1004, Work Hour Controls
29. EN-AA-110, Diverse and Flexible Coping Strategies (FLEX) Program
30. ER-AA-100-2002, Maintenance Rule Program Administration
31. NP-909, Shutdown Risk
32. OM-AA-101-1000, Shutdown Risk Management
33. OM-AA-202-1000, Outage Scope Control
34. OP-AA-1000, Conduct of Infrequently Performed Tests or Evolutions
35. WM-AA-200, Work Management Process Overview
36. WM-AA-203, On-Line Scheduling Process

2.1.3 Miscellaneous Documents (i.e., PC/M, ECs, Correspondence)

1. NUMARC 91-06, Guidelines for Industry Actions to Assess Shutdown Management
2. NUREG-1410, Loss of Vital AC Power and RHR During Mid-Loop Operation at Vogtle Unit 1
3. NRC Information Notice 93-72, Observations from Recent Shutdown Risk and Outage Management Pilot Team Inspections
4. JPN-PTN-SEMS-94-049
5. PC/M 94-059, Diesel Engine Driver for Standby Steam Gen Feedwater Pp P82B
6. PC/M 95-060, Blackstart Diesel Generator Elimination
7. JPN-NR 96-009, Dated February 9, 1996
8. PTN-BFSM-97-018, Spent Fuel Pool and Reactor Coolant System Heatup Following Loss of Cooling
9. INPO SER 1-98, Recurring Inadvertent Reductions of RCS Inventory
10. CR 98-127, OEF 98-005 for INPO SER 1-98
11. CR 98-1373, Containment Closure Requirements of 0-ADM-051
12. CR 98-1657, Less than Adequate Compliance with Requirements and Responsibilities Contained in 0-ADM-051
13. Calculation PTN-BFJF-99-041, Time to Reach Boiling Conditions After a Loss of RHR
14. CR 02-0608, Curves Included in this Procedure Not Accurate
15. Evaluation PTN-ENG-SEMS-03-003, Rev. 0
16. L-2003-021, Dated 2/1/03
17. CR 04-1947, Incorrect Volume Used in SFP Time to Boil Calculation
18. CR 2006-7472, Loss of Shutdown Cooling During Restoration of 3C 480V Load Center
19. Evaluation PTN-ENG-SEFJ-07-003, Rev 0, Time to Core Uncovery from Mid Loop RCS After EOC with Loss of RHR
20. CR 2006-10277, CA #9, Add a Curve to 0-ADM-051 for Time to Core Uncovery
21. PTN-ENG-SEMS-03-003 Rev. 3, Implementation of Core Offload to 72 hours
22. PTN-ENG-SENS-07-032, Rev 1, RHR System Operation with the Reactor Cavity Filled and the Vessel Upper Internals in Place (EC 271084)

2.1.3 (Cont'd)

23. Engineering Calculation PTN-3FJF-11-153, Rev 0, Turkey Point Unit 3 Spent Fuel Pool Heat Up and Time to 200°F on Loss of Cooling During and After Cycle 25

24. Engineering Calculation PTN-4FJF-11-154, Rev 0, Turkey Point Unit 4 Spent Fuel Pool Heat Up and Time to 200°F on Loss of Cooling During and After Cycle 26

25. INPO Event Report, Level 1, 11-2, Fukushima Daiichi Nuclear Station Spent Fuel Pool Loss of Cooling and Makeup, April 25, 2011

26. AR 1744866, Condition Evaluation Justifies Usage or RAD-6304 as Backup to R-14

27. PTN-BFSM-97-018, RCS Heat-Up Following Loss of Cooling

28. PC/M 09-139, EPU EC 247008, LAR Umbrella Mod

29. Zachry Calculation 10-117, Reduced Inventory Operations for EPU

30. EC 282393, PTN-BFSM-14-013 Loss of RHR at Two and a Half Feet Below Reactor Vessel Flange Calculation for Turkey Point NSSS EPU Program

31. EC 280781, U3 Containment Equipment Hatch Fast Closure Door

32. EC 281053, U4 Containment Equipment Hatch Fast Closure Door

33. EC 280301, Unit 3 and 4 Fukushima FLEX Strategy Implementation Umbrella Modification.

34. ECs 279532 (279533), Unit 3 (Unit 4) Fukushima FLEX Modifications - Electrical

35. ECs 280631 (279586), Unit 3 (Unit 4) Mechanical FLEX Modifications for Beyond Design Basis External Events (BDBEE)

36. Nuclear Energy Institute (NEI) Position Paper: Shutdown / Refueling Modes, dated September 18, 2013 (ADAMS Accession No. ML13273A514) (Endorsed by the NRC staff (ADAMS Accession No. ML13267A382)

37. 5610-M-722C, Rev. 0, Non-Power Operations Fire Safe Shutdown Analysis

38. EC 282069, Transition of PTN Fire Protection Licensing Basis from 10CFR50 Appendix R to NFPA 805

2.2 Records Required

2.2.1 Advanced notification shall be provided to the Shift Manager for Temporary Changes to the system alignments of Key Safe Shutdown Systems/Components when the minimum required equipment of Enclosures 1 through 7 will not be met. This includes scheduled equipment outages of equipment for maintenance or modification.

2.2.2 A log of all active Temporary Change Notices shall be maintained on Forms 368, similar to Attachment 5.

2.2.3 A mark up of plant operating drawings shall be provided to the Shift Manager whenever Temporary Changes are made on Key Safe Shutdown Systems.

2.2.4 Copies of forms similar to Attachments 1 through 21 shall be maintained in an Outage Risk Assessment Notebook. Two copies of this notebook should be provided, one in the Unit 3 and 4 Control Room; and one in the Work Control Center (WCC) or designated Electronic Risk Assessment Notebook folder.

2.2.5 Completed copies of the below listed items constitute Quality Assurance Records, they shall be transmitted to QA Records for retention in accordance with the Quality Assurance Records Program requirements:

1. None

2.3 Commitment Documents

2.3.1 NRC Generic Letter 88-017, Loss of Decay Heat Removal, Dated October 17, 1988

2.3.2 L-2001-201, FPL and NRC, Proposed License Amendments; Response to Request for Additional Selective Implementation of Alternate Source Term; Containment Equipment Door Open During Core Alterations, August 30, 2001

3.0 RESPONSIBILITIES

3.1 Work Controls Manager Organization

3.1.1 The Work Controls Manager is responsible for the following:

1. Overall management of the outage organization.

2. Development of Outage Activities such that the interaction with all involved departments and the planning, scheduling, and execution of the outage schedule provides for Defense-In-Depth throughout the outage.

3. Obtaining Risk Assessment Team review and Plant Manager approval for all schedule changes that may occur before and during the outage when these changes may impact the Key Safe Shutdown Functions as follows:

   a. During the outage, when daily schedule changes affect risk ties (R Logic), obtaining prior approvals as required using a form similar to Attachment 7.

   b. Before the outage, after freeze of the schedule from a risk perspective, when schedule changes affect risk ties (R Logic), obtaining prior approvals as required using a form similar to Attachment 7.

4. Communication of current plant status and Safety System availability to plant personnel during the course of the outage. Higher Risk Evolutions and any Contingency Plans should also be conveyed to all appropriate plant personnel.

   a. This information should be disseminated per OM-AA-100, Outage Control Center Program.

5. Ensuring that the schedule is sufficiently detailed to convey the impact on Key Safe Shutdown Equipment availability.

6. Ensuring that activities scheduled during Higher Risk Evolutions are limited and strictly controlled.

7. Ensure Containment Testing is scheduled prior to RCS Depressurization and entry into Enclosure 2 in order to demonstrate the station's ability to meet the containment closure time limits detailed in Enclosure 13.
   (Ref Commitment SOER 09-01)

8. Establishing an outage overtime policy, in accordance with AD-AA-101-1004, Work Hour Controls, that ensures personnel involved in Higher Risk Evolutions are alert.

9. Scheduling to maximize Key Safe Shutdown System availability.

10. Assigning and tracking corrective action items from the post outage critique.

3.1.1 (Cont'd)

11. Assigning personnel to be responsible for closure of the equipment and personnel hatches.

12. Obtaining a list of outage clearance boundaries which affect equipment related to the operating unit and assessing the risk associated with that effect using PSA Development, or other means as appropriate.

13. Providing a page in the Plan of the Day that identifies upcoming TCNs for both the shutdown unit and the operating unit. This page should also include TSAs and LCOs for both units. (N/A if OCC is utilized)

14. Provide in writing the names if any, of individuals who have been delegated signature authority for the approval of TCNs and Protected Train Work, Attachment 6.

3.1.2 Risk Assessment Team

1. The Shutdown Safety Manager is responsible for the following:

NOTE

Enclosure 11 should be used as an aid in determining higher risk activities.

a. Reviewing the outage schedule to ensure that Key Safe Shutdown Functions are optimized and that Key Safe Shutdown Equipment availability is being maintained as follows:

(1) Prior to the outage, reviewing the outage schedule for higher risk activities, and ensuring those activities are clearly identified in the schedule (R Logic).

(2) Prior to the outage, ensuring the higher risk activities are properly tied to maximize Defense-In-Depth.

(3) Prior to the outage, ensuring the outage schedule and higher risk activities are to be developed so as to minimize or eliminate work on protected/operating shutdown cooling equipment.

(4) During the outage, reviewing schedule updates when R Logic risk ties are changed or broken for impact on risk using a form similar to Attachment 7.

b. Reviewing proposed switchyard work to assure that the reliability of the off-site power source is maintained. Go to 0-ADM-216, PTN and PTF Shared System Work Control and Switchyard Access.

3.1.2.1 (Cont'd)

c. Reviewing of all Contingency Plans for Higher Risk Evolutions and for those periods when Defense-In-Depth as defined in this procedure is not met. Request a discretionary TCN when minimum equipment for Defense-In-Depth is met; however, heightened awareness and contingencies are needed to permit a higher risk activity.

d. Assigning and tracking Action Items that are required to implement approved Contingency Plans.

e. Reviewing the non-outage unit activities and combination of activities that may affect Key Safe Shutdown Functions on the shutdown unit.

f. Conducting a weekly audit of the Outage Risk Assessment Notebook in the Control Room and the Work Control Center.

g. Within 72 hours of the start of a planned outage, review emergent issues of equipment unavailability and ensure TCNs written if required out-of-service equipment will not be returned to service by the planned outage start date.

h. When unavoidable, prior to, and during, the outage, reviewing, approving, and making recommendations to the senior management team for work on protected/operating train using a form similar to Attachment 6.

i. Schedule meetings and assemble risk assessment team members to review the shutdown risk plan prior to the review and approval by senior management. The team members are those delegated by department managers, knowledgeable of the requirements of this procedure, and independent from those who developed the risk logic and shutdown risk plan.

2. The Risk Assessment Team is responsible for the following:

a. Reviewing the outage schedule to ensure that Key Safe Shutdown Functions are optimized and that Key Safe Shutdown Equipment availability is being maintained as follows:

(1) Prior to the outage, ensuring the higher risk activities are properly tied to maximize Defense-In-Depth.

(2) Prior to the outage, ensuring the outage schedule is developed so as to minimize or eliminate work on protected/operating shutdown cooling equipment.

(3) Review proposed switchyard work to assure that the reliability of the off-site power source is maintained.

(4) Reviewing of all Contingency Plans for Higher Risk Evolutions, including 805 High Risk Evolutions, and for those periods when Defense-In-Depth as defined in this procedure is not met.

3.1.2.2.a (Cont'd)

(5) Review the shutdown risk plan to ensure the periods the plant has reduced defenses is kept as short as possible and contingency plans are clearly established.

b. During the outage, attend team meetings to review the outage schedule to ensure the risk profile is maintained in order to maximize availability of key safe shutdown functions. Review revisions to the shutdown safety plan that result from risk significant schedule changes or emergent work when needed.

3.2 Operations Management Organization

3.2.1 The Operations Manager is responsible for the following:

1. Providing the Work Controls organization input and oversight in the development of outage activities such that the execution of the outage schedule provides for Defense-In-Depth throughout the outage.

2. Conducting a Post Outage Critique that assesses the outage from a safety perspective.

3. Ensuring the Risk Assessment Team Chairperson submits an annual report to the Chief Nuclear Officer in accordance with NP-909, Shutdown Risk.

4. Approving the performance of all Higher Risk Evolutions.

5. Assuring that all Operations personnel are cognizant of the configuration of Key Safe Shutdown Systems.

6. Assuring that Operations personnel are knowledgeable of the requirement to operate in a conservative manner when conducting shutdown and infrequent evolutions. Tailboard Meetings should normally be utilized for these evolutions.

7. Supervising activities of the Risk Assessment Team.

8. Requesting Contingency Plans from the System Engineers when the minimum equipment recommendations will not be met.

9. Provide in writing the names if any, of individuals who have been delegated signature authority for the approval of TCNs and Protected Train Work, Attachment 6.

3.2.2 Shift Manager

1. The Shift Manager is responsible for the following:

    a. Maintaining the Minimum Required Equipment configuration as identified in Enclosures 1 through 7.

    b. Assuring that all shift operating personnel are cognizant of the current plant configuration, Key Safe Shutdown Equipment availability, Contingency Plans in affect, and times to core boiling.

    c. Maintaining control of plant switchyard access.

    d. Assuring compliance with plant Technical Specifications.

    e. Ensuring that the Control Room copy of the Outage Risk Assessment Notebook is being properly maintained.

    f. Ensuring that Key Safe Shutdown System availability is maximized and that equipment outages are kept to minimum duration. Ensure all required conditions are met to consider a shutdown safety system available when a system work window is closed.

    g. Controlling activities on Containment penetrations to be able to close all open penetrations in the event of a loss of RHR cooling in accordance with Enclosure 13. [Commitment Step 2.3.1]

    h. Shut down cooling and plant control. Control Room evacuation may be necessary at any time. Procedure 0-ONOP-105, Control Room Evacuation, is written for the plant initially in Mode 1, 2, or 3. When one or both units are in Mode 4, 5, or 6, only those steps to restore shutdown cooling and stabilize the plant systems after evacuation are necessary.

NOTE

Enclosure 12 may be used as an aid in determining component availability.

    i. When the availability of a component is in question, assessing component availability.

    j. Ensure Protected Equipment signs are installed and removed, as required, when entering/exiting Enclosures 1 through 7, in accordance with Attachments 8 through 21 as applicable.

    k. If the outage unit experiences an unplanned entry into orange or red risk, then refer to 0-ADM-216, PTN and PTF Shared System Work Control and Switchyard Access, and re-evaluate the need to suspend work in the switchyard.

3.2.3 Shift Technical Advisor (STA)

1. Each On-Shift STA is responsible for the following:

   a. Review plant status and provide Attachment 4 to Work Controls for update of Risk Status of the POD.

   b. Review plant status to identify the color code of safe shutdown functions and update the Risk Assessment Notebooks.

   c. Look ahead on the schedule for planned changes in risk and planned changes in the applicable enclosure. Update and distribute Attachment 4 at the time of the planned change.

3.3 Engineering Manager Organization

3.3.1 Engineering Manager

1. The Engineering Manager is responsible for the following:

   a. Assuring that appropriate department personnel are well informed of Higher Risk Evolutions, including 805 High Risk Evolutions, and reduced safe shutdown equipment availability.

   b. Reviewing all Contingency Plans for Higher Risk Evolutions.

   c. Conducting a weekly audit of the Outage Risk Assessment Notebook in the Control Room and the WCC.

   d. Provide in writing the names if any, of individuals who have been delegated signature authority for the approval of TCNs and Protected Train Work, Attachment 6.

3.3.2 System Engineer

1. Each plant System Engineer whose system is associated with the minimum Required Equipment is responsible for the following:

   a. Notifying the Shift Manager in writing of all Temporary Changes in configuration to Key Safe Shutdown Equipment.

   b. Providing evaluations as required by the Risk Assessment Team.

   c. Taking the lead in resolution of problems and conflicts pertaining to maintaining an acceptable configuration of their system.

   d. Performing a periodic (minimum of weekly) walkdowns to verify system configuration and condition prior to Higher Risk Evolutions and prior to update of the Outage Risk Assessment Notebook.

   e. Developing Contingency Plans as requested by the Work Controls Manager or the Shift Manager. These plans shall be documented on a form similar to Attachment 2 and filed in the Outage Risk Assessment Notebooks.

   f. Ensuring that personnel involved with Contingency Plans have been identified and are familiar with the plan.

   g. Ensuring the inclusion of contingency plan actions are incorporated into PWOs as necessary and presenting these plans to the Risk Assessment Team.

   h. Ensuring that work plans for their system minimize equipment unavailability to the maximum extent practical.

   i. Ensuring that the Defense-In-Depth concept is maintained for their system.

   j. Checking EOOS Book and equipment clearances for the systems they are responsible for.

   k. Removal of Temporary Change Notices from the Outage Risk Assessment Notebook in the Control Room and the WCC when they no longer are applicable. Temporary Change Notices shall be retained for the Post Outage Critique.

   l. Performing a qualitative assessment of total equipment out of service when preparing a Temporary Change Notice. The assessment compares unavailability of equipment versus reliability of maintaining the Key Safe Shutdown Functions.

3.3.3 Fire Safe Shutdown Engineer / Fire Protection Engineer

1. The Fire Safe Shutdown Engineer OR the Fire Protection Engineer is responsible for the following:

   a. Notifying the Engineering Manager and Risk Assessment Team in writing of any maintenance evolution which may increase the Fire Risk in an area with a pinch point during an 805 High Risk Evolution and provide suggestions for mitigating actions or Shutdown Contingency Plans to compensate for the increased risk.

   b. Evaluating the Fire Safe Shutdown condition of the plant during 805 High Risk Evolutions while in Non-Power Operations by performing pinch point analyses using Enclosure 14, especially for tasks identified as having the potential to introduce fire hazards on the checklist on Enclosure 11.

   c. Evaluating means of compensating for increased fire risk in areas with pinch points during 805 High Risk Evolutions, including but not limited to:

      (1) Restriction of hot work in areas during periods of increased vulnerability

      (2) Verification of functional detection and / or suppression in the vulnerable analysis area

      (3) Restriction of transient combustible materials in area during periods of increased vulnerability

      (4) Plant equipment configuration changes (e.g., removing power from equipment once it is placed in its desired position)

      (5) Provision of additional fire patrols at periodic intervals or other appropriate compensatory measures (such as surveillance cameras) during increased vulnerability

      (6) Reschedule the work to a period with lower risk or higher defense-in-depth

3.4 Training Manager Organization

3.4.1 Training Manager

1. The Training Manager is responsible for the following:

   a. Providing training briefs, special training, etc., as required to support Operations and Maintenance in Higher Risk Evolutions. This training should emphasize maintenance of the Key Safe Shutdown Functions and Equipment.

   b. Ensuring that operator training provides knowledge of the Key Safe Shutdown Functions.

3.5 Maintenance Manager

3.5.1 The Maintenance Manager is responsible for the following:

1. Ensuring that resources are allocated in such a fashion as to minimize the duration of unavailability of Key Safe Shutdown Equipment.

2. Controlling and pre-approving all overtime for personnel involved in work that could affect Key Safe Shutdown Functions.

3. Ensuring that material, documentation, and tooling for work being performed during Higher Risk Evolutions is pre-staged in order to minimize the duration of the evolution.

4. Ensuring that equipment is promptly returned to Operations on the completion of maintenance activities.

5. Ensuring that applicable Maintenance personnel and any temporary contractors are adequately trained and knowledgeable of activities that could affect Key Safe Shutdown Functions and that controls are adequate to ensure that work activities do not affect in-service equipment.

6. Ensuring that emergent outage work added to the schedule per OM-AA-202-1000, Outage Scope Control, is reviewed for impact on the Key Safe Shutdown Functions.

7. Provide and maintain personnel at the equipment hatch and airlocks of the Containment Building to be able to close the equipment hatch with (1) A minimum of 4 bolts or (2) The fast-closure rollup door, and the personnel hatch as follows: (Ref. Plant procedure 0-GMM-051.02, Containment Equipment Hatch.)

   a. In accordance with Enclosure 13.

   b. Provide for the potential unavailability of AC power and the environmental conditions expected.

8. Assigning personnel to monitor the number of lines and hoses that block closure of the containment hatch and airlocks and assuring quick disconnect devices are utilized.

4.0 DEFINITIONS

4.1 Available

> **NOTE**
>
> *Enclosure 12 may be used as an aid in determining component availability.*

4.1.1 The status of a system, required support systems, structure, or component that is in service or can be placed in service in a Functional or Operable state by immediate manual, local-manual, or automatic action.

4.2 Containment Closure

4.2.1 The action to secure containment and its associated structures, systems, and components as a Functional barrier to fission product release.

4.3 Shutdown Risk Contingency Plans

4.3.1 An approved plan of compensatory actions or measures:

1. To maintain Defense-In-Depth by alternate means when pre-outage planning reveals that specified systems, structures, or components will not be available, or have significant potential to be lost.

2. To restore Defense-In-Depth when planned system, structure, or component availability drops below the planned level.

3. To minimize the likelihood of loss of Key Safe Shutdown Functions during Higher Risk Evolutions.

4.3.2 Shutdown Risk Contingency Plans are developed in accordance with OM-AA-101-1000, Shutdown Risk Management, and accompany the applicable TCN.

4.4 Decay Heat Removal Capability

4.4.1 The ability to maintain Reactor Coolant System temperature and pressure, and Spent Fuel Pool (SFP) temperature below the specified limits following plant shutdown.

4.5 Defense-In-Depth

4.5.1 For the purpose of managing risk during unit shutdown, Defense-In-Depth is the concept of:

1. Providing systems, structures, and components to ensure backup of Key Safe Shutdown Functions using redundant, alternate, or diverse methods;
2. Planning and scheduling outage activities in a manner that optimizes safety system availability;
3. Providing administrative controls and contingency plans that support and/or supplement the above elements.

4.6 Extended Loss of AC Power (ELAP)

4.6.1 An event where all unit ac busses are not energized and criteria for determining that the event is outside the current SBO licensing basis are met or will be met. A concurrent loss of all AC power on both Unit 3 and Unit 4 constitutes an ELAP on both units. A failure to restore power through the SBO cross-tie within 10 minutes of recognizing the need for the SBO cross-tie, constitutes an ELAP on a single unit.

4.7 Functional

4.7.1 A system, and required support systems, or component is capable of performing the function for which it is intended to be used for to maintain the Key Safe Shutdown Function. The component or system may not have all of its associated support equipment available, and temporary supporting systems may be used.

4.8 Higher Risk Evolutions

4.8.1 Outage activities, plant configurations, or conditions during shutdown where the plant is more susceptible to an event causing the loss of a Key Safe Shutdown Function. These are defined as activities that can affect the minimum required equipment of Enclosures 1 through 7.

4.9 Key Safe Shutdown Function

4.9.1 Decay Heat Removal, Inventory Control, on-site and off-site power availability, reactivity control, containment closure, and shutdown monitoring instrumentation.

4.10 Key Safe Shutdown Systems

4.10.1 Those systems, and required support systems, necessary to maintain the plant in a safe condition while in cold or refueling shutdown conditions. This includes systems necessary to maintain spent fuel cooling, Decay Heat Removal Capability, Inventory Control, off-site and on-site power capability, reactivity control, and containment integrity instrumentation.

4.11 Lowered Inventory

4.11.1 A condition in which the Reactor Coolant Inventory is lowered to support refueling support refueling activities and core damages risk is not substantially different than Reduced Inventory conditions. Reactor water level is at or below the Reactor Vessel flange, level is maintained above 3 feet below the flange, and fuel is in the Reactor.

4.12 Partial Draindown

4.12.1 The Reactor Coolant System level is lower than 10 percent in the Pressurizer.

4.13 Phase I

4.13.1 The initial portion of an outage in which the decay heat load is high and additional equipment is maintained Functional. This provides for a better Defense-In-Depth. It is defined as the first 240 hours following unit shutdown or completion of fuel offload to the Spent Fuel Pit, whichever occurs first.

4.14 Phase II

4.14.1 The later stages of an outage in which the decay heat load is reduced and relaxations of Functional equipment requirements are allowed. It is defined as greater than 240 hours following unit shutdown, or start of fuel reload to the reactor vessel as part of a full core offload, whichever occurs first.

4.15 Reduced Inventory

4.15.1 A condition with fuel in the reactor vessel and the Reactor Coolant System drained down lower than three feet below the vessel flange.

4.16 Probabilistic Safety Assessment (PSA)

4.16.1 An organized methodology for determining and establishing the likelihood of what combination of system and component failures will lead to a catastrophic event resulting in undue risk to the public. Probabilistic Safety Assessments are performed in the Risk and Reliability Assessment Group (RRAG).

4.17 Risk Assessment Team

4.17.1 A team whose charter is to review the outage plan, revisions to the outage plan and higher risk activities to ensure that Key Safe Shutdown Functions are being maintained at the highest practical levels. Members typically have diverse expertise and background including; SRO, STA, Outage Management, Fire Protection (NFPA 805 Licensed Plants Only), PRA/PSA, and Reactor / Nuclear Engineering. The Team composition should be commensurate with the complexity of the outage, risk significant activities and site specific needs. The minimum quorum requirements are:

- Operations, 2 members, at least one of whom is a licensed SRO at PTN
- Central Outage Group (Work Control Representative)
- Reactor / Nuclear Engineering
- Fire Protection (upon NFPA 805 Licensing)

4.17.2 The Chairperson is appointed by the Operations Manager. The Chairman determines the minimum quorum required to hold a meeting. This determination considers the subject matter to be reviewed and may include additional experts brought in to review specific items.

4.17.3 The Chairperson is responsible for submitting an annual report to the Chief Nuclear Officer in accordance with NP-909, Shutdown Risk.

4.18 Risk Significant Support Equipment

4.18.1 The term applied to equipment necessary to support Key Safe Shutdown Equipment Functions.

4.18.2 This equipment may affect the opposite unit if it is operating.

4.19 Tailboard Meeting

4.19.1 The common term applied to a Pre-Job Briefing held with the personnel involved in an evolution.

4.20 Temporary Change

4.20.1 A change to the system, and required support systems, alignments of the Key Safe Shutdown Systems when this change results in the following condition:

1. The minimum equipment requirements of Enclosures 1 through 7 not being met. This includes equipment outages for maintenance, testing, or modifications.

4.21 Safe Shutdown Function Color Code

4.21.1 Each Safe Shutdown Function is assigned a color code based on the decrease of our Defense-In-Depth as noted on Enclosures 1 through 7. A reduction in equipment availability is graded on a critical function that is supported by that equipment, a color code is assigned.

4.21.2 Each key safe shutdown function shall be assigned with a color code based on the equipment available to support that function. Although it may be acceptable to issue a TCN to cover a condition where reduced equipment is available, color coding of key safe shutdown functions is completed on an absolute basis.

4.21.3 Color coding is completed on a daily basis for the following key safe shutdown functions, systems, and support equipment:

1. Decay Heat Removal
2. Inventory Control
3. Power Availability
4. Containment Integrity
5. Instrumentation
6. Risk Significant Equipment
7. SFP Cooling

4.21.4 As part of the daily outage meeting discussion of Outage Risk Assessment, identification of plant conditions and Defense-In-Depth plans will be related to a color code based on effect on safe shutdown function equipment status.

4.22 Color Code Definitions

GREEN: Acceptable levels of performance of key safe shutdown functions are being maintained. There is no adverse affect on outage risk.

WHITE: Acceptable levels of performance of key safe shutdown functions are being maintained. Shutdown monitoring instrumentation or Risk Significant Equipment that supports Key Functions is less than listed in the required equipment column; however, our Defense-In-Depth strategy is not compromised.

YELLOW: A degradation of a key safe shutdown function has occurred. The level of degradation may affect our defense in depth strategy. Heightened awareness is desired for this condition. Additional degrees of defense remain and operation at this condition is acceptable considering the risk and scheduler considerations.

ORANGE: A significant degradation of a key safe shutdown function has occurred. Our Defense-In-Depth strategy has been compromised. Heightened management awareness is required for the duration of the configuration.

RED: All barriers of our Defense-In-Depth strategy have been broken. Equipment is in an unacceptable condition. All efforts are to be focused on the restoration.

4.23 805 High Risk Evolution

4.23.1 Plant operating states and evolutions where time-to-boil and time to uncover the core are reduced significantly such that sufficient time to take necessary actions to mitigate the effects of the loss are not reliable. Specifically, these plant operating states and evolutions include portions of Mode 5 and Mode 6 where reduced inventory / partial draindown operations are in progress with a vented RCS such that the steam generators cannot sustain core decay heat removal. These plant operating states are covered in Enclosures 2 and 5.

4.23.2 RCS Operations with RHR aligned and without the plant being vented requires consideration of fire prevention controls in the Control Room, Cable Spreading Room, and North-South Breezeway areas as identified in the 3-DRAIN and 4-DRAIN pinch points in Enclosure 14. Note that existing transient combustible controls and hot work controls in these areas should be adequate to mitigate the risk of fire in these areas without the need to require additional controls, though that remains at the discretion of the Risk Assessment Team.

5.0 PROCEDURE

NOTE

In the event of Control Room evacuation during refueling activities, 0-ONOP-105, Control Room Evacuation, shall be followed in accordance with notations addressing unit mode (see note prior to Section 4.0 in 0-ONOP-105, Control Room Evacuation, for example).

5.1 General Precautions and Instructions

5.1.1 The following items are general precautions and limitations that should be observed when operating either unit in a shutdown condition:

1. The figures and notes provided by this procedure in the Outage Risk Assessment Notebook are not to be used by Operations or any other plant personnel in lieu of controlled plant procedures, design documents, and Technical Specifications. The purpose of this information is to provide adequate information to assist Operations in recognizing and responding to abnormal configurations that may impact the Key Safe Shutdown Functions and Equipment. They may be used also as a guideline for outage planning.

CAUTION

The RCS loops can not be considered a valid coolant loop per Technical Specifications once RCS pressure has been decreased below 100 psig until Substep 5.1.1.2 has been completed.

2. The RCS loops shall not be considered filled per Tech Spec 3.4.1.4.1 unless the following conditions are met:

   a. The RCS has been filled and vented with no intervening evolutions that could introduce air into the steam generators (e.g., RCS level has remained above the reactor vessel nozzles)

   AND

   b. The RCS is pressurized (either water solid or with a pressurizer steam bubble) and above 100 psig.

   AND

   c. At least two steam generators are filled to greater than 10 percent Narrow Range Level.

3. Entering a Reduced Inventory condition shall be prior approved by the Operations Manager and Plant Manager.

4. The activities described herein need only be performed for those systems required to maintain the Key Safe Shutdown Functions. Activities described that impact Spent Fuel Pool cooling need only be performed for the first 100 days after unit shutdown for refueling.

5.1.1 (Cont'd)

5. To support Spent Fuel Pool Cooling Heat Removal System the following systems shall be monitored and supported by their individual System Engineers:

   a. Spent Fuel Pool Cooling (SFP Cooling)

   b. Spent Fuel Storage System (SFP Storage)

   c. Component Cooling Water System (CCW)

   d. Intake Cooling Water System (ICW)

   e. Emergency Diesel Generators (EDG)

   f. Spent Fuel Building Ventilation (SFP HVAC)

   g. On-Site and Off-Site Power Availability Functions (Ref. Substep 5.1.1.8).

      (1) When the Reactor is defueled, System Engineers shall monitor the requirements of Enclosure 7 for on-site and off-site power.

6. To support the Decay Heat Removal Capability function, the following systems shall be monitored and supported by their individual System Engineers.

   a. Residual Heat Removal (RHR)

   b. Steam Generator (SG)

   c. Reactor Coolant System (RCS)

   d. Component Cooling Water (CCW)

   e. Intake Cooling Water (ICW)

   f. Chemical and Volume Control System (CVCS)

   g. Safety Injection and RWST (SI)

   h. Spent Fuel Pool Cooling (SFP Cooling) - See Substep 5.1.1.4.

   i. On-Site and Off-Site Power Availability Functions (Ref. Substep 5.1.1.8).

      (1) When the Reactor is Defueled, System Engineers shall monitor the requirements of Enclosure 7 for on-site and off-site power and Decay Heat Removal.

5.1.1 (Cont'd)

7. To support the Inventory Control capability function the following systems shall be monitored and supported by their individual System Engineers:

    a. Chemical and Volume Control System (CVCS)

    b. Primary Water System (PW)

    c. CVCS Boric Acid Storage System (BAST)

    d. Safety Injection and RWST (SI)

    e. Reactor Coolant System (RCS)

    f. Residual Heat Removal (RHR)

8. To support the On-Site and Off-Site Power Availability Function the following systems shall be monitored and supported by their individual System Engineers:

    a. Switchyard (SWYD)

    b. Startup Transformer (SU)

    c. Main and Aux Transformer (MAIN & AUX XFMR)

    d. C Bus Transformer (C BUS XFMR)

    e. 4160 Volt Busses, including Station Blackout Tie (4 kV Dist)

    f. Emergency Diesel Generators (EDG)

    g. 480 Volt Distribution (480V Dist)

    h. 125 Volt DC System (125VDC Dist)

    i. 120 Volt Vital AC System (120VAC Dist)

5.1.1 (Cont'd)

9. To support the Reactivity Control Function, the following systems shall be monitored and supported by their individual System Engineers:

    a. Rod Control System (CRDM)

    b. Chemical and Volume Control System (CVCS)

    c. CVCS Boric Acid Storage System (BAST)

    d. Primary Water System (PW)

    e. Safety Injection and RWST (SI)

    f. Reactor Coolant System (RCS)

    g. Residual Heat Removal (RHR)

    h. Steam Generator System (SG)

10. To support the Shutdown Monitoring Instrumentation Function the following systems and components shall be monitored and supported by their individual System/Component Engineers:

    a. Nuclear Instrumentation (NIS)

    b. Area Radiation Monitoring System (ARMS)

    c. Process Radiation Monitoring System (PRMS)

    d. Core Exit Thermocouples (CET)

    e. Reactor Vessel Level System (QSPDS HJTC)

    f. RCS Draindown Level System (RCSDDLIS)

    g. Containment Water Level System (Wide Range)

    h. Containment Sump Level Systems (Narrow Range and Pneumatic)

    i. Pressurizer Level System (PZR LVL)

    j. RCS Pressure Instrumentation (RCS PRES)

    k. RCS Wide Range Temperature Instrument (RCS TEMP)

    l. OMS Actuation circuits (OMS)

    m. RCS Pressure Control Instruments (RCS PRES CONT)

    n. Fire Detection Instrumentation (FIRE DET)

    o. Containment Pressure System

5.1.1 (Cont'd)

11. To support Fire Protection Systems, the following systems shall be monitored by their individual System Engineers:

    a. Raw Water Storage Tanks (RWT)

    b. Fire Water Pumps and Water Distribution Systems (FIRE DIST)

    c. Automatic and Manual Deluge Systems (FIRE SUPPRESSION)

    d. Halon Systems (HALON SYS)

    e. Fire Extinguishers (FIRE EXT)

    f. Fire Detection Systems (FIRE DET)

    g. Fire Barriers and Doors (FIRE BARRIERS)

12. To support Risk Significant Support Equipment, the following systems and components shall be monitored and supported by their individual System Engineers/Component Engineers:

    a. Auxiliary Building HVAC

    b. Instrument Air

    c. DC Equipment Room HVAC

    d. Service Water

    e. Load Center/Switchgear Room HVAC

13. Refueling outages are performed with some consistency of activities. Enclosure 8 contains a typical refueling outage overview. Also shown is the relationship of the outage chronology to the specific enclosures of this procedure.

14. When the unit is depressurized in Enclosure 2 of the outage, work should not be permitted on the Units 3 and 4 side of the switchyard or in the Cable Spreading Room Generator Lockout Panels until the water level in the refueling cavity is 23 feet or greater than the Reactor Vessel Flange. If work is required during this time, Attachment 6 must be completed.

15. In Enclosure 5, work should not be permitted on the Unit 3 and 4 side of the switchyard or in the Cable Spreading Room Generator Lockout Panels until water level is greater than or equal to 10% in the pressurizer following reactor head installation. If work is required during this time, Attachment 6 must be completed.

5.1.1 (Cont'd)

16. When restoring power to the Startup Transformer from a backfeed alignment, work (restoration) should not be permitted until the refueling cavity is greater than or equal to 23 ft above the reactor vessel flange, and the core is reloaded to avoid challenging SFP cooling with the core offloaded unless an alternate means of SFP cooling is available.

17. During Enclosures 2 and 5, the secondary side of at least two steam generator levels should be maintained above 70% WR to support reflux cooling in the event of a loss of RHR.

18. The alternate RHR flow path through MOV-*-872 should be maintained available during Enclosures 1, 2, 5, and 6 to provide additional Defense-In-Depth and support the contingencies used in off normal operating procedures.

19. When entering a Partial Draindown condition, the following shall apply:

    a. During Phase 1 of an outage, both Emergency Diesel Generators on the affected unit shall remain available until the water level in the refueling cavity is 23 feet or greater than the Reactor Vessel Flange.

    b. Two RHR, two CCW, and two ICW pumps shall remain available until the water level in the refueling cavity is 23 feet or greater than the Reactor Vessel Flange.

    c. The RCS vent path shall be at least the area equivalent to the removal of a pressurizer safety.

    d. At least 2 CETs shall be available. CETs may be rendered unavailable when reactor vessel head detensioning has commenced.

20. It is permissible for only one train of RHR to be operable and in operation in Mode 6 with the refueling cavity flooded to greater than or equal to 23 feet, without regard to whether the reactor vessel upper internals assembly is in place or removed provided the reactor has been subcritical for at least 72 hours. (Ref: PTN-ENG-SENS-07-032)

5.1.1 (Cont'd)

21. Hoses and equipment which prevents closure of the equipment hatch and personnel airlock doors should be kept to a minimum when fuel is in the reactor vessel.

    a. The Work Controls Manager shall assign personnel to periodically monitor the number of lines.

    b. Lines and hoses should be equipped with quick disconnects at the hatch or airlock.

    c. When large equipment is fouling the hatches, a specific plan shall be in place to clear the hatch in the event Containment Closure needs to be established. The equipment hatch (with (1) a minimum of 4 bolts or (2) the fast-closure rollup door) and the personnel hatch shall be capable of closure following a loss of RHR cooling as follows:

        (1) In accordance with Enclosure 13.

        (2) Figures 1, 2, and 3 provide RCS heat-up rate information for planning purposes. Personnel required should be in place and dressed out, but may be assigned other duties that would not interfere with their ability to close the hatch.

        (3) The capability for containment closure includes provisions for unavailability of AC power, and the environmental conditions expected.

        (4) Activities which would prevent equipment hatch closure within the required time will be included in the R-Logic to ensure the ability to meet containment closure is maintained.

22. At least one process valve in each penetration that is not pressurized should be kept closed or capable of being closed whenever fuel is in the Reactor Vessel. Exceptions may be taken under administrative controls for testing, surveillance, and maintenance.

    a. If an exception is taken, and at least one valve in the penetration is capable of closure either manually from the Control Room or locally, the penetration shall be logged on a form similar to Attachment 3. The log entry shall identify the actions necessary to close the penetration.

    b. If an exception is taken, and the penetration is not capable of being closed by at least one valve, a TCN with a contingency plan to achieve closure is required PRIOR to authorizing work on the penetration.

    c. If an exception is taken while RCS level is lower than 3 feet below the vessel flange, and the penetration is not capable of being closed by at least one valve, a TCN with a contingency plan to achieve closure and meet 20 psi containment pressure is required PRIOR to authorizing work on the penetration. [Commitment Step – 2.3.1]

5.1.1 (Cont'd)

23. If the Containment Equipment Hatch is maintained open, then the individual responsible for Fast Closure of the Equipment Hatch shall sign Part B of Attachment 3. The Equipment Hatch is required to be closed with (1) a minimum of 4 bolts or (2) the fast-closure rollup door as follows: [Commitment Step 2.3.1]

    a. In accordance with Enclosure 13.

    b. The capability for containment closure includes provisions for unavailability of AC power, and the environmental conditions expected.

24. If the Personnel Airlock Door is maintained open, then the individual responsible to close at least one Containment Personnel Airlock Door shall sign Part C of Attachment 3. This individual is required to close at least one airlock door if directed by the Shift Manager in accordance with Enclosure 13. [Commitment Step 2.3.1]

25. A minimum of 72 hours after shutdown is required prior to commencing full core offload to the Spent Fuel Pool. Engineering concurrence should be obtained prior to commencing full core offload to the Spent Fuel Pool based on actual core power history, canal temperature, etc. Additionally, there is an administrative limit of less than or equal to 140°F SFP temperature for fuel offload to occur.

26. ANYTIME the Reactor Coolant System is to be drained to less than 70% Pressurizer Level (Cold Cal. LT-*-462) install a Reactor Vessel Head Vent path and a Pressurizer Vessel Vent path using *-OP-041.7, Draining the Reactor Coolant System, Subsection 5.1.
(Refer to Substeps 2.1.3.10 and 2.1.3.11.)

27. If the Reactor Coolant System is to be drained lower than 3 feet below the Reactor Vessel Flange with fuel in the reactor vessel, the following requirements are applicable: [Commitment Step – 2.3.1]

    a. All prerequisites are met in accordance with 3/4-NOP-041.9, Reduced Inventory Operations.

    b. Two CETs are in operation with continuous Control Room read out if the reactor head is on the flange.

    c. Both RCS level indications are available in the Control Room with continuous readout and the level hose is in service with an operator stationed locally in containment or monitoring from the Control Room via a camera and monitor with an Uninterruptible Power Supply (UPS).

    d. Containment Closure will meet the requirements listed in the Precautions and Limitations of 3/4-NOP-041.9, Reduced Inventory Operations.

5.1.1.27 (Cont'd)

e. One train of RHR in service and the other train of RHR operable.

f. OP-AA-1000, Conduct of Infrequently Performed Tests or Evolutions, Brief

g. Sufficient, non-hand held lighting available on L1-3-6422.

h. Two of four Source Range NI with one audible count rate.

i. Pinch point evaluation in Enclosure 14 performed to assess the fire risk during non-power operations and adequate compensatory measures as defined in Section 3.3.3.1.c have been considered and implemented where appropriate.

28. The requirements of Enclosures 1 through 7 are verified shiftly using 3/4-OSP-201.1, RO Daily Logs. If revisions are made to Enclosures 1 through 7, then 3/4-OSP-201.1 should be reviewed to determine if it also needs to be revised.

29. During A or B 4 kV Bus outages, grounds may be installed at *AC13 cubicle. The following requirements must be satisfied:

a. The specific steps for removal of grounds, and restoration of the *AC13 cubicle shall be provided in the associated A or B 4 kV Bus TCN.

b. The time that grounds are installed should be minimized.

30. Alternate Shutdown Panel shall be aligned to Standby Alignment in Mode 1 through Mode 5.

31. While on Backfeed alignment, QR42, 43, 44, and 45 cabinets are posted as Protected Train equipment. This is to help prevent inadvertent actuation of Safeguard relays that open Auxiliary Transformer breakers *AA02 and *AB02.

32. If any degraded unplanned change in Safe Shutdown Function Color Code occurs that results in a change to Yellow, Orange, or Red, then refer to OM-AA-101-1000, Shutdown Risk Management, for additional actions and any additional required notifications. For an unplanned Color Code change from Green to White, the Shutdown Safety Manager should be informed as soon as reasonably possible.

33. FLEX Considerations

a. The preferred plant state for response to a shutdown ELAP is the RCS closed, and intact, with 100% of core cooling provided by at least one steam generator. This condition is preferred for the following reasons:

1) Containment building integrity is not challenged

2) Unborated water is used to feed the S/Gs, as opposed to borated water that would be needed for RCS feed and bleed cooling.

5.1.1.33 (Cont'd)

3) The issues of long term containment water management, and flooding, as are associated with RCS feed and bleed cooling, are precluded.

b. During ELAP conditions, a SG is considered fully available for heat transfer if it has secondary side liquid inventory, an available feed source, an available steaming path, and a full and open primary flowpath (RCS is filled with liquid or steam with no obstructions), with the reactor vessel head installed.

1) IF all of the above conditions are met, with the exception of the reactor vessel head, but the upper internals are installed, the SG may be capable of removing a portion of core decay heat.

c. During a shutdown ELAP event, the Standby Feedwater system is assumed to be unavailable, and the fastest means of establishing a S/G feedwater source may be using AFW, provided the opposite unit S/G pressure is sufficient (greater than 150 psig) to provide steam to at least one AFW pump. If the opposite unit S/G pressure is less than 150 psig, but greater than 100 psig, the opposite unit should be allowed to heatup to approximately 366F to establish S/G pressure greater than 150 psig. If the opposite unit cannot heatup, or its S/G pressure is less than 100 psig, then use of the FLEX Well pump for a feedwater source thru one of the AFW FLEX connections is required. The deployment, and setup, of the FLEX Well pump from the FESB may take several hours.

d. If both units are in mode 5 for a hurricane event, and an ELAP event occurs, then one of the units should be allowed to heat up to approximately 366F to establish S/G pressure greater than 150 psig for AFW pump operation. The unit that is expected to reach a S/G pressure of 150 psig in the shortest time should be selected based on highest decay heat, and highest initial temperature. This is necessary due to possible delays in FLEX well pump deployment, and setup, due to hurricane conditions.

e During ELAP conditions with the RCS opened to atmosphere, containment building integrity is threatened if at least one of the following vent paths is NOT open:

* Both Personnel Hatch airlock doors open

OR

* Both Emergency Hatch airlock doors open

OR

* Equipment Hatch AND Containment Equipment Hatch Fast Closure Doors open

5.1.1.33 (Cont'd)

f. During Enclosures 2 through 5 with the RCS open to atmosphere, at least one of the above containment building vent paths shall be maintained open, or be capable of being opened. Containment closure requirements discussed in Enclosure 13, and elsewhere in this procedure do not apply during ELAP conditions with the RCS open.

g. If at least one S/G is available, and the RCS is open to atmosphere, and the openings can be pre-emptively closed relatively quickly before losing habitability conditions inside containment, then these pre-emptive actions should be considered a high priority. The pre-emptive actions are listed in 3/4-ONOP-004.14, Loss Of All AC Power While in Modes 5, 6, Or Defueled.

h. If the RCS is open to atmosphere, and cannot be closed following an ELAP, then the predominant core cooling method will be RCS feed and bleed. RCS feed and bleed cooling is an acceptable core cooling method, however, there are several undesired associated consequences:

1) Containment building integrity is challenged if an adequate containment building vent is not available.

2) Borated water is required as the long term makeup source.

3) Large amounts of water will be released in the containment building with the potential for containment flooding.

i. The undesired consequences of RCS feed and bleed core cooling discussed above can be minimized by supplementing RCS feed and bleed core cooling with some partial core cooling provided by at least one S/G by natural circulation, or reflux cooling, depending on RCS level.

j. If the RCS is open to atmosphere, and cannot be closed following an ELAP, RCS feed and bleed by gravity from the RWST may be the fastest method of establishing RCS makeup, however, a very large RCS vent path is required to prevent the RCS from pressurizing and shutting off the RCS gravity makeup flow. RCS gravity feed and bleed core cooling is not a long term core cooling method, and only lasts until RWST inventory is exhausted, or until RWST and RCS levels equalize. The only RCS vent path large enough to ensure RCS gravity bleed and feed is the reactor vessel head removed. Any other plant state with the RCS open to atmosphere, and the reactor vessel head installed, or with RCS level higher than RWST level, may require pumped RCS feed and bleed core cooling.

5.1.1.33 (Cont'd)

k. During an ELAP with the RCS open to atmosphere, RCS pumped feed and bleed strategies require the use of FLEX portable equipment. The FLEX 480V Portable Diesel Generator is required to power charging pumps, and the FLEX Well Pump is required to provide charging pump fluid drive cooling. Deployment, and setup, of this equipment from the FESB may take several hours. In some plant states, the time to core uncovery may be shorter than the time to deploy FLEX equipment from the FESB. In these plant states, pre-staging of the required FLEX portable equipment in its predetermined FLEX deployment location is required.

l. If the refueling cavity is flooded when an ELAP event occurs, and the refueling cavity, and the Spent Fuel Pit are connected (tube gate valve open, and SFP keyway gate removed), or can be connected, then refueling cavity level can be maintained using SFP makeup from an unborated source. If the refueling cavity, and the SFP, cannot be connected, then pumped RCS feed and bleed using a borated source is required.

m. If the RCS is defueled when an ELAP event occurs, a high priority should be placed on deployment, and setup, of the SFP makeup nozzles, and hoses (stored in the SFP building) prior to the 58 foot elevation of the SFP becoming inaccessible. The SFP could begin to boil in as little as 2.7 hours following the event. It is expected that sufficient time will exist for deployment, and setup, of the FLEX SFP Pump from the FESB before SFP level lowers to that which requires makeup to be initiated (42.92 feet).

5.2 Advanced Notification of Temporary Changes

5.2.1 The System Engineer should communicate and interact with cognizant and responsible Projects Supervisor, Operations, Maintenance, and Scheduling personnel to determine those upcoming (24 hours to 7 days) activities which may effect the configuration of systems included in this procedure.

5.2.2 When the minimum equipment requirements of Enclosures 1 through 7 will not be met, and results in a yellow, orange, or red risk color, or a discretionary TCN is requested by the Risk Assessment Team, the System Engineer shall complete a Temporary Change Notification along with a markup of applicable plant operating drawings. This notice shall also address any special notes, precautions, training briefs, procedural references, or Shutdown Risk Contingency Plans as necessary to adequately address the proposed change and maintain the Defense-In-Depth approach.

5.2.3 The System Engineer shall review the Temporary Change Notice with the Shift Manager to determine if sufficient detail is provided to adequately control the change and to inform the operations staff of the change.

5.2.4 The Shift Manager shall approve the change in plant status.

5.2.5 Temporary change notifications shall be approved/accepted by Plant Management as defined by the scope of the change. If a department is unaffected by the temporary change, it is acceptable to mark N/A on their respective signature line.

5.2.6 A Risk Assessment Team Member shall update the Outage Risk Assessment Notebook in the Control Room and the Work Control Center.

5.2.7 The Shift Manager is responsible through the shift turnover process to notify the oncoming shift of all new Temporary Changes received since the last time they stood shift.

5.2.8 A Risk Assessment Team Member shall notify the Shift Manager, and revise the Outage Risk Assessment Notebook to reflect restoration of all Temporary Changes. This should be done within one working day of restoration. The Temporary Change Notice shall be removed from the Outage Risk Assessment Notebook in the Control Room and the WCC and a copy be retained for the Post Outage Critique.

5.2.9 Emergent evolutions shall be performed as directed by the Shift Manager with follow up RSSC forms or TCNs, if required, completed and recorded in the Outage Risk Assessment Notebook in the Control Room and the WCC within 72 hours.

5.2.10 The Temporary Change Notice shall include a qualitative or quantitative (PSA Evaluation) of the total equipment that is out of service during the evolution. Equipment unavailability should be assessed against the reliability of maintaining the Key Safe Shutdown Functions.

5.2.11 The TCN will include recovery guidelines and procedure mark-ups, if applicable, to any off normal response procedure designed to mitigate the loss of a key safe shutdown function that is challenged by the system or equipment configuration. (Ref SOER 09-01)

5.3 Outage Schedule Risk Assessment

5.3.1 During development of the outage schedule, the Work Controls Manager shall perform the following activities:

1. Using input from Operations, Higher Risk Evolutions shall be identified.
2. Key Safe Shutdown Equipment maintenance windows should be kept to a minimum practical duration.
3. Obtain Risk Assessment Team review of the schedule.
4. Ensure that activities scheduled during Higher Risk Evolutions are kept to a minimum.
5. Establish the outage work schedules.
6. Obtain a thorough independent review of the schedule with emphasis on maintaining Key Safe Shutdown Functions.
7. Ensure that the schedule is distributed to all plant personnel who are required to perform or support activities in the schedule.
8. Identify activities that could result in open containment penetrations with fuel in the Reactor Vessel.
9. When it is determined that work on the protected/operating train is unavoidable, ensuring that prior approval is obtained using a form similar to Attachment 6.

5.3.2 During the outage, the Work Controls Manager/OCC Outage Manager shall perform the following risk assessment activities:

1. Obtain prior risk review and prior approval as required for schedule changes that affect the Key Safe Shutdown Functions (R-Logic) using a form similar to Attachment 7.
2. Risk Assessment Team meetings should be held at least weekly.
3. Contingency Plans for Higher Risk Evolutions shall be communicated to appropriate plant personnel.
4. Unavailability of Key Safe Shutdown Equipment shall be conveyed to appropriate plant personnel. An individual responsible for returning the equipment to Available status should normally be assigned. Means which should be used to communicate status include any of the following:
   a. Plant television monitors
   b. The Plan of the Day
   c. Weekly site newsletter
   d. Outage Communications Tool (see OM-AA-100, Outage Control Center Program)

5.3.2 (Cont'd)

5. The Work Controls OCC Outage Manager shall obtain Operations Manager, Maintenance Manager, Engineering Manager, and Plant Manager review and approval of all Contingency Plans developed. This shall be done when minimum equipment is not available or when Higher Risk Evolutions are planned.

6. Ensure that the Fire Protection Department performed a weekly overall assessment of impaired fire protection features and transient combustibles.

7. Ensure that activities are scheduled and performed in a manner in which Containment Closure can be achieved following a loss of cooling as follows:

   a. In accordance with Enclosure 13.

   b. The capability for containment closure includes provisions for unavailability of AC power, and the environmental conditions expected.

   c. Figures 1, 2, and 3 provide RCS heat-up rate information for planning purposes.

8. Ensure each outage that a Containment Closure Test is performed in accordance with Attachment 22 for all penetrations under exception and listed in Attachment 3 prior to entering RCS Depressurization or equivalent periods of high risk as directed by the Outage Manager.

9. When fuel is in the reactor vessel and RCS Inventory will be lower than 3 feet below the vessel flange, equipment requirements will be controlled via plant procedure 3/4-NOP-041.9, Reduced Inventory Operations. If minimum equipment requirements can not be met, evolutions will be stopped or secured by the most expedient actions, and RCS level will be restored to higher than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

5.4 Minimum Required Equipment

5.4.1 Typical post shutdown unit heat up rates following a loss of cooling are shown in Figures 1, 2, and 3. The time frames for operator action prior to heating above 200°F at the core outlet can be derived from these curves.

NOTES

- *Enclosures 1 through 7 contain suggested preplanned contingency actions which the Shift Manager can evaluate for implementation when minimum equipment requirements are not met. The Shift Manager shall determine which contingencies are to be implemented for any given situation.*

- *Steps 5.4.2 through 5.4.4 only apply when fuel is in the Containment Building. When the reactor is defueled, Spent Fuel Pool status and required support systems should be as specified in the OATC logs and Enclosure 7 and monitored by the System Engineers.*

- *If a loss of Spent Fuel Pit Cooling occurs when the reactor is defueled, take actions to restore the required systems as specified in 3/4-ONOP-033.1, Spent Fuel Pit Cooling System Malfunction, 3/4-ONOP-030, Component Cooling Water System Malfunction, 3/4-ONOP-019, Intake Cooling Water System Malfunction, and/or applicable TCNs. Typical reactor defueled Spent Fuel Pit heat up rates are provided in Figure 4, and can be utilized to estimate available repair/action time.*

5.4.2 During Phase I of an outage, the equipment listed in Enclosures 1 through 3 should be maintained available. When the minimum equipment recommendations are not met, the Shift Manager shall determine the appropriate contingencies to be implemented.

5.4.3 During Phase II of an outage, the equipment listed in Enclosures 4 through 6 should be maintained available. When the minimum equipment recommendations are not met, the Shift Manager shall determine the appropriate contingencies to be implemented.

5.4.4 Except for approved testing, surveillances, and operating evolutions, which are screened per Enclosure 12, to reduce equipment below levels required in Enclosures 1 through 7, the following shall be accomplished:

1. The time of the equipment outage shall be minimized.

2. A Shutdown Risk Contingency Plan shall be developed and approved by the Work Controls Manager, Operations Manager, Maintenance Manager, Engineering Manager, and Plant Manager when work on the equipment results in yellow, orange, or red color code. An exception to this is RCS level yellow condition in Enclosures 2 and 5; a TCN is not required.

3. The Risk Assessment Team shall review the deviation and any Contingency Plan.

4. A form similar to Attachment 2 shall be completed and filed in the Outage Risk Assessment Notebook in the Control Room and the WCC.

5. The Shift Manager may waive the above requirements for emergency problems arising on shift; however, the Operations Manager and Plant Manager shall be notified as soon as practical, and the above requirements shall be performed within 72 working hours.

6. To heighten awareness, certain permanently installed equipment that supports FLEX strategies has been identified in the enclosures of this procedure. FLEX support equipment shall not be reduced below that required in the enclosures of this procedure on a discretionary basis. If unavoidable equipment issues result in required FLEX support equipment below that required in the enclosures of this procedure, then the following, at a minimum, shall be reviewed during preparation of the resulting TCN:

   a. 3/4-ONOP-004.14, Loss Of All AC Power While In Modes 5, 6, Or Defueled

   b. 0-ADM-566, DIVERSE AND FLEXIBLE COPING STRATEGIES (FLEX) PROGRAM

   c. EN-AA-110, DIVERSE AND FLEXIBLE COPING STRATEGIES (FLEX) PROGRAM

   d. EC 280301, Unit 3 and 4 Fukushima FLEX Strategy Implementation Umbrella Modification.

   e. Nuclear Energy Institute (NEI) Position Paper: Shutdown / Refueling Modes, dated September 18, 2013 (ADAMS Accession No. ML13273A514) (Endorsed by the NRC staff (ADAMS Accession No. ML13267A382).

5.4.5 When the containment penetration status is reduced below that required in Substep 5.1.1.22, the deviation shall be recorded by the Unit Supervisor on a form similar Attachment 3 in the Outage Risk Assessment Notebook in the WCC.

5.5 Protection of Required Equipment

NOTES

- *Enclosure 10 depicts the general concept for protection of required equipment in active support of shutdown cooling.*
- *Specific guidance for placement and removal of signs and/or physical barriers is provided in Attachments 8 through 21.*
- *All postings are not intended to provide physical barriers, rather, to provide information and heightened awareness.*

5.5.1 The strategy for protection of shutdown cooling includes the concept that the designated operating shutdown cooling train, and its power supplies, shall always be protected.

5.5.2 In addition, when a single train of shutdown cooling is protected, it shall also be in operation. In cases where both shutdown cooling trains are protected, only one train is required to be operating. The associated RHR pump, CCW pump, and ICW pump shall be powered from the same electrical source. Any deviation requires prior approval using a form similar to Attachment 6 (see 3/4-OP-050, Residual Heat Removal System, section 4.5 for additional guidance of operable RHR Train(s)).

5.5.3 Required equipment that actively supports shutdown cooling shall be protected by means of signs and/or physical barriers.

5.5.4 Required equipment not in active support of shutdown cooling should be protected by other administrative means which includes the following:

1. Schedule logic ties
2. Outage communication tools
3. Shift turnovers and turnover meetings
4. Periodic required equipment verifications performed by operations personnel
5. Supplemental posting in accordance with OP-AA-102-1003, Guarded Equipment, directed by the Shift Manager on equipment designated Critical or Essential that must remain operable or functional for the given plant conditions and are not protected by the posting requirements of 0-ADM-051, Attachments 8 through 21.

NOTES

For the purposes of this procedure, the following activities are not considered work:

- *Non-intrusive activities (e.g., walk-downs, Routine Security and Firewatch Roves, OPS ECO activities involving tag hang or removal only, thermography, etc.) that do not involve component manipulations*
- *Emergency response actions*
- *Chemistry sampling of the SFP in the SFP Heat Exchanger Room*
- *Routine operator rounds including adjusting components to maintain plant parameter, resetting local annunciators, etc.*
- *Chemistry sampling of CCW at the running pump*
- *Filling SFP*

Verbal permission to enter, as specified on the posted sign or barrier, is still required for the non-routine walkdowns.

5.5.5 In the attachments that post the protected train barriers, the D 4 kV Bus Room is protected when the C ICW or CCW Pump is required to support operability on the protected RHR Train or SFP Cooling Train (i.e., B RHR train in service and protected with the B ICW Pump unavailable and C ICW Pump running with the D 4 kV Bus aligned to the B 4 kV Bus).

5.5.6 To maximize effectiveness of Protected Equipment signs and/or barriers, work should not be scheduled or allowed on required equipment that is posted as protected unless plant design or emergent conditions make the work unavoidable.

5.5.7 When work on required equipment that is posted as protected is unavoidable due to plant design or emergent conditions, then the activity shall be reviewed by the Risk Assessment Team, and approved by the Senior Management Team. A form similar to Attachment 6 shall be used to document the deviation and approval.

5.5.8 A copy of the approved Attachment 6 shall be in hand at the job site prior to commencing work.

5.5.9 The Shift Manager may determine that it is prudent to manipulate plant equipment marked by Protected Train postings and may authorize personnel to enter Protected Train areas without an Attachment 6 in hand to prevent or mitigate a hazardous condition and/or to stabilize plant conditions. This may include, but is not limited to, taking actions directed by an ARP or ONOP. If time permits, the OCC should be consulted to assist in making this determination. The Risk Assessment Team should be notified as soon as possible to allow preparation of a form similar to Attachment 6 if further entry is required.

5.5.10 The Risk Assessment Team may require additional shutdown contingency plans or compensatory measures during 805 High Risk Evolutions to mitigate the fire risk increase from maintenance in areas where pinch points are identified.

5.6 Outage Emergent Work Review

5.6.1 Emergent work shall be evaluated for addition to the outage per OM-AA-202-1000, Outage Scope Control.

5.6.2 When emergent work and/or changing conditions impacts the outage schedule, the Work Controls Manager or OCC Outage Manager on shift, shall determine if the Key Safe Shutdown Functions are affected.

1. The Work Controls Manager shall use Operations input to make this determination.
2. A Temporary Change Notice is processed as required by Subsection 5.2 and 5.4.

NOTE

A minor change to a R flagged activity is when no adverse risk significant change occurs due to the requested change having obvious inconsequential degradation to outage or shutdown safety risk. Review of Enclosure 1 through 7 and 11 should be considered to verify no adverse impact to risk. Ensure the basis is adequately documented.

3. If R-Logic ties are impacted, and the changes are not deemed as minor by the Shutdown Safety Manager, prior approval to break R-Logic ties shall be obtained using a form similar to Attachment 7.
4. If R-Logic ties are impacted, and the changes are deemed as minor by the Shutdown Safety Manager, breaking R-Logic ties may be done with the verbal approval of the Shutdown Safety Manager provided such approval is documented using a form similar to Attachment 7.
5. If emergent conditions require work on protected/operating shutdown cooling train, approvals shall be obtained using a form similar to Attachment 6.

5.7 Post Outage Critique

5.7.1 The Operations Manager shall conduct a Post Outage Critique of the outage activities from a risk perspective.

5.7.2 The Post Outage Critique shall be approved by the Plant Manager.

5.7.3 Corrective Action items from the critique shall be assigned to the responsible department head and tracked until closure.

END OF TEXT

FIGURE 1
(Page 1 of 1)

TYPICAL HEAT UP RATES W/VESSEL FULL

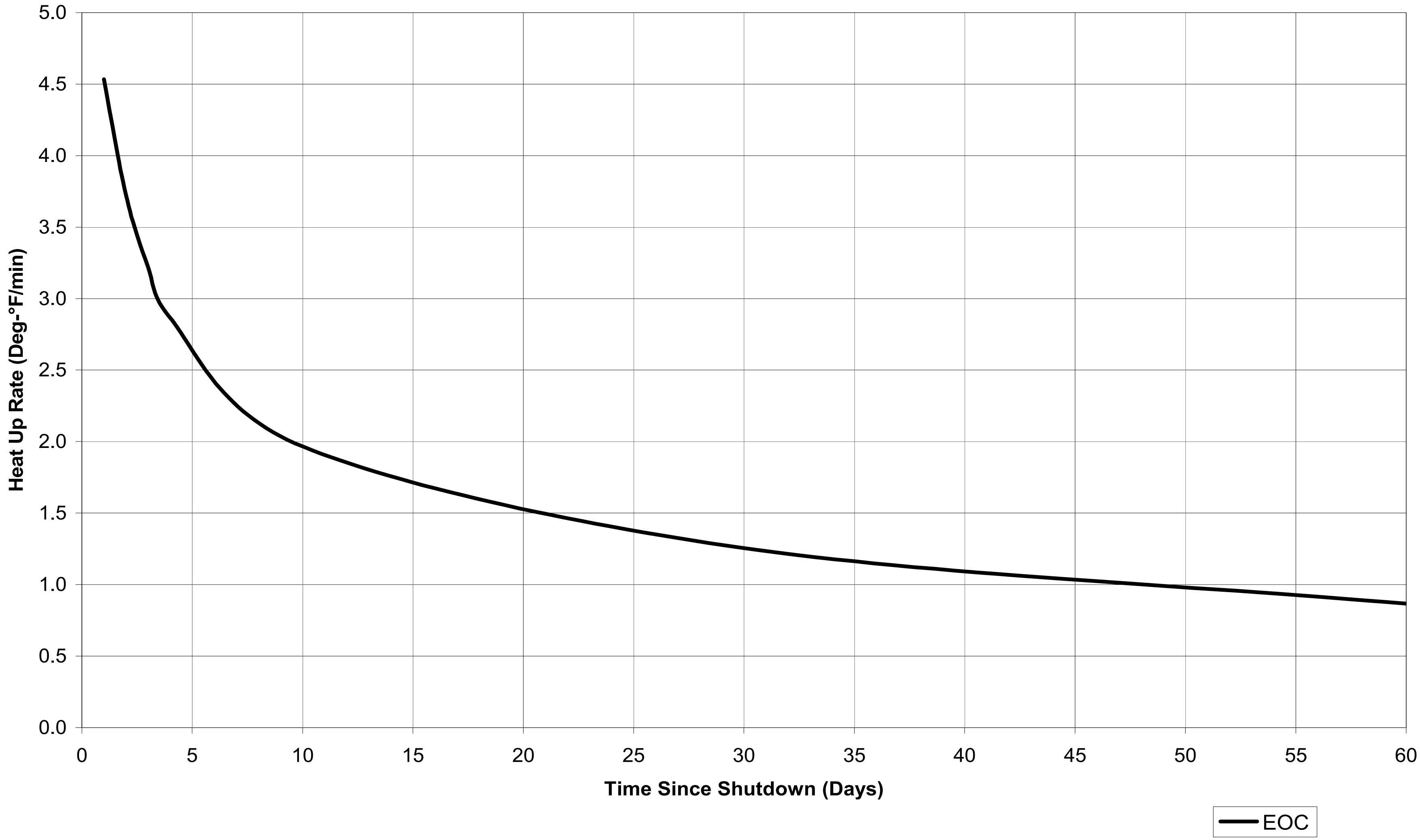

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FIGURE 2
(Page 1 of 2)

LOSS OF RHR COOLING AT MID-LOOP OPERATIONS

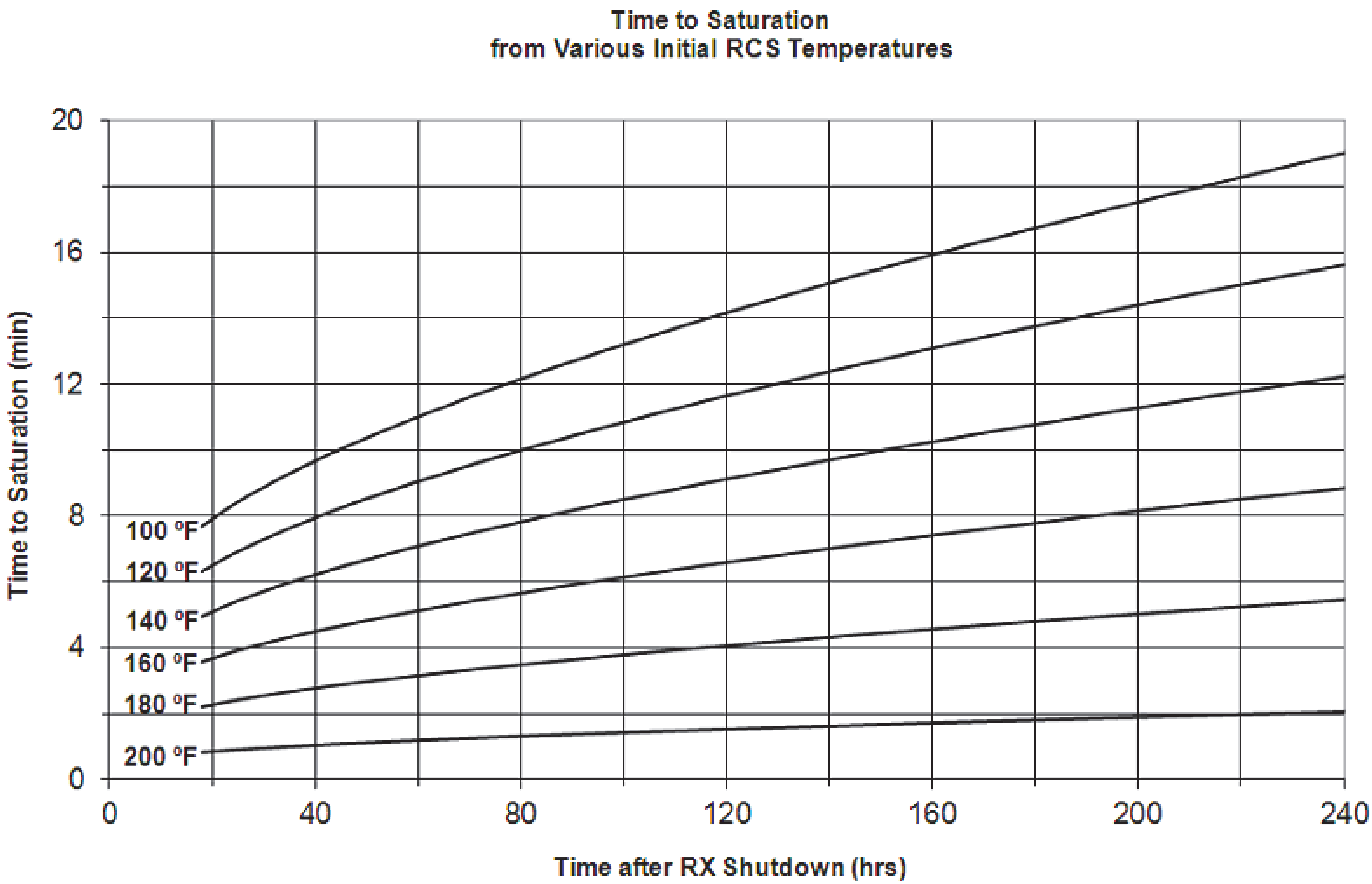

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FIGURE 2
(Page 2 of 2)

LOSS OF RHR COOLING AT MID-LOOP OPERATIONS

Shutdown Time (hr)	Decay Heat (%)	Initial RCS Temperature (°F)					
		100	120	140	160	180	200
		Time to Saturation (min)					
12	0.756	6.90	5.67	4.44	3.21	1.98	0.74
18	0.678	7.70	6.32	4.95	3.58	2.21	0.83
24	0.627	8.33	6.85	5.36	3.88	2.39	0.90
30	0.588	8.88	7.29	5.71	4.13	2.55	0.96
36	0.557	9.37	7.70	6.03	4.36	2.69	1.01
42	0.532	9.82	8.07	6.32	4.57	2.82	1.06
48	0.510	10.24	8.41	6.59	4.76	2.94	1.10
56	0.485	10.76	8.84	6.92	5.01	3.09	1.16
60	0.474	11.01	9.05	7.09	5.12	3.16	1.19
72	0.446	11.72	9.63	7.54	5.45	3.36	1.26
84	0.422	12.38	10.17	7.97	5.76	3.55	1.33
96	0.402	13.00	10.68	8.37	6.05	3.73	1.40
108	0.384	13.60	11.17	8.75	6.33	3.90	1.47
120	0.369	14.17	11.64	9.12	6.59	4.06	1.53
148	0.339	15.42	12.67	9.93	7.18	4.42	1.66
172	0.318	16.43	13.50	10.57	7.64	4.71	1.77
196	0.300	17.38	14.28	11.18	8.09	4.98	1.87
220	0.286	18.28	15.02	11.77	8.51	5.24	1.97
244	0.273	19.15	15.74	12.33	8.91	5.49	2.06
268	0.261	19.98	16.42	12.86	9.30	5.73	2.15
292	0.251	20.78	17.08	13.38	9.67	5.96	2.24
316	0.242	21.55	17.71	13.87	10.03	6.18	2.32
340	0.234	22.30	18.32	14.35	10.38	6.39	2.40
364	0.227	23.02	18.91	14.81	10.71	6.60	2.48
388	0.220	23.71	19.48	15.26	11.03	6.80	2.56
412	0.214	24.39	20.04	15.69	11.35	6.99	2.63
436	0.209	25.04	20.57	16.11	11.65	7.18	2.70
460	0.203	25.67	21.09	16.52	11.95	7.36	2.77
484	0.199	26.29	21.60	16.92	12.23	7.54	2.83
508	0.194	26.88	22.09	17.30	12.51	7.71	2.90
532	0.190	27.47	22.57	17.68	12.78	7.88	2.96
556	0.186	28.03	23.03	18.04	13.04	8.04	3.02
580	0.183	28.58	23.49	18.40	13.30	8.20	3.08
604	0.179	29.12	23.93	18.74	13.55	8.35	3.14
628	0.176	29.64	24.36	19.08	13.79	8.50	3.19
652	0.173	30.16	24.78	19.41	14.03	8.65	3.25
676	0.170	30.65	25.19	19.73	14.26	8.79	3.30
700	0.168	31.14	25.59	20.04	14.49	8.93	3.36
724	0.165	31.62	25.98	20.35	14.71	9.07	3.41
748	0.163	32.09	26.37	20.65	14.93	9.20	3.46
772	0.160	32.55	26.74	20.95	15.14	9.33	3.51
796	0.158	33.00	27.11	21.24	15.35	9.46	3.56
820	0.156	33.44	27.47	21.52	15.56	9.59	3.60
844	0.154	33.87	27.83	21.80	15.76	9.71	3.65
868	0.152	34.29	28.18	22.07	15.96	9.84	3.70
892	0.150	34.71	28.52	22.34	16.15	9.96	3.74
916	0.149	35.12	28.86	22.61	16.34	10.07	3.78
940	0.147	35.53	29.19	22.87	16.53	10.19	3.83

FIGURE 3
(Page 1 of 2)

LOSS OF RHR COOLING AT 2.5 FEET BELOW REACTOR VESSEL FLANGE OPERATIONS

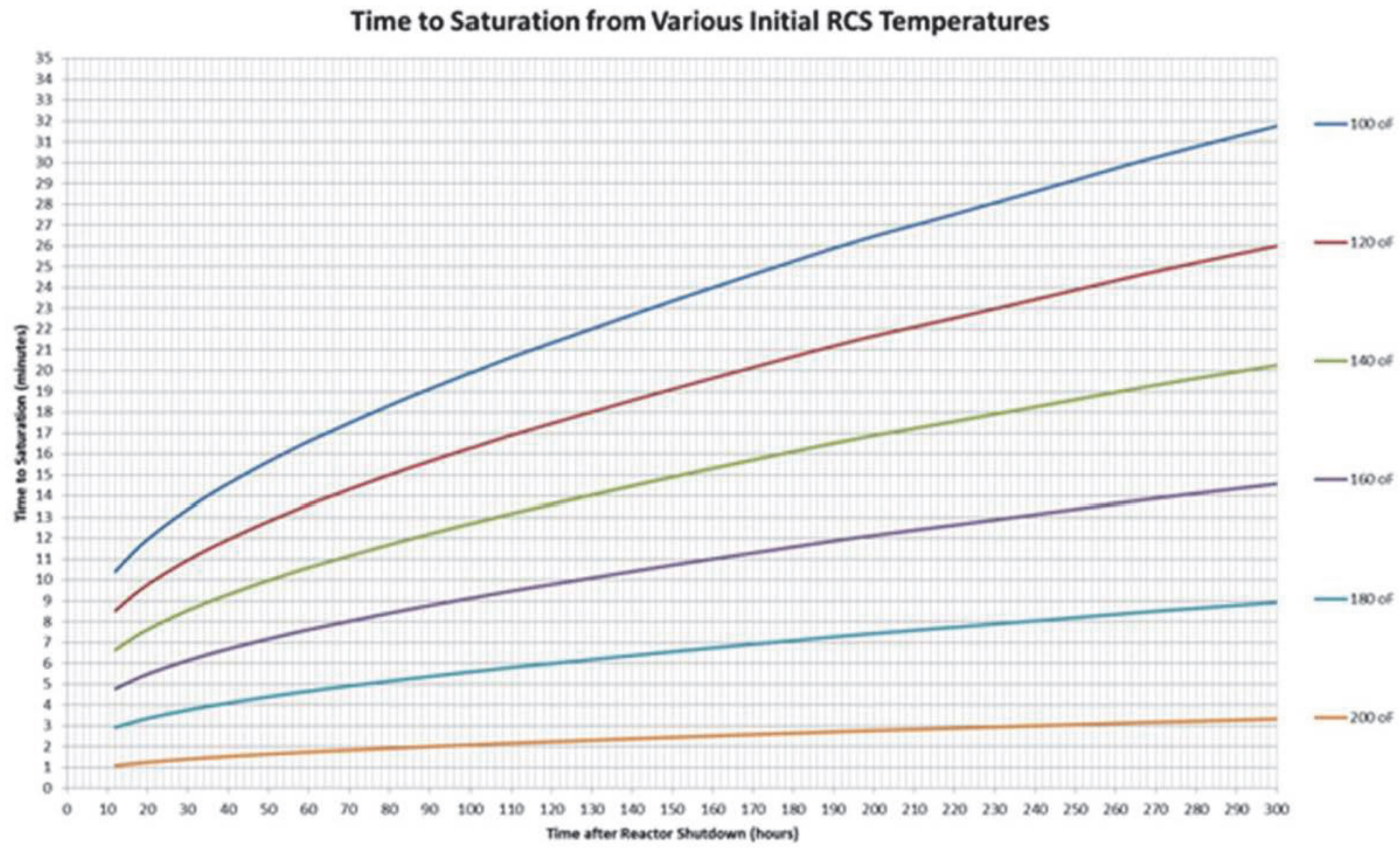

FIGURE 3
(Page 2 of 2)

LOSS OF RHR COOLING AT 2.5 FEET BELOW REACTOR VESSEL FLANGE OPERATIONS

Shutdown Time (hrs)	Decay Fraction (%)	Q decay (BTU/sec)	Initial RCS Temperature (°F)					
			100	120	140	160	180	200
			Time to Saturation (min)					
12	0.756	18,949.23	10.41	8.52	6.64	4.78	2.93	1.09
18	0.678	16,994.15	11.61	9.50	7.41	5.33	3.26	1.22
24	0.627	15,715.83	12.56	10.28	8.01	5.76	3.53	1.32
30	0.588	14,738.29	13.39	10.96	8.54	6.14	3.76	1.41
36	0.557	13,961.27	14.13	11.57	9.02	6.49	3.97	1.48
42	0.532	13,334.64	14.80	12.11	9.44	6.79	4.16	1.55
48	0.51	12,783.21	15.44	12.64	9.85	7.08	4.34	1.62
56	0.485	12,156.58	16.23	13.29	10.36	7.45	4.56	1.70
60	0.474	11,880.87	16.61	13.60	10.60	7.62	4.67	1.74
72	0.446	11,179.04	17.65	14.45	11.26	8.10	4.96	1.85
84	0.422	10,577.48	18.65	15.27	11.90	8.56	5.24	1.96
96	0.402	10,076.18	19.58	16.03	12.50	8.99	5.50	2.06
108	0.384	9,625.01	20.50	16.78	13.08	9.41	5.76	2.15
120	0.369	9,249.03	21.33	17.46	13.61	9.79	6.00	2.24
148	0.339	8,497.08	23.22	19.01	14.82	10.66	6.53	2.44
172	0.318	7,970.71	24.76	20.27	15.80	11.36	6.96	2.60
196	0.3	7,519.54	26.24	21.48	16.74	12.04	7.38	2.75
220	0.286	7,168.62	27.53	22.53	17.56	12.63	7.74	2.89
244	0.273	6,842.78	28.84	23.61	18.40	13.23	8.10	3.03
268	0.261	6,542.00	30.16	24.69	19.25	13.84	8.48	3.17
292	0.251	6,291.35	31.36	25.67	20.01	14.39	8.82	3.29
316	0.242	6,065.76	32.53	26.63	20.76	14.93	9.14	3.41
340	0.234	5,865.24	33.64	27.54	21.47	15.44	9.46	3.53
364	0.227	5,689.78	34.68	28.39	22.13	15.91	9.75	3.64
388	0.22	5,514.33	35.78	29.29	22.83	16.42	10.06	3.76
412	0.214	5,363.94	36.79	30.11	23.47	16.88	10.34	3.86
436	0.209	5,238.61	37.67	30.83	24.03	17.29	10.59	3.95
460	0.203	5,088.22	38.78	31.75	24.75	17.80	10.90	4.07
484	0.199	4,987.96	39.56	32.38	25.24	18.15	11.12	4.15
508	0.194	4,862.63	40.58	33.22	25.89	18.62	11.41	4.26
532	0.19	4,762.37	41.43	33.92	26.44	19.01	11.65	4.35
556	0.186	4,662.11	42.32	34.65	27.01	19.42	11.90	4.44
580	0.183	4,586.92	43.02	35.21	27.45	19.74	12.09	4.51
604	0.179	4,486.66	43.98	36.00	28.06	20.18	12.36	4.62
628	0.176	4,411.46	44.73	36.62	28.54	20.53	12.57	4.69
652	0.173	4,336.27	45.51	37.25	29.04	20.88	12.79	4.78
676	0.17	4,261.07	46.31	37.91	29.55	21.25	13.02	4.86
700	0.168	4,210.94	46.86	38.36	29.90	21.50	13.17	4.92
724	0.165	4,135.74	47.71	39.06	30.44	21.89	13.41	5.01
748	0.163	4,085.61	48.30	39.54	30.82	22.16	13.57	5.07
772	0.16	4,010.42	49.20	40.28	31.40	22.58	13.83	5.16
796	0.158	3,960.29	49.83	40.79	31.79	22.86	14.00	5.23
820	0.156	3,910.16	50.46	41.31	32.20	23.16	14.18	5.30
844	0.154	3,860.03	51.12	41.85	32.62	23.46	14.37	5.37
868	0.152	3,809.90	51.79	42.40	33.05	23.77	14.56	5.44
892	0.15	3,759.77	52.48	42.96	33.49	24.08	14.75	5.51
916	0.149	3,734.70	52.83	43.25	33.71	24.25	14.85	5.55
940	0.147	3,684.57	53.55	43.84	34.17	24.58	15.05	5.62

FIGURE 4
(Page 1 of 1)

TYPICAL RCS HEAT UP RATES FOR REDUCED INVENTORY

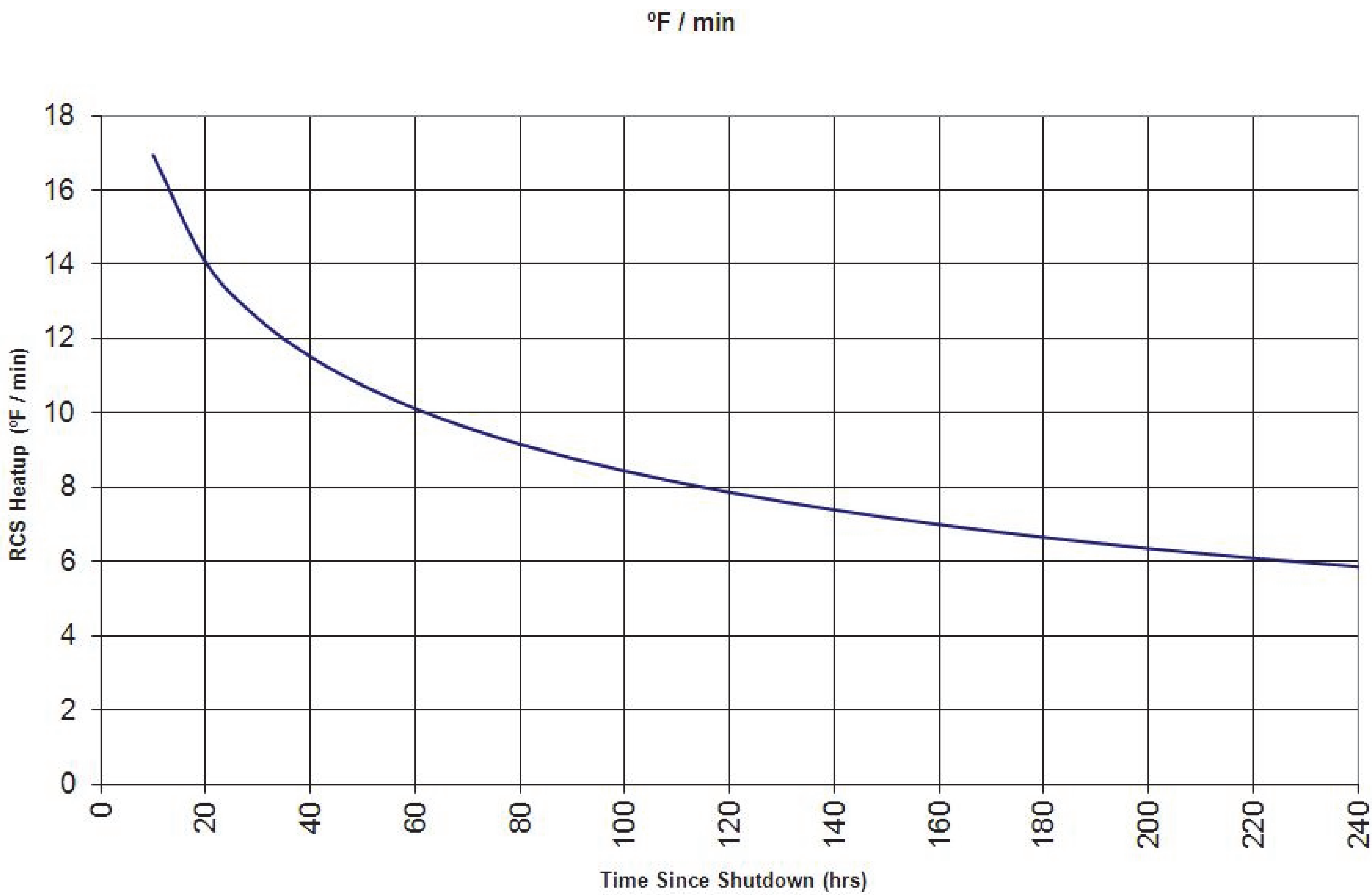

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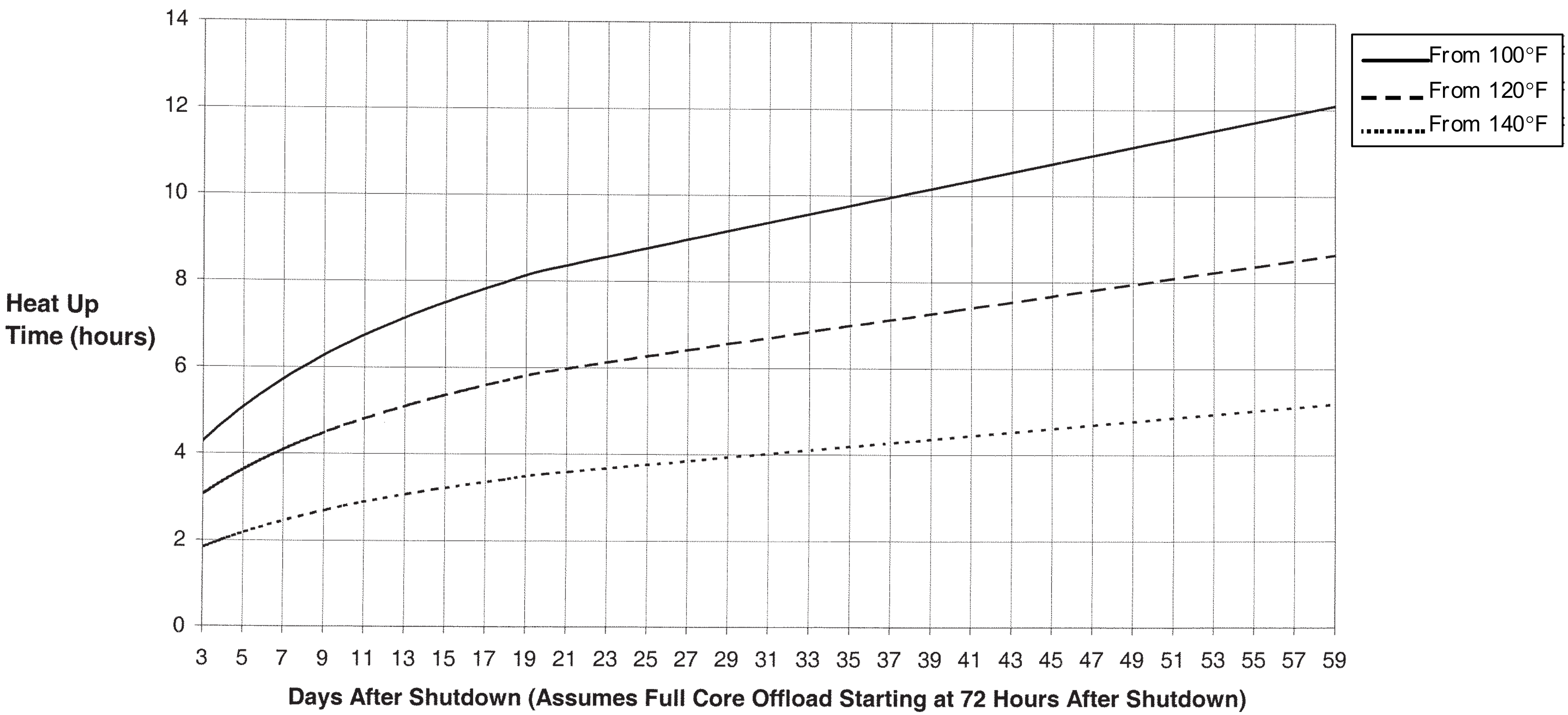
FIGURE 5
(Page 1 of 1)

TYPICAL HEAT UP RATES IN SFP



W/FULL OFFLOAD

NOTE: Heat Up Curves to 200°F are Found in the Plant Curve Book, Section 8

FIGURE 6
(Page 1 of 1)

TIME TO CORE UNCOVERY FROM MID-LOOP
(Assuming Adequate Vent to Atmospheric Pressure)

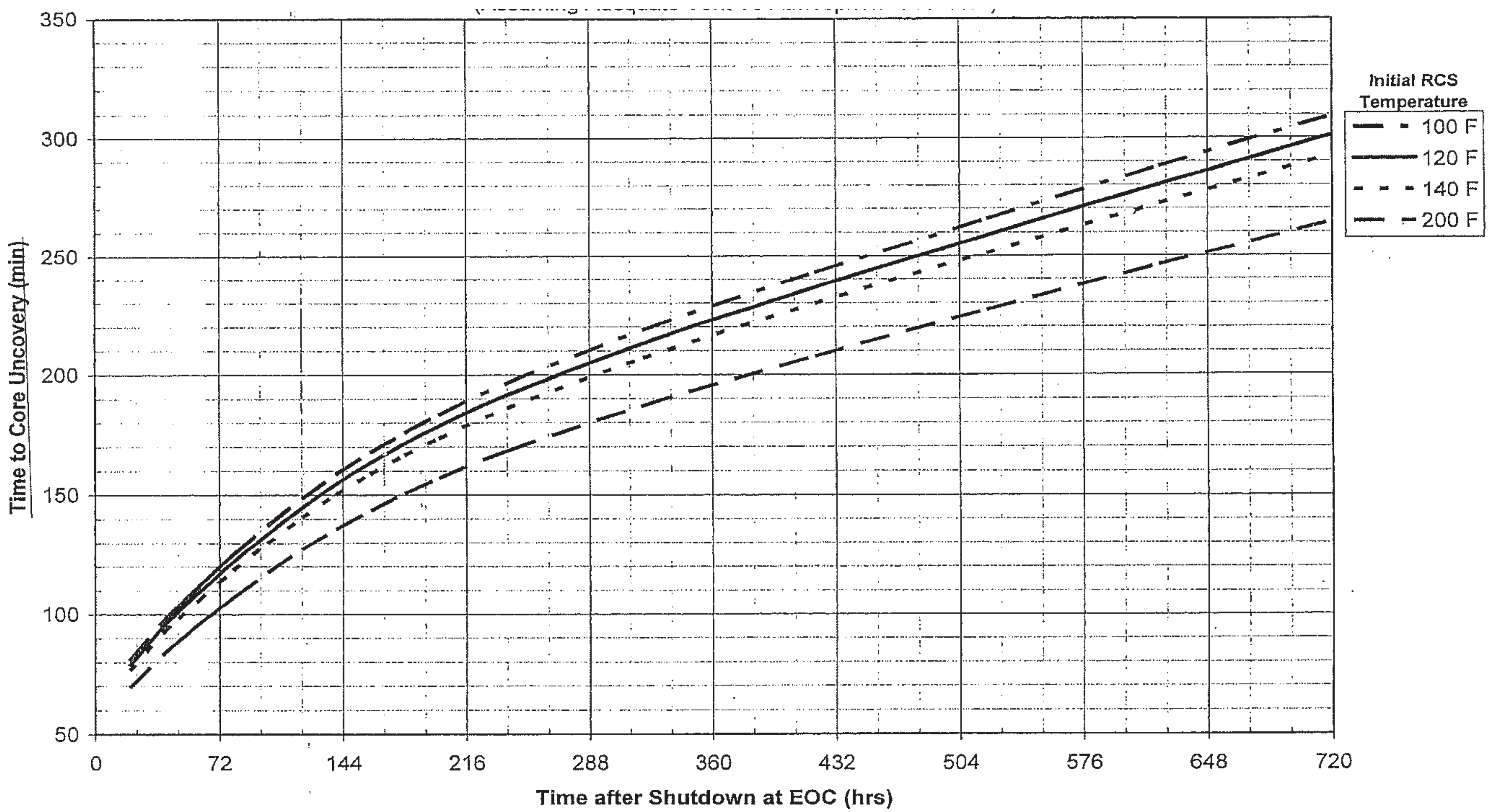


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FIGURE 7
(Page 1 of 2)

PROTECTED EQUIPMENT SIGN EXAMPLE

Protected Train Sign Format and Content

NOTES

- *This guideline is intended to provide consistency for protected train postings to ensure the meaning of the signs is clear to station personnel.*
- *Operations in the Work Control Center should be the point of contact to avoid unnecessary distractions in the Control Room.*

1. Signs should contain contact phone numbers for the Work Control Center.
2. Signs should be laminated or moisture resistant.
3. Signs should be attached using magnetic tape or Velcro attachment devices. The use of tape should be avoided.
4. Signs should be similar to example shown in Figure 6.

FIGURE 7
(Page 2 of 2)

PROTECTED EQUIPMENT SIGN EXAMPLE

ENCLOSURE 1
(Page 1 of 13)

MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
Decay Heat Removal	Two RHR Pumps	1. Take immediate action to repair the failed pump. 2. Go to 3/4-ONOP-050, Loss of RHR, for loss of RHR. 3. Maximize RCS Inventory as much as is achievable. 4. Maintain RCS pressurized to 100 psig to meet loops filled criteria. 5. Maintain RCS temperature as low as possible. 6. Ensure Feed and Bleed Decay Heat Removal capability, using the HHSI pumps, is available. 7. Maintain Decay Heat Removal capability with at least two steam generators, including a source of feedwater. 8. Suspend any activities that would risk the remaining RHR, ICW, or CCW Pumps; EDG; and 4 kV Bus. 9. Upon loss of both pumps, initiate actions to establish containment closure except for the equipment hatch. 10. Verify that the equipment hatch can be closed within the time frame to heat up to Mode 4 following a loss of shutdown cooling as predicted using the heatup rates of Figure 1. Station the necessary personnel at the hatch with direct communications to the OATC.	1 – ORANGE 0 - RED
	Two RHR Heat Exchangers	1. Take action as described for RHR Pumps.	1 – YELLOW 0 - RED
	Two CCW Pumps	1. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 2. Carry out other actions per RHR pumps above.	1 – ORANGE 0 - RED
	Two CCW Heat Exchangers	1. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 2. Take action to restore the unavailable component to service. 3. Take other actions as described for RHR Pumps.	1 HX – ORANGE 0 - RED

ENCLOSURE 1
(Page 2 of 13)

MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
Decay Heat Removal (Cont'd)	Two ICW Pumps	1. Go to 3/4-ONOP-019, Intake Cooling Water Malfunction, for loss of ICW. 2. Suspend activities that may risk the remaining ICW pumps. 3. CCW cross-tie to the other unit may be appropriate. 4. Notify Work Controls Manager, Operations Manager, Maintenance Manager, and Plant Managers.	1 – ORANGE 0 - RED
	Two ICW Headers	1. Verify that at least two ICW pumps **AND** two CCW Heat Exchangers are aligned to the remaining ICW header. 2. Prior to removing an ICW header from service, verify that the basket strainer associated with the remaining header is clean. 3. Have a contingency plan, with responsible individuals designated, in place to restore the header to service.	1 – YELLOW 0 - RED
	Source of feedwater and a flowpath from one of the following: SGFP SSGFP Condensate PP Condensate Transfer PP SGWL PP	1. Take action to restore the unavailable component. 2. Restrict Activities that could potentially threaten RHR.	0 - YELLOW
	Two Steam Dump to Atmosphere Valves**	1. Take action to restore the unavailable component. 2. Restrict Activities that could potentially threaten RHR.	0 – YELLOW
	Two S/G's > 10% NR	1. Ensure compliance with TS 3.4.1.4.1. 2. Take action to restore at least one S/G to > 10% NR. 3. Restrict activities that could potentially threaten RHR cooling. 4. **IF** at least two S/Gs can **NOT** be restored to > 10% NR within 4 hours, **THEN** transition to Enclosure 2.	0 - YELLOW

**FLEX support equipment

ENCLOSURE 1
(Page 3 of 13)

MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
Inventory Control	Two Charging Pumps ** (one with an available EDG power source to meet the requirement below).	1. Initiate action to repair the unavailable charging pump. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of at least two HHSI Pumps with suction aligned to an RWST with at least 20,000 gallons of water **<u>AND</u>** an available flowpath to the RCS. 4. Do **<u>NOT</u>** reduce RCS Inventory, if possible take action to maximize RCS Inventory. 5. Maintain RCS temperature as low as possible. 6. Suspend activities that would place any remaining charging pump and its power supply at risk.	1 – YELLOW 0 - ORANGE
	Flowpath from the Charging Pumps to the RCS (Regen HX or RCP seals) and suction capability from BAST or RWST **	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of two HHSI Pumps with suction aligned to an RWST with at least 20,000 gallons of water **<u>AND</u>** a flowpath available to the RCS.	0 – ORANGE 0 – RED, if no HHSI flowpath
	Two of four Primary Water Pumps	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify capability to cross connect Primary Water from the opposite unit. 4. Verify the availability of the charging pump suction from the RWST.	1 – YELLOW 0 - ORANGE
	Two of four Boric Acid Pumps **	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of the charging pump suction from the RWST. 4. Verify the availability of two HHSI pumps with suction aligned to an RWST with at least 20,000 gallons of water **<u>AND</u>** an available flowpath to the RCS.	1 – YELLOW 0 - ORANGE

**FLEX support equipment

ENCLOSURE 1
(Page 4 of 13)

MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
Inventory Control (Cont'd)	Two of four HHSI Pumps each with an emergency power supply and suction capability from an RWST with at least 20,000 gallons of water.	1. Initiate action to restore the unavailable components. 2. Verify the availability of at least two charging pumps. 3. Maximize RCS Inventory. 4. Maintain RCS temperature as low as possible. 5. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 – YELLOW 0 - ORANGE
	Hot Leg Injection Flowpath	1. Initiate action to restore the unavailable components. 2. Ensure Cold Leg Injection Flowpath available. 3. Verify availability of at least two charging pumps. 4. Maintain RCS inventory. 5. Maintain RCS temperature as low as possible.	0 - YELLOW
	Alternate RHR Flowpath	1. Initiate action to restore MOV-*-872 or associated flowpath. 2. **IF** power **NOT** available to MOV-*-872, **THEN** designate an operator to be dispatched to locally operate MOV-*-872 when directed by *-ONOP-041.8, Shutdown LOCA (Mode 5 or 6)	0 - WHITE
On-Site and Off-Site Power	Two Transformers capable of the below powering A or B 4 kV Bus * • Startup • AUX on backfeed • Opposite unit Startup Transformer to **A** Bus • One **C** Bus transformer to **A** or **B** Bus	1. Go to 3/4-ONOP-004, Loss of Off-Site Power, for loss of off-site power. 2. Go to 3/4-ONOP-092.3, Startup Transformer Malfunction, for S/U Transformer malfunction. 3. Initiate actions to return the required transformer to service. 4. Verify the availability of both EDGs. 5. Verify the availability of the station blackout tie. 6. Suspend activities that would risk the remaining power supplies. 7. Verify the availability of one C Bus to power A or B 4 kV Bus. 8. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 XFMR with SBO tie - YELLOW 1 XFMR without SBO tie - ORANGE 0 XFMR - RED

* Reference Step 5.1.1.29

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
On-Site and Off-Site Power	A, B, and D 4 kV Busses	1. Take action to restore the out-of-service components. Go to appropriate procedure below: 3/4-ONOP-004.2, Loss of A 4 kV Bus 3/4-ONOP-004.3, Loss of B 4 kV Bus 3/4-ONOP-004.5, Loss of D 4 kV Bus 2. Verify at least two on-site sources of AC power are available. 3. For loss of off-site power, go to 3/4-ONOP-004, Loss of Off-Site Power. 4. With A, B, or D 4 kV Busses unavailable, verify the ability to power A or B Bus from one C Bus transformer. 5. With D 4 kV Bus unavailable, maintain both associated unit EDGs available.	Loss of D Bus - YELLOW Loss of A or B Bus - ORANGE 1 - RED
	Two Emergency Diesel Generators on the Associated Unit	1. Take action to restore the unavailable EDG to service. 2. Suspend activities that may risk the off-site power sources. 3. Verify availability of the station blackout tie. 4. Verify the ability to power A or B Bus from one C Bus transformer.	1 – YELLOW 0 - ORANGE
	Station Blackout Tie	1. Verify availability of both associated unit EDGs. 2. Suspend activities that may risk the off-site power supplies. 3. Verify the ability to power A or B Bus from one C Bus transformer.	0 w/ C Bus tie – YELLOW 0 - w/ Opposite Unit SU Xfmr - YELLOW 0 w/o: • C Bus tie **AND** • Opposite unit SU XFMR - ORANGE

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
Reactivity Control	C_B> 0-OSP-028.8 SDM Calculation	1. Take action to restore boron concentration (C_B) to > 0-OSP-028.8, SDM Calculation. 2. Verify no primary water additions in progress.	RED if C_B < 0-OSP-028.8 SDM Calculation
Shutdown Monitoring Instrumentation	Two of four Source Range Instruments	1. Take action to restore the failed components. 2. Suspend activities that could reduce the available Shutdown Margin. 3. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 – WHITE 0 - YELLOW
	ARMS Channels: Three Inside Containment #	1. Take action to restore the failed components. 2. Install temporary monitoring equipment in the affected area. 3. Suspend activities that may increase radiation levels in the affected area.	Loss of 1 or more - WHITE
	PRMS Channels: R-11, R-12, R-14 or RAD-6304, R-19	1. Take action to secure releases via the unmonitored pathway or take action to continue releases as allowed by Technical Specifications. 2. Consider installation of temporary monitoring equipment.	Loss of 1 or more – WHITE
	2 Core Exit Thermocouples	1. Arrange with I&C for alternate readouts or monitoring of CETs if possible. 2. Verify that two channels of wide range T_{HOT} are available. 3. Maintain RCS greater than 10 percent Wide Range Pressurizer Level.	0 - YELLOW

One at a time may be OOS for calibration.

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
Shutdown Monitoring Instrumentation (Cont'd)	One Channel of Reactor Vessel Level HJTC (QSPDS)	1. Take action to restore at least one channel as soon as possible. 2. Maximize RCS Inventory as much as is allowed by plant conditions. 3. Maintain RCS greater than 10 percent Wide Range Pressurizer Level.	0 - WHITE
	One Channel of Containment Water Level Indication	1. Take action to restore one channel to service as soon as possible.	0 - WHITE
	Two Channels of Containment Sump Level Indication	1. Restore two channels to service as soon as possible. 2. Suspend activities that may result in increased sump level. 3. Verify that any temporary drain hoses are **NOT** resulting in loss of RCS Inventory at least once per shift.	1 – WHITE 0 - YELLOW
	One of Four Channels of Pressurizer Level Indication	1. Suspend activities which may result in RCS Inventory loss.	0 - WHITE
	RCS Pressure Instruments PT-402, PT-403, and PT-405	1. Verify sufficient OMS trains are still available. 2. Secure power to any MOV which could result in RHR loss due to unwanted action from the unavailable pressure channel. (N/A if interlocks defeated.) 3. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 – WHITE 0 - YELLOW
	RCS Wide Range T_{HOT} and T_{COLD}: At least one channel per loop	1. Verify the availability of two CETs. 2. Verify that OMS controls are **NOT** affected by the unavailable channel.	Per loop, only T_{HOT} or T_{COLD} – WHITE

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function / Support Equipment	Required Equipment	Contingency Action	Color Code
Containment Closure	Equipment Hatch (capable of being closed with (1) a minimum of 4 bolts or (2) the fast-closure rollup door in accordance with Enclosure 13.) *	1. Suspend activities that risk required Decay Heat Removal Equipment. 2. Initiate action to restore the capability to close the hatch in the required time frame. 3. Notify Maintenance, Operations, Work Controls, and Plant Managers.	Required Time Met - GREEN Required Time Not Met (TCN Required) - YELLOW
	Personnel Hatch (capable of being closed in accordance with Enclosure 13.) *	1. Suspend activities that risk required Decay Heat Removal Equipment. 2. Initiate action to restore the capability to close the hatch in the required time frame. 3. Notify Maintenance, Operations, Work Controls, and Plant Managers.	
	Containment Penetrations (At least one valve in each penetration that is **NOT** pressurized should be kept closed, or capable of being closed in accordance with Enclosure 13.) Exceptions may be taken under administrative controls for testing, surveillance, and maintenance.	1. If an exception is taken **AND** at least one valve in the penetration is capable of closure, either manually from the Control Room or locally, the penetration shall be logged on Attachment 3. The log entry shall identify the actions necessary to close the penetration. 2. If an exception is taken **AND** the penetration is **NOT** capable of being closed by at least one valve, a TCN with a contingency plan to achieve closure is required PRIOR to authorizing work on the penetration. 3. Initiate action to restore closure capability. 4. Suspend activities that would risk required Decay Heat Removal Equipment. 5. Notify Maintenance, Operations, Work Controls, and Plant Managers.	
Risk Significant Equipment	One Auxiliary Building Exhaust Fan	1. **IF** out-of-service time is to exceed 119 hours, **THEN** notify Work Controls Manager and Plant Managers. 2. Assess the impact on the operating unit. 3. Assess the impact on the running RHR Pump.	0 - YELLOW

* Capability includes provisions for the unavailability of AC power and environmental conditions expected.

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
Risk Significant Equipment (Cont'd)	One Diesel Driven Instrument Air Compressor **AND** the Instrument Air Cross Tie Lines	1. Verify the availability of a portable Instrument Air Compressor. 2. Verify the availability of the Instrument Air Cross Tie. 3. **IF** out-of-service time is to exceed 548 hours, **THEN** notify Work Controls Manager and Plant Managers. 4. Assess the impact on the operating unit.	0 – YELLOW
	Vital DC Room HVAC - two of three units required E16D, E16E, E16F	1. Monitor temperature in the Inverter and DC Equipment Rooms. 2. Install portable fans **OR** verify availability of portable fans. 3. Assess the impact on the operating unit.	1 – WHITE 0 - YELLOW
	One Service Water Pump	1. Assess the impact on the operating unit.	0 - WHITE

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment	At least one SG with ALL of the following: • SG level as required elsewhere in this enclosure Steam Dump to Atmosphere Valve unisolated w/Control Room OR local control • Secondary shell side intact • Functional AFW FCV w/Control Room OR local control	1. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations. # 2. Maintain RCS and PRZ vent paths through the following valves available: + • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 3. Restore required equipment as soon as possible	N/A
	At least one AFW Pump	1. Prestage FLEX Well Pump, and FLEX Piping Skid with associated hoses,in it's FLEX deployment location. # 2. Restore required equipment as soon as possible	N/A
	At least one AFW FLEX connection * AFPD-004 OR * AFPD-005	1. IF at least one AFW Pump not available, THEN perform the following: a. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations. # b. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 c. Restore required equipment as soon as possible 2. Otherwise, restore required equipment as soon as possible.	N/A

+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.

Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one AFW Steam Supply Flowpath to the available AFW pump from either unit	1. Prestage FLEX Well Pump, and FLEX Piping Skid with associated hoses,in it's FLEX deployment location. # 2. Restore required equipment as soon as possible	N/A
	Available flowpath from available AFW pump to available SG	1. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations. # 2. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 3. Restore required equipment as soon as possible.	N/A
	Available flowpath from available AFW FLEX connection to available SG	1. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations. # 2. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 3. Restore required equipment as soon as possible.	N/A
	At least 1 CST with >210,000 gal and an available flowpath to the avail AFW pump	1. Prestage FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations. # 2. Restore required equipment as soon as possible.	N/A

+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.
Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one of the following containment vent paths open, or capable of being opened:** * Both Personnel Hatch Airlock Doors open * Both Emergency Escape Hatch Airlock Doors open * Equipment Hatch open AND associated Equipment Hatch Fast Closure Door open	1. Restore required equipment, or capability, as soon as possible.	N/A
	CVCS Blender FLEX PW connection, *- 370, AND a flowpath to charging pump suction	1. Restore required equipment as soon as N/A possible	N/A

+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.
** Applicable when the secondary shell side of a S/G is open to Containment atmosphere: The personnel airlock is the only acceptable vent path during a hurricane event.
Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one CST FLEX connection on each unit's CST: • Unit 3 FLEX-CST-1 OR FLEX-CST-2 AND • Unit 4 FLEX-CST-7 OR FLEX-CST-8	1. Restore required equipment as soon as possible	N/A
	At least one 480V FLEX connection capable of supplying at least one available charging pump, one available boric acid pump, and both *A1 AND *B1 battery chargers: **# * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *A Load Center OR * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *C Load Center OR * All of the following: • TB8101(TB5877) • *B Load Center OR * All of the following: • TB8101(TB5877) • *D Load Center	1. Restore required equipment as soon as possible	N/A

** Load center cross-tie may be credited when assessing capabilities

*A1/*B1 battery chargers NOT required if *A2/*B2 battery chargers, and FLEX capability to power opposite unit D MCC available

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
Decay Heat Removal	Two RHR Pumps	1. Take immediate action to repair the failed pump. 2. Go to 3/4-ONOP-050, Loss of RHR, for loss of RHR. 3. Establish or maintain Reactor Vessel level higher than three feet below the vessel flange. Maximize RCS Inventory as much as is achievable. 4. Maintain RCS temperature as low as possible. 5. Ensure Feed and Bleed decay heat removal capability, using the HHSI pumps, is available. 6. Suspend any activities that would risk the remaining RHR, ICW, or CCW Pumps; EDG; and 4 kV Bus. 7. Upon loss of both pumps, initiate actions to establish containment closure except for the equipment hatch. 8. Verify that the equipment hatch can be closed within the time frame to heat up to Mode 4 following a loss of shutdown cooling as time to saturation predicted using the Figure 2 or Figure 3. Station the necessary personnel at the hatch with direct communications to the OATC. 9. Investigate the possibility of flooding the Reactor Cavity to a height of 23 feet above the Reactor Vessel Flange. 10. **<u>IF</u>** RCS Inventory is at Mid-Loop, **<u>THEN</u>** refer to Figure 5.	1 – ORANGE 0 - RED
	Two RHR Heat Exchangers	1. Take action as described for RHR Pumps.	1 HX – ORANGE 0 HX – RED
	Two CCW Pumps*	1. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 2. Carry out other actions as described per RHR pumps above.	1 – ORANGE 0 - RED

* Powered from independent power sources if RCS level lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
Decay Heat Removal (Cont'd)	Two CCW Heat Exchangers	1. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 2. Take action to restore the unavailable component to service. 3. Take other actions as described for RHR Pumps.	1 HX – ORANGE 0 HX - RED
	Two ICW Pumps*	1. Go to 3/4-ONOP-019, Intake Cooling Water Malfunction, for loss of ICW. 2. Suspend activities that may risk the remaining ICW Pumps. 3. CCW cross-tie to the other unit may be appropriate. 4. Notify Work Controls Manager, Operations Manager, Maintenance Manager, and Plant Managers.	1 – ORANGE 0 - RED
	Two ICW Headers	1. Verify at least two ICW pumps **<u>AND</u>** two CCW Heat Exchangers are aligned to the remaining ICW header. 2. Prior to removing an ICW header from service, verify that the basket strainer associated with the remaining header is clean. 3. Have a contingency plan, with responsible individuals designated, in place to restore the header to service.	1 – YELLOW 0 - RED
	Two S/Gs > 70% WR	1. Take action to restore at least one S/G to > 70% WR level. 2. Suspend any activities that would risk the remaining RHR, ICW, or CCW Pumps; EDG; and 4 kV Bus.	0 - WHITE

* Powered from independent power sources if RCS level lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
Inventory Control	Two Charging ** Pumps (One with an available EDG power source. Both with an available EDG to meet the requirement below.*)	1. Initiate action to repair the unavailable charging pump. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of two HHSI Pumps with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS. 4. Do **NOT** reduce RCS Inventory; if possible, take action to maximize RCS Inventory. 5. Maintain RCS temperature as low as possible. 6. Suspend activities that would place any remaining charging pump and its power supply at risk.	1 – ORANGE 0 - RED
	Flowpath from the charging pump to the RCS (Regen HX or RCP seals) **AND** suction capability from BAST or RWST **	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of two HHSI Pumps with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS.	0 – ORANGE 0 – RED if no HHSI flowpath
	Two of four Primary Water Pumps	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify capability to cross connect Primary Water from opposite unit. 4. Verify the availability of the charging pump suction from the RWST.	1 – YELLOW 0 - ORANGE
	Two of four Boric Acid Pumps **	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of the charging pump suction from the RWST. 4. Verify the availability of two HHSI pumps with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS.	1 – YELLOW 0 - ORANGE

* Two charging pumps are required with available EDG power source, if RCS level is lower than 3 feet below the vessel flange. [Commitment Step - 2.3.1]
** FLEX support equipment

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
Inventory Control (Cont'd)	Two of four HHSI Pumps each with an emergency power supply **AND** suction capability from an RWST with at least 20,000 gallons of water	1. Initiate action to restore the unavailable components. 2. Verify the availability of at least two charging pumps. 3. Maximize RCS Inventory. 4. Maintain RCS temperature as low as possible. 5. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1–YELLOW 0-ORANGE
	Hot Leg Injection Flowpath*	1. Initiate action to restore the unavailable components. 2. Ensure Cold Leg Injection Flowpath available. 3. Verify availability of at least two charging pumps. 4. Maintain RCS inventory. 5. Maintain RCS temperature as low as possible.	0 - YELLOW
	RCS Inventory at or above 5% level in pressurizer. (Color code determination only)	N/A	YELLOW drained to higher than 3 feet below flange ORANGE Drained hot leg mid nozzle
	Alternate RHR Flowpath	1. Initiate action to restore MOV-*-872 or associated flowpath. 2. **IF** power **NOT** available to MOV-*-872, **THEN** designate an operator to be dispatched to locally operate MOV-*-872, when directed by *-ONOP-041.8, Shutdown LOCA (Mode 5 or 6)	0 - WHITE

* Both hot and cold leg injection path are required if RCS level is lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

ENCLOSURE 2

MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
On-Site and Off-Site Power	Two of the below listed Transformers capable of powering A or B 4 kV Bus • Startup • AUX on backfeed • Opposite unit startup transformer to A Bus • Either unit's C Bus transformer to **A** or **B** Bus	1. Go to 3/4-ONOP-004, Loss of Off-Site Power, for loss of off-site power. 2. Go to 3/4-ONOP-092.3, Startup Transformer Malfunction, for S/U transformer malfunction. 3. Initiate actions to return the required transformer to service. 4. Verify the availability of both EDGs. 5. Verify the availability of the station blackout tie. 6. Suspend activities that would risk the remaining power supplies. 7. Verify the ability of one C Bus to power A or B 4 kV Bus. 8. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 XFMR – ORANGE 0 XFMR – RED
	A, B, and D 4 kV Busses	1. Take action to restore the out-of-service components. Go to appropriate procedure below: 3/4-ONOP-004.2, Loss of A 4 kV Bus 3/4-ONOP-004.3, Loss of B 4 kV Bus 3/4-ONOP-004.5, Loss of D 4 kV Bus 2. Verify at least two on-site sources of AC power are available. 3. For loss of off-site power go to 3/4-ONOP-004, Loss of Off-Site Power. 4. With A, B, or D 4 kV Busses unavailable, verify the ability to power A or B Bus from one C Bus transformer. 5. With D 4 kV Bus unavailable, maintain both associated unit EDGs available.	Loss of D Bus – YELLOW Loss of A or B Bus – ORANGE 1 - RED
	Two Emergency Diesel Generators on the Associated Unit	1. Take action to restore the unavailable EDG to service. 2. Suspend activities that may risk the off-site power sources. 3. Verify availability of the station blackout tie. 4. Verify the ability to power A or B Bus from one C Bus transformer.	1 – YELLOW 0 – ORANGE

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
On-Site and Off-Site Power (Cont'd)	Station Blackout Tie	1. Verify availability of both associated unit EDGs. 2. Suspend activities that may risk the off-site power supplies. 3. Verify the ability to power A or B Bus from one C Bus transformer.	0 w/ C Bus tie – YELLOW 0 - w/ Opposite Unit SU Xfmr - YELLOW 0 w/o: • C Bus tie **AND** • Opposite unit SU XFMR - ORANGE
Reactivity Control	C_B > 0-OSP-028.8, SDM Calculation, for Mode 5, or > Required Refueling C_B for Mode 6	1. Take action to restore boron concentration (C_B) to > 0-OSP-028.8 SDM Calculation, or > Required Refueling C_B, as applicable. 2. Verify no primary water additions in progress.	RED if C_B < the required conc

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
Shutdown Monitoring Instrumentation	Two of Four Source Range Instruments (1 with Audible Count Rate in Mode 6)	1. Take action to restore the failed components. 2. Suspend activities that could reduce the available Shutdown Margin. 3. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1/4 - WHITE 0/4 - YELLOW
	ARMS Channels: Three Inside Containment #	1. Take action to restore the failed components. 2. Install temporary monitoring equipment in the affected area. 3. Suspend activities that may increase radiation levels in the affected area.	Loss of 1 or more - WHITE
	PRMS Channels: R-11, R-12, R-14 or RAD-6304	1. Take action to secure releases via the unmonitored pathway **OR** take action to continue releases as allowed by Technical Specifications. 2. Consider installation of temporary monitoring equipment.	Loss of 1 or more - WHITE
	2 Core Exit Thermocouples (Required when the reactor vessel head is fully tensioned.)*	1. Arrange with I&C for alternate readouts or monitoring of CETs, if possible. 2. Verify that two channels of wide range T_{HOT} are available. 3. Maintain RCS greater than 10% Wide Range Pressurizer Level.	0 YELLOW
	One Channel of Reactor Vessel Level HJTC (QSPDS) (Required when the reactor vessel head is fully tensioned.)	1. Take action to restore at least one channel as soon as possible. 2. Maximize RCS Inventory as much as is allowed by plant conditions. 3. Maintain RCS greater than 10% Wide Range Pressurizer Level. 4. **IF** OOS as part of reactor disassembly, **THEN** verify two channels of the reactor vessel draindown level indication available, one with Control Room readout. If < 2 channels available, maintain RCS level higher than 3 feet below the vessel flange.	0 - WHITE

* A minimum of two (2) CETs are required whenever RCS level is lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

\# In containment, one at a time may be OOS for calibration, if RCS level is not lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
Shutdown Monitoring Instrumentation (Cont'd)	One Channel of Containment Water Level Indication	1. Take action to restore one channel to service as soon as possible.	0 - WHITE
	Two Channels of Containment Sump Level Indication*	1. Restore two channels to service as soon as possible. 2. Suspend activities that may result in increased sump level. 3. Verify that any temporary drain hoses are **NOT** resulting in loss of RCS Inventory at least once per shift.	1 – WHITE 0 - YELLOW
	One Pressurizer Cold Calibrated Level Indication ##, **	1. Suspend activities which may result in RCS Inventory loss. 2. Monitor temporary drain hoses for loss of RCS Inventory at least once per shift. 3. Consider installation of temporary level hose as appropriate for plant conditions.	0 - WHITE
	RCS Pressure Instruments PT-402, PT-403, and PT-405	1. Verify sufficient OMS trains are still available. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 – WHITE 0 – YELLOW
	RCS Wide Range T_{HOT} and T_{COLD}: At least one channel per loop	1. Verify the availability of two CETs. 2. Verify that OMS controls are **NOT** affected by the unavailable channel.	For each loop only T_{HOT} or T_{COLD} – WHITE None – YELLOW
	Reactor Vessel Draindown Level Indication: Two of three channels available, (includes level hose) one with Control Room indication #, ***	1. Maintain RCS level higher than three (3) feet below the vessel flange. 2. Do **NOT** reduce RCS Inventory until two channels are available. 3. Investigate the possibility of verifying Reactor Vessel Level via some other means, (i.e., level hose or QSPDS).	1 – YELLOW 0 – ORANGE Requires Control Room indication

The level hose and both draindown level indicators are required for RCS level lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

May be OOS during depressurization of RCS for refill of reference leg.

* Two channels are required if RCS level is lower than 3 feet below the vessel flange. [Commitment Step 2.3.1]

** If RCS level is on scale in reactor vessel draindown level instruments, then pressurizer cold calibrated level instrument not required.

*** If pressurizer cold calibrated level indication is greater than 10%, then reactor vessel draindown level indication is not required.

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Function / Support Equipment	Required Equipment	Contingency Action	Color Code
Containment Closure	Equipment Hatch (capable of being closed with (1) a minimum of 4 bolts or (2) the fast-closure rollup door in accordance with Enclosure 13) * +	1. Suspend activities that risk required Decay Heat Removal Equipment. 2. Initiate action to restore the capability to close the hatch in the required time frame. 3. Notify Maintenance, Operations, Work Controls, and Plant Managers.	Required Time Met - GREEN Required Time **NOT** Met (TCN Required) - YELLOW Required Time **NOT** Met During Reduced Inventory - ORANGE
	Personnel Hatch (capable of being closed in accordance with Enclosure 13) * +	1. Suspend activities that risk required Decay Heat Removal Equipment. 2. Initiate action to restore the capability to close the hatch in the required time frame. 3. Notify Maintenance, Operations, Work Controls, and Plant Managers.	
	Containment Penetrations (At least one valve in each penetration that is **NOT** pressurized should be kept closed or capable of being closed in accordance with Enclosure 13) # Exceptions may be taken under administrative controls for testing, surveillance, and maintenance. *	1. If an exception is taken **AND** at least one valve in the penetration is capable of closure, either manually from the Control Room or locally, the penetration shall be logged on Attachment 3. The log entry shall identify the actions necessary to close the penetration. 2. If an exception is taken **AND** the penetration is **NOT** capable of being closed by at least one valve, a TCN with a contingency plan to achieve closure is required PRIOR to authorizing work on the penetration. 3. If an exception is taken while RCS level is lower than 3 feet below the vessel flange, **AND** the penetration is **NOT** capable of being closed by at least one valve, a TCN with a contingency plan to achieve closure and meet 20 psi containment pressure is required PRIOR to authorizing work on the penetration. 4. Initiate action to restore closure capability. 5. Suspend activities that would risk required Decay Heat Removal Equipment. 6. Notify Maintenance, Operations, Work Controls, and Plant Managers.	

* If RCS level lower than 3 feet below the vessel flange prior to fuel offload, control in accordance with 3/4-NOP-041.09, Reduced Inventory Operations, until RCS level returns above 3 feet below the vessel flange. [Commitment Step – 2.3.1]

\# See Substep 5.1.1.19.c for requirements if RCS level lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

\+ Capability includes provisions for the unavailability of AC power and environmental conditions expected.

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
Risk Significant Equipment	One Auxiliary Building Exhaust Fan	1. **IF** out-of-service time is to exceed 119 hours, **THEN** notify Work Controls Manager and Plant Managers. 2. Assess the impact on the operating unit. 3. Assess the impact on the running RHR pump.	0 - YELLOW
	One Diesel Driven Instrument Air Compressor **AND** the Instrument Air Cross Tie Lines	1. Verify the availability of a portable Instrument Air Compressor. 2. Verify the availability of the Instrument Air Cross Tie. 3. **IF** out-of-service time is to exceed 548 hours, **THEN** notify Work Controls Manager and Plant Managers. 4. Assess the impact on the operating unit.	0 – YELLOW
	Vital DC Room HVAC - Two of three units required E16D E16E E16F	1. Monitor temperature in the Inverter and DC Equipment Rooms. 2. Install portable fans or verify availability of portable fans. 3. Assess the impact on the operating unit.	1 – WHITE 0 – YELLOW
	One Service Water Pump	1. Assess the impact on the operating unit.	0 - WHITE

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment	At least one SG with ALL of the following: • SG level as required elsewhere in this enclosure • Steam Dump to Atmosphere Valve unisolated w/Control Room OR local control • Secondary shell side intact • Functional AFW FCV w/Control Room OR local control	1. IF the RCS is closed, THEN perform the following: a. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations.# b. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 c. Restore required equipment as soon as possible 2. Otherwise, Restore required equipment as soon as possible.	N/A
	At least one AFW Pump	1. IF the RCS is closed, prestage FLEX Well Pump, and FLEX Piping Skid with associated hoses, in it's FLEX deployment location.# 2. Restore required equipment as soon as possible	N/A
	At least one AFW FLEX connection * AFPD-004 OR * AFPD-005	1. IF at least one AFW Pump not available, AND the RCS is closed, THEN perform the following: a. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations.# b. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 c. Restore required equipment as soon as possible. 2. Otherwise, restore required equipment as soon as possible.	N/A

\# Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg
\+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one AFW Steam Supply Flowpath to the available AFW pump from either unit	1. IF the RCS is closed, prestage FLEX Well Pump, and FLEX Piping Skid with associated hoses, in it's FLEX deployment location.# 2. Restore required equipment as soon as possible	N/A
	Available flowpath from available AFW pump to available SG	1. IF the RCS is closed, THEN perform the following: a. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations.# b. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 c. Restore required equipment as soon as possible 2. Otherwise, Restore required equipment as soon as possible.	N/A

\# Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg

\+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	Available flowpath from available AFW FLEX connection to available SG	1. IF the RCS is closed, THEN perform the following: a. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations.$ b. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 c. Restore required equipment as soon as possible 2. Otherwise, Restore required equipment as soon as possible.	N/A
	At least 1 CST with >210,000 gal and an available flowpath to the avail AFW pump	1. IF the RCS is closed, prestage FLEX Well Pump, and FLEX Piping Skid with associated hoses,in it's FLEX deployment location.$ 2. Restore required equipment as soon as possible	N/A
	At least one of the following containment vent paths open, or capable of being opened:** *Both Personnel Hatch Airlock Doors open *Both Emergency Escape Hatch Airlock Doors open * Equipment Hatch open AND associated Equipment Hatch Fast Closure Door open	1. Restore required equipment as soon as possible.	N/A

** Applicable when either the following is open to Containment atmosphere:
* The RCS pressure boundary
* The secondary shell side of a S/G that is NOT drained

$ Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg

Applicable when the RCS pressure boundary is open to Containment atmosphere: The personnel airlock is the only acceptable vent path during a hurricane event.

+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	FLEX 480V Portable Diesel Generator and associated cables prestaged in FLEX deployment location ##	1. Restore required equipment as soon as possible.	N/A
	FLEX Well Pump, FLEX Piping Skid, and associated hoses prestaged in FLEX deployment location ##$	1. Restore required equipment as soon as possible.	N/A

** Applicable when either the following is open to Containment atmosphere: The personnel airlock is the only acceptable vent path during a hurricane event.
 * The RCS pressure boundary
 * The secondary shell side of a S/G that is NOT drained

$ Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg

Applicable when the RCS pressure boundary is open to Containment atmosphere:

+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one RWST gravity feed flowpath:## * All of the following: • MOV-*-864A & B • *-887 • MOV-*-872 OR * All of the following: • MOV-*-864A & • B *-887 • MOV-*-863A OR B • HCV-*-758 • MOV-*-744A OR B OR * All of the following: • MOV-*-864A & B • MOV-*-862A & B • HCV-*-758 • MOV-*-744A OR B OR * All of the following: • MOV-*-864A & B • MOV-*-862A & B • MOV-*-750 & 751	1. Restore required equipment as soon as possible	N/A
	CVCS Blender FLEX PW connection, *- 370, AND a flowpath to charging pump suction	1. Restore required equipment as soon as possible.	N/A
	At least one CST FLEX connection on each unit's CST: • Unit 3 * FLEX-CST-1 OR * FLEX-CST-2 AND • Unit 4 * FLEX-CST-7 OR * FLEX-CST-8	1. Restore required equipment as soon as possible	NA

Applicable when Reactor vessel head removed, AND RWST level higher than RCS level

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one 480V FLEX connection capable of supplying at least one available charging pump, one available boric acid pump, and both *A1 AND *B1 battery chargers: **# * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *A Load Center OR * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *C Load Center OR * All of the following: • TB8101(TB5877) • *B Load Center OR * All of the following: • TB8101(TB5877) • *D Load Center	1. Restore required equipment as soon as possible.	N/A

** Load center cross-tie may be credited when assessing capabilities

*A1/*B1 battery chargers NOT required if *A2/*B2 battery chargers, and FLEX capability to power opposite unit D MCC available

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function	Required Equipment	Contingency Action	Color Code
Decay Heat Removal	Two RHR Pumps	1. Take immediate action to repair the failed pump. 2. Go to 3/4-ONOP-050, Loss of RHR, for loss of RHR. 3. Maintain Reactor Cavity level greater than 23 feet above the vessel flange. 4. Maintain RCS temperature as low a possible. 5. Suspend any activities that would risk the remaining RHR, ICW, or CCW Pumps; EDG; and 4 kV Bus. 6. Upon loss of both pumps, initiate actions to establish containment closure except for the equipment hatch. 7. Verify that the equipment hatch can be closed within the time frame specified in Enclosure 13. Station the necessary personnel at the hatch with direct communications to the OATC.	1 – YELLOW 0 - RED
	Two RHR Heat Exchangers	1. Take action as described for RHR Pumps.	1 – YELLOW 0 - RED
	Two CCW Pumps	1. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 2. Carry out other actions per RHR pumps above.	1 – YELLOW 0 – RED

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function	Required Equipment	Contingency Action	Color Code
Decay Heat Removal (Cont'd)	Two CCW Heat Exchangers	1. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 2. Take action to restore the unavailable component to service. 3. Take other actions as described for RHR Pumps.	1 – ORANGE 0 - RED
	Two ICW Pumps	1. Go to 3/4-ONOP-019, Intake Cooling Water Malfunction, for loss of ICW. 2. Suspend activities that may risk the remaining ICW Pumps. 3. CCW cross-tie to the other unit may be appropriate. 4. Notify Work Controls Manager, Operations Manager, Maintenance Manager, and Plant Managers.	1 – YELLOW 0 - RED
	Two ICW Headers	1. Verify that at least two ICW pumps **AND** two CCW heat exchangers are aligned to the remaining ICW header. 2. Prior to removing an ICW header from service, verify that the basket strainer associated with the remaining header is clean. 3. Have a contingency plan, with responsible individuals designated, in place to restore the header to service.	1 – YELLOW 0 – RED

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function	Required Equipment	Contingency Action	Color Code
Inventory Control	Two Charging ** Pumps (one with an available EDG power source).	1. Initiate action to repair the unavailable charging pump. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of two HHSI Pumps with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS. 4. Do **NOT** reduce RCS Inventory; if possible, take action to maximize RCS Inventory. 5. Maintain RCS temperature as low as possible. 6. Suspend activities that would place any remaining charging pump and its power supply at risk.	1 – YELLOW 0 - ORANGE
	Flowpath from the charging pump to the RCS (Regen HX or RCP seals) and suction capability from BAST or RWST **	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of two HHSI Pumps with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS.	0- ORANGE 0 – RED if no HHSI flowpath
	One of four Primary Water Pump	1. Initiate action to repair the unavailable component. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify capability to cross connect Primary Water from opposite unit. 4. Verify the availability of the charging pump suction from the RWST.	0 – YELLOW

** FLEX support equipment

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function	Required Equipment	Contingency Action	Color Code
Inventory Control (Cont'd)	Two of four Boric Acid Pumps **	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of the charging pump suction from the RWST. 4. Verify the availability of two HHSI pumps with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS.	1 – YELLOW 0 – ORANGE
	Two of four HHSI Pumps each with an emergency power supply **AND** suction capability from an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS.	1. Initiate action to restore the unavailable components. 2. Verify the availability of at least two charging pumps. 3. Maximize RCS Inventory. 4. Maintain RCS temperature as low as possible. 5. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 – YELLOW 0 – ORANGE
On-Site and Off-Site Power	Two Transformers capable of powering A or B 4 kV Bus * • Startup • AUX on backfeed • Opposite unit startup transformer to A Bus • One C Bus transformer to **A** or **B** Bus	1. Go to 3/4-ONOP-004, Loss of Off-Site Power, for loss of off-site power. 2. Go to 3/4-ONOP-092.3, Startup Transformer Malfunction, for S/U transformer malfunction. 3. Initiate actions to return the required transformer to service. 4. Verify the availability of both EDGs. 5. Verify the availability of the station blackout tie. 6. Suspend activities that would risk the remaining power supplies. 7. Verify the availability of one C Bus to power A or B 4 kV Bus 8. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 XFMR with SBO tie - YELLOW 1 XFMR without SBO tie - ORANGE 0 XFMR - RED

* Reference Step 5.1.1.29
** FLEX support equipment

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function	Required Equipment	Contingency Action	Color Code
On-Site and Off-Site Power (Cont'd)	A, B **AND** D 4 kV Busses	1. Except during refueling outage, scheduled bus outages (one bus at a time), take action to restore the out-of-service components. Go to the appropriate procedure below: 3/4-ONOP-004.2, Loss of A 4 kV Bus 3/4-ONOP-004.3, Loss of B 4 kV Bus 3/4-ONOP-004.5, Loss of D 4 kV Bus 2. Verify at least two on-site sources of AC power are available. 3. For loss of off-site power go to 3/4-ONOP-004, Loss of Off-Site Power. 4. With A, B, or D 4 kV Busses unavailable, verify the ability to power A or B Bus from one C Bus transformer. 5. With D 4 kV Bus unavailable, maintain both associated unit EDGs available.	2 – YELLOW Loss of D Bus **AND** A or B - ORANGE Loss of A **AND** B Busses - RED
	Two Emergency Diesel Generators on the Associated Unit	1. Take action to restore the unavailable EDG to service. 2. Suspend activities that may risk the Off-Site power sources. 3. Verify availability of the station blackout tie. 4. Verify the ability to power A or B Bus from one C Bus transformer.	1 – YELLOW 0 - ORANGE
	Station Blackout Tie	1. Verify availability of both associated unit EDGs. 2. Suspend activities that may risk the off-site power supplies. 3. Verify the ability to power A or B Bus from one C Bus transformer.	0 w/ C Bus tie – YELLOW 0 - w/ Opposite Unit SU Xfmr - YELLOW 0 w/o: • C Bus tie **AND** • Opposite unit SU XFMR - ORANGE

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function	Required Equipment	Contingency Action	Color Code
Reactivity Control	C_B > Required Refueling C_B	1. Take actions to increase boron concentration (C_B). 2. Suspend core alterations if in progress until C_B > Required Refueling C_B 3. Verify no primary water additions to the refueling cavity in progress.	RED if < Required Refueling C_B
Shutdown Monitoring Instrumentation	Two of four Source Range Instruments One with Audible Count Rate	1. Take action to restore the failed components. 2. Suspend activities that could reduce the available Shutdown Margin. 3. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1/4 - WHITE 0/4 - YELLOW Audible CR may be inoperable if no fuel movement in progress
	ARMS Channels: Three Inside Containment	1. Take action to restore the failed components. 2. Install temporary monitoring equipment in the affected area. 3. Suspend activities that may increase radiation levels in the affected area.	Loss of one or more - WHITE
	PRMS Channels: R-11, R-12, R-14, or RAD-6304	1. Take action to secure releases via the unmonitored pathway **OR** take action to continue releases as allowed by Technical Specifications. 2. Consider installation of temporary monitoring equipment.	Loss of one or more - WHITE
	One Channel of Containment Water Level Indication	1. Take action to restore one channel to service as soon as possible.	0 - WHITE
	Two Channels of Containment Sump Level Indication	1. Restore two channels to service as soon as possible. 2. Suspend activities that may result in increased sump level. 3. Verify that any temporary drain hoses are **NOT** resulting in loss of RCS Inventory at least once per shift.	1 – WHITE 0 - YELLOW

In containment, one at a time may be OOS for calibration.

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function / Support Equipment	Required Equipment	Contingency Action	Color Code
Containment Closure	Equipment Hatch (capable of being closed with (1) a minimum of 4 bolts or (2) the fast-closure rollup door in accordance with Enclosure 13)*	1. Suspend activities that risk required Decay Heat Removal Equipment. 2. Initiate action to restore the capability to close the hatch in the required time frame. 3. Notify Maintenance, Operations, Work Controls, and Plant Managers.	Required Time Met - GREEN Required Time **NOT** Met, Core Alts **NOT** in Progress (TCN Required) - YELLOW Required Time **NOT** Met, During Core Alts - ORANGE
	Personnel Hatch (capable of being closed in accordance with Enclosure 13)*	1. Suspend activities that risk required Decay Heat Removal Equipment. 2. Initiate action to restore the capability to close the hatch in the required time frame. 3. Notify Maintenance, Operations, Work Controls, and Plant Managers.	
	Containment Penetrations (At least one valve in each penetration that is **NOT** pressurized should be kept closed or capable of being closed in accordance with Enclosure 13) Exceptions may be taken under administrative controls for testing, surveillance, and maintenance.	1. If an exception is taken **AND** at least one valve in the penetration is capable of closure, either manually from the Control Room or locally, the penetration shall be logged on Attachment 3. The log entry shall identify the actions necessary to close the penetration. 2. If an exception is taken **AND** the penetration is **NOT** capable of being closed by at least one valve, a **TCN** with a contingency plan to achieve closure is required PRIOR to authorizing work on the penetration. 3. Initiate action to restore closure capability. 4. Suspend activities that would risk required Decay Heat Removal Equipment. 5. Notify Maintenance, Operations, Work Controls, and Plant Managers.	

* Capability includes provisions for the unavailability of AC power and environmental conditions expected.

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

System / Support Equipment	Required Equipment	Contingency Action	Color Code
Risk Significant Equipment	One Auxiliary Building Exhaust Fan	1. **IF** out-of-service time is to exceed 119 hours, **THEN** notify Work Controls Manager and Plant Managers. 2. Assess the impact on the operating unit. 3. Assess the impact on the running RHR pump.	0 - YELLOW
	One Diesel Driven Instrument Air Compressor **AND** the Instrument Air Cross Tie Lines	1. Verify the availability of a portable Instrument Air Compressor. 2. Verify the availability of the Instrument Air Cross Tie. 3. **IF** out-of-service time is to exceed 548 hours, **THEN** notify Work Controls Manager and Plant Managers. 4. Assess the impact on the operating unit.	0 – YELLOW
	Vital DC Room HVAC - two of three units required E16D, E16E, E16F	1. Monitor temperature in the Inverter and DC Equipment Rooms. 2. Install portable fans or verify availability of portable fans. 3. Assess the impact on the operating unit.	1 – WHITE 0 – YELLOW
	One Service Water Pump	1. Assess the impact on the operating unit.	0 - WHITE

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

System	Required Equipment	Contingency Action	Color Code
Spent Fuel Cooling - (N/A if the reactor core is fully loaded)	SFP Cooling Pump A and B	1. Take immediate action to repair the failed pump(s). 2. Establish Emergency SFP Cooling Pump operation per 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction. 3. Notify Operations, Work Controls, Maintenance, and Plant Managers. 4. Monitor Spent Fuel Pool temperature and level frequently. 5. Suspend any activities that would risk remaining equipment required (ICW, CCW, Electrical, Makeup). 6. Go to 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction. 7. Consider returning fuel assemblies from the SFP back to the reactor.	1 – ORANGE 0 - RED
	SFP Heat Exchangers A and B	1. Take immediate action to restore the affected heat exchanger(s). 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Monitor Spent Fuel Pool temperature and level frequently. 4. Go to 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction. 5. Consider aligning temporary cooling (such as Containment Chillers) to the B SFP Heat Exchanger. 6. Consider returning fuel assemblies from the SFP back to the reactor.	1 – YELLOW 0 – ORANGE
	SFP Exhaust Fan	1. Initiate action to restore exhaust fan to service. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Suspend any activities that would risk Spent Fuel Pool Cooling capabilities.	0 – WHITE
	SFP Heat Exchanger Room Ventilation Fan	1. Initiate action to restore ventilation fan to service. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Suspend any activities that would risk Spent Fuel Pool Cooling capabilities. 4. Consider aligning temporary ventilation to maintain room temperature below design temperature of 104°F.	0 - YELLOW

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**MINIMUM REQUIRED EQUIPMENT, PHASE I,
LARGE DECAY HEAT LOAD AND REACTOR CAVITY
FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE**

System / Support Equipment	Required Equipment	Contingency Action	Color Code
Spent Fuel Cooling - (Cont'd) (N/A if the reactor core is fully loaded)	C 480 Volt Load Center # and Opposite Unit B 480 Volt Load Center	1. Initiate actions to restore power to affected load center(s). 2. Notify Operations, Maintenance, Work Controls, and Plant Managers. 3. Verify the ability to power the Emergency SFP Cooling Pump IAW 3-NOP-033 / 4-OP-033, Spent Fuel Pit Cooling System. 4. Monitor SFP temperature and level frequently. 5. Go to 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction. 6. Consider returning fuel assemblies from the SFP back to the reactor.	1- De-Energized - ORANGE * Both De-Energized - RED **
SFP Water Makeup Sources (N/A if the reactor core is fully loaded)	Two of following water sources: - RWST and RWST purification pump - PWT and PW pump - CVS Holdup Tank and Recirc Pump	1. Initiate actions to restore SFP makeup source in accordance with 3-NOP-033 / 4-OP-033, Spent Fuel Pit Cooling System. 2. Consider Fire Protection System and dual hose station. 3. Notify Operations, Maintenance, Work Controls, and Plant Managers. 4. Monitor SFP level and temperature frequently. 5. Suspend all activities that would risk spent fuel cooling capabilities.	1 – YELLOW 0 – ORANGE
SFP Monitoring Instrumentation (N/A if the reactor core is fully loaded)	One Channel of SFP Level Indication	1. Initiate action to restore at least one SFP Level Indication to service. 2. Establish Compensatory Action to locally monitor SFP Level.	0 - WHITE
	ARMS Channels: One in SFP Area	1. Initiate action to restore at least one ARMS Channel to service. 2. Contact RP to commence periodic monitoring of SFP radiation levels. 3. Consider having RP install alternative radiation monitoring equipment in SFP area.	0 - WHITE

* YELLOW - If Alternate Power available to pump affected by de-energized Load Center.
** ORANGE - If Alternate Power available to one pump.
\# FLEX support equipment

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

System / Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment	At least one SG with ALL of the following:** • SG level > 70% WR OR > 0% NR • Steam Dump to Atmosphere Valve unisolated w/Control Room OR local control • Secondary shell side intact • Functional AFW FCV w/Control Room OR local control	1. Restore required equipment as soon as possible.	N/A
	At least one AFW Pump**	1. Restore required equipment as soon as possible.	N/A
	At least one AFW FLEX connection** * AFPD-004 OR * AFPD-005	1. Restore required equipment as soon as possible.	N/A
	At least one AFW Steam Supply Flowpath to the available AFW pump from either unit**	1. Restore required equipment as soon as possible.	N/A
	Available flowpath from available AFW pump to available SG**	1. Restore required equipment as soon as possible.	N/A
	Available flowpath from available AFW FLEX connection to available SG**	1. Restore required equipment as soon as possible.	N/A
	1 CST with > 210,000 gal and an avail flowpath to the avail AFW pump**	1. Restore required equipment as soon as possible.	N/A

** Applicable when upper internals installed
The personnel airlock is the only acceptable vent path during a hurricane event

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

System / Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one of the following containment vent paths open, or capable of being opened: # * Both Personnel Hatch Airlock Doors open * Both Emergency Escape Hatch Airlock Doors open * Equipment Hatch open AND associated Equipment Hatch Fast Closure Door open	1. Restore required equipment as soon as possible.	N/A

** Applicable when upper internals installed
The personnel airlock is the only acceptable vent path during a hurricane event

ENCLOSURE 3
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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

System / Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	CVCS Blender FLEX PW connection, *- 370, AND a flowpath to charging pump suction	1. Restore required equipment as soon as possible.	N/A
	At least one CST FLEX connection on each unit's CST: ## • Unit 3 * FLEX-CST-1 OR * FLEX-CST-2 AND • Unit 4 * FLEX-CST-7 OR * FLEX-CST-8	1. Restore required equipment as soon as possible.	N/A

** Load center cross-tie may be credited when assessing capabilities

*A1/*B1 battery chargers NOT required if *A2/*B2 battery chargers, and FLEX capability to power opposite unit D MCC available

Applicable when upper internals installed

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MINIMUM REQUIRED EQUIPMENT, PHASE I, LARGE DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

System / Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one 480V FLEX connection capable of supplying at least one available charging pump, one available boric acid pump, and both *A1 AND *B1 battery chargers: **# * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *A Load Center OR * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *C Load Center OR * All of the following: • TB8101(TB5877) • *B Load Center OR * All of the following: • TB8101(TB5877) • *D Load Center	1. Restore required equipment as soon as possible.	N/A

** Load center cross-tie may be credited when assessing capabilities

*A1/*B1 battery chargers NOT required if *A2/*B2 battery chargers, and FLEX capability to power opposite unit D MCC available

Applicable when upper internals installed

ENCLOSURE 4
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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function	Required Equipment	Contingency Action	Color Code
Decay Heat Removal	Two RHR Pumps	1. Take immediate action to repair the failed pump. 2. Go to 3/4-ONOP-050, Loss of RHR, for loss of RHR. 3. Maintain Reactor Cavity level greater than 23 feet above the vessel flange. 4. Maintain RCS temperature as low as possible. 5. Suspend any activities that would risk the remaining RHR, ICW, or CCW Pumps; EDG; and 4 kV Bus. 6. Upon loss of both pumps, initiate actions to establish containment closure except for the equipment hatch. 7. Verify that the equipment hatch can be closed within the time frame specified in Enclosure 13. Station the necessary personnel at the hatch with direct communications to the OATC.	1 – YELLOW 0 - RED
	Two RHR Heat Exchangers	1. Take action as described for RHR Pumps.	1 – YELLOW 0 - RED
	Two CCW Pumps	1. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 2. Carry out other actions per RHR pumps above.	1 – YELLOW 0 - RED

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function	Required Equipment	Contingency Action	Color Code
Decay Heat Removal (Cont'd)	Two CCW Heat Exchangers	1. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 2. Take action to restore the unavailable component to service. 3. Take other actions as described for RHR Pumps. 4. With only one CCW Heat Exchanger available, suspend activities that would risk the remaining heat exchanger.	1 – YELLOW 0 - RED
	Two ICW Pumps	1. Go to 3/4-ONOP-019, Intake Cooling Water Malfunction, for loss of ICW. 2. Suspend activities that may risk the remaining ICW Pumps. 3. CCW cross-tie to the other unit may be appropriate. 4. Notify Work Controls Manager, Operations Manager, Maintenance Manager, and Plant Managers.	1 – YELLOW 0 - RED
	One ICW Header	1. Obtain Operations and Plant Manager permission prior to removing an ICW Header from service. 2. Verify one ICW pump **AND** one CCW Heat Exchanger are aligned to the functional header. 3. Verify functional header basket strainer is clean. 4. Initiate actions to restore at least one header to functional status. 5. Take actions as described for ICW Pump.	0 - RED

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function	Required Equipment	Contingency Action	Color Code
Inventory Control	One Charging ** Pump (one with an available EDG power source)	1. Initiate action to repair the unavailable charging pump. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of one HHSI Pump with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS. 4. Do **NOT** reduce RCS Inventory; if possible, take action to maximize RCS Inventory. 5. Maintain RCS temperature as low as possible.	0 – ORANGE
	Flowpath from the charging pump to the RCS (Regen HX or RCP seals) **AND** suction capability from the BAST or RWST **	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of one HHSI Pump with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS.	0 – ORANGE 0 – RED if no HHSI flowpath
	One of four Primary Water Pumps	1. Initiate action to repair the unavailable component. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify capability to cross connect Primary Water from opposite unit. 4. Verify the availability of the charging pump suction from the RWST.	0 - YELLOW
	One of four Boric Acid Pumps **	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of the charging pump suction from the RWST. 4. Verify the availability of one HHSI pump with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS.	0 - ORANGE

** FLEX support equipment

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function	Required Equipment	Contingency Action	Color Code
Inventory Control (Cont'd)	One of four HHSI Pumps each with an emergency power supply **AND** suction capability from an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS.	1. Initiate action to restore the unavailable components. 2. Verify the availability of at least one charging pump. 3. Maximize RCS Inventory. 4. Maintain RCS temperature as low as possible. 5. Notify Operations, Work Controls, Maintenance, and Plant Managers.	0 – YELLOW
On-Site and Off-Site Power	Two of the below listed Transformers capable of powering the A or B 4 kV Bus * • Startup • AUX on backfeed • Opposite unit startup transformer to A Bus • One C Bus transformer to A or B Bus	1. Go to 3/4-ONOP-004, Loss of Off-Site Power, for loss of off-site power. 2. Go to 3/4-ONOP-092.3, Startup Transformer Malfunction, for S/U transformer malfunction. 3. Initiate actions to return the required transformer to service. 4. Verify the availability of both EDGs. 5. Verify the availability of the station blackout tie. 6. Suspend activities that would risk the remaining power supplies. 7. Verify the availability of one C Bus to power A or B 4 kV Bus. 8. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 XFMR with SBO tie - YELLOW 1 XFMR without SBO tie - ORANGE 0 XFMR - RED

* Reference Step 5.1.1.29

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function	Required Equipment	Contingency Action	Color Code
On-Site and Off-Site Power (Cont'd)	A, B, and D 4 kV Busses	1. Except during refueling outage, scheduled bus outages (one bus at a time), take action to restore the out-of-service components. Go to appropriate procedure below: 3/4-ONOP-004.2, LOSS OF A 4 kV BUS 3/4-ONOP-004.3, LOSS OF B 4 kV BUS 3/4-ONOP-004.5, LOSS OF D 4 kV BUS 2. Verify at least two on-site sources of AC power are available. 3. For loss of off-site power go to 3/4-ONOP-004, Loss of Off-Site Power. 4. With A, B, or D 4 kV Busses unavailable, verify the ability to power A or B Bus from one C Bus transformer. 5. With D 4 kV Bus unavailable, maintain both associated unit EDGs available.	2 – YELLOW Loss of D Bus **AND** A or B Busses - ORANGE Loss of A **AND** B Busses - RED
	One Emergency Diesel Generator on the Associated Unit	1. Take action to restore the unavailable EDG to service. 2. Suspend activities that may risk the off-site power sources. 3. Verify availability of the station blackout tie. 4. Verify the ability to power A or B Bus from one C Bus transformer.	0 - ORANGE
	Station Blackout Tie	1. Verify availability of both associated unit EDGs. 2. Suspend activities that may risk the off-site power supplies. 3. Verify the ability to power A or B Bus from one C Bus transformer.	0 w/ C bus tie –YELLOW 0 - w/ Opposite Unit SU Xfmr - YELLOW 0 w/o: • C Bus tie **AND** • Opposite unit SU XFMR - ORANGE

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function	Required Equipment	Contingency Action	Color Code
Reactivity Control	C_B > Required Refueling C_B	1. Take action to increase boron concentration (C_B) to > Required Refueling C_B. 2. Suspend core alterations until C_B > Required Refueling C_B. 3. Verify no primary water additions to the refueling cavity in progress.	RED if C_B < Required Refueling C_B
Shutdown Monitoring Instrumentation	Two of four Source Range Instruments One w/ Audible Count Rate	1. Take action to restore the failed components. 2. Suspend activities that could reduce the available Shutdown Margin. 3. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1/4 - WHITE 0/4 – YELLOW Audible CR may be inoperable if no fuel movement.
	ARMS Channels: Three Inside Containment	1. Take action to restore the failed components. 2. Install temporary monitoring equipment in the affected area. 3. Suspend activities that may increase radiation levels in the affected area.	Loss of 1 or more - WHITE
	PRMS Channels: R-11, R-12, R-14, or RAD-6304	1. Take action to secure releases via the unmonitored pathway <u>OR</u> take action to continue releases as allowed by Technical Specifications. 2. Consider installation of temporary monitoring equipment.	Loss of 1 or more - WHITE
	One Channel of Containment Water Level Indication	1. Take action to restore one channel to service as soon as possible.	0 – WHITE
	Two Channels of Containment Sump Level Indication	1. Restore two channels to service as soon as possible. 2. Suspend activities that may result in increased sump level. 3. Verify that any temporary drain hoses are <u>**NOT**</u> resulting in loss of RCS Inventory at least once per shift.	1 – WHITE 0 - YELLOW

\# In containment, one at a time may be OOS for calibration.

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

Function / Support Equipment	Required Equipment	Contingency Action	Color Code
Containment Closure	Equipment Hatch (capable of being closed with (1) a minimum of 4 bolts or (2) the fast-closure rollup door in accordance with Enclosure 13) *	1. Suspend activities that risk required Decay Heat Removal Equipment. 2. Initiate action to restore the capability to close the hatch in the required time frame. 3. Notify Maintenance, Operations, Work Controls, and Plant Managers.	Required Time Met - GREEN Required Time **NOT** Met, Core Alts **NOT** in Progress (TCN Required) - YELLOW Required Time **NOT** Met, During Core Alts - ORANGE
	Personnel Hatch (capable of being closed in accordance with Enclosure 13) *	1. Suspend activities that risk required Decay Heat Removal Equipment. 2. Initiate action to restore the capability to close the hatch in the required time frame. 3. Notify Maintenance, Operations, Work Controls, and Plant Managers.	
	Containment Penetrations (At least one valve in each penetration that is **NOT** pressurized should be kept closed or capable of being closed in accordance with Enclosure 13.) Exceptions may be taken under administrative controls for testing, surveillance, and maintenance.	1. If an exception is taken **AND** at least one valve in the penetration is capable of closure, either manually from the Control Room or locally, the penetration shall be logged on Attachment 3. The log entry shall identify the actions necessary to close the penetration. 2. If an exception is taken **AND** the penetration is **NOT** capable of being closed by at least one valve, a **TCN** with a contingency plan to achieve closure is required PRIOR to authorizing work on the penetration. 3. Initiate action to restore closure capability. 4. Suspend activities that would risk required Decay Heat Removal Equipment. 5. Notify Maintenance, Operations, Work Controls, and Plant Managers.	
Risk Significant Equipment	One Auxiliary Building Exhaust Fan	1. **IF** out-of-service time is to exceed 119 hours, **THEN** notify Work Controls Manager and Plant Managers. 2. Assess the impact on the operating unit. 3. Assess the impact on the running RHR pump.	0 - YELLOW

* Capability includes provisions for unavailability of AC power and environmental conditions expected.

ENCLOSURE 4

MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

System / Support Equipment	Required Equipment	Contingency Action	Color Code
Risk Significant Equipment (Cont'd)	One Diesel Driven Instrument Air Compressor **AND** the Instrument Air Cross Tie Lines	1. Verify the availability of a portable Instrument Air Compressor. 2. Verify the availability of the Instrument Air Cross Tie. 3. **IF** out-of-service time is to exceed 548 hours, **THEN** notify Work Controls Manager and Plant Managers. 4. Assess the impact on the operating unit.	0 – YELLOW
	Vital DC Room HVAC - Two of three units required E16D E16E E16F	1. Monitor temperature in the Inverter and DC Equipment Rooms. 2. Install portable fans or verify availability of portable fans. 3. Assess the impact on the operating unit.	1 – WHITE 0 - YELLOW
	One Service Pump	1. Assess the impact on the operating unit.	0 – WHITE

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

System	Required Equipment	Contingency Action	Color Code
Spent Fuel Cooling - (N/A if the reactor core is fully loaded)	SFP Cooling Pump A and B	1. Take immediate action to repair the failed pump(s). 2. Establish Emergency SFP Cooling Pump operation per 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction. 3. Notify Operations, Work Controls, Maintenance, and Plant Managers. 4. Monitor Spent Fuel Pool temperature and level frequently. 5. Suspend any activities that would risk remaining equipment required (ICW, CCW, Electrical, Makeup). 6. Go to 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction. 7. Consider returning fuel assemblies from the SFP back to the reactor.	1 – YELLOW 0 – ORANGE
	SFP Heat Exchangers A and B	1. Take immediate action to restore the affected Heat Exchanger(s). 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Monitor Spent Fuel Pool temperature and level frequently. 4. Go to 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction. 5. Consider aligning temporary cooling (such as Containment Chillers) to the B SFP Heat Exchanger. 6. Consider returning fuel assemblies from the SFP back to the reactor.	1 – YELLOW 0 – ORANGE
	SFP Exhaust Fan	1. Initiate action to restore exhaust fan to service. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Suspend any activities that would risk Spent Fuel Pool Cooling capabilities.	0 – WHITE
	SFP Heat Exchanger Room Ventilation Fan	1. Initiate action to restore ventilation fan to service. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Suspend any activities that would risk Spent Fuel Pool Cooling capabilities. 4. Consider aligning temporary ventilation to maintain room temperature below design temperature of 104°F.	0 - YELLOW

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

System / Support Equipment	Contingency Action	Contingency Action	Color Code
Spent Fuel Cooling - (Cont'd) (N/A if the reactor core is fully loaded)	C 480 Volt Load Center ** and Opposite Unit B 480 Volt Load Center	1. Initiate actions to restore power to affected load center(s). 2. Notify Operations, Maintenance, Work Controls, and Plant Managers. 3. Verify the ability to power the Emergency SFP Cooling Pump IAW 3/4-NOP-033, Spent Fuel Pit Cooling System. 4. Monitor SFP temperature and level frequently. 5. Go to 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction. 6. Consider returning fuel assemblies from the SFP back to the reactor.	1- De-Energized - YELLOW Both - De-Energized - ORANGE *
SFP Water Makeup Sources (N/A if the reactor core is fully loaded)	Two of the following water sources: - RWST and RWST purification pump - PWT and PW pump - CVS Holdup Tank and Recirc Pump	1. Initiate actions to restore SFP makeup source in accordance with 3/4–NOP-033, Spent Fuel Pit Cooling System. 2. Consider Fire Protection System and dual hose station. 3. Notify Operations, Maintenance, Work Controls, and Plant Managers. 4. Monitor SFP level and temperature frequently. 5. Suspend all activities that would risk spent fuel cooling capabilities.	1 or less – YELLOW
SFP Monitoring Instrumentation (N/A if the reactor core is fully loaded)	One Channel of SFP Level Indication	1. Initiate action to restore at least one SFP Level Indication to service. 2. Establish Compensatory Action to locally monitor SFP Level.	0 - WHITE
	ARMS Channels: One in SFP Area	1. Initiate action to restore at least one ARMS Channel to service. 2. Contact RP to commence periodic monitoring of SFP radiation levels. 3. Consider having RP install alternative radiation monitoring equipment in the SFP Area.	0 - WHITE

* YELLOW - If Alternate Power available to one pump.
** FLEX support equipment

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

System / Support Equipment	Contingency Action	Contingency Action	Color Code
FLEX Support Equipment	At least one SG with ALL of the following:** • SG level > 70% WR OR > 0% NR • Steam Dump to Atmosphere Valve unisolated w/Control Room OR local control • Secondary shell side intact • Functional AFW FCV w/Control Room OR local control	1. Restore required equipment as soon as possible.	N/A
	At least one AFW Pump**	1. Restore required equipment as soon as possible.	N/A
	At least one AFW FLEX connection** * AFPD-004 OR * AFPD-005	1. Restore required equipment as soon as possible.	N/A
	At least one AFW Steam Supply Flowpath to the available AFW pump from either unit**	1. Restore required equipment as soon as possible.	N/A
	Available flowpath from available AFW pump to available SG**	1. Restore required equipment as soon as possible.	N/A
	Available flowpath from available AFW FLEX connection to available SG**	1. Restore required equipment as soon as possible.	N/A

** Applicable when upper internals installed
The personnel airlock is the only acceptable vent path during a hurricane event

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

System / Support Equipment	Contingency Action	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	1 CST with > 210,000 gal and an avail flowpath to the avail AFW pump**	1. Restore required equipment as soon as possible.	N/A
	At least one of the following containment vent paths open, or capable of being opened:# * Both Personnel Hatch Airlock Doors open * Both Emergency Escape Hatch Airlock Doors open * Equipment Hatch open AND associated Equipment Hatch Fast Closure Door open	1. Restore required equipment as soon as possible.	N/A

** Applicable when upper internals installed
The personnel airlock is the only acceptable vent path during a hurricane event

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND REACTOR CAVITY FLOODED GREATER THAN 23 FEET ABOVE THE VESSEL FLANGE

System / Support Equipment	Contingency Action	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	CVCS Blender FLEX PW connection, *- 370, AND a flowpath to charging pump suction	1. Restore required equipment as soon as possible.	N/A
	At least one CST FLEX connection on each unit's CST: ## • Unit 3 * FLEX-CST-1 OR * FLEX-CST-2 AND • Unit 4 * FLEX-CST-7 OR * FLEX-CST-8	1. Restore required equipment as soon as possible.	N/A
	At least one 480V FLEX connection capable of supplying at least one available charging pump, one available boric acid pump, and both *A1 AND *B1 battery chargers: **# * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *A Load Center OR * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *C Load Center OR * All of the following: • TB8101(TB5877) • *B Load Center OR * All of the following: • TB8101(TB5877) • *D Load Center	1. Restore required equipment as soon as possible.	

** Load center cross-tie may be credited when assessing capabilities

\# *A1/*B1 battery chargers NOT required if *A2/*B2 battery chargers, and FLEX capability to power opposite unit D MCC available

\## Applicable when upper internals installed

ENCLOSURE 5
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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
Decay Heat Removal	Two RHR Pumps	1. Take immediate action to repair the failed pump. 2. Go to 3/4-ONOP-050, Loss of RHR, for loss of RHR. 3. Establish or maintain Reactor Vessel level higher than three feet below the vessel flange. Maximize RCS Inventory as much as is achievable. 4. Maintain RCS temperature as low as possible. 5. Ensure Feed and Bleed decay heat removal capability, using the HHSI pumps, is available. 6. Suspend any activities that would risk the remaining RHR, ICW, or CCW Pumps; EDG; and 4 kV Bus. 7. Upon loss of both pumps, initiate actions to establish containment closure, except for the equipment hatch. 8. Verify that the equipment hatch can be closed within the time frame to heat up to Mode 4 following a loss of shutdown cooling as predicted using the time to saturation of Figure 2 or Figure 3. Station the necessary personnel at the hatch with direct communications to the OATC. 9. Investigate the possibility of flooding the Reactor Cavity to a height of 23 feet above the Reactor Vessel Flange. 10. **IF** RCS Inventory is at Mid-Loop, **THEN** refer to Figure 5, Time to Core Uncovery from Mid-Loop.	1 – ORANGE 0 - RED
	Two RHR Heat Exchangers	1. Take action as described for RHR Pumps.	1 – ORANGE 0 - RED
	Two CCW Pumps*	1. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 2. Carry out other actions as described per RHR pumps above.	1 – ORANGE 0 - RED

* Powered from independent power sources if RCS level lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
Decay Heat Removal (Cont'd)	Two CCW Heat Exchangers	1. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 2. Take action to restore the unavailable component to service. 3. With only one CCW Heat Exchanger available, suspend operations that would risk the remaining heat exchanger. 4. Take other actions as described for RHR Pumps.	1 – ORANGE 0 - RED
	Two ICW Pumps*	1. Go to 3/4-ONOP-019, Intake Cooling Water Malfunction, for loss of ICW. 2. Suspend activities that may risk the remaining ICW Pumps. 3. CCW cross-tie to the other unit may be appropriate. 4. Notify Work Controls Manager, Operations Manager, Maintenance Manager, and Plant Managers.	1 – ORANGE 0 - RED
	Two ICW Headers	1. Verify that at least two ICW pumps **<u>AND</u>** two CCW Heat Exchangers are aligned to the remaining ICW Header. 2. Prior to removing an ICW Header from service, verify that the basket strainer associated with the remaining header is clean. 3. Have a contingency plan, with responsible individuals designated, in place to restore the header to service.	1 – YELLOW 0 - RED
	Two S/Gs > 70% WR	1. Take action to restore at least one S/G to > 70% WR. 2. Suspend any activities that would risk the remaining RHR, ICW, or CCW Pumps; EDG; and 4Kv Bus.	0 - WHITE

* Powered from independent power sources if RCS level lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
Inventory Control	Two Charging ** Pumps (One with an available EDG power source. Both with an available EDG to meet the requirement below #)	1. Initiate action to repair the unavailable charging pump. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of two HHSI Pumps with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS. 4. Do **NOT** reduce RCS Inventory; if possible, take action to maximize RCS Inventory. 5. Maintain RCS temperature as low as possible. 6. Suspend activities that would place any remaining charging pump and its power supply at risk.	1 – ORANGE 0 - RED
	Flowpath from the charging pump to the RCS (Regen HX or RCP seals) **AND** suction capability from the BAST or RWST **	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of two HHSI Pumps with suction aligned to an RWST with at least 20,000 gallons of water **AND** available flowpath to the RCS.	0 - ORANGE 0 – RED if no HHSI Flowpath
	One of four Primary Water Pumps	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify capability to cross connect Primary Water from the opposite unit. 4. Verify the availability of the charging pump suction from the RWST.	0 – YELLOW
	Two of four Boric Acid Pumps **	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of the charging pump suction from the RWST. 4. Verify the availability of two HHSI pumps with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS.	1 – YELLOW 0 – ORANGE

\# Two charging pumps required with available EDG power source if RCS level is lower than 3 feet below the vessel flange.

[Commitment Step 2.3.1]

** FLEX support equipment

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
Inventory Control (Cont'd)	Two of four HHSI Pumps each with an emergency power supply **AND** suction capability from an RWST with at least 20,000 gallons of water	1. Initiate action to restore the unavailable components. 2. Verify the availability of at least two charging pumps. 3. Maximize RCS Inventory. 4. Maintain RCS temperature as low as possible. 5. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 – YELLOW 0 - ORANGE
	Hot Leg Injection Flowpath*	1. Initiate action to restore the unavailable components. 2. Ensure Cold Leg Injection Flowpath available 3. Verify the availability of at least two charging pumps. 4. Maintain RCS Inventory. 5. Maintain RCS temperature as low as possible.	0 – YELLOW
	RCS Inventory at or above 5% in pressurizer. (Color Code Determination Only)	N/A	YELLOW drained to higher than 3' below flange ORANGE Drained to hot leg mid nozzle
	Alternate RHR Flowpath	1. Initiate action to restore MOV-*-872 or associated flowpath. 2. **IF** power **NOT** available to MOV-*-872, **THEN** designate and operator to be dispatched to locally operate MOV-*-872 when directed by *-ONOP-041.8, Shutdown LOCA (Mode 5 or 6).	0 - WHITE
On-Site and Off-Site Power	Two of the below listed Transformers capable of powering A or B 4 kV Bus • Startup • AUX on backfeed • Opposite unit startup transformer to **A** Bus • Either unit's **C** Bus transformer to **A** or **B** Bus	1. Go to 3/4-ONOP-004, Loss of Off-Site Power, for loss of off-site power. 2. Go to 3/4-ONOP-092.3, Startup Transformer Malfunction, for S/U transformer malfunction. 3. Initiate actions to return the required transformer to service. 4. Verify the availability of both EDGs. 5. Verify the availability of the station blackout tie. 6. Suspend activities that would risk the remaining power supplies. 7. Verify the availability of one C Bus to power A or B 4 kV Bus. 8. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 trf – ORANGE 0 - RED

* Both hot and cold leg injection paths are required if RCS level is lower than 3 feet below the vessel flange.
[Commitment Step – 2.3.1]

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
On-Site and Off-Site Power (Cont'd)	A, B, and D 4 kV Busses	1. Take action to restore the out-of-service components. Go to appropriate procedure below: 3/4-ONOP-004.2, Loss of A 4 kV Bus 3/4-ONOP-004.3, Loss of B 4 kV Bus 3/4-ONOP-004.5, Loss of D 4 kV Bus 2. Verify at least two on-site sources of AC power are available. 3. For loss of Off-Site power go to 3/4-ONOP-004, Loss of Off-Site Power. 4. With A, B, or D 4 kV Busses unavailable, verify the ability to power A or B Bus from one C Bus transformer. 5. With D 4 kV Bus unavailable, maintain both associated unit EDGs available.	Loss of D Bus - YELLOW Loss of A or B Bus – ORANGE 1 - RED
	One Emergency Diesel Generator on the Associated Unit*	1. Take action to restore the unavailable EDG to service. 2. Suspend activities that may risk the off-site power sources. 3. Verify availability of the station blackout tie. 4. Verify the ability to power A or B from one C Bus transformer.	0 - ORANGE
	Station Blackout Tie	1. Verify availability of both associated unit EDGs. 2. Suspend activities that may risk the off-site power supplies. 3. Verify the ability to power A or B from one C Bus transformer.	0 w/ C bus tie – YELLOW 0 - w/ Opposite Unit SU Xfmr - YELLOW 0 w/o: • C Bus tie **AND** • Opposite unit SU XFMR - ORANGE

* Two EDGs required if RCS level lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
Reactivity Control	C_B > 0-OSP-028.8 SDM Calculation for Mode 5, or > Required Refueling C_B for Mode 6	1. Take action to restore boron concentration (C_B) to > 0-OSP-028.8 SDM Calculation, or > Required Refueling C_B as applicable. 2. Verify no primary water additions in progress.	RED if C_B < the required conc
Shutdown Monitoring Instrumentation	Two of Four Source Range Instruments (1 w/ Audible Count Rate in Mode 6)	1. Take action to restore the failed components. 2. Suspend activities that could reduce the available Shutdown Margin. 3. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1/4 - WHITE 0/4 - YELLOW
	ARMS Channels: Three Inside Containment One Spent Fuel Pool #	1. Take action to restore the failed components. 2. Install temporary monitoring equipment in the affected area. 3. Suspend activities that may increase radiation levels in the affected area.	Loss of 1 or more - WHITE
	PRMS Channels: R-11, R-12, R-14 or RAD-6304	1. Take action to secure releases via the unmonitored pathway **<u>OR</u>** take action to continue releases as allowed by Technical Specifications. 2. Consider installation of temporary monitoring equipment.	Loss of 1 or more - WHITE
	2 Core Exit Thermocouples (Required when the reactor vessel head is fully tensioned.)*	1. Arrange with I&C for alternate readouts or monitoring of CETs if possible. 2. Verify that two channels of wide range T_{HOT} are available. 3. Maintain RCS greater than 10 percent Wide Range Pressurizer Level.	0 – YELLOW
	One Channel of Reactor Vessel Level HJTC (QSPDS) (Required when the reactor vessel head is fully tensioned.)	1. Take action to restore at least one channel as soon as possible. 2. Maximize RCS Inventory as much as is allowed by plant conditions. 3. Maintain RCS greater than 10 percent Wide Range Pressurizer Level. 4. If OOS as part of reactor disassembly, verify two channels of the reactor vessel draindown level indication available, one with Control Room readout. If <2 channels available, maintain RCS level higher than 3 feet below the vessel flange.	0 – WHITE

* A minimum of two (2) CETs are required whenever RCS level is lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

\# One at a time may be OOS for calibration.

ENCLOSURE 5

MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Function	Required Equipment	Contingency Action	Color Code
Shutdown Monitoring Instrumentation (Cont'd)	One Channel of Containment Water Level Indication	1. Take action to restore one channel to service as soon as possible.	0 - WHITE
	Two Channels of Containment Sump Level Indication	1. Restore two channels to service as soon as possible. 2. Suspend activities that may result in increased sump level. 3. Verify that any temporary drain hoses are **NOT** resulting in loss of RCS Inventory at least once per shift.	1 – WHITE 0 - YELLOW
	One Pressurizer Cold Calibrated Level Indication **	1. Suspend activities which may result in RCS Inventory loss. 2. Monitor temporary drain hoses for loss of RCS Inventory at least once per shift. 3. Consider installation of a temporary level hose as appropriate for plant conditions.	0 - WHITE
	RCS Pressure Instruments PT-402, PT-403, and PT-405	1. Verify sufficient OMS trains are still available. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers.	0 – WHITE
	RCS Wide Range T_{HOT} and T_{COLD}: At least one channel per loop	1. Verify the availability of two CETs. 2. Verify that OMS controls are **NOT** affected by the unavailable channel.	None –WHITE
	Reactor Vessel Draindown Level Indication: Two of three channels available, (includes level hose) one with Control Room indication*#	1. Maintain RCS level higher than 3 feet below the vessel flange. 2. Do **NOT** reduce RCS Inventory until two channels are available. 3. Investigate the possibility of verifying Reactor Vessel Level via some other means, (i.e., level hose or QSPDS).	1 available – YELLOW 0 – ORANGE requires Control Room Indication

* The level hose and both draindown level indicators are required for RCS level lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

** If RCS level is on scale in reactor vessel draindown instruments, then pressurizer cold calibrated level instrument is not required.

\# If pressurizer cold calibrated level indication is greater than 10%, then reactor vessel draindown level indication is not required.

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Function / Support Equipment	Required Equipment	Contingency Action	Color Code
Containment Closure	Equipment Hatch (capable of being closed with (1) a minimum of 4 bolts or (2) the fast-closure rollup door in accordance with Enclosure 13)* +	1. Suspend activities that risk required Decay Heat Removal Equipment. 2. Initiate action to restore the capability to close the hatch in the required time frame. 3. Notify Maintenance, Operations, Work Controls, and Plant Managers.	Required Time Met - GREEN Required Time **NOT** Met (TCN Required) - YELLOW Required Time **NOT** Met During Reduced Inventory - ORANGE
	Personnel Hatch (capable of being closed in accordance with Enclosure 13)* +	1. Suspend activities that risk required Decay Heat Removal Equipment. 2. Initiate action to restore the capability to close the hatch in the required time frame. 3. Notify Maintenance, Operations, Work Controls, and Plant Managers.	
	Containment Penetrations (At least one valve in each penetration that is **NOT** pressurized should be kept closed or capable of being closed in accordance with Enclosure 13) # Exceptions may be taken under administrative controls for testing, surveillance, and maintenance.	1. If an exception is taken **AND** at least one valve in the penetration is capable of closure, either manually from the Control Room or locally, the penetration shall be logged on Attachment 3. The log entry shall identify the actions necessary to close the penetration. 2. If an exception is taken **AND** the penetration is **NOT** capable of being closed by at least one valve, a **TCN** with a contingency plan to achieve closure is required PRIOR to authorizing work on the penetration. 3. If an exception is taken while RCS level is lower than 3' below the vessel flange **AND** the penetration is **NOT** capable of being closed by at least one valve, a TCN with a contingency plan to achieve closure and meet 20 psi containment pressure is required PRIOR to authorizing work on the penetration. 4. Initiate action to restore closure capability. 5. Suspend activities that would risk required Decay Heat Removal Equipment. 6. Notify Maintenance, Operations, Work Controls, and Plant Managers.	

* If RCS level lower than 3 feet below the vessel flange prior to fuel offload, control in accordance with 3/4-NOP-041.09, Reduced Inventory Operations, until RCS level returns above 3 feet below the vessel flange. [Commitment Step – 2.3.1]

\# See Substep 5.1.1.22.c for requirements if RCS level lower than 3 feet below the vessel flange. [Commitment Step – 2.3.1]

\+ Capability includes provisions for unavailability of AC power and environmental conditions expected.

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
Risk Significant Equipment	One Auxiliary Building Exhaust Fan	1. **<u>IF</u>** out-of-service time is to exceed 119 hours, **<u>THEN</u>** notify Work Controls Manager and Plant Managers. 2. Assess the impact on the operating unit. 3. Assess the impact on the running RHR pump.	0 – YELLOW
	One Diesel Driven Instrument Air Compressors and the Instrument Air Cross Tie Lines	1. Verify the availability of a portable Instrument Air Compressor. 2. Verify the availability of the Instrument Air Cross Tie. 3. **<u>IF</u>** out-of-service time is to exceed 548 hours, **<u>THEN</u>** notify Work Controls Manager and Plant Managers. 4. Assess the impact on the operating unit.	0 – YELLOW
	Vital DC Room HVAC - Two of three units required E16D E16E E16F	1. Monitor temperature in the Inverter and DC Equipment Rooms. 2. Install portable fans **<u>OR</u>** verify availability of portable fans. 3. Assess the impact on the operating unit.	1 – WHITE 0 - YELLOW
	One Service Water Pump	1. Assess the impact on the operating unit.	0 – WHITE

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment	At least one SG with ALL of the following: • SG level as required elsewhere in this enclosure • Steam Dump to Atmosphere Valve unisolated w/Control Room OR local control • Secondary shell side intact • Functional AFW FCV w/Control Room OR local control	1. IF the RCS is closed, THEN perform the following: a. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations.# b. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 c. Restore required equipment as soon as possible 2. Otherwise, Restore required equipment as soon as possible.	N/A
	At least one AFW Pump	1. IF the RCS is closed, prestage FLEX Well Pump, and FLEX Piping Skid with associated hoses,in it's FLEX deployment location.# 2. Restore required equipment as soon as possible	N/A
	At least one AFW FLEX connection * AFPD-004 OR * AFPD-005	1. IF at least one AFW Pump not available, AND the RCS is closed, THEN perform the following: a. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations.# b. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 c. Restore required equipment as soon as possible. 2. Otherwise, restore required equipment as soon as possible.	N/A

\# Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg
\+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one AFW Steam Supply Flowpath to the available AFW pump from either unit	1. IF the RCS is closed, prestage FLEX Well Pump, and FLEX Piping Skid with associated hoses,in it's FLEX deployment location.# 2. Restore required equipment as soon as possible	N/A
	Available flowpath from available AFW pump to available SG	1. IF the RCS is closed, THEN perform the following: a. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations.# b. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 c. Restore required equipment as soon as possible 2. Otherwise, Restore required equipment as soon as possible.	N/A

\# Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg
\+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	Available flowpath from available AFW FLEX connection to available SG	1. IF the RCS is closed, THEN perform the following: a. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations.$ b. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 c. Restore required equipment as soon as possible 2. Otherwise, Restore required equipment as soon as possible.	N/A
	At least 1 CST with >210,000 gal and an available flowpath to the avail AFW pump	1. IF the RCS is closed, prestage FLEX Well Pump, and FLEX Piping Skid with associated hoses,in it's FLEX deployment location.$ 2. Restore required equipment as soon as possible	N/A
	At least one of the following containment vent paths open, or capable of being opened:** * Both Personnel Hatch Airlock Doors open * Both Emergency Escape Hatch Airlock Doors open * Equipment Hatch open AND associated Equipment Hatch Fast Closure Door open	1. Restore required equipment as soon as possible.	N/A

** Applicable when either the following is open to Containment atmosphere: The personnel airlock is the only acceptable vent path during a hurricane event.
- The RCS pressure boundary
- The secondary shell side of a S/G that is NOT drained

$ Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg

Applicable when the RCS pressure boundary is open to Containment atmosphere

\+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	FLEX 480V Portable Diesel Generator and associated cables prestaged in FLEX deployment location##	1. Restore required equipment as soon as possible.	N/A
	FLEX Well Pump, FLEX Piping Skid, and associated hoses prestaged in FLEX deployment location##$	1. Restore required equipment as soon as possible.	N/A

** Applicable when either the following is open to Containment atmosphere: The personnel airlock is the only acceptable vent path during a hurricane event.
- The RCS pressure boundary
- The secondary shell side of a S/G that is NOT drained

$ Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg

Applicable when the RCS pressure boundary is open to Containment atmosphere

\+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one RWST gravity feed flowpath:## * All of the following: • MOV-*-864A & B • *-887 • MOV-*-872 OR * All of the following: • MOV-*-864A &B • *-887 • MOV-*-863A OR B • HCV-*-758 • MOV-*-744A OR B OR * All of the following: • MOV-*-864A & B • MOV-*-862A & B • HCV-*-758 • MOV-*-744A OR B OR * All of the following: • MOV-*-864A & B • MOV-*-862A & B • MOV-*-750 & 751	1. Restore required equipment as soon as possible	N/A
	CVCS Blender FLEX PW connection, *- 370, AND a flowpath to charging pump suction	1. Restore required equipment as soon as possible	N/A
	At least one CST FLEX connection on each unit's CST: • Unit 3 * FLEX-CST-1 OR * FLEX-CST-2 AND • Unit 4 * FLEX-CST-7 OR * FLEX-CST-8	1. Restore required equipment as soon as possible	N/A

Applicable when Reactor vessel head removed, AND RWST level higher than RCS level

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITHOUT RCS LOOPS NOT FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one 480V FLEX connection capable of supplying at least one available charging pump, one available boric acid pump, and both *A1 AND *B1 battery chargers: **# * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *A Load Center OR * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *C Load Center OR * All of the following: • TB8101(TB5877) • *B Load Center OR * All of the following: • TB8101(TB5877) • *D Load Center	1. Restore required equipment as soon as possible.	N/A

** Load center cross-tie may be credited when assessing capabilities.
*A1/*B1 battery chargers NOT required if *A2/*B2 battery chargers, and FLEX capability to power opposite unit D MCC available

ENCLOSURE 6
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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
Decay Heat Removal	Two RHR Pumps	1. Take immediate action to repair the failed pump. 2. Go to 3/4-ONOP-050, Loss of RHR, for loss of RHR. 3. Maximize RCS Inventory as much as is achievable. 4. Maintain RCS pressurized to 100 psig to meet loops filled criteria. 5. Maintain RCS temperature as low as possible. 6. Ensure Feed and Bleed decay heat removal capability, using the HHSI pumps, is available. 7. Maintain Decay Heat Removal capability with at least two Steam Generators, including a source of feedwater. 8. Suspend any activities that would risk the remaining RHR, ICW, or CCW Pumps; EDG; and 4 kV Bus. 9. Upon loss of both pumps, initiate actions to establish Containment Closure except for the equipment hatch. 10. Verify that the equipment hatch can be closed within the time frame to heat up to Mode 4 following a loss of shutdown cooling as predicted using the heatup rates of Figure 1. Station the necessary personnel at the hatch with direct communications to the OATC.	1 – YELLOW 0 – RED
	Two RHR Heat Exchangers	1. Take action as described for RHR Pumps.	1 – YELLOW 0 - RED
	Two CCW Pumps	1. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 2. Carry out other actions as described per RHR pumps above.	1 – ORANGE 0 - RED
	Two CCW Heat Exchangers	1. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 2. Take action to restore the unavailable component to service. 3. Take other actions as described for RHR Pumps.	1 – ORANGE 0 - RED

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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
Decay Heat Removal (Cont'd)	Two ICW Pumps	1. Go to 3/4-ONOP-019, Intake Cooling Water Malfunction, for loss of ICW. 2. Suspend activities that may risk the remaining ICW Pumps. 3. CCW cross-tie to the other unit may be appropriate. 4. Notify Work Controls Manager, Operations Manager, Maintenance Manager, and Plant Managers.	1 – ORANGE 0 - RED
	Two ICW Headers	1. Verify at least two ICW pumps **<u>AND</u>** two CCW Heat Exchangers are aligned to the remaining ICW Header. 2. Prior to removing an ICW header from service, verify that the basket strainer associated with the remaining header is clean. 3. Have a contingency plan, with responsible individuals designated, in place to restore the header to service.	1 – YELLOW 0 - RED
	Source of feedwater and a flowpath from one of the following: SGFP SSGFP Condensate PP Condensate Transfer PP SGWL PP	1. Take action to restore the unavailable component. 2. Restrict activities that could potentially threaten RHR	0 - YELLOW
	Two Steam Dump to Atmosphere Valves **	1. Take action to restore the unavailable component. 2. Restrict activities that could potentially threaten RHR	0 - YELLOW
	Two S/Gs > 10% NR	1. Ensure compliance with TS 3.4.1.4.1. 2. Take action to restore at least one S/G to > 10% NR. 3. Restrict activities that could potentially threaten RHR cooling. 4. **<u>IF</u>** at least two S/Gs can **<u>NOT</u>** be restored to > 10% NR within 4 hours, **<u>THEN</u>** transition to Enclosure 5.	0 - WHITE

** FLEX support equipment

ENCLOSURE 6
(Page 3 of 12)

MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
Inventory Control	Two Charging ** Pumps (one with an available EDG power source)	1. Initiate action to repair the unavailable charging pump. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of two HHSI Pumps with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS. 4. Do **NOT** reduce RCS Inventory; if possible, take action to maximize RCS Inventory. 5. Maintain RCS temperature as low as possible. 6. Suspend activities that would place any remaining charging pump and its power supply at risk.	1 – YELLOW 0 - ORANGE
	Flowpath from the charging pump to the RCS (Regen HX or RCP seals) **AND** suction capability from BAST or RWST **	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of two HHSI Pumps with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS.	0 – ORANGE
	One of four Primary Water Pumps	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify capability to cross connect Primary Water from the opposite unit. 4. Verify the availability of the charging pump suction from the RWST.	0 – YELLOW
	One of four Boric Acid Pumps**	1. Initiate action to repair the unavailable components. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Verify the availability of the charging pump suction from the RWST. 4. Verify the availability of two HHSI pumps with suction aligned to an RWST with at least 20,000 gallons of water **AND** an available flowpath to the RCS.	0 - ORANGE

** FLEX support equipment

ENCLOSURE 6
(Page 4 of 12)

MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
Inventory Control (Cont'd)	Two of four HHSI Pumps each with an emergency power supply **AND** suction capability from an RWST with at least 20,000 gallons of water.	1. Initiate action to restore the unavailable components. 2. Verify the availability of at least two charging pumps. 3. Maximize RCS Inventory. 4. Maintain RCS temperature as low as possible. 5. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 – YELLOW 0 - ORANGE
	Hot Leg Injection Flowpath*	1. Initiate action to restore the unavailable components. 2. Ensure Cold Leg Injection Flowpath available. 3. Verify the availability of at least two charging pumps. 4. Maintain RCS Inventory. 5. Maintain RCS temperature as low as possible.	0 - YELLOW
	Alternate RHR Flowpath	1. Initiate action to restore MOV-*-872 or associated flowpath. 2. **IF** power **NOT** available to MOV-*-872, **THEN** designate an operator to be dispatched to locally operate MOV-*-872 when directed by *-ONOP-041.8, Shutdown LOCA (Mode 5 or 6).	0 - WHITE
On-Site and Off-Site Power	Two of the below listed Transformers capable of powering A or B 4 kV Bus * • Startup • AUX on backfeed • Opposite unit Startup Transformer to **A** Bus • Either Unit's C Bus transformer to **A** or **B** Bus	1. Go to 3/4-ONOP-004, Loss of Off-Site Power, for loss of off-site power. 2. Go to 3/4-ONOP-092.3, Startup Transformer Malfunction, for S/U transformer malfunction. 3. Initiate actions to return the required transformer to service. 4. Verify the availability of both EDGs. 5. Verify the availability of the station blackout tie. 6. Suspend activities that would risk the remaining power supplies. 7. Verify the availability of one C Bus to power A or B 4 kV Bus 8. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 XFMR with SBO tie - YELLOW 1 XFMR without SBO tie - ORANGE 0 XFMR - RED

* Reference Step 5.1.1.29

ENCLOSURE 6
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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
On-Site and Off-Site Power (Cont'd)	A, B, and D 4 kV Busses	1. Take action to restore the out-of-service components. Go to appropriate procedure below: 3/4-ONOP-004.2, Loss of A 4 kV Bus 3/4-ONOP-004.3, Loss of B 4 kV Bus 3/4-ONOP-004.5, Loss of D 4 kV Bus 2. Verify at least two on-site sources of AC power are available. 3. For loss of off-site power go to 3/4-ONOP-004, Loss of Off-Site Power. 4. With A, B, or D 4 kV Busses unavailable, verify the ability to power A or B Bus from one C Bus transformer. 5. With D 4 kV Bus unavailable, maintain both associated unit EDGs available.	Loss of A or B Bus – YELLOW Loss of either A & D **OR** B & D Bus - ORANGE 0 - RED
	One Emergency Diesel Generator on the Associated Unit	1. Take action to restore the unavailable EDG to service. 2. Suspend activities that may risk the off-site power sources. 3. Verify availability of the station blackout tie. 4. Verify the ability to power A or B Bus from one C Bus transformer.	0 - ORANGE
	Station Blackout Tie	1. Verify availability of both associated unit EDGs. 2. Suspend activities that may risk the off-site power supplies. 3. Verify the ability to power A or B Bus from one C Bus transformer.	0 w/ C bus tie – YELLOW 0 - w/ Opposite Unit SU Xfmr - YELLOW 0 w/o: • C Bus tie **AND** • Opposite unit SU XFMR - ORANGE

ENCLOSURE 6
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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
Reactivity Control	C_B > 0-OSP-028.8 SDM Calculation	1. Take action to restore boron concentration (C_B) to > 0-OSP-028.8 SDM Calculation. 2. Verify no primary water additions in progress.	RED if C_B < 0-OSP-028.8 SDM Calculation
Shutdown Monitoring Instrumentation	Two of Four Source Range Instruments 1 w/ Audible Count Rate	1. Take action to restore the failed components. 2. Suspend activities that could reduce the available Shutdown Margin. 3. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1/4 - WHITE 0/4 - YELLOW
	ARMS Channels: Three Inside Containment #	1. Take action to restore the failed components. 2. Install temporary monitoring equipment in the affected area. 3. Suspend activities that may increase radiation levels in the affected area.	Loss of 1 or more - WHITE
	PRMS Channels R-11, R-12, R-14 or RAD-6304, R-19	1. Take action to secure releases via the unmonitored pathway **OR** take action to continue releases as allowed by Technical Specifications. 2. Consider installation of temporary monitoring equipment.	Loss of 1 or more - WHITE
	2 Core Exit Thermocouples	1. Arrange with I&C for alternate readouts or monitoring of CETs if possible. 2. Verify that two channels of wide range T_{HOT} are available. 3. Maintain RCS greater than 10 percent Wide Range Pressurizer Level.	0 –YELLOW

\# One at a time may be OOS for calibration.

ENCLOSURE 6
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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH AT LEAST TWO RCS LOOPS FILLED

Function	Required Equipment	Contingency Action	Color Code
Shutdown Monitoring Instrumentation (Cont'd)	One Channel of Reactor Vessel Level HJTC (QSPDS)	1. Take action to restore at least one channel as soon as possible. 2. Maximize RCS Inventory as much as is allowed by plant conditions. 3. Maintain RCS greater than 10 percent Wide Range Pressurizer Level.	0 - WHITE
	One Channel of Containment Water Level Indication	1. Take action to restore one channel to service as soon as possible.	0 - WHITE
	Two Channels of Containment Sump Level Indication	1. Restore two channels to service as soon as possible. 2. Suspend activities that may result in increased sump level. 3. Verify that any temporary drain hoses are **NOT** resulting in loss of RCS Inventory at least once per shift.	1 – WHITE 0 - YELLOW
	One of four channels of Pressurizer Level Indication	1. Suspend activities which may result in RCS Inventory loss.	0 - WHITE
	RCS Pressure Instruments PT-402, PT-403, and PT-405	1. Verify sufficient OMS trains are still available. 2. Secure power to any MOV which could result in RHR loss due to unwanted action from an unavailable pressure channel. (N/A if interlocks defeated.) 3. Notify Operations, Work Controls, Maintenance, and Plant Managers.	1 – WHITE 0 – YELLOW
	RCS Wide Range T_{HOT} and T_{COLD}: At least one channel per loop	1. Verify the availability of two CETs. 2. Verify that OMS controls are **NOT** affected by the unavailable channel.	Per Loop only T_{HOT} or T_{COLD} – WHITE NONE – YELLOW

ENCLOSURE 6
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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Function / Support Equipment	Required Equipment	Contingency Action	Color Code
Containment Closure	Equipment Hatch (capable of being closed with (1) a minimum of 4 bolts or (2) the fast-closure rollup door in accordance with Enclosure 13) *	1. Suspend activities that risk required Decay Heat Removal Equipment. 2. Initiate action to restore the capability to close the hatch in the required time frame. 3. Notify Maintenance, Operations, Work Controls, and Plant Managers.	Required Time Met - GREEN Required Time <u>**NOT**</u> Met (TCN Required) - YELLOW
	Personnel Hatch (capable of being closed in accordance with Enclosure 13) *	1. Suspend activities that risk required Decay Heat Removal Equipment. 2. Initiate action to restore the capability to close the hatch in the required time frame. 3. Notify Maintenance, Operations, Work Controls, and Plant Managers.	
	Containment Penetrations (At least one valve in each penetration that is <u>**NOT**</u> pressurized should be kept closed or capable of being closed in accordance with Enclosure 13) Exceptions may be taken under administrative controls for testing, surveillance, and maintenance.	1. If an exception is taken <u>**AND**</u> at least one valve in the penetration is capable of closure, either manually from the Control Room or locally, the penetration shall be logged on Attachment 3. The log entry shall identify the actions necessary to close the penetration. 2. If an exception is taken <u>**AND**</u> the penetration is <u>**NOT**</u> capable of being closed by at least one valve, a **TCN** with a contingency plan to achieve closure is required PRIOR to authorizing work on the penetration. 3. Initiate action to restore closure capability. 4. Suspend activities that would risk required Decay Heat Removal Equipment. 5. Notify Maintenance, Operations, Work Controls, and Plant Managers.	
Risk Significant Equipment	One Auxiliary Building Exhaust Fan	1. <u>**IF**</u> out-of-service time is to exceed 119 hours, <u>**THEN**</u> notify Work Controls Manager and Plant Managers. 2. Assess the impact on the operating unit. 3. Assess the impact on the Operating RHR pump.	0 - YELLOW

* Capability includes provisions for unavailability of AC power and environmental conditions expected.

ENCLOSURE 6
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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
Risk Significant Equipment (Cont'd)	One Diesel Driven Instrument Air Compressor **AND** the Instrument Air Cross Tie Lines	1. Verify the availability of a portable Instrument Air Compressor. 2. Verify the availability of the Instrument Air Cross Tie. 3. **IF** out-of-service time is to exceed 548 hours, **THEN** notify Work Controls Manager and Plant Managers. 4. Assess the impact on the operating unit.	0 – YELLOW
	Vital DC Room HVAC - Two of three units required E16D, E16E, E16F	1. Monitor temperature in the Inverter and DC Equipment Rooms. 2. Install portable fans or verify availability of portable fans. 3. Assess the impact on the operating unit.	1 – WHITE 0 - YELLOW
	One Service Water Pump	1. Assess the impact on the operating unit.	0 - WHITE

ENCLOSURE 6

MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment	At least one SG with ALL of the following: • SG level as required elsewhere in this enclosure • Steam Dump to Atmosphere Valve unisolated w/Control Room OR local control • Secondary shell side intact • Functional AFW FCV w/Control Room OR local control	1. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations. # 2. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 3. Restore required equipment as soon as possible	N/A
	At least one AFW Pump	1. Prestage FLEX Well Pump, and FLEX Piping Skid with associated hoses,in it's FLEX deployment location. # 2. Restore required equipment as soon as possible	N/A
	At least one AFW FLEX connection * AFPD-004 OR * AFPD-005	1. IF at least one AFW Pump not available, THEN perform the following: a. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations.# b. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 c. Restore required equipment as soon as possible. 2. Otherwise, restore required equipment as soon as possible.	N/A

\+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.

\# Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg

ENCLOSURE 6

MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one AFW Steam Supply Flowpath to the available AFW pump from either unit	1. Prestage FLEX Well Pump, and FLEX Piping Skid with associated hoses, in it's FLEX development location. # 2. Restore required equipment as soon as possible	N/A
	Available flowpath from available AFW pump to available SG	1. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations. # 2. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-661 • SV-*-6612 3. Restore required equipment as soon as possible.	N/A

\+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.

\# Credit may be taken for FLEX Skid and hoses stored in the Aux Bldg

ENCLOSURE 6
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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	Available flowpath from available AFW FLEX connection to available SG	1. Prestage FLEX 480V Portable Generator with associated cables, and FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations.# 2. Maintain RCS and PRZ vent paths through the following valves available:+ • SV-*-6318A OR SV-*-6318B • SV-*-6319A OR SV-*-6319B • SV-*-6611 • SV-*-6612 3. Restore required equipment as soon as possible.	N/A
	At least 1 CST with >210,000 gal and an available flowpath to the avail AFW pump	1. Prestage FLEX Well Pump, and FLEX Piping Skid with associated hoses, in their FLEX deployment locations. 2. Restore required equipment as soon as possible.	N/A
	At least one of the following containment vent paths open, or capable of being opened:** * Both Personnel Hatch Airlock Doors open * Both Emergency Escape Hatch Airlock Doors open * Equipment Hatch open AND associated Equipment Hatch Fast Closure Door open	1. Restore required equipment, or capability, as soon as possible.	N/A
	CVCS Blender FLEX PW connection, *- 370, AND a flowpath to charging pump suction	1. Restore required equipment, or capability, as soon as possible.	N/A

+ Ensures a RCS bleed path for RCS feed and bleed cooling. The status of installation of the reactor vessel head vent spool piece does not affect availability.

** Applicable when the secondary shell side of a S/G is open to Containment atmosphere. The personnel airlock is the only acceptable vent path during a hurricane event

ENCLOSURE 6
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MINIMUM REQUIRED EQUIPMENT, PHASE II, REDUCED DECAY HEAT LOAD AND RCS TEMP LESS THAN 200 DEGREES WITH RCS LOOPS FILLED

Support Equipment	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment (Cont'd)	At least one CST FLEX connection on each unit's CST: Unit 3 * FLEX-CST-1 OR * FLEX-CST-2 AND Unit 4 * FLEX-CST-7 OR * FLEX-CST-8	1. Restore required equipment as soon as possible	N/A
	At least one 480V FLEX connection capable of supplying at least one available charging pump, one available boric acid pump, and both *A1 AND *B1 battery chargers: **# * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *A Load Center OR * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *C Load Center OR * All of the following: • TB8101(TB5877) • *B Load Center OR * All of the following: • TB8101(TB5877) • *D Load Center	1. Restore required equipment as soon as possible	N/A

** Load center cross-tie may be credited when assessing capabilities
*A1/*B1 battery chargers NOT required if *A2/*B2 battery chargers, and FLEX capability to power opposite unit D MCC available

ENCLOSURE 7
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MINIMUM REQUIRED EQUIPMENT
SPENT FUEL POOL DURING REFUELING OUTAGES

System	Required Equipment	Contingency Action	Color Code
Spent Fuel Cooling	SFP Cooling Pump A and B	1. Take immediate action to repair the failed pump(s). 2. Establish Emergency SFP Cooling Pump operation per 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction. 3. Notify Operations, Work Controls, Maintenance, and Plant Managers. 4. Monitor Spent Fuel Pool temperature and level frequently. 5. Suspend any activities that would risk remaining equipment required (ICW, CCW, Electrical, Makeup). 6. Go to 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction.	1 – ORANGE 0 – RED
	SFP Heat Exchangers A and B	1. Take immediate action to restore the affected Heat Exchanger(s). 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Monitor Spent Fuel Pool temperature and level frequently. 4. Go to 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction. 5. Consider aligning temporary cooling (such as Containment Chillers) to the B SFP Heat Exchanger.	1 – ORANGE 0 – RED

ENCLOSURE 7
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MINIMUM REQUIRED EQUIPMENT SPENT FUEL POOL DURING REFUELING OUTAGES

System	Required Equipment	Contingency Action	Color Code
	Two ICW Pumps	1. Go to 3/4-ONOP-019, Intake Cooling Water Malfunction, for loss of ICW. 2. Initiate action to restore at least one (1) ICW Pump to service. 3. Monitor SFP temperature and level periodically. 4. Notify Operations, Maintenance, Work Controls, and Plant Managers. 5. Go to 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction.	1 – YELLOW 0 – RED
	One ICW Header	1. Obtain Operations and Plant Manager permission prior to removing an ICW Header from service. 2. Verify one ICW pump **AND** one CCW Heat Exchanger are aligned to the functional header. 3. Verify functional header basket strainer is clean. 4. Initiate actions to restore at least one header to functional status. 5. Take actions as described for ICW Pump.	0 – RED
	Two CCW Pumps	1. Take action to restore at least one pump to service. 2. Go to 3/4-ONOP-030, Component Cooling Water Malfunction, for loss of CCW. 3. Notify Operations, Maintenance, Work Controls, and Plant Managers. 4. Monitor SFP temperature and level frequently. 5. Go to 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction.	1 – YELLOW 0 – RED
	One CCW Heat Exchanger	1. Take actions as described for CCW pump.	0 – RED

ENCLOSURE 7
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MINIMUM REQUIRED EQUIPMENT SPENT FUEL POOL DURING REFUELING OUTAGES

Function / System	Required Equipment	Contingency Action	Color Code
Spent Fuel Cooling	A and B 4 kV Bus	1. Go to 3/4-ONOP-004, Loss of Off-Site Power, for loss of off-site power. 2. Take action to restore out-of-service components. 3. Notify Operations, Maintenance, Work Controls, and Plant Managers. 4. Go to appropriate procedure below: 3/4-ONOP-004.2, Loss of A 4 kV Bus 3/4-ONOP-004.3, Loss of B 4 kV Bus	1 – YELLOW 0 bus - RED
	Spent Fuel Pit Exhaust Fan	1. Initiate action to restore exhaust fan to service. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Suspend any activities that would risk Spent Fuel Pool Cooling capabilities.	0 – WHITE
	SFP Heat Exchanger Room Ventilation Fan	1. Initiate action to restore ventilation fan to service. 2. Notify Operations, Work Controls, Maintenance, and Plant Managers. 3. Suspend any activities that would risk Spent Fuel Pool Cooling capabilities. 4. Consider aligning temporary ventilation to maintain room temperature below design temperature of 104°F.	0 - YELLOW
Onsite/ Offsite Power Function	One Emergency Diesel Generator on the associated unit	1. Take action to restore the unavailable EDG to service. 2. Suspend activities that may risk the off-site power sources. 3. Verify the availability of the Station Blackout Ties. 4. Verify the ability to energize A **OR** B 4 kV Bus from either unit C Bus.	0 – ORANGE

ENCLOSURE 7
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MINIMUM REQUIRED EQUIPMENT
SPENT FUEL POOL DURING REFUELING OUTAGES

Function / System	Required Equipment	Contingency Action	Color Code
Onsite/ Offsite Power Function (Cont'd)	C 480 Volt Load Center # and Opposite Unit B 480 Volt Load Center	1. Initiate actions to restore power to affected load center(s). 2. Notify Operations, Maintenance, Work Controls, and Plant Managers. 3. Verify the ability to power the Emergency SFP Cooling Pump IAW 3/4-NOP-033, Spent Fuel Pit Cooling System. 4. Monitor SFP temperature and level frequently. 5. Go to 3/4-ONOP-033.1, Spent Fuel Pit (SFP) Cooling System Malfunction.	1- De-energized - ORANGE * Both De-energized - RED **
Shutdown Monitoring Instrumentation	One Channel of SFP Level Indication	1. Initiate action to restore at least one SFP Level indication to service. 2. Establish Compensatory Action to locally monitor SFP Level.	0 - WHITE
	ARMS Channels: One in SFP Area	1. Initiate action to restore at least one ARMS Channel to service. 2. Contact RP to commence periodic monitoring of SFP radiation levels. 3. Consider having RP install alternative radiation monitoring equipment in SFP area.	0 - WHITE
SFP Water Makeup Sources	Two of following water sources: - RWST and RWST purification pump - PWT and PW pump - CVS Holdup Tank and Recirc Pump	1. Initiate actions to restore SFP makeup source in accordance with 3/4-NOP-033, Spent Fuel Pit Cooling System. 2. Consider Fire Protection System and dual hose station. 3. Notify Operations, Maintenance, Work Controls, and Plant Managers. 4. Monitor SFP level and temperature frequently. 5. Suspend all activities that would risk spent fuel cooling capabilities.	1 or less – YELLOW

* YELLOW - If Alternate Power available to pump affected by de-energized Load Center.
** ORANGE - If Alternate Power available to one pump.
\# FLEX support equipment

ENCLOSURE 7
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MINIMUM REQUIRED EQUIPMENT
SPENT FUEL POOL DURING REFUELING OUTAGES

Function / System	Required Equipment	Contingency Action	Color Code
FLEX Support Equipment	At least one 480V FLEX connection capable of supplying both *A1 AND *B1 battery chargers: **# * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *A Load Center OR * All of the following: • TB8102(TB5878) • TB8103(TB8109) • *C Load Center OR * All of the following: • TB8101(TB5877) • *B Load Center OR * All of the following: • TB8101(TB5877) • *D Load Center	1. Restore required equipment as soon as possible.	N/A

** Load center cross-tie may be credited when assessing capabilities

*A1/*B1 battery chargers NOT required if *A2/*B2 battery chargers, and FLEX capability to power opposite unit D MCC available

ENCLOSURE 8
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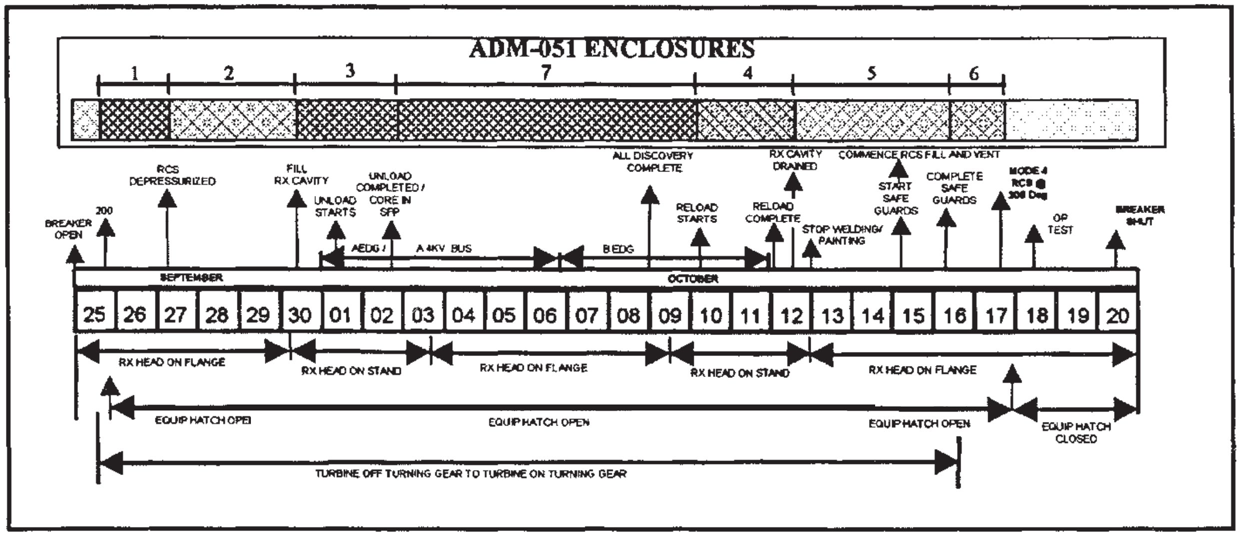
UNIT 4 2000 REFUELING OUTAGE OVERVIEW

UNIT 4 2000
REFUELING OUTAGE OVERVIEW



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ENCLOSURE 9
(Page 1 of 1)

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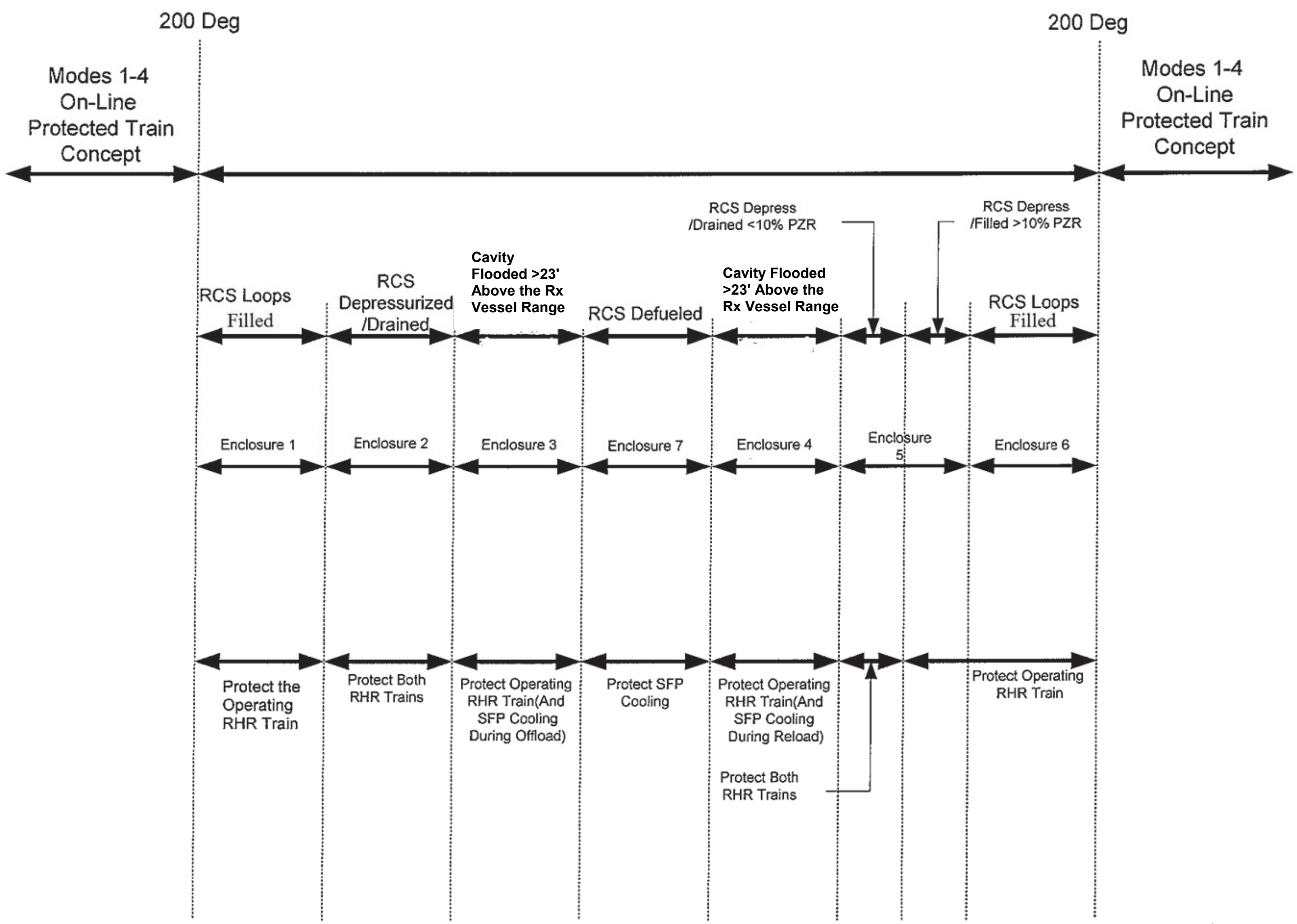
ENCLOSURE 10
(Page 1 of 4)

MODES 5, 6, AND DEFUELED
ACTIVE SHUTDOWN COOLING EQUIPMENT PROTECTED TRAIN CONCEPT



ENCLOSURE 10
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MODES 5, 6, AND DEFUELED
ACTIVE SHUTDOWN COOLING EQUIPMENT PROTECTED TRAIN CONCEPT

NOTE

Specific procedural guidance for the placement and removal of signs and barriers is provided in Attachments 8 through 21.

<u>Enclosure 1 RCS Loops Filled</u>

Protect the following equipment with signs and/or barriers:

- Switchyard bay for the transformer (Startup or Main) supplying the safety related 4 kV Buses.
- Transformer (Startup or Main and Aux) supplying the safety related 4 kV Buses.
- Operating RHR Train 4 kV Switchgear
- Operating RHR Train Vital 480V Load Centers
- Operating RHR Train EDG Rooms
- 3A MCC Vital Section (3A Train only)
- D Bus Room (if C CCW pump or C ICW pump is required for the operating RHR Train)
- Operating RHR Pump Room
- Operating RHR Train CCW Pump
- Operating RHR Train ICW Pump
- 2 of 3 CCW HX

<u>Enclosure 2 and 5 (Pressurizer Drained <10%) With RCS Loops Not Filled</u>

Protect the following equipment with signs and/or barriers:

- Switchyard bay for the transformer (Startup or Main) supplying the safety related 4 kV Buses.
- Transformer (Startup or Main and Aux) supplying the safety related 4 kV Buses.
- Both A and B 4 kV Switchgear
- Vital 480V Load Centers
- Both EDG Rooms
- 3A MCC Vital Section (3A Train only)
- D Bus Room (if C CCW pump or C ICW pump is required for the protected RHR Train)
- Both RHR Pump Rooms
- Operating RHR Train CCW Pump
- Operating RHR Train ICW Pump
- 1 Non-Operating RHR Train CCW Pump
- 1 Non-Operating RHR Train ICW pump
- 2 of 3 CCW HX

ENCLOSURE 10
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MODES 5, 6, AND DEFUELED
ACTIVE SHUTDOWN COOLING EQUIPMENT PROTECTED TRAIN CONCEPT

Enclosure 3 and 4 Cavity Flooded >23' Above the Vessel Flange

Protect the following equipment with signs and/or barriers:

- Switchyard bay for the transformer (Startup or Main) supplying the safety related 4 kV buses
- Transformer (Startup or Main and Aux) supplying the safety related 4 kV buses
- Operating RHR Train 4 kV Switchgear
- Operating RHR Train Vital 480V Load Centers or all vital 480V Load Centers when cross-tied
- C 480V Load Center (if core less than fully loaded)
- SFP Cooling Equipment Room and heat exchanger (if core less than fully loaded)
- Operating RHR train EDG Rooms
- 3A MCC Vital Section (3A Train only)
- D Bus Room (if C CCW pump or C ICW pump is required for the operating RHR Train)
- Operating RHR Pump Room
- Operating RHR train CCW pump
- Operating RHR train ICW pump
- 2 of 3 CCW HX
- SFP makeup water sources (pumps)
- SFP Pump 480V Load Center breakers

Enclosure 5 (Pressurizer Filled >10%) With RCS Loops Not Filled

Protect the following equipment with signs and/or barriers:

- Switchyard bay for the transformer (Startup or Main) supplying the safety related 4 kV buses
- Transformer (Startup or Main and Aux) supplying the safety related 4 kV buses
- Operating RHR train 4 kV Switchgear
- Operating RHR train vital 480V Load Centers
- Operating RHR train EDG Rooms
- 3A MCC Vital Section (3A Train only)
- D Bus Room (if C CCW pump or C ICW pump is required for the operating RHR Train)
- Operating RHR Pump Room
- Operating RHR train CCW pump
- Operating RHR train ICW pump
- 2 of 3 CCW HX

Enclosure 6 RCS Loops Filled

Protect the following equipment with signs and/or barriers:

- Switchyard bay for the transformer (Startup or Main) supplying the safety related 4 kV buses
- Transformer (Startup or Main and Aux) supplying the safety related 4 kV buses
- Operating RHR train 4 kV Switchgear
- Operating RHR train vital 480V Load Centers
- Operating RHR Train EDG Rooms
- 3A MCC Vital Section (3A Train only)
- D Bus Room (if C CCW pump or C ICW pump is required for the protected RHR Train)
- Operating RHR Pump Room
- Operating RHR train CCW pump
- Operating RHR train ICW pump
- 2 of 3 CCW HX

ENCLOSURE 10
(Page 4 of 4)

MODES 5, 6, AND DEFUELED
ACTIVE SHUTDOWN COOLING EQUIPMENT PROTECTED TRAIN CONCEPT

Enclosure 7 RCS Defueled

Protect the following equipment with signs and/or barriers:

- Switchyard bay for the transformer (Startup or Main) supplying the safety related 4 kV buses.
- Transformer (Startup or Main and Aux) supplying the safety related 4 kV buses.
- If C 480V Load Center fed from A 4 kV Bus:
  - A 4 kV Switchgear
  - A EDG Rooms
  - 3A MCC Vital Section
  - A 480V Load Center
  - 1 A train CCW pump
  - 1 A train ICW pump
- If C 480V Load Center fed from D 480V Load Center:
  - B 4 kV Switchgear
  - B EDG Rooms
  - B and D 480V Load Centers
  - 1 B train CCW pump
  - 1 B train ICW pump
- C 480V Load Center or all vital 480V Load Centers when cross-tied
- SFP Cooling Equipment Room
- D Bus Room (if C CCW pump or C ICW pump is required for the operating SFP cooling loop)
- 1 of 3 CCW HX
- SFP makeup water sources (pumps)
- SFP pump 480V Load Center breakers

ENCLOSURE 11
(Page 1 of 1)

OUTAGE ACTIVITY REVIEW CHECKLIST

1.	Does the activity involve work in or affecting the Switchyard?	Yes ☐	No ☐
2.	Does the activity affect, or have the potential to effect, required equipment listed in Enclosures 1 through 7 (Even if not reducing below the minimum Required)?	Yes ☐	No ☐
3.	Does the activity involve configuration, or changing configuration of operating shutdown cooling trains?	Yes ☐	No ☐
4.	Does the activity involve work on or near protected/operating shutdown cooling equipment?	Yes ☐	No ☐
5.	Does the activity challenge containment closure or provide a direct path to atmosphere that does not meet the requirements of Attachment 3?	Yes ☐	No ☐
6.	Does the activity involve a freeze seal that threatens Inventory Control?	Yes ☐	No ☐
7.	Does the activity involve the potential introduction of hazards (e.g., fire, flooding, etc.) *	Yes ☐	No ☐
8.	Does the activity or evolution have the potential to result in a rapid loss of RCS or SFP Inventory in the event of an active failure or personnel error.	Yes ☐	No ☐

A **Yes** answer indicates that the activity should be considered a **R-Logic** activity in the outage schedule unless further review concludes the activity is adequately controlled by other existing processes or procedures.

* Evaluate hot work performed in areas that risk Key Safe Shutdown Functions. Determine if contingency plans are required.

ENCLOSURE 12
(Page 1 of 1)

COMPONENT AVAILABILITY SCREENING CHECKLIST

NOTE

A conservative approach should be employed when assessing component availability.

1.	If the component is on a CLEARANCE, is it under Operations control, or capable of being placed under Operations control, in a reasonable time frame? (i.e., the component is not under a Danger Tag)	YES ☐	NO ☐	N/A ☐
2.	Can the component be restored in a time frame consistent with the anticipated need for the component?	YES ☐	NO ☐	N/A ☐
3.	Is the component intact and can be made functional by automatic or simple manual action?	YES ☐	NO ☐	N/A ☐
4.	Is the contingency plan for the restoration of the component well communicated and understood by all groups involved?	YES ☐	NO ☐	N/A ☐
5.	Is the contingency plan for restoration of the component adequate and reasonably expected to be accomplished?	YES ☐	NO ☐	N/A ☐
6.	Is the component under a non-intrusive surveillance not requiring extensive efforts (i.e., filling and venting of systems, etc) to restore?	YES ☐	NO ☐	N/A ☐
7.	If the component or function is temporary, has the component been tested?	YES ☐	NO ☐	N/A ☐

Any **NO** answers indicate the component should be considered **unavailable**.

ENCLOSURE 13
(Page 1 of 1)

CONTAINMENT CLOSURE TIME LIMITS

0-ADM-051 Enclosure	Ctmt Closure Time Limit *	May be extended with TCN?	Comments
1	30 minutes	Y	
2 (Not RI, time to core boil <30 minutes)	Time to core boiling	N	NUMARC 91-06 Guidelines
2 (Not RI, time to core boil >30 minutes)	30 minutes	Y	Still limited to time to core boiling (NUMARC 91-06)
2 (RI, time to core boil <30 minutes)	Time to core boiling	N	NUMARC 91-06 Guidelines Containment Closure req'd to be initiated w/I 5 minutes **
2 (RI, time to core boil >30 minutes)	30 minutes	N	NRC Commitment (GL88-17) Containment Closure req'd to be initiated w/I 5 minutes **
3 (no core alts)	30 minutes	Y	Time to core boiling is assumed to be >30 minutes in this enclosure. Still limited to time to core boiling. NUMARC 91-06 Guidelines
3 (During core alts)	30 minutes	N	NUMARC 93-01 Guidelines [Commitment 2.3.2]
4 (no core alts)	30 minutes	Y	Time to core boiling is assumed to be >30 minutes in this enclosure. Still limited to time to core boiling. NUMARC 91-06 Guidelines
4 (During core alts)	30 minutes	N	NUMARC 93-01 Guidelines [Commitment 2.3.2]
5 (Not RI, time to core boil <30 minutes)	Time to core boiling	N	NUMARC 91-06 Guidelines
5 (Not RI, time to core boil >30 minutes)	30 minutes	Y	Still limited to time to core boiling. NUMARC 91-06 Guidelines
5 (RI, time to core boil <30 minutes)	Time to core boiling	N	NUMARC 91-06 Guidelines Containment Closure req'd to be initiated w/I 5 minutes **
5 (RI, time to core boil >30 minutes)	30 minutes	N	NRC Commitment (GL88-17) Containment Closure req'd to be initiated w/I 5 minutes **
6	30 minutes	Y	
7	N/A		
RI - Reduced Inventory			

* Containment Closure time limits do not apply when ELAP conditions exist.
** If ELAP conditions exist, and are not diagnosed within 5 minutes, one of the containment hatches may have to be re-opened to provide the required FLEX containment vent.

ENCLOSURE 14
(Page 1 of 10)

UNIT 3 AND 4 KEY SAFETY FUNCTION PINCH POINT TABLES

1. Check if the plant operating state being analyzed meets the definition of an 805 High Risk Evolution as defined in Section 4.23. Although this enclosure may be performed at any time during an outage as deemed necessary by the Risk Assessment Team, performance of this enclosure is only required for plant operating states which meet the definition of an 805 High Risk Evolution.

2. Because of breaker coordination and non-safety-related bus concerns with reactor vessel draindown level indication, during 805 High Risk Evolutions (regardless of the presence or lack of an X in the pinch point table) PTN has committed to:

    a. Always requiring the local reactor vessel level indication be monitored during draindown activities (either via video camera or by a person in containment in communication with the main control room)

    b. Immediately stopping any evolution which affects reactor vessel level if the method of monitoring the local reactor vessel level indication is lost until the monitoring is restored

    c. Immediately stationing a person in containment in communication with the main control room (MCR) if video monitoring of draindown level is lost until the video monitoring is restored or until the high risk evolution is complete

3. Use 5610-M-722C to identify any out-of-service equipment credited for NFPA 805 Non-Power Operations and determine the appropriate Key Safety Function (KSF) and path to which the out-of-service component belongs.

    a. Referring to the Pinch Point Table for the appropriate unit, identify any KSF equipment that is out of service.

    b. Consider that there is an “X” in every cell below the component that is out of service (This is an aid to cross-check if any other KSF component would remain available in the event of a fire in each Fire Area).

    c. Identify the Fire Areas in which all components for that KSF would be potentially failed in the event of a fire, accounting for any component that is out of service.

    d. Example:

        - The 3C ICW Pump is scheduled to be replaced during the Outage when RCS Level is drained below the flange to remove the reactor head (YELLOW RISK PERIOD).

        - Assume that there is an “X” in every cell below the ICW_C column.

ENCLOSURE 14

UNIT 3 AND 4 KEY SAFETY FUNCTION PINCH POINT TABLES

- Fire Area "CC" considers the 3A & 3B ICW PP unavailable due to a postulated fire in Fire Area "CC".
- Because the 3C ICW Pump is NOT available, all ICW pumps would be potentially failed due to a fire in Fire Area "CC" thus affecting the Decay Heat Removal KSF.

NOTES

Treatment of Alternate Power Supplies

- *Electrical support equipment is included in the Pinch Point table and individually treated the same as other equipment ("X" indicates that the equipment is lost for a fire in that area). These losses have NOT been linked with the loss of the supported equipment due to its loss of power. This was done to allow the Risk Assessment Team to consider the use of alternate power supplies to an otherwise unaffected component (e.g., use of the crosstie between the A and B load centers to ensure both remain powered when one of their associated switchgear is potentially damaged by fire in an area). As a result, the Risk Assessment Team MUST also consider where such alternate power supplies would not be available for use and should consider the appropriate KSF path as potentially failed (i.e., considered to have an "X" in the cells for that KSF path in each fire area).*
- *For example, the Pinch Point Table indicates that a fire in Fire Area EEE (Unit 3 Steam Generator Feed Pump Area) may cause a loss of the 3A 4kV Switchgear. However, there is no indication in the table that the train A RHR, ICW, CCW, or Charging Pump may not be available, though unless a special lineup or manual action to restore the switchgear was done, the pumps would not be available. This would need to be considered by the Risk Assessment Team.*

4. Identify all Pinch Points (i.e., fire areas where all paths supporting a KSF are potentially failed).

5. Notify the Engineering Manager of the Pinch Points for the plant operating state evaluated and provide recommended compensatory measures to decrease fire risk during the evaluated evolutions as required by Section 3.3.3.

ENCLOSURE 14
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Unit 3 Pinch Point Table

		Decay Heat Removal								Electrical Distribution System																										Inventory				Monitoring		
		RHR Pumps		CCW Pumps			ICW Pumps			Offsite Sources			Onsite Source		4 KV SWGR			480V Buses			120 V Vital Inverters								120V Vital Pnls		125 VDC Buses				RCS				RCS		
FIRE AREA	Description	RHR_A	RHR_B	CCW_A	CCW_B	CCW_C	ICW_A	ICW_B	ICW_C	SUT_A	SUT_B	OPP SUT	EDG_A	EDG_B	3AA	3AB	3AD	3-480V_A	3-480V_B	3-480V_H	3Y01	3Y02	3Y04	3Y05	3Y06	3Y07	4Y04	4Y06	120V Pnl_A	120V Pnl_B	3D01	3D23	4D23	4D01	CVCS_A	CVCS_B	CVCS_C	3-DRAIN	CET_A	CET_B	RX VESS LVL
A	Unit 3 and 4 Hallway South of Holdup Tanks	-	-	X	X	X	-	-	-	-	-	-	-	X	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AA	Unit 3 Train B Emergency Diesel Generator Day Tank Rm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AAA	Units 3 and 4 Holdup Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B	Unit 3 RHR Heat Exchanger and Pump Room	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BB	Unit 3 Train A Emergency Diesel Generator Day Tank Rm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BBB	Unit 3 and 4 Safety Injection Pump Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	Unit 4 RHR Heat Exchanger and Pump Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CC	Units 3 and 4 Auxiliary Building North-South Breezewy	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	1	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	-
CCC	Units 3 and 4 Vestibule Elevator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	Unit 4 Pipe and Valve Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DD	Unit 4 480V Load Centers A and B Room	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DDD	Unit 4 Steam Generator Feed Pump Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	Unit 3 Pipe and Valve Room	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-
EE	Unit 4 480V Load Centers C and D Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EEE	Unit 3 Steam Generator Feed Pump Area	-	-	-	-	-	-	-	-	-	-	-	-	-	X	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F	Units 3 and 4 Auxiliary Building Hallway	X	X	X	X	X	-	-	-	-	-	-	-	X	-	-	-	X	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-
FF	Unit 3 480V Load Centers A and B Room	-	-	-	-	-	-	-	-	X	X	X	X	X	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-
FFF	Units 3 and 4 Purge Supply Fan Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G	Units 3 and 4 Electrical Equipment and Spare Battery Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-
GG	Unit 3 480V Load Centers C and D Room	-	-	-	-	-	-	-	-	X	X	X	X	X	-	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-
H	Unit 3 West Electrical Penetration Room	X	2	X	-	-	X	-	-	X	X	X	X	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	3	3	-	-	X	X
HH	Units 3 and 4 Cable Spreading Room and Electrical Cable Chase	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	X	X	-	-	-	-	X	X	X	X	X	X	X

Notes:
1. Bus fails due to failure of A and B Buses.
2. This train of RHR fails only due to spurious closure of either MOV-3-750 or MOV-3-751.
3. Charging path available; letdown or aux spray isolation requires a manual action.
4. Available with MCR action.

ENCLOSURE 14
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Unit 3 Pinch Point Table

		Decay Heat Removal								Electrical Distribution System																									Inventory				Monitoring		
		RHR Pumps		CCW Pumps			ICW Pumps			Offsite Sources			Onsite Source		4 KV SWGR			480V Buses			120 V Vital Inverters								120V Vital Pnls		125 VDC Buses				RCS				RCS		
FIRE AREA	Description	RHR_A	RHR_B	CCW_A	CCW_B	CCW_C	ICW_A	ICW_B	ICW_C	SUT_A	SUT_B	OPP SUT	EDG_A	EDG_B	3AA	3AB	3AD	3-480V_A	3-480V_B	3-480V_H	3Y01	3Y02	3Y04	3Y05	3Y06	3Y07	4Y04	4Y06	120V Pnl_A	120V Pnl_B	3D01	3D23	4D23	4D01	CVCS_A	CVCS_B	CVCS_C	3-DRAIN	CET_A	CET_B	RX VESS LVL
I	Unit 3 South Electrical Penetration Room	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	4	-	X	-	X
II	Unit 4 B DC Equipment Room	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	X	-	-	-	X	-	X	-	-	-	-	X	-	-	-	-	X	X	-
J	Unit 4 North Electrical Penetration Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JJ	Unit 4 Battery Rack B Room	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-
K	Unit 4 West Electrical Penetration Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KK	Unit 3 Battery Rack A Room	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	X	-
L	Units 3 and 4 Auxiliary Building Fan Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-
LL	Unit 3 A DC Equipment Room	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	-	-	-	X	-	-	-	X	-	X	-	X	-	-	-	-	-	-	-	-	X	-
MM	Units 3 and 4 Control Room	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X
N	Unit 4 Charging Pump Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN	Units 3 and 4 A DC Equipment Room	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	-	X	-	X	-	-	X	-	X	X	-	-	-	X	-	-	-	-	-	X	-	-
O	Unit 3 Charging Pump Room	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-
OD-047	Unit 4 Component Cooling Pump and Heat Exchanger	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-
OD-054	Unit 3 Component Cooling Pump and Heat Exchanger Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-
OD-076	Unit 4 Lube Oil Reservoir Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-077	Unit 4 Laydown Area, Instrument Air Compressors and Condensate Storage Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-078	Unit 4 Instrument Air Equipment Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-079	Outdoor Area West of Unit 4 Containment	-	-	-	-	-	-	-	-	X	X	X	X	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X	-	-	X	-
OD-080	Unit 4 Main Condenser Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-081	Unit 4 Main and Start-up Transformer and Unit 3 Turbine Lube Oil Reservoir Area	-	-	-	-	-	-	-	-	X	X	X	X	-	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-082	Unit 4 Auxiliary Transformer Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-083	Unit 3 Instrument Air Equipment Area	-	-	-	-	-	-	-	-	-	-	-	X	-	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-084	Units 3 and 4 Auxiliary Feedwater Pump Area	X	X	-	-	X	-	-	X	X	X	X	X	-	-	-	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	-	X	X	X
OD-085	Unit 3 Main Condenser Area	-	-	-	-	-	-	-	-	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
1. Bus fails due to failure of A and B Buses.
2. This train of RHR fails only due to spurious closure of either MOV-3-750 or MOV-3-751.
3. Charging path available; letdown or aux spray isolation requires a manual action.
4. Available with MCR action.

ENCLOSURE 14
(Page 5 of 10)

Unit 3 Pinch Point Table

		Decay Heat Removal								Electrical Distribution System																									Inventory				Monitoring		
		RHR Pumps		CCW Pumps			ICW Pumps			Offsite Sources			Onsite Source		4 KV SWGR			480V Buses			120 V Vital Inverters								120V Vital Pnls		125 VDC Buses				RCS				RCS		
FIRE AREA	Description	RHR_A	RHR_B	CCW_A	CCW_B	CCW_C	ICW_A	ICW_B	ICW_C	SUT_A	SUT_B	OPP SUT	EDG_A	EDG_B	3AA	3AB	3AD	3-480V_A	3-480V_B	3-480V_H	3Y01	3Y02	3Y04	3Y05	3Y06	3Y07	4Y04	4Y06	120V Pnl_A	120V Pnl_B	3D01	3D23	4D23	4D01	CVCS_A	CVCS_B	CVCS_C	3-DRAIN	CET_A	CET_B	RX VESS LVL
OD-086	Unit 3 Main Transformer and Startup Transformer	-	-	-	-	X	-	-	X	X	X	X	X	-	X	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-
OD-087	Unit 3 Auxiliary Transformer Area	-	-	-	-	-	-	-	-	X	X	X	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
OD-088	Unit 3 Switchgear/D.G. Building Vestibule	-	-	-	-	X	-	-	X	X	X	X	X	-	X	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-
OD-089	Unit 3 Condensate Storage Tank Area	-	-	-	-	-	-	-	-	X	X	X	X	-	X	-	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-090	Unit 3 Emergency Diesel Generator Oil Storage Tank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-091	Unit 4 Condensate Pump Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-092	Unit 3 Condensate Pump Area	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-105	Units 3 and 4 Turbine Building Mezzanine Deck	-	-	-	-	-	-	-	-	X	X	X	X	-	-	-	X	X	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	X	-	X	-	-	-	X
OD-113	Unit 4 Feedwater Platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-114	Unit 4 Main Steam Header Platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-115	Unit 3 Main Steam Header Platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-116	Unit 3 Feedwater Platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-117	Units 3 and 4 Turbine Deck	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-118	Units 3 and 4 Auxiliary Building Roof	-	-	-	-	X	-	-	X	-	-	-	X	-	-	-	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-
OD-119	Unit 4 Circulating Water Intake Structure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-120	Unit 3 Circulating Water Intake Structure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-121	Units 3 and 4 Intake Laydown Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-122	Units 3 and 4 Water Treatment Room	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-123	Units 3 and 4 Refueling Water Storage Tanks Area	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-124	Outside Area NE of Unit 3 Containment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-125	Units 3 and 4 Land Area South of Unit 4 Containment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-127	Units 1 and 2 Fuel Oil Storage Tank Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-128	Units 3 and 4 Distribution Switchyard	-	-	-	-	-	-	-	-	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-131	Units 3A and 3B Diesel Generator Radiator Rooms	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
1. Bus fails due to failure of A and B Buses.
2. This train of RHR fails only due to spurious closure of either MOV-3-750 or MOV-3-751.
3. Charging path available; letdown or aux spray isolation requires a manual action.
4. Available with MCR action.

ENCLOSURE 14
(Page 6 of 10)

Unit 3 Pinch Point Table

		Decay Heat Removal								Electrical Distribution System																								Inventory				Monitoring		
		RHR Pumps		CCW Pumps			ICW Pumps			Offsite Sources			Onsite Source		4 KV SWGR			480V Buses			120 V Vital Inverters								120V Vital Pnls		125 VDC Buses				RCS				RCS		
FIRE AREA	Description	RHR_A	RHR_B	CCW_A	CCW_B	CCW_C	ICW_A	ICW_B	ICW_C	SUT_A	SUT_B	OPP SUT	EDG_A	EDG_B	3AA	3AB	3AD	3-480V_A	3-480V_B	3-480V_H	3Y01	3Y02	3Y04	3Y05	3Y06	3Y07	4Y04	4Y06	120V Pnl_A	120V Pnl_B	3D01	3D23	4D23	4D01	CVCS_A	CVCS_B	CVCS_C	3-DRAIN	CET_A	CET_B	RX VESS LVL
OD-143	Unit 3 Emergency Diesel Generator Roof	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-999	Miscellaneous Areas	-	-	-	-	X	-	-	X	X	X	X	X	-	4	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OO	Units 3 and 4 B DC Equipment Room	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	-	X	X	X	X	-	X	-	-	X	-	X	-	-	-	-	-	-	X	X	-
P	Unit 4 Containment Building	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PP	Unit 4 Battery Rack A Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	X	-	-	-	X	-	-	-	-	-	-	-	-
Q	Unit 3 Containment Building	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	-	X	X	X
QQ	Unit 3 Battery Rack B Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	-	-
R	Unit 4 Reactor Control Rod Equipment Room	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-
RR	Unit 4 Train A Emergency Diesel Generator Room	-	-	-	-	X	-	-	X	-	-	-	-	-	4	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	Units 3 and 4 Computer Room	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X
SS	Unit 4 Train B Emergency Diesel Generator Room	-	-	-	-	X	-	-	X	-	-	-	-	4	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T	Unit 3 Reactor Control Rod Equipment Room	X	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	X	3	-	X	-	-
TT	Unit 3 Switchgear Room 3D	-	-	-	-	X	-	-	X	-	-	-	4	4	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U	4160 V Switchgear 4B Room	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UU	Unit 4 Switchgear Room 4D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
V	4160 V Switchgear 4A Room	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VV	Unit 4 Train A EDG Control Rm.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W	4160 V Switchgear 3B Room	-	X	-	X	X	-	X	X	X	X	X	-	X	-	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-
WW	Unit 4 Train A Diesel Oil Storage Tank and Transfer Pump Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X	4160 V Switchgear 3A Room	X	-	X	-	X	X	-	X	X	X	X	X	-	X	-	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X	-	-	-	-
XX	Unit 4 Train B Diesel Oil Transfer Pump and Oil Storage TankRoom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y	Unit 3 Train B Emergency Diesel Generator Building	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YY	Unit 4 Train B Emergency Diesel Generator Control Rm.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Z	Unit 3 Train A Emergency Diesel Generator Building	-	-	-	-	-	-	-	-	-	-	-	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
1. Bus fails due to failure of A and B Buses.
2. This train of RHR fails only due to spurious closure of either MOV-3-750 or MOV-3-751.
3. Charging path available; letdown or aux spray isolation requires a manual action.
4. Available with MCR action.

ENCLOSURE 14
(Page 7 of 10)

Unit 4 Pinch Point Table

		Decay Heat Removal								Electrical Distribution System																									Inventory				Monitoring		
		RHR		CCW			ICW			Offsite			Onsite		4 KV SWGR			480V Buses			120 V Vital Inverters								120V		125 VDC Buses				RCS				RCS		
FIRE AREA	Description	RHR_A	RHR_B	CCW_A	CCW_B	CCW_C	ICW_A	ICW_B	ICW_C	SUT_A	SUT_B	OPP SUT	EDG_A	EDG_B	4AA	4AB	4AD	4-480V_A	4-480V_B	4-480V_H	4Y01	4Y02	4Y04	4Y05	4Y06	4Y07	3Y04	3Y06	120V Pnl_A	120V Pnl_B	3D01	3D23	4D23	4D01	CVCS_A	CVCS_B	CVCS_C	4-DRAIN	CET_A	CET_B	RX VESS LVL
A	Unit 3 and 4 Hallway South of Holdup Tanks	X	X	X	X	-	X	X	-	-	-	-	X	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-
AA	Unit 3 Train B Emergency Diesel Generator Day Tank Rm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AAA	Units 3 and 4 Holdup Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B	Unit 3 RHR Heat Exchanger and Pump Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BB	Unit 3 Train A Emergency Diesel Generator Day Tank Rm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BBB	Unit 3 and 4 Safety Injection Pump Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	Unit 4 RHR Heat Exchanger and Pump Room	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CC	Units 3 and 4 Auxiliary Building North-South Breezewy	X	X	X	X	X	X	X	-	X	X	X	-	X	X	X	1	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X
CCC	Units 3 and 4 Vestibule Elevator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	Unit 4 Pipe and Valve Room	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-
DD	Unit 4 480V Load Centers A and B Room	-	-	-	-	-	-	-	-	X	X	X	X	X	-	-	-	X	X	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-
DDD	Unit 4 Steam Generator Feed Pump Area	-	-	-	-	-	-	-	-	-	-	-	-	-	X	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	Unit 3 Pipe and Valve Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EE	Unit 4 480V Load Centers C and D Room	-	-	-	-	-	-	-	-	X	X	X	X	X	-	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-
EEE	Unit 3 Steam Generator Feed Pump Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F	Units 3 and 4 Auxiliary Building Hallway	X	X	-	-	-	-	-	-	-	-	-	-	X	X	-	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	X	-	X	X	X	-	-	-	-
FF	Unit 3 480V Load Centers A and B Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FFF	Units 3 and 4 Purge Supply Fan Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	X	-	-	-	-	-	-	-	-
G	Units 3 and 4 Electrical Equipment and Spare Battery Room	X	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X	X	X	-	X	X	X
GG	Unit 3 480V Load Centers C and D Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H	Unit 3 West Electrical Penetration Room	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HH	Units 3 and 4 Cable Spreading Room and Electrical Cable Chase	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	X	X	-	-	-	-	X	X	X	X	X	X	X

Notes:
1. Bus fails due to failure of A and B Buses.
2. This train of RHR fails only due to spurious closure of either MOV-4-750 or MOV-4-751.
3. Charging path available; letdown or aux spray isolation requires a manual action.
4. Available with MCR action.

ENCLOSURE 14
(Page 8 of 10)

Unit 4 Pinch Point Table

		Decay Heat Removal								Electrical Distribution System																								Inventory				Monitoring		
		RHR		CCW			ICW			Offsite			Onsite		4 KV SWGR			480V Buses			120 V Vital Inverters								120V		125 VDC Buses				RCS				RCS		
FIRE AREA	Description	RHR_A	RHR_B	CCW_A	CCW_B	CCW_C	ICW_A	ICW_B	ICW_C	SUT_A	SUT_B	OPP SUT	EDG_A	EDG_B	4AA	4AB	4AD	4-480V_A	4-480V_B	4-480V_H	4Y01	4Y02	4Y04	4Y05	4Y06	4Y07	3Y04	3Y06	120V Pnl_A	120V Pnl_B	3D01	3D23	4D23	4D01	CVCS_A	CVCS_B	CVCS_C	4-DRAIN	CET_A	CET_B	RX VESS LVL
I	Unit 3 South Electrical Penetration Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
II	Unit 4 B DC Equipment Room	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	-	-	X	-	-	-	X	-	-	X	-	-	-	X	-	-	-	-	X	X	-
J	Unit 4 North Electrical Penetration Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X
JJ	Unit 4 Battery Rack B Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	X	-
K	Unit 4 West Electrical Penetration Room	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	-	-	X	X
KK	Unit 3 Battery Rack A Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	X	-
L	Units 3 and 4 Auxiliary Building Fan Room	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	X	-	-	-	-
LL	Unit 3 A DC Equipment Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	X	-	-	-	X	-	-	-	-	-	-	-	-	X	-
MM	Units 3 and 4 Control Room	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X
N	Unit 4 Charging Pump Room	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-
NN	Units 3 and 4 A DC Equipment Room	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	-	X	-	-	-	X	X	X	-	X	-	-	-	X	-	-	-	-	-	X	-	-
O	Unit 3 Charging Pump Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-047	Unit 4 Component Cooling Pump and Heat Exchanger	-	-	-	-	-	-	-	-	-	-	-	X	X	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X	-	-	-	-
OD-054	Unit 3 Component Cooling Pump and Heat Exchanger Area	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-076	Unit 4 Lube Oil Reservoir Area	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-077	Unit 4 Laydown Area, Instrument Air Compressors and Condensate Storage Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-078	Unit 4 Instrument Air Equipment Area	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-079	Outdoor Area West of Unit 4 Containment	X	2	X	-	X	X	X	X	X	X	X	X	-	X	-	X	X	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	X	-	X	-	-	X	X
OD-080	Unit 4 Main Condenser Area	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-081	Unit 4 Main and Start-up Transformer and Unit 3 Turbine Lube Oil Reservoir Area	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-082	Unit 4 Auxiliary Transformer Area	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
OD-083	Unit 3 Instrument Air Equipment Area	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-084	Units 3 and 4 Auxiliary Feedwater Pump Area	X	-	X	-	X	X	-	X	X	X	X	X	-	X	-	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X	-	-	-	-
OD-085	Unit 3 Main Condenser Area	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
1. Bus fails due to failure of A and B Buses.
2. This train of RHR fails only due to spurious closure of either MOV-4-750 or MOV-4-751.
3. Charging path available; letdown or aux spray isolation requires a manual action.
4. Available with MCR action.

ENCLOSURE 14
(Page 9 of 10)

Unit 4 Pinch Point Table

		Decay Heat Removal								Electrical Distribution System																									Inventory				Monitoring		
		RHR		CCW			ICW			Offsite			Onsite		4 KV SWGR			480V Buses			120 V Vital Inverters								120V		125 VDC Buses				RCS				RCS		
FIRE AREA	Description	RHR_A	RHR_B	CCW_A	CCW_B	CCW_C	ICW_A	ICW_B	ICW_C	SUT_A	SUT_B	OPP SUT	EDG_A	EDG_B	4AA	4AB	4AD	4-480V_A	4-480V_B	4-480V_H	4Y01	4Y02	4Y04	4Y05	4Y06	4Y07	3Y04	3Y06	120V Pnl_A	120V Pnl_B	3D01	3D23	4D23	4D01	CVCS_A	CVCS_B	CVCS_C	4-DRAIN	CET_A	CET_B	RX VESS LVL
OD-086	Unit 3 Main Transformer and Startup Transformer	-	-	-	-	X	-	-	X	X	X	X	X	-	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-087	Unit 3 Auxiliary Transformer Area	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
OD-088	Unit 3 Switchgear/D.G. Building Vestibule	-	-	-	-	X	-	-	X	X	X	X	X	-	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-089	Unit 3 Condensate Storage Tank Area	-	-	-	-	X	-	-	X	X	X	X	X	-	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-090	Unit 3 Emergency Diesel Generator Oil Storage Tank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-091	Unit 4 Condensate Pump Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
OD-092	Unit 3 Condensate Pump Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-105	Units 3 and 4 Turbine Building Mezzanine Deck	-	-	-	-	-	-	-	-	X	X	X	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	X	-	X	-	-	-	X
OD-113	Unit 4 Feedwater Platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-
OD-114	Unit 4 Main Steam Header Platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-115	Unit 3 Main Steam Header Platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-116	Unit 3 Feedwater Platform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-117	Units 3 and 4 Turbine Deck	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-118	Units 3 and 4 Auxiliary Building Roof	-	-	-	-	X	-	-	X	-	-	-	X	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	X	-
OD-119	Unit 4 Circulating Water Intake Structure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-120	Unit 3 Circulating Water Intake Structure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-121	Units 3 and 4 Intake Laydown Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-122	Units 3 and 4 Water Treatment Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-123	Units 3 and 4 Refueling Water Storage Tanks Area	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-124	Outside Area NE of Unit 3 Containment	-	-	-	-	X	-	-	X	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-125	Units 3 and 4 Land Area South of Unit 4 Containment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-127	Units 1 and 2 Fuel Oil Storage Tank Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-128	Units 3 and 4 Distribution Switchyard	-	-	-	-	-	-	-	-	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-131	Units 3A and 3B Diesel Generator Radiator Rooms	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
1. Bus fails due to failure of A and B Buses.
2. This train of RHR fails only due to spurious closure of either MOV-4-750 or MOV-4-751.
3. Charging path available; letdown or aux spray isolation requires a manual action.
4. Available with MCR action.

ENCLOSURE 14

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Unit 4 Pinch Point Table

		Decay Heat Removal								Electrical Distribution System																								Inventory				Monitoring		
		RHR		CCW			ICW			Offsite			Onsite		4 KV SWGR			480V Buses			120 V Vital Inverters								120V		125 VDC Buses				RCS				RCS		
FIRE AREA	Description	RHR_A	RHR_B	CCW_A	CCW_B	CCW_C	ICW_A	ICW_B	ICW_C	SUT_A	SUT_B	OPP SUT	EDG_A	EDG_B	4AA	4AB	4AD	4-480V_A	4-480V_B	4-480V_H	4Y01	4Y02	4Y04	4Y05	4Y06	4Y07	3Y04	3Y06	120V Pnl_A	120V Pnl_B	3D01	3D23	4D23	4D01	CVCS_A	CVCS_B	CVCS_C	4-DRAIN	CET_A	CET_B	RX VESS LVL
OD-143	Unit 3 Emergency Diesel Generator Roof	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OD-999	Miscellaneous Areas	-	-	-	-	X	-	-	X	X	X	X	X	-	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OO	Units 3 and 4 B DC Equipment Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	X	X	X	-	-	X	X	-	X	-	X	-	-	-	-	-	-	-	X	-
P	Unit 4 Containment Building	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	-	X	X	X
PP	Unit 4 Battery Rack A Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-
Q	Unit 3 Containment Building	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QQ	Unit 3 Battery Rack B Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-
R	Unit 4 Reactor Control Rod Equipment Room	X	X	-	-	-	-	-	-	-	-	-	-	X	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	X	3	-	-	X	-
RR	Unit 4 Train A Emergency Diesel Generator Room	-	-	-	-	X	-	-	X	-	-	-	X	-	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	Units 3 and 4 Computer Room	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X
SS	Unit 4 Train B Emergency Diesel Generator Room	-	-	-	-	X	-	-	X	-	-	-	-	X	-	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T	Unit 3 Reactor Control Rod Equipment Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-
TT-A	Unit 3 Switchgear Room 3D-Train A Shutdown	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TT-B	Unit 3 Switchgear Room 3D-Train B Shutdown	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U	4160 V Switchgear 4B Room	-	X	-	X	X	-	X	X	X	X	X	-	X	-	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	-	-	-	X
UU-A	Unit 4 Switchgear Room 4D-Train A Shutdown	-	-	-	-	X	-	-	X	-	-	-	4	4	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UU-B	Unit 4 Switchgear Room 4D-Train B Shutdown	-	-	-	-	X	-	-	X	-	-	-	4	4	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
V	4160 V Switchgear 4A Room	X	-	X	-	X	X	-	X	X	X	X	X	-	X	-	X	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X	-	-	-	-
VV	Unit 4 Train A EDG Control Rm.	-	-	-	-	-	-	-	-	-	-	-	X	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W	4160 V Switchgear 3B Room	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WW	Unit 4 Train A Diesel Oil Storage Tank and Transfer Pump Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X	4160 V Switchgear 3A Room	-	-	-	-	-	-	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XX	Unit 4 Train B Diesel Oil Transfer Pump and Oil Storage TankRoom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y	Unit 3 Train B Emergency Diesel Generator Building	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YY	Unit 4 Train B Emergency Diesel Generator Control Rm.	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Z	Unit 3 Train A Emergency Diesel Generator Building	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
1. Bus fails due to failure of A and B Buses.
2. This train of RHR fails only due to spurious closure of either MOV-4-750 or MOV-4-751.
3. Charging path available; letdown or aux spray isolation requires a manual action.
4. Available with MCR action.

ATTACHMENT 1
(Page 1 of 1)

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ATTACHMENT 2
(Page 1 of 2)

TEMPORARY CHANGE NOTIFICATION

Temporary Change Number ________ ________ ________
UNIT — CYCLE or **FO** name — NUMBER

System Number ______________________ System Name ____________

Initiating Document/Activity ________

Description:

Expected Duration of Change ______________________

Plant Contact ______________________

Work Phone ____________ Home Phone ____________ Beeper ________

KEY SAFE SHUTDOWN FUNCTION(S) AFFECTED:

Decay Heat Removal	Inventory Control	Power Availability	Reactivity Control	Containment Integrity	Instrumen-tation	Fire Protection	Risk Significant Support Equipment

Evaluation/Assessment of Key Safe Shutdown Functions

Note: Evaluation should include:

1. Consideration of common or unit specific equipment that affects the other unit.
2. Review of all TCNs in effect during the duration of this TCN to ensure the total impact of all equipment out of service is considered.

F-367 1:2 – Rev. 2 (8/30/10 – 0-ADM-051)

ATTACHMENT 2
(Page 2 of 2)

TEMPORARY CHANGE NOTIFICATION

Temporary Change Number ______________ ____________ ____________

Affected Drawings and Procedures (Attach Markups and OTSCs)

____
____
____
____
____
____
____
____

☐ Yes ☐ No The applicable off-normal response procedures are challenged by this TCN.

If Yes, the appropriate recovery guidelines are included in the procedure mark-ups and are available in the Control Room.

Special Notes/Off Normal Guidance/Contingencies:

☐ YES ☐ NO PWO requires contingency actions

If YES, then verify PWO contingencies are incorporated and reviewed as acceptable.

Approval/Acceptance

Risk Assessment Lead ______________________________ Date ____________

System Engineer ____________________ SM ____________________ Date ____________

Operations Manager ____________________ Plant General Manager ____________________

Engineering Manager ____________________ Work Controls Manager ____________________

Maintenance Manager ______________________________

F-367 2:2 – Rev. 2 (8/30/10 – 0-ADM-051)

ATTACHMENT 3
(Page 1 of 3)

CONTAINMENT PENETRATION EXCEPTIONS

Part A

Penetration	Actions Required For Closure	Department Responsible For Closure	Estimated Time to Close	Date Entered	Date Closed

F-369/1:3 – Rev. 5 (0-ADM-051)

ATTACHMENT 3
(Page 2 of 3)

CONTAINMENT PENETRATION EXCEPTIONS
EQUIPMENT HATCH DOOR

Date:______________________

Part B

Date and Time Accepted	Containment Coordinator/Designee Name (Print)	Signature*	Notify SM/US Ext 6493

* Signature - Indicates designated individual accepts responsibility to close the Containment Equipment Hatch with a minimum of 4 bolts (or close the fast-closure rollup door) in accordance with 0-ADM-051, Enclosure 13, when and if directed by the Shift Manager. The designated person has an assigned crew of individuals and has verified the necessary equipment to close the Equipment Hatch is staged in accordance with 0–GMM–051.2, including provisions for unavailability of AC power and environmental conditions expected.

Reviewed by:_______________________________________
Shift Manager or SRO Designee

ATTACHMENT 3
(Page 3 of 3)

CONTAINMENT PENETRATION EXCEPTIONS
PERSONNEL AIRLOCK DOOR

Date:______________________

Part C

Date and Time Accepted	Name (Print)	Signature*

* Signature – Indicates designated individual accepts responsibility to close in an expeditious manner within 30 minutes, or prior to time to core boiling, (whichever is less) at least one Containment Personnel Airlock Door when directed by the Shift Manager. If RCS level lower than 3 feet below the vessel prior to fuel offload, control in accordance with 3/4-OP-041.9 until RCS level returns above 3 feet below the vessel. [Commitment Step-2.3.1]

Reviewed by: ______________________________________
Shift Manager or SRO Designee

ATTACHMENT 4
(Page 1 of 12)

OUTAGE RISK ASSESSMENT AND PROTECTED TRAIN POSTING VERIFICATION

INSTRUCTIONS FOR COMPLETING OUTAGE RISK ASSESSMENT FORMS

NOTES

- *Complete Parts A and B at the following times:*
  - *Prior to shift turnover and to be available for the crew meetings.*
  - *When changing enclosures or minimum equipment as used to determine risk color.*
  - *Upon commencing or completing fuel movement in containment or the SFP.*
- *Part B should be completed each shift when swapping protected train equipment*
- *Updates to Attachment 4, Part A and B should be provided as soon as reasonably possible.*
- *Part C is a daily verification of protected train postings and should be performed each dayshift and documented in the RCO logs when completed.*

Completion of Part A

1. Evaluate color determination using the current enclosure based on plant conditions.
2. Obtain review of Attachment 4, Part A from the Shift Manager or designee.
3. Scan Attachment 4, Part A, and email to Document Control Technician at DL-PTN-Document-Control@fpl.com who will:
   a. Provide a copy to the OCC Manager.
   b. Place a copy of the Risk Assessment Book in the WCC.
4. Place the reviewed copy of Attachment 4, Part A in the Risk Assessment Book in the Control Room.

NOTE

Part B will be maintained electronically and the following pages provide an example of the information contained in the electronic version.

Completion of Part B

1. Open the electronic version of the Risk Control Form.
2. Obtain a copy of the latest revision to the outage schedule from the Work Controls web site.
3. Open the Risk Control Form worksheet tab corresponding to the applicable enclosure of 0-ADM-051.

ATTACHMENT 4
(Page 2 of 12)

OUTAGE RISK ASSESSMENT AND PROTECTED TRAIN POSTING VERIFICATION

INSTRUCTIONS FOR COMPLETING OUTAGE RISK ASSESSMENT FORMS

4. Update the Risk Control Form for the current plant conditions. Identify the status of components by the following convention:

    a. Protected or required components per 0-ADM-51 will be shaded a light gray.

    b. Running or energized equipment will be bolded.

5. Update the top of the form with current date, time, and risk color determination.

6. Calculate and record the time to boil for the reactor and the SFP. This calculation should be based on current plant conditions.

    a. For reactor time to boil, use Figure 1, Typical Heat Up Rates With Vessel Full; Figure 2, Loss of RHR Cooling at Mid-Loop Operations; Figure 3 Loss of RHR at 2.5 Feet Below Reactor Vessel Flange Operations or Figure 4, Typical RCS Heat Up Rates for Reduced Inventory, as appropriate

    b. For SFP time to boil, Use the Plant Curve Book to determine time to heat SFP to 200°F.

7. Include the applicable TCNs number and title if currently in affect.

8. If risk color is less than white due to an equipment failure or unanticipated change in plant condition and a TCN has not been completed, then provide information identifying the at risk components.

9. Provide the completed copy to the Shift Manager or Senior Operator at the Controls designee for review.

10. Post the reviewed copy of Attachment 4, Part B in an appropriate location in the Control Room.

11. Save a copy Attachment 4, Part B in G:\Wc\DeptShares\0-ADM-051 Risk Status\PTX-XX.

12. E-mail Attachment 4, Part B to Document Control Technician at DL-PTN-Document-Control@fpl.com who will:

    a. Provide three 11 X 17 copies and post them at the OCC, WCC, and Operation's Turnover Meeting Room.

ATTACHMENT 4
(Page 3 of 12)

OUTAGE RISK ASSESSMENT AND PROTECTED TRAIN POSTING VERIFICATION

INSTRUCTIONS FOR COMPLETING OUTAGE RISK ASSESSMENT FORMS

13. The OCC Manager, using his discretion based on outage staffing needs, will ensure that the applicable department Supervisor places a copy of Attachment 4 Part B, in an appropriate location assessable to his personnel, at:

    a. I&C Maint.

    b. Elect. Maint

    c. Mech. Maint

    d. AMES

    e. Projects

    f. RSS

    g. Turbine Team

    h. EPU

Completion of Part C

1. The Watchstanders associated with the shutdown unit are to perform the daily walkdown of the protected train postings applicable to their watchstation.

    a. Watchstanders outside of the Control Room associated with the shutdown unit may be required to perform the walkdown for postings located at the opposite unit while verifying protected train postings.

    b. Control Room Watchstanders are to perform the walkdown of the protected train postings in the Control Room.

    c. Switchyard postings need only be checked weekly by the ANPO and may be performed concurrently with rounds taken at the Unit 1 and 2 Gas House.

2. The applicable Watchstander is to obtain a copy of the current protected train posting attachment in the Risk Assessment book.

3. Perform a check of the protected train postings:

    a. Ensure the proper placement of postings and barriers has been maintained to adequately identify protected equipment or areas.

    b. Ensure no unauthorized work is occurring in these protected areas.

4. Document completion of this walkdown in the appropriate Unit Narrative Log or Operator Rounds Data Logger.

ATTACHMENT 4
(Page 4 of 12)

OUTAGE RISK ASSESSMENT AND PROTECTED TRAIN POSTING VERIFICATION

COLOR CODE DETERMINATION WORKSHEET

PART A
Protected Train: B
Enclosure in Effect: 1

KEY SAFE SHUTDOWN FUNCTION	EQUIPMENT	EQUIPMENT COLOR CODE	FUNCTION COLOR CODE
Decay Heat Removal	RHR Pumps	G Y O R N/A	GREEN
	RHR Heat Exchanger	G Y O R N/A	
	CCW Pumps	G Y O R N/A	
	CCW Heat Exchanger	G Y O R N/A	
	ICW Pumps	G Y O R N/A	
	ICW Headers	G Y O R N/A	
	Source of FdWtr & flowpath	G Y N/A	
	2 SDTA Valves	G Y N/A	
Inventory Control	Charging Pumps	G Y O R N/A	GREEN
	Charging Flowpath	G O R N/A	
	Primary Water Pump	G Y O N/A	
	BA Transfer Pumps	G Y O N/A	
	HHSI Pumps	G Y O N/A	
	RCS Inventory	G Y O N/A	
Power Availability	Transformers	G Y O R N/A	GREEN
	A, B, C, D Buses	G Y O R N/A	
	Associated Unit's EDGs	G Y O N/A	
	Station Blackout Tie	G Y O N/A	
Reactivity Control	RCS Boron Concentration	G R N/A	GREEN
Instrumentation	Source Range	G W Y N/A	GREEN
	ARMs Channels	G W N/A	
	PRMs Channels	G W N/A	
	CETs	G Y N/A	
	RVLIS	G W N/A	
	CNTMT Water Level Ind	G W N/A	
	CNTMT Sump Level Ind	G W Y N/A	
	PRZ Level Indication	G W N/A	
	RCS Pressure Indication	G W Y N/A	
	RCS Wide Range Temp	G W Y N/A	
	RX Draindown Level	G Y O N/A	

EXAMPLE OF ELECTRONIC VERSION

ATTACHMENT 4
(Page 5 of 12)

OUTAGE RISK ASSESSMENT AND PROTECTED TRAIN POSTING VERIFICATION

COLOR CODE DETERMINATION WORKSHEET

PART A
Enclosure in Effect: 1

KEY SAFE SHUTDOWN FUNCTION	EQUIPMENT	EQUIPMENT COLOR CODE	FUNCTION COLOR CODE
Containment Integrity	Penetration Isolation	G Y O N/A	GREEN
Risk Significant Equipment	Aux Building Exhaust Fan	G Y N/A	GREEN
	IAC - Diesel Driven	G Y N/A	
	DC Room HVAC	G W Y N/A	
	Service Water Pumps	G W N/A	
Spent Fuel Cooling	SFP Cooling Pump A and B	G Y O R N/A	GREEN
	SFP HX's A&B	G Y O R N/A	
	Two ICW Pumps	G Y R N/A	
	One ICW Header	G R N/A	
	Two CCW Pumps	G Y R N/A	
	One CCW Heat Exchanger	G R N/A	
	A and B Switchgear	G Y R N/A	
	One Associated Unit's EDG	G O N/A	
	C LC & Opposite Unit B LC	G Y O R N/A	
	SFP Exhaust Fan	G W N/A	
	SFP HX Room Vent Fan	G Y N/A	
SFP Makeup Water	Two of Three Sources	G Y O N/A	GREEN

EXAMPLE OF ELECTRONIC VERSION

Enclosure In Effect: 1

MIDS
SHIFT

8/19/2014 9:18
DATE / TIME

Peter Meier
Prepared by:

Outage Risk Assessment: GREEN

Signature on file (MM/DD/YY @ HHMM)
Reviewed by: Shift Manager/SRO Designee Date/Time

ATTACHMENT 4
(Page 6 of 12)

OUTAGE RISK ASSESSMENT AND PROTECTED TRAIN POSTING VERIFICATION

PART B - RISK CONTROL

PART B - RISK CONTROL - Enclosure 1

Phase 1, Fuel in Reactor, RCS Temperature < 200 F, At Least Two RCS Loops Available

Status: COLOR

Date: MM/DD/YY Time: HHMM

Designation: Shaded = Protected/Posted Bold = Running or Energized

Protected Train	3A	3B			
Decay Heat Removal					
RHR Pumps	3A	3B			
RHR Heat Exchangers	3A	3B			
CCW Pumps	3A	3B	3C		
CCW Heat Exchangers	3A	3B	3C		
ICW Pumps	3A	3B	3C		
ICW Headers	3A	3B			
Source of Feedwater:					
SGFP	3A	3B			
SBSGFP	A	B			
Condensate Pump	3A	3B	3C		
Condensate Transfer Pump	Unit 3	Unit 4			
SGWL Pump	3A	3B	3C		
Steam Dump to Atmosphere	CV-3-1606	CV-3-1607	CV-3-1608		
Inventory Control					
Charging Pumps	3A	3B	3C		
Boration Source	BAST	RWST	Tank Levels =	XXXK / XXXK	
Primary Water Pumps	3A	3B	4A	4B	
Boric Acid Pumps	3A	3B	4A	4B	
HHSI Pumps	3A	3B	4A	4B	
Hot Leg Injection Flowpath	MOV-3-869	MOV-3-866A	MOV-3-866B	3-890	
Onsite / Offsite Power					
Transformers	U3 Startup Xfmr	U3 Aux Xfmr Backfeed	U4 Startup Xfmr to A B	Unit 3 C Bus Xfmr	Unit 4 C Bus Xfmr
4160 Bus	3A	3B	3C	3D	
Emergency Diesels	3A	3B			
Station Blackout Tie	3AD07	4AD07			
Reactivity Control					
Shutdown Boron Concentration Adequate?	YES	Actual Cb (ppm)	Required Cb (ppm)		
Shutdown Monitoring Instrumentation					
Source Range	N-31	N-32	"A" Gamma	"B" Gamma	
ARMS Channels	R1401	R1402	R1403		
PRMS Channel	R-11	R-12	R-14 or RAD-6304	R-19	
Two Core Exit Thermocouples Available?	YES	NO	Reactor Disassembled		
QSPDS Channel Reactor Vessel HJTC	A	B	Reactor Disassembled		
Containment Water Level	LI-3-6309A	LI-3-6309B			
Containment Sump Level	LI-3-6308A	LI-3-6308B	LT-3-1546		
Pressurizer Level	LT-3-459	LT-3-460	LT-3-461	LT-3-462	
RCS Pressure	PT-3-402	PT-3-403	PT-3-405		
RCS Wide Range THOT	TI-3-413A TI-3-413B	TI-3-423A TI-3-423B	TI-3-433A TI-3-433B		
RCS Wide Range TCOLD	TI-3-410A TI-3-410B	TI-3-420A TI-3-420B	TI-3-430A TI-3-430B		
Containment Closure					
Equipment Hatch	Open	Closed			
Personnel Hatch	Open	Closed			
Risk Significant Equip.					
Aux Bldg Exhaust Fan	A	B			
Instrument Air CD	3CD	4CD			
Instrument Air Crosstied?	YES	NO			
Vital DC Room HVAC	E16D	E16E	E16F		
Service Water Pumps	A	B	C	D	
Reactor Time to Boil:	**XXX**	**Minutes**			
SFP Time to 200deg:	**XXX**	**Minutes**			
Applicable TCNs:					
Reason Risk Increas N/A					

Signature on file (MM/DD/YY @ HHMM) Signature on file (MM/DD/YY @ HHMM)

Performed By: (Print STA's Name Here) Reviewed By: (Print SM's Name Here)

Procedure No.: 0-ADM-051	Procedure Title: Outage Risk Assessment and Control	Page: 180 / Approval Date: 5/3/16

ATTACHMENT 4
(Page 7 of 12)

OUTAGE RISK ASSESSMENT AND PROTECTED TRAIN POSTING VERIFICATION

PART B - RISK CONTROL

PART B - RISK CONTROL - Enclosure 2

Phase 1, Fuel in Reactor, RCS Temperature < 200 F, No RCS Loops Available

Status: COLOR

Date: MMDDYY Time: HHMM

Designation: Shaded = Protected/Posted Bold = Running or Energized

Protected Train	3A	3B			
Decay Heat Removal					
RHR Pumps	3A	3B			
RHR Heat Exchangers	3A	3B			
CCW Pumps	3A	3B	3C		
CCW Heat Exchangers	3A	3B	3C		
ICW Pumps	3A	3B	3C		
ICW Headers	A	B			
Inventory Control					
Charging Pumps	3A	3B	3C		
Boration Source	BAST	RWST	Tank Levels =	XXXK / XXXK	
Primary Water Pumps	3A	3B	4A	4B	
Boric Acid Pumps	3A	3B	4A	4B	
HHSI Pumps	3A	3B	4A	4B	
RCS Inventory at or above 5% PRZ Cold Cal Level?	YES	NO			
Hot Leg Injection Flowpath	MOV-3-869	MOV-3-866A	MOV-3-866B	3-990	
Onsite / Offsite Power					
Transformers	U3 Startup Xfmr	U3 Aux Xfmr Backfeed	U4 Startup Xfmr	Unit 3 C Bus Xfmr	Unit 4 C Bus Xfmr
4160 Bus	3A	3B	3C	3D	
Emergency Diesels	3A	3B			
Station Blackout Tie	3AD07	4AD07			
Reactivity Control					
Shutdown Boron Concentration Adequate?	YES	Actual Cb (ppm)	Required Cb (ppm)		
Shutdown Monitoring Instrumentation					
Source Range	N-31	N-32	"A" Gamma metrics	"B" Gamma metrics	
ARMS Channels	R1401	R1402	R1403		
PRMS Channel	R-11	R-12	R-14 -OR- RAD-6304		
Two Core Exit Thermocouples Available?	YES	NO	Reactor Disassembled		
QSPDS Channel Reactor Vessel HJTC	A	B	Reactor Disassembled		
Containment Water Level	LI-3-6309A	LI-3-6309B			
Containment Sump Level	LI-3-6308A	LI-3-6308B	LT-3-1546		
Pressurizer Cold Cal Level	LT-3-462				
RCS Pressure	PT-3-402	PT-3-403	PT-3-405		
RCS Wide Range THOT	TI-3-413A TI-3-413B	TI-3-423A TI-3-423B	TI-3-433A TI-3-433B		
RCS Wide Range TCOLD	TI-3-410A TI-3-410B	TI-3-420A TI-3-420B	TI-3-430A TI-3-430B		
RCS Drain Down Level	LIS-3-6421	LI-3-6422	LIS-3-6423		
Containment Closure					
Equipment Hatch	Open	Closed			
Personnel Hatch	Open	Closed			
Risk Significant Equip.					
Aux Bldg Exhaust Fan	A	B			
Instrument Air CD	3CD	4CD			
Instrument Air Crosstied?	YES	NO			
Vital DC Room HVAC	E16D	E16E	E16F		
Service Water Pumps	A	B	C	D	
Reactor Time to Boil:	XX	Minutes			
SFP Time to 200deg:	XX	Minutes			
Applicable TCNs:					
Reason Risk Increase N/A					

Signature on file (MM/DD/YY @ HHMM) Signature on file (MM/DD/YY @ HHMM)

Performed By: (Print STA's Name Here) Reviewed By: (Print SM's Name Here)

ATTACHMENT 4
(Page 8 of 12)

OUTAGE RISK ASSESSMENT AND PROTECTED TRAIN POSTING VERIFICATION

PART B - RISK CONTROL

PART B - RISK CONTROL - Enclosure 3

Phase 1, Fuel in Reactor, Reactor Cavity Flooded > 23 Feet Above Reactor Head Flang

Status: COLOR

Date: MM/DD/YY Time: HHMM

Designation: Shaded = Protected/Posted Bold = Running or Energized

Protected Train	3A	3B			
Decay Heat Removal					
RHR Pumps	3A	3B			
RHR Heat Exchangers	3A	3B			
CCW Pumps	3A	3B	3C		
CCW Heat Exchangers	3A	3B	3C		
ICW Pumps	3A	3B	3C		
ICW Headers	A	B			
Inventory Control					
Charging Pumps	3A	3B	3C		
Boration Source	BAST	RWST	Tank Levels =	XXXK / XXXK	
Primary Water Pumps	3A	3B	4A	4B	
Boric Acid Pumps	3A	3B	4A	4B	
HHSI Pumps	3A	3B	4A	4B	
Onsite / Offsite Power					
Transformers	U3 Startup Xfmr	U3 Aux Xfmr Backfeed	U4 Startup Xfmr	Unit 3 C Bus Xfmr	Unit 4 C Bus Xfmr
4160 Bus	3A	3B	3C	3D	
Emergency Diesels	3A	3B			
Station Blackout Tie	3AD07	4AD07			
Reactivity Control					
Shutdown Boron Concentration Adequate?	YES/NO	Actual Cb (ppm)	Required Cb (ppm)		
Shutdown Monitoring Instrumentation					
Source Range	N-31	N-32	"A" Gamma metrics	"B" Gamma metrics	
ARMS Channels	R1401	R1402	R1403	R1407	R1421
PRMS Channel	R-11	R-12	R-14 -OR- RAD-6304		
Containment Water Level	LI-3-6309A	LI-3-6309B			
Containment Sump Level	LI-3-6308A	LI-3-6308B	LT-3-1546		
Containment Closure					
Equipment Hatch	Open	Closed			
Personnel Hatch	Open	Closed			
Risk Significant Equip.					
Aux Bldg Exhaust Fan	A	B			
Instrument Air CD	3CD	4CD			
Instrument Air Crosstied?	NO				
Vital DC Room HVAC	E16D	E16E	E16F		
Service Water Pumps	A	B	C	D	
SFP Cooling and Makeup Sources					
SFP Cooling Pump	A	B			
SFP HX A&B	A	B			
SFP Exhaust Fan	ON	OFF			
SFP HX Room Vent Fan	ON	OFF			
3C 480V LC & 4B 480V LC	3C LC	4B LC			
SFP Make-up Water Source	RWST & Purification Pump	PWST & PW Pump	CVCS Holdup Tank & Recirc Pump		
Reactor Time to Boil:	XXX Minutes				
SFP Time to 200deg:	XXX Minutes				

Applicable TCNs:

Reason Risk Increased N/A

Signature on file (MM/DD/YY @ HHMM) Signature on file (MM/DD/YY @ HHMM)

Performed By: (Print STA's Name Here) Reviewed By: (Print SM's Name Here)

EXAMPLE OF ELECTRONIC VERSION

ATTACHMENT 4
(Page 9 of 12)

OUTAGE RISK ASSESSMENT AND PROTECTED TRAIN POSTING VERIFICATION

PART B - RISK CONTROL

PART B - RISK CONTROL - Enclosure 4

Phase 2, Fuel in Reactor, Reactor Cavity Flooded > 23 Feet Above Reactor Head Flange

Status: COLOR

Date: MM/DD/YY Time: HHMM

Designation: Shaded = Protected/Posted Bold = Running or Energized

Protected Train	3A	3B			
Decay Heat Removal					
RHR Pumps	3A	3B			
RHR Heat Exchangers	3A	3B			
CCW Pumps	3A	3B	3C		
CCW Heat Exchangers	3A	3B	3C		
ICW Pumps	3A	3B	3C		
ICW Headers	A	B			
Inventory Control					
Charging Pumps	3A	3B	3C		
Boration Source	BAST	RWST	Tank Levels =	XXXK / XXXK	
Primary Water Pumps	3A	3B	4A	4B	
Boric Acid Pumps	3A	3B	4A	4B	
HHSI Pumps	3A	3B	4A	4B	
Onsite / Offsite Power					
Transformers	U3 Startup Xfmr	U3 Aux Xfmr Backfeed	U4 Startup Xfmr	Unit 3 C Bus Xfmr	Unit 4 C Bus Xfmr
4160 Bus	3A	3B	3C	3D	
Emergency Diesels	3A	3B			
Station Blackout Tie	3AD07	4AD07			
Reactivity Control					
Shutdown Boron Concentration Adequate?	YES/NO	Actual Cp (ppm)	Required Cp (ppm)		
Shutdown Monitoring Instrumentation					
Source Range	N-31	N-32	"A" Gamma metrics	"B" Gamma metrics	
ARMS Channels	R1401	R1402	R1403	R1407	R1421
PRMS Channel	R-11	R-12	R-14 -OR- RAD-6304		
Containment Water Level	LI-3-6309A	LI-3-6309B			
Containment Sump Level	LI-3-6308A	LI-3-6308B	LT-3-1546		
Containment Closure					
Equipment Hatch	Open	Closed			
Personnel Hatch	Open	Closed			
Risk Significant Equip.					
Aux Bldg Exhaust Fan	A	B			
Instrument Air CD	3CD	4CD			
Instrument Air Crosstied?	YES	NO			
Vital DC Room HVAC	E16D	E16E	E16F		
Service Water Pumps	A	B	C	D	
SFP Cooling and Makeup Sources					
SFP Cooling Pump	A	B			
SFP HX A&B	A	B			
SFP Exhaust Fan	ON	OFF			
SFP HX Room Vent Fan	ON	OFF			
3C 480V LC & 4B 480V LC	3C LC	4B LC			
SFP Make-up Water Source	RWST & Purification Pump	PWST & PW Pump	CVCS Holdup Tank & Recirc Pump		
Reactor Time to Boil:	XXX	Minutes			
SFP Time to 200deg:	XXX	Minutes			
Applicable TCNs:					
Reason Risk Increase: N/A					

Signature on file (MM/DD/YY @ HHMM) Signature on file (MM/DD/YY @ HHMM)

Performed By: (Print STA's Name Here) Reviewed By: (Print SM's Name Here)

ATTACHMENT 4
(Page 10 of 12)

OUTAGE RISK ASSESSMENT AND PROTECTED TRAIN POSTING VERIFICATION

PART B - RISK CONTROL

PART B - RISK CONTROL - Enclosure 5

Phase 2, Fuel in Reactor, RCS Temperature < 200 F, No RCS Loops Available

Status: Color

Date: MMDDYY Time: XXXX

Designation: Shaded = Protected/Posted Bold = Running or Energized

Protected Train	3A	3B			
Decay Heat Removal					
RHR Pumps	3A	3B			
RHR Heat Exchangers	3A	3B			
CCW Pumps	3A	3B	3C		
CCW Heat Exchangers	3A	3B	3C		
ICW Pumps	3A	3B	3C		
ICW Headers	A	B			
Inventory Control					
Charging Pumps	3A	3B	3C		
Boration Source	BAST	RWST	Tank Levels =	XXK / XXK	
Primary Water Pumps	3A	3B	4A	4B	
Boric Acid Pumps	3A	3B	4A	4B	
HHSI Pumps	3A	3B	4A	4B	
RCS Inventory at or above 5% PRZ Cold Cal Level?	YES/NO				
Hot Leg Injection Flowpath	MOV-3-869	MOV-3-866A	MOV-3-866B	3-990	
Onsite and Offsite Power					
Transformers	U3 Startup Xfmr	U3 Aux Xfmr Backfeed	U4 Startup Xfmr	Unit 3 C Bus Xfmr	Unit 4 C Bus Xfmr
4160 Bus	3A	3B	3C	3D	
Emergency Diesels	3A	3B			
Station Blackout Tie	3AD07	4AD07			
Reactivity Control					
Shutdown Boron Concentration Adequate?	YES	Actual Cb (ppm)	Required Cb (ppm)		
Shutdown Monitoring Instrumentation					
Source Range	N-31	N-32	"A" Gamma metrics	"B" Gamma metrics	
ARMS Channels	R1401	R1402	R1403	R1407	R1421
PRMS Channel	R-11	R-12	R-14 -OR- RAD-6304		
Two Core Exit Thermocouples Available?	YES/NO		Head Fully Tensioned		
QSPDS Channel Reactor Vessel HJTC	A	B	Head Fully Tensioned		
Containment Water Level	LI-3-6309A	LI-3-6309B			
Containment Sump Level	LI-3-6308A	LI-3-6308B	LT-3-1546		
Pressurizer Cold Cal Level	LT-3-462				
RCS Pressure	PT-3-402	PT-3-403	PT-3-405		
RCS Wide Range THOT	TI-3-413A TI-3-413B	TI-3-423A TI-3-423B	TI-3-433A TI-3-433B		
RCS Wide Range TCOLD	TI-3-410A TI-3-410B	TI-3-420A TI-3-420B	TI-3-430A TI-3-430B		
RCS Drain Down Level	LIS-3-6421	LI-3-6422	LIS-3-6423		
Containment Closure					
Equipment Hatch	Open	Closed			
Personnel Hatch	Open	Closed			
Risk Significant Equipment					
Aux Bldg Exhaust Fan	A	B			
Instrument Air CD	3CD	4CD			
Instrument Air Crosstied?	YES	NO			
Vital DC Room HVAC	E16D	E16E	E16F		
Service Water Pumps	A	B	C	D	
Reactor Time to Boil:	xx	**Minutes**			
SFP Time to 200deg:	xx	**Minutes**			
Applicable TCNs:					
Reason Risk Increase					

Signature on file (MM/DD/YY @ HHMM) Signature on file (MM/DD/YY @ HHMM)
Performed By: (Print STA's Name Here) Reviewed By: (Print SM's Name Here)

ATTACHMENT 4
(Page 11 of 12)

OUTAGE RISK ASSESSMENT AND PROTECTED TRAIN POSTING VERIFICATION

PART B - RISK CONTROL

PART B - RISK CONTROL - Enclosure 6

Phase 2, Fuel in Reactor, RCS Temperature < 200 F, At Least Two RCS Loops Available

Status: COLOR

Date: MM/DD/YY Time: HHMM

Designation: Shaded = Protected/Posted Bold = Running or Energized

Protected Train	3A	3B			
Decay Heat Removal					
RHR Pumps	3A	3B			
RHR Heat Exchangers	3A	3B			
CCW Pumps	3A	3B	3C		
CCW Heat Exchangers	3A	3B	3C		
ICW Pumps	3A	3B	3C		
ICW Headers	3A	3B			
Source of Feedwater:					
SGFP	3A	3B			
SBSGFP	3A	3B			
Condensate Pump	3A	3B	3C		
Condensate Transfer Pump	Unit 3	Unit 4			
SGWL Pump	3A	3B	3C		
Steam Dump to Atmosphere	CV-3-1606	CV-3-1607	CV-3-1608		
Inventory Control					
Charging Pumps	3A	3B	3C		
Boration Source	BAST	RWST	Tank Levels =	XXXK / XXXK	
Primary Water Pumps	3A	3B	4A	4B	
Boric Acid Pumps	3A	3B	4A	4B	
HHSI Pumps	3A	3B	4A	4B	
Hot Leg Injection Flowpath	MOV-3-869	MOV-3-866A	MOV-3-866B	3-890	
Onsite / Offsite Power					
Transformers	U3 Startup Xfmr	U3 Aux Xfmr Backfeed	U4 Startup Xfmr	Unit 3 C Bus Xfmr	Unit 4 C Bus Xfmr
4160 Bus	3A	3B	3C	3D	
Emergency Diesels	3A	3B			
Station Blackout Tie	3AD07	4AD07			
Reactivity Control					
Shutdown Boron Concentration Adequate?	YES	Actual Cb (ppm)	Required Cb (ppm)		
Shutdown Monitoring Instrumentation					
Source Range	N-31	N-32	"A" Gamma metrics	"B" Gamma metrics	
ARMS Channels	R1401	R1402	R1403		
PRMS Channel	R-11	R-12	R-14 -OR- RAD-6304	R-19	
Two Core Exit Thermocouples Available?	YES/NO		Reactor Disassembled		
QSPDS Channel Reactor Vessel HJTC	A	B	Reactor Disassembled		
Containment Water Level	LI-3-6309A	LI-3-6309B			
Containment Sump Level	LI-3-6308A	LI-3-6308B	LT-3-1546		
Pressurizer Level	LT-3-459	LT-3-460	LT-3-461	LT-3-462	
RCS Pressure	PT-3-402	PT-3-403	PT-3-405		
RCS Wide Range THOT	TI-3-413A TI-3-413B	TI-3-423A TI-3-423B	TI-3-433A TI-3-433B		
RCS Wide Range TCOLD	TI-3-410A TI-3-410B	TI-3-420A TI-3-420B	TI-3-430A TI-3-430B		
Containment Closure					
Equipment Hatch	Open	Closed			
Personnel Hatch	Open	Closed			
Risk Significant Equip.					
Aux Bldg Exhaust Fan	A	B			
Instrument Air CD	3CD	4CD			
Instrument Air Crosstied?	YES	NO			
Vital DC Room HVAC	E16D	E16E	E16F		
Service Water Pumps	A	B	C	D	
Reactor Time to Boil:	XX	Minutes			
SFP Time to 200deg:	XX	Minutes			
Applicable TCNs:					
Reason Risk Increas N/A					

Signature on file (MM/DD/YY @ HHMM) Signature on file (MM/DD/YY @ HHMM)

Performed By: (Print STA's Name Here) Reviewed By: (Print SM's Name Here)

ATTACHMENT 4
(Page 12 of 12)

OUTAGE RISK ASSESSMENT AND PROTECTED TRAIN POSTING VERIFICATION

PART B - RISK CONTROL

PART B - RISK CONTROL - Enclosure 7

Spent Fuel Pool Minimum Required Equipment

Status: COLOR

Date: MM/DD/YY Time: HHMM

Designation: Shaded = Protected/Posted Bold = Running or Energized

Protected Train	3A	3B			
SFP Cooling					
SFP Cooling Pump	3A	3B			
SFP HX A&B	A	B			
ICW Pumps	3A	3B	3C		
ICW Headers	A	B			
CCW Pumps	3A	3B	3C		
CCW Heat Exchangers	3A	3B	3C		
4160 Bus	3A	3B			
SFP Exhaust Fan	ON	OFF			
SFP HX Room Vent Fan	ON	OFF			
Onsite / Offsite Power					
Emergency Diesels	3A	3B			
3C 480V LC & 4B 480V LC	3C LC	4B LC			
SFP Makeup Sources					
SFP Make-up Water Source	RWST & Purification Pump	PWST & PW Pump	CVCS Holdup Tank & Recirc Pump		
SFP Time to 200deg:	**XX Minutes**				

Applicable TCNs:

Reason Risk Increased: N/A

Signature on file (MM/DD/YY @ HHMM) Signature on file (MM/DD/YY @ HHMM)

Performed By: (Print STA's Name Here) Reviewed By: (Print SM's Name Here)

EXAMPLE OF ELECTRONIC VERSION

ATTACHMENT 5
(Page 1 of 1)

TEMPORARY CHANGE INDEX

TEMPORARY CHANGE INDEX

Number	Key Function	Description	Date Entered	Date Restored

F-368 Rev. 1(8/22/07 – 0-ADM-051)

ATTACHMENT 6
(Page 1 of 2)

APPROVAL OF WORK ON PROTECTED/OPERATING TRAIN

Description of Activity

Justification for Work on Protected/Operating Train (i.e., plant design, emergent condition, etc)

Risk Assessment Team Review

Additional protected equipment signs or barriers required as a result of the work? If Yes, list specific components/locations. YES ☐ NO ☐

Any additional recommended compensatory actions? If Yes, list below. YES ☐ NO ☐

Recommendation by the Risk Assessment Team:

YES ☐ NO ☐ ______________________
Risk Assessment Mgr (OPS)

Level of Approval: 1 ☐ OPS Only

2 ☐ ALL

ATTACHMENT 6
(Page 2 of 2)

APPROVAL OF WORK ON PROTECTED/OPERATING TRAIN

NOTES

- *Level of approval is determined by the Risk Assessment Manager or the Shift Manager. Level 1 approval is required for those activities of low risk to key safe shutdown equipment and Level 2 approval is for those instances that the activity performed on the protected train equipment could result in a loss of a key function or a significant loss of defense-in-depth.*
- *Delegation of signature authority for the individuals below must be in writing to the Risk Assessment Team Leader.*
- *Review by the Shift Manager is required prior to performing activity permitted by this attachment.*
- *A copy of this approved attachment shall be in hand at the job site prior to commencing work.*
- *Level 2 approval for higher risk exceptions by the below individuals must be in a **face to face** or per telecom group discussion.*

Level 1 and Level 2

Approved by: ______________________________
Operations Manager

Level 2 (Higher Risk)

Approved by: ______________________________
Engineering Manager

Approved by: ______________________________
Work Controls Manager

Approved by: ______________________________
Plant General Manager

Approval Expires: ______________________________
(Date/Time or specific plant condition)

Reviewed by: ______________________________
Shift Manager

Restoration

If additional protected equipment signs and barriers used, verify removed upon completion of activity. (Signs or barriers listed specifically on page 1 of this attachment)

____
Shift Manager or SRO Designee

ATTACHMENT 7
(Page 1 of 2)

RISK SIGNIFICANT SCHEDULE CHANGE (RSSC)

NOTES

- *Submittal of this form is the responsibility of the department or project lead requesting an R-Logic or potentially risk significant schedule change.*
- *A minor change to a R flagged activity is when NO adverse risk significant change occurs due to the requested change having obvious inconsequential degradation to outage or shutdown safety risk. Review of Enclosures 1 through 7 and 11 should be considered to verify no adverse impact to risk. Ensure the basis is adequately documented.*
- *Complete only Section 1 or 2 as applicable and retain the approved copy in the Outage Risk Assessment Notebook.*
- *A Condition Report must be attached to all Risk Significant Schedule Changes not deemed as minor.*

Section 1: Minor Change Yes ☐ No ☐ (See Section 2)

1. Describe the change:

2. Describe impact or reason determined as minor change:

3. Approval as Minor RSSC

_______________________________ _______________
Risk Assessment Team Lead *Date*

4. Schedule changes processed: _______________
WC Initials

5. Retain this form in the Outage Risk Assessment Notebook.

ATTACHMENT 7
(Page 2 of 2)

RISK SIGNIFICANT SCHEDULE CHANGE (RSSC)

Section 2: Risk Significant Schedule Change Yes ☐ No ☐

1. Describe Risk Significant Schedule Change and Activities:

2. Discuss overall benefits and risk of change in terms of nuclear safety/outage risk including the impact on required equipment in Enclosures 1 through 7.

3. Approval of RSSC: Yes ☐ No ☐

   Remarks: ______________________________

   ____

   ____

   ______________________________ ______________
   Risk Assessment Team Lead *Date*

   ______________________________ ______________
   Operations Manager *Date*

   ______________________________ ______________
   Plant General Manager *Date*

4. RAT member delineate risk logic ties for the approved change.

   ____

   ____

5. Schedule changes processed: ______________
   WC Initials

6. WC and/or OCC Outage Managers apprised of changes: ______________
   Initials

7. Document in Condition Report and attach copy of CR.

8. Retain this form in the Outage Risk Assessment Notebook.

ATTACHMENT 8
(Page 1 of 7)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

NOTES

- *The steps in this attachment may be performed in any order.*
- *All postings are NOT intended to provide physical barriers; rather, to provide information and heightened awareness.*
- *If the operating train is swapped, or if components within a train are swapped, protected equipment postings should be placed or removed as necessary to maintain the postings and equipment status consistent. The new alignment should be posted prior to de-posting the previously protected equipment*
- *Attachment 23, Unit 3 Protected Train De-Posting Checklist, should be prepared prior to entering the field to change Protected Train postings and may be performed concurrently with this attachment.*
- *If a deviation in the specified method for posting is required, then obtain SRO approval using Attachment 25, Protected Equipment Posting Deviations, prior to implementing the deviation.*
- *See Figure 6 for Protected Equipment sign format and content guidance.*

1. **IF** offsite power is from the Startup Transformer, **THEN** perform the following:

   a. In the switchyard, install barriers around the Startup Transformer bay as follows:

____ (1) Install a barrier on the East side of the bay facing East.

____ (2) Install a barrier on the North side facing North.

____ (3) Install a barrier on the West side facing West.

____ (4) Install a barrier on the South side facing South.

____ b. At the Startup Transformer, install barriers around the Startup Transformer.

2. **IF** offsite power is from backfeed, **THEN** perform the following:

   a. In the switchyard, install barriers around the Main Transformer bay as follows:

____ (1) Install a barrier on the East side of the bay facing East.

____ (2) Install a barrier on the North side facing North.

____ (3) Install a barrier on the West side facing West.

____ (4) Install a barrier on the South side facing South.

____ b. At the Main and Aux Transformers, install barriers around the Main and Aux Transformers.

ATTACHMENT 8
(Page 2 of 7)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

3. **IF** 3A Train is the designated operating train, **THEN** post signs and/or barriers as follows:

   a. Install barriers in the 3A 4 kV Bus Room at the following locations:

____ (1) East side of the 3A Switchgear Bus from the North wall to the South wall.

____ (2) West end of the 3A Switchgear Bus:

- On the West end of the 3A Switchgear, place a barrier from the Northwest corner of the 3A Switchgear to the South wall (allow access to LP34).
- On the North side (rear) of the 3A Switchgear, place a barrier between the 3L MCC and 3A Sequencer (3C23A-1) that extends to the 3A Switchgear.
- On the North side (rear) of the 3A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 3AA01, 3AA02, 3AA03, 3AA04, 3AA05, and 3AA06 (six signs total).

   b. Perform the following in the U3 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

(1) Install barriers at the following locations:

____ • In front and rear sections of 3B 480V LC

____ • In front and rear sections of 3D 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

   c. Install barriers at the following entry doors to 3A EDG Rooms:

____ (1) Door 073-1

____ (2) Door 072-2

____ (3) Door 131-1 to the 3A EDG radiator area

____ (4) Door 075-1to the 3A EDG Day Tank Room

   d. Post 3A MCC 480V MCC Vital Section as follows:

____ (1) At the 3A Vital MCC, starting from the North end, place a magnetic Protected Equipment sign on the first and second cabinet door.

ATTACHMENT 8
(Page 3 of 7)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

3. (Cont'd)

e. **IF** the 3A ICW **OR** CCW pump is unavailable, **THEN** ensure the 3D Bus is aligned to the 3A Bus, and install barriers at the following entry doors to 3D 4 kV Bus Room:

____ (1) Door 134-1

____ (2) Door 134-2

f. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 3A RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 3A CCW Pump

OR

____ ii. 3C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 3A ICW Pump

OR

____ ii. 3C ICW Pump

ATTACHMENT 8
(Page 4 of 7)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

4. **IF** 3B Train is the designated operating train, **THEN** post signs and/or barriers as follows:

a. Install barriers in the 3B 4 kV Bus Room at the following locations:

____ (1) East side of the 3B Switchgear Bus from the North wall to the South wall (Permit access to the ASD panel.)

____ (2) West end of the 3B Switchgear Bus:

- On the West end of the 3B Switchgear, place a barrier from the Northwest corner of the 3B Switchgear to the South wall.
- On the North side (rear) of the 3B Switchgear, place a barrier at the East end of the 3M MCC that extends to the 3B Switchgear.
- On the North side (rear) of the 3B Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 3AB01, 3AB02, 3AB03, and 3AB04 (four signs total).

b. Perform the following in the U3 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

(1) Install barriers at the following locations:

____ • In front and rear sections of 3B 480V LC

____ • In front and rear sections of 3D 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

c. Install barriers at the following entry doors to 3B EDG Rooms:

____ (1) Door 072-1

____ (2) Door 072-2

____ (3) Vital area door 3EDG3131 to the 3B EDG radiator area

____ (4) Door 074-1 to the 3B EDG Day Tank Room

d. **IF** the 3B ICW or CCW pump is unavailable, **THEN** ensure the 3D Bus is aligned to the 3B Bus, and install barriers at the following entry doors to 3D 4 kV Bus Room:

____ (1) Door 134-1

____ (2) Door 134-2

ATTACHMENT 8
(Page 5 of 7)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

4. (Cont'd)

e. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 3B RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 3B CCW Pump

OR

____ ii. 3C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 3B ICW Pump

OR

____ ii. 3C ICW Pump

5. In the 3A 4 kV Bus Room, install signs as follows:

____ a. Place a Protected Equipment sign on the front of 3C23A (old Sequencer Cabinet) located on the North wall of the 3A 4 kV Bus Room.

____ b. Place a Protected Equipment sign on the 3AA04 cubicle door.

ATTACHMENT 8
(Page 6 of 7)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

6. In the 3B 4 kV Bus Room, install signs as follows:

____ a. Place a Protected Equipment sign on the front of 3C23B (old Sequencer Cabinet) located on the North wall of the 3B 4 kV Bus Room.

____ b. Place a Protected Equipment sign on the 3AB04 cubicle door.

____ 7. In the CCW Room, install barriers around the CCW Pump whose 4 kV power supply is protected above.

____ a. Record pump protected ___________________

____ 8. Install barriers at the top of stairway to running protected RHR Pump Room (10 ft).

____ a. Record RHR Pump Room protected ___________________

____ 9. Install barriers on the South end of 2 of 3 CCW HXs.

____ a. Record HXs protected ___________________

____ 10. At the Intake, install barriers around the ICW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ___________________

____ 11. In the Control Room, place a barrier and Protected Train sign behind the southernmost section of the 3C04 section of Vertical Panel A (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 12. **<u>IF</u>** applicable, **<u>THEN</u>** ensure unnecessary Protected Train Postings have been removed using Attachment 23, Unit 3 Protected Train De-Posting Checklist, as a guide.

ATTACHMENT 8
(Page 7 of 7)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

____ 13. **IF** any Protected Equipment Posting is required to be removed, **THEN** review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be concurrently removed. (N/A if not Protected Equipment Postings are being removed.)

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
______________________________	________________
______________________________	________________
______________________________	________________

REVIEWED BY:____ Date:__________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 9
(Page 1 of 5)

**UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 2 AND 5 (PRESSURIZER DRAINED <10%)**

NOTE

- *The steps in this attachment may be performed in any order.*
- *All postings are NOT intended to provide physical barriers; rather, to provide information and heightened awareness.*
- *If the operating train is swapped, or if components within a train are swapped, protected equipment postings should be placed or removed as necessary to maintain the postings and equipment status consistent. The new alignment should be posted prior to de-posting the previously protected equipment*
- *Attachment 23, Unit 3 Protected Train De-Posting Checklist, should be prepared prior to entering the field to change Protected Train postings and may be performed concurrently with this attachment.*
- *If a deviation in the specified method for posting is required, then obtain SRO approval using Attachment 25, Protected Equipment Posting Deviations, prior to implementing the deviation.*
- *See Figure 6 for Protected Equipment sign format and content guidance.*

1. **IF** offsite power is from the startup transformer, **THEN** perform the following:
   a. In the switchyard, install barriers around the Startup Transformer bay as follows:
____ (1) Install a barrier on the East side of the bay facing East.
____ (2) Install a barrier on the North side facing North.
____ (3) Install a barrier on the West side facing West
____ (4) Install a barrier on the South side facing South.
____ b. At the Startup Transformer, install barriers around the Startup Transformer.

2. **IF** offsite power is from backfeed, **THEN** perform the following:
   a. In the switchyard, install barriers around the Main Transformer bay as follows:
____ (1) Install a barrier on the East side of the bay facing East.
____ (2) Install a barrier on the North side facing North.
____ (3) Install a barrier on the West side facing West
____ (4) Install a barrier on the South side facing South.
____ b. At the Main and Aux Transformers, install barriers around the Main and Aux Transformers.

ATTACHMENT 9
(Page 2 of 5)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 2 AND 5 (PRESSURIZER DRAINED <10%)

3. Install barriers in the 3A 4 kV Bus Room at the following locations:

____ a. East side of the 3A Switchgear Bus from the North wall to the South wall

____ b. West end of the 3A Switchgear Bus:

- On the West end of the 3A Switchgear, place a barrier from the Northwest corner of the 3A Switchgear to the South wall (allow access to LP34).
- On the North side (rear) of the 3A Switchgear, place a barrier between the 3L MCC and 3A Sequencer (3C23A-1) that extends to the 3A Switchgear.
- On the North side (rear) of the 3A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 3AA01, 3AA02, 3AA03, 3AA04, 3AA05, and 3AA06 (six signs total).

4. Install barriers in the 3B 4 kV Bus Room at the following locations:

____ a. East side of the 3B Switchgear Bus from the North wall to the South wall (Permit access to the ASD panel.)

____ b. West end of the 3B Switchgear Bus:

- On the West end of the 3B Switchgear, place a barrier from the Northwest corner of the 3B Switchgear to the South wall.
- On the North side (rear) of the 3B Switchgear, place a barrier at the East end of the 3M MCC that extends to the 3B Switchgear.
- On the North side (rear) of the 3B Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 3AB01, 3AB02, 3AB03, and 3AB04 (four signs total).

5. Perform the following in the U3 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

a. Install barriers at the following locations:

____ • In front and rear sections of 3A 480V LC

____ • In front and rear sections of 3B 480V LC

____ • In front and rear sections of 3C 480V LC

____ • In front and rear sections of 3D 480V LC

___ b. Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

ATTACHMENT 9
(Page 3 of 5)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 2 AND 5 (PRESSURIZER DRAINED <10%)

6. Install barriers at the following entry doors to 3A and 3B EDG Rooms:

____ a. Door 073-1

____ b. Door 075-1to the 3A EDG Day Tank Room

____ c. Door 072-1

____ d. Vital area door 3EDG3131 to the 3B EDG radiator area

____ e. Door 074-1 to the 3B EDG Day Tank Room

7. Post 3A MCC 480V MCC Vital Section as follows:

____ a. At the 3A Vital MCC, starting from the North end, place a magnetic Protected Equipment sign on the first and second cabinet door.

8. In the 3A 4 kV Bus Room, install signs as follows:

____ a. Place a Protected Equipment sign on the front of 3C23A (old Sequencer Cabinet) located on the North wall of the 3A 4 kV Bus Room.

____ b. Place a Protected Equipment sign on the 3AA04 cubicle door.

9. In the 3B 4 kV Bus Room, install signs as follows:

____ a. Place a Protected Equipment sign on the front of 3C23B (old Sequencer Cabinet) located on the North wall of the 3B 4 kV Bus Room.

___ b. Place a Protected Equipment sign on the 3AB04 cubicle door.

ATTACHMENT 9
(Page 4 of 5)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 2 AND 5 (PRESSURIZER DRAINED <10%)

10. **IF** 3C CCW pump, or 3C ICW pump, is required to support operability of either RHR train (i.e., any A or B ICW/CCW pump is unavailable), **THEN** install barriers at the following entry doors to 3D 4 kV Bus Room:

____ a. Door 134-1

____ b. Door 134-2

____ 11. In the CCW Room, install barriers around the CCW pumps whose 4 kV power supplies were protected above.

____ a. Record pumps protected ______________________

____ 12. Install barriers at the top of stairway to the 3A RHR Pump Room (10 ft).

____ 13. Install barriers at the top of stairway to the 3B RHR Pump Room (10 ft).

____ 14. Install barriers on the South end of 2 of 3 CCW HXs.

____ a. Record HXs protected ______________________

____ 15. At the Intake, install barriers around the ICW pumps whose 4 kV power supplies were protected above.

____ a. Record pumps protected ______________________

16. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected / operating train: (N/A pumps not operating)

____ a. 3A RHR Pump

____ b. 3B RHR Pump

____ c. 3A CCW Pump

____ d. 3B CCW Pump

____ e. 3C CCW Pump

____ f. 3A ICW Pump

____ g. 3B ICW Pump

____ h. 3C ICW Pump

____ i. Record operating train ______________________

ATTACHMENT 9
(Page 5 of 5)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 2 AND 5 (PRESSURIZER DRAINED <10%)

____ 17. In the Control Room, behind the southernmost 3C04 section of Vertical Panel A that contains the Lockout Relay Reset buttons, place a barrier and Protected Train sign across 3C04 section (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 18. **IF** applicable, **THEN** ensure unnecessary Protected Train postings have been removed using Attachment 23, Unit 3 Protected Train De-Posting Checklist, as a guide.

____ 19. **IF** any Protected Equipment Posting is required to be removed, **THEN** review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be concurrently removed. (N/A if no Protected Equipment Postings are being removed.)

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
____________________	__________
____________________	__________
____________________	__________

REVIEWED BY:______________________________________ Date:______________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 10
(Page 1 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

NOTES

- *The steps in this attachment may be performed in any order.*
- *All postings are not intended to provide physical barriers; rather, to provide information and heightened awareness.*
- *If the operating train is swapped, or if components within a train are swapped, protected equipment postings should be placed or removed as necessary to maintain the postings and equipment status consistent. The new alignment should be posted prior to de-posting the previously protected equipment*
- *Attachment 23, Unit 3 Protected Train De-Posting Checklist, should be prepared prior to entering the field to change Protected Train postings and may be performed concurrently with this attachment.*
- *If a deviation in the specified method for posting is required, then obtain SRO approval using Attachment 25, Protected Equipment Posting Deviations, prior to implementing the deviation.*
- *See Figure 6 for Protected Equipment sign format and content guidance.*

1. **IF** offsite power is from the Startup Transformer, **THEN** perform the following:
   a. In the switchyard, install barriers around the Startup Transformer bay as follows:
      ____ (1) Install a barrier on the East side of the bay facing East.
      ____ (2) Install a barrier on the North side facing North.
      ____ (3) Install a barrier on the West side facing West.
      ____ (4) Install a barrier on the South side facing South.
   ____ b. At the Startup Transformer, install barriers around the Startup Transformer.
2. **IF** offsite power is from backfeed, **THEN** perform the following:
   a. In the switchyard, install barriers around the Main Transformer bay as follows:
      ____ (1) Install a barrier on the East side of the bay facing East.
      ____ (2) Install a barrier on the North side facing North.
      ____ (3) Install a barrier on the West side facing West.
      ____ (4) Install a barrier on the South side facing South.
   ____ b. At the Main and Aux Transformers, install barriers around the Main and Aux Transformers.

ATTACHMENT 10
(Page 2 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

3. **IF** 3A Train is the designated operating train, **THEN** post signs and/or barriers as follows:

   a. Install barriers in the 3A 4 kV Bus Room at the following locations:

____ (1) East side of the 3A Switchgear Bus from the North wall to the South wall.

____ (2) West end of the 3A Switchgear Bus:

- On the West end of the 3A Switchgear, place a barrier from the Northwest corner of the 3A Switchgear to the South wall (allow access to LP34).
- On the North side (rear) of the 3A Switchgear, place a barrier between the 3L MCC and 3A Sequencer (3C23A-1) that extends to the 3A Switchgear.
- On the North side (rear) of the 3A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 3AA01, 3AA02, 3AA03, 3AA04, 3AA05, and 3AA06 (six signs total).

   b. In the 3A 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 3C23A (old Sequencer Cabinet) located on the North wall of the 3A 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 3AA04 cubicle door.

____ c. In the 3B 4 kV Bus Room, place a Protected Equipment sign on the 3AB04 cubicle door.

   d. **IF** the 480V LCs are split, **THEN:**

____ (1) Install barriers in front and rear sections of 3A and 3C 480V LCs (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers).

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

____ (3) **IF** the reactor core is less than fully loaded, **THEN** place a Protected Train sign on 480V LC Breaker 30309, 3A SFP Cooling Pump.

ATTACHMENT 10
(Page 3 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

3. (Cont'd)

e. Install barriers at the following entry doors to 3A EDG Rooms:

____ (1) Door 073-1

____ (2) Door 072-2

____ (3) Door 131-1 to the 3A EDG radiator area

____ (4) Door 075-1 to the 3A EDG Day Tank Room

f. Post 3A MCC 480V MCC Vital Section as follows:

____ (1) At the 3A Vital MCC, starting from the North end, place a magnetic Protected Equipment sign on the first and second cabinet door.

g. **IF** the 3A ICW or CCW pump is unavailable, **THEN** ensure the 3D Bus is aligned to the 3A Bus, and install barriers at the following entry doors to 3D 4 kV Bus Room:

____ (1) Door 134-1

____ (2) Door 134-2

____ h. Install barriers at the top of stairway to the 3A RHR Pump Room (10 ft).

i. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 3A RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 3A CCW Pump

OR

____ ii. 3C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 3A ICW Pump

OR

____ ii. 3C ICW Pump

ATTACHMENT 10
(Page 4 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

4. **IF** 3B Train is the designated operating train, **THEN** post signs and/or barriers as follows:

a. Install barriers in the 3B 4 kV Bus Room at the following locations:

____ (1) East side of the 3B Switchgear Bus from the North wall to the South wall (Permit access to the ASD panel.)

____ (2) West side of the 3B Switchgear Bus from the North wall to the South wall

b. In the 3B 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 3C23B (old Sequencer Cabinet) located on the North wall of the 3B 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 3AB04 cubicle door.

c. **IF** the 480V LCs are split, **THEN**:

____ (1) Install barriers in front of 3B and 3D 480V LCs.

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

d. Install barriers at the following entry doors to 3B EDG Rooms:

____ (1) Door 072-1

____ (2) Door 072-2

____ (3) Vital area door 3EDG3131 to the 3B EDG radiator area

____ (4) Door 074-1 to the 3B EDG Day Tank Room.

ATTACHMENT 10
(Page 5 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

4. (Cont'd)

e. **IF** 3B ICW or CCW pump is unavailable, **THEN** ensure the 3D Bus is aligned to the 3B Bus, and install barriers at the following entry doors to 3D 4 kV Bus Room:

____ (1) Door 134-1

____ (2) Door 134-2

f. **IF** the reactor core is less than fully loaded, **THEN** perform the following:

(1) **IF** 3C 480V LC is fed from 3A 4 kV Bus, and is required to supply SFP cooling, **THEN** post signs and/or barriers as follows:

a) Install barriers in the 3A 4 kV Bus Room at the following locations:

____ 1) East side of the 3A Switchgear Bus from the North wall to the South wall.

____ 2) West end of the 3A Switchgear Bus:

- On the West end of the 3A Switchgear, place a barrier from the Northwest corner of the 3A Switchgear to the South wall (allow access to LP34).
- On the North side (rear) of the 3A Switchgear, place a barrier between the 3L MCC and 3A Sequencer (3C23A-1) that extends to the 3A Switchgear.
- On the North side (rear) of the 3A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 3AA01, 3AA02, 3AA03, 3AA04, 3AA05, and 3AA06 (six signs total).

b) In the 3A 4 kV Bus Room, install signs as follows:

____ 1) Place a Protected Equipment sign on the front of 3C23A (old Sequencer Cabinet) located on the North wall of the 3A 4 kV Bus Room.

ATTACHMENT 10
(Page 6 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

4.f.(1) (Cont'd)

c) Install barriers at the Unit 3 480V Load Center Rooms:

____ 1) Install barriers in front and rear sections of 3A and 3C 480V LCs (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers).

____ 2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

____ 3) Place a Protected Train sign on 480V LC Breaker 30309, 3A SFP Cooling pump.

d) Install barriers at the following entry doors to 3A EDG Rooms:

____ 1) Door 073-1

____ 2) Door 72-2

3) Door 131-1 to 3A EDG radiator area

4) Door 075-1 to the 3A EDG Day Tank Room

____ g. In the 3A 4 kV Bus Room, place a Protected Equipment sign on the 3AA04 cubicle door.

____ h. Install barriers at the top of stairway to the 3B RHR Pump Room (10 ft).

i. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 3B RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 3B CCW Pump

OR

____ ii. 3C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 3B ICW Pump

OR

____ ii. 3C ICW Pump

ATTACHMENT 10
(Page 7 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

5. **IF** the 480V LCs are cross-tied, **THEN** post signs and/or barriers as follows:

   a. Perform the following in the U3 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

      (1) Install barriers at the following locations:

____ • In front and rear sections of 3A 480V LC

____ • In front and rear sections of 3B 480V LC

____ • In front and rear sections of 3C 480V LC

____ • In front and rear sections of 3D 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

____ (3) **IF** the reactor core is less than fully loaded, **THEN** place a Protected Train sign on the 480V LC Breaker 30309, 3A SFP Cooling pump.

____ 6. In the CCW Room, install barriers around the CCW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ________________________

____ 7. Install barriers on the South end of 2 of 3 CCW HXs.

____ a. Record HXs protected ________________________

8. **IF** the reactor core is less than fully loaded, **THEN** perform the following:

____ a. Install a barrier at the SFP Pump and HX Room entry door.

____ b. Place a Protected Train sign on 480V LC Breaker Cubicle 40201, SFP Cooling Pumps.

____ c. **IF** the 3A SFP Cooling Pump is powered from a temporary source, **THEN** place a Protected Train sign on the temporary source breaker.

____ (1) Record breaker protected ______________________

____ 9. At the Intake, install barriers around the ICW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ________________________

ATTACHMENT 10
(Page 8 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

____ 10. **IF** offsite power is from backfeed, **THEN** place a Protected Equipment sign at the Safeguards Racks to protect the Aux Transformer breaker.

a. 3QR42

b. 3QR43

c. 3QR44

d. 3QR45

____ 11. **IF** the RWST is one of the two credited sources of makeup water to the Spent Fuel Pit, **THEN** place a magnetic Stop sign on Protected Train sign on RWST purification pump breaker 30788 (U3 outage).

____ 12. **IF** Primary Water is one of the two credited sources of makeup water to the Spent Fuel Pit, **THEN** place a magnetic Stop sign on one of the following Primary Water Pump breakers: 0885 (3A), 30664 (3B), 0884 (4A), 40664 (4B).

a. Record the breaker protected ______________________

____ 13. **IF** the CVCS HUT is one of two credited sources of makeup water to the Spent Fuel Pit, **THEN** place a magnetic Stop sign on CVCS HUT recirculation pump breaker, 0853.

____ 14. In the Control Room, behind the southernmost 3C04 section of Vertical Panel A that contains the Lockout Relay Reset buttons, place a barrier and Protected Train sign across 3C04 section (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 15. **IF** applicable, **THEN** ensure unnecessary Protected Train Postings have been removed using Attachment 23, Unit 3 Protected Train De-Posting Checklist, as a guide.

____ 16. **IF** any Protected Equipment Posting is required to be removed, **THEN** review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be concurrently removed. (N/A if no Protected Equipment Postings are being removed.)

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
____________________________	________________
____________________________	________________
____________________________	________________

REVIEWED BY:____ Date:_________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 11
(Page 1 of 6)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 5 (PRESSURIZER FILLED >10%)

NOTES

- *The steps in this attachment may be performed in any order.*
- *All postings are NOT intended to provide physical barriers; rather, to provide information and heightened awareness.*
- *If the operating train is swapped, or if components within a train are swapped, Protected Equipment postings should be placed or removed as necessary to maintain the postings and equipment status consistent. The new alignment should be posted prior to de-posting the previously protected equipment.*
- *Attachment 23, Unit 3 Protected Train De-Posting Checklist, should be prepared prior to entering the field to change Protected Train postings and may be performed concurrently with this attachment.*
- *If a deviation in the specified method for posting is required, then obtain SRO approval using Attachment 25, Protected Equipment Posting Deviations, prior to implementing the deviation.*
- *See Figure 6 for Protected Equipment sign format and content guidance.*

1. **IF** offsite power is from the Startup Transformer, **THEN** perform the following:
   a. In the switchyard, install barriers around the Startup Transformer bay as follows:
   ____ (1) Install a barrier on the East side of the bay facing East.
   ____ (2) Install a barrier on the North side facing North.
   ____ (3) Install a barrier on the West side facing West.
   ____ (4) Install a barrier on the South side facing South.
   ____ b. At the Startup Transformer, install barriers around the Startup Transformer.
2. **IF** offsite power is from backfeed, **THEN** perform the following:
   a. In the switchyard, install barriers around the Main Transformer bay as follows:
   ____ (1) Install a barrier on the East side of the bay facing East.
   ____ (2) Install a barrier on the North side facing North.
   ____ (3) Install a barrier on the West side facing West.
   ____ (4) Install a barrier on the South side facing South.
   ____ b. At the Main and Aux Transformers, install barriers around the Main and Aux Transformers.

ATTACHMENT 11
(Page 2 of 6)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 5 (PRESSURIZER FILLED >10%)

3. **IF** 3A Train is the designated operating train, **THEN** post signs and/or barriers as follows:

   a. Install barriers in the 3A 4 kV Bus Room at the following locations:

____ (1) East side of the 3A Switchgear Bus from the North wall to the South wall.

____ (2) West end of the 3A Switchgear Bus:

- On the West end of the 3A Switchgear, place a barrier from the Northwest corner of the 3A Switchgear to the South wall (allow access to LP34).
- On the North side (rear) of the 3A Switchgear, place a barrier between the 3L MCC and 3A Sequencer (3C23A-1) that extends to the 3A Switchgear.
- On the North side (rear) of the 3A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 3AA01, 3AA02, 3AA03, 3AA04, 3AA05, and 3AA06 (six signs total).

   b. In the 3A 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 3C23A (old Sequencer Cabinet) located on the North wall of the 3A 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 3AA04 cubicle door.

____ c. In the 3B 4 kV Bus Room, place a Protected Equipment sign on the 3AB04 cubicle door.

____ d. Perform the following in the U3 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

   (1) Install barriers at the following locations:

____ • In front and rear sections of 3A 480V LC

____ • In front and rear sections of 3C 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

ATTACHMENT 11
(Page 3 of 6)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 5 (PRESSURIZER FILLED >10%)

3 (Cont'd)

e. Install barriers at the following entry doors to 3A EDG Rooms:

____ (1) Door 073-1

____ (2) Door 072-2

____ (3) Door 131-1 to the 3A EDG radiator area

____ (4) Door 075-1 to the 3A EDG Day Tank Room

f. Post 3A MCC 480V MCC Vital Section as follows:

____ (1) At the 3A Vital MCC, starting from the North end, place a magnetic Protected Equipment sign on the first and second cabinet door.

____ g. Install barriers at top of stairway to the 3A RHR Pump Room (10 ft).

h. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 3A RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 3A CCW Pump

OR

____ ii. 3C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 3A ICW Pump

OR

____ ii. 3C ICW Pump

ATTACHMENT 11
(Page 4 of 6)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 5 (PRESSURIZER FILLED >10%)

4. **IF** 3B Train is the designated operating train, **THEN** post signs and/or barriers as follows:

   a. Install barriers in the 3B 4 kV Bus Room at the following locations:

____ (1) East side of the 3B Switchgear Bus from the North wall to the South wall (Permit access to the ASD panel.)

____ (2) West end of the 3B Switchgear Bus:

   - On the West end of the 3B Switchgear, place a barrier from the Northwest corner of the 3B Switchgear to the South wall.
   - On the North side (rear) of the 3B Switchgear, place a barrier at the East end of the 3M MCC that extends to the 3B Switchgear.
   - On the North side (rear) of the 3B Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 3AB01, 3AB02, 3AB03, and 3AB04 (four signs total).

   b. In the 3B 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 3C23B (old Sequencer Cabinet) located on the North wall of the 3B 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 3AB04 cubicle door.

____ c. In the 3A4 kV Bus Room, place a Protected Equipment sign on the 3AA04 cubicle door.

ATTACHMENT 11
(Page 5 of 6)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 5 (PRESSURIZER FILLED >10%)

4. (Cont'd)

d. Perform the following in the U3 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

(1) Install barriers at the following locations:

____ • In front and rear sections of 3B 480V LC

____ • In front and rear sections of 3D 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

e. Install barriers at the following entry doors to 3B EDG Rooms:

____ (1) Door 072-1

____ (2) Door 072-2

____ (3) Vital area door 3EDG3131 to the 3B EDG radiator area

____ (4) Door 074-1 to the 3B EDG Day Tank Room.

____ f. Install barriers at top of stairway to the 3B RHR Pump Room (10 ft).

g. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 3B RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 3B CCW Pump

<u>OR</u>

____ ii. 3C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 3B ICW Pump

<u>OR</u>

____ ii. 3C ICW Pump

ATTACHMENT 11
(Page 6 of 6)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 5 (PRESSURIZER FILLED >10%)

5. **IF** the 3C CCW or ICW pump is running and required for operability of the protected RHR train, **THEN** install barriers at the following entry doors to the 3D 4 kV Bus Room.

____ a. Door 134-1

____ b. Door 134-2

____ 6. In the CCW Room, install barriers around the CCW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ______________________

____ 7. Install barriers on the South end of 2 of 3 CCW HXs.

____ a. Record HXs protected ______________________

____ 8. At the Intake, install barriers around the ICW Pump whose 4 kV power supply is protected above.

____ a. Record pump protected ______________________

____ 9. In the Control Room, behind the southernmost 3C04 section of Vertical Panel A that contains the Lockout Relay Reset buttons, place a barrier and Protected Train sign across 3C04 section (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 10. **IF** applicable, **THEN** ensure unnecessary Protected Train postings have been removed using Attachment 23, Unit 3 Protected Train De-Posting Checklist, as a guide.

____ 11. **IF** any Protected Equipment Posting is required to be removed, **THEN** review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be concurrently removed. (N/A if no Protected Equipment Postings are being removed.)

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
______________________________	________________
______________________________	________________
______________________________	________________

REVIEWED BY:____ Date:_________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 12
(Page 1 of 6)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 6

NOTES

- *The steps in this attachment may be performed in any order.*
- *All postings are NOT intended to provide physical barriers; rather, to provide information and heightened awareness.*
- *If the operating train is swapped, or if components within a train are swapped, Protected Equipment postings should be placed or removed as necessary to maintain the postings and equipment status consistent. The new alignment should be posted prior to de-posting the previously protected equipment.*
- *Attachment 23, Unit 3 Protected Train De-Posting Checklist, should be prepared prior to entering the field to change Protected Train postings and may be performed concurrently with this attachment.*
- *If a deviation in the specified method for posting is required, then obtain SRO approval using Attachment 25, Protected Equipment Posting Deviations, prior to implementing the deviation.*
- *See Figure 6 for Protected Equipment sign format and content guidance.*

1. **IF** offsite power is from the Startup Transformer, **THEN** perform the following:
   a. In the switchyard, install barriers around the Startup Transformer bay as follows:
____ (1) Install a barrier on the East side of the bay facing East.
____ (2) Install a barrier on the North side facing North.
____ (3) Install a barrier on the West side facing West.
____ (4) Install a barrier on the South side facing South.
____ b. At the Startup Transformer, install barriers around the Startup Transformer.
2. **IF** offsite power is from backfeed, **THEN** perform the following:
   a. In the switchyard, install barriers around the Main Transformer bay as follows:
____ (1) Install a barrier on the East side of the bay facing East.
____ (2) Install a barrier on the North side facing North.
____ (3) Install a barrier on the West side facing West.
____ (4) Install a barrier on the South side facing South.
____ b. At the Main and Aux Transformers, install barriers around the Main and Aux Transformers.

ATTACHMENT 12
(Page 2 of 6)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 6

3. **IF** 3A Train is the designated operating train, **THEN** post signs and/or barriers as follows:

   a. Install barriers in the 3A 4 kV Bus Room at the following locations:

____ (1) East side of the 3A Switchgear Bus from the North wall to the South wall.

____ (2) West end of the 3A Switchgear Bus:

- On the West end of the 3A Switchgear, place a barrier from the Northwest corner of the 3A Switchgear to the South wall (allow access to LP34).
- On the North side (rear) of the 3A Switchgear, place a barrier between the 3L MCC and 3A Sequencer (3C23A-1) that extends to the 3A Switchgear.
- On the North side (rear) of the 3A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 3AA01, 3AA02, 3AA03, 3AA04, 3AA05, and 3AA06 (six signs total).

   b. In the 3A 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 3C23A (old Sequencer Cabinet) located on the North wall of the 3A 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 3AA04 cubicle door.

____ c. In the 3B 4 kV Bus Room, place a Protected Equipment sign on the 3AB04 cubicle door.

   d. Perform the following in the U3 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

   (1) Install barriers at the following locations:

____ • In front and rear sections of 3A 480V LC

____ • In front and rear sections of 3C 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

ATTACHMENT 12
(Page 3 of 6)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 6

3. (Cont'd)

e. Install barriers at the following entry doors to 3A EDG Rooms:

____ (1) Door 073-1

____ (2) Door 072-2

____ (3) Door 131-1 to the 3A EDG radiator area

____ (4) Door 075-1to the 3A EDG Day Tank Room

f. Post 3A MCC 480V MCC Vital Section as follows:

____ (1) At the 3A Vital MCC, starting from the North end, place a magnetic Protected Equipment sign on the first and second cabinet door.

g. **IF** the 3A ICW or CCW pump is unavailable, **THEN** ensure the 3D Bus is aligned to the 3A Bus, and install barriers at the following entry doors to 3D 4 kV Bus Room:

____ (1) Door 134-1

____ (2) Door 134-2

h. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 3A RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 3A CCW Pump

OR

____ ii. 3C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 3A ICW Pump

OR

____ ii. 3C ICW Pump

ATTACHMENT 12
(Page 4 of 6)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 6

4. **IF** 3B Train is the designated operating train, **THEN** post signs and/or barriers as follows:

   a. Install barriers in the 3B 4 kV Bus Room at the following locations:

____ (1) East side of the 3B Switchgear Bus from the North wall to the South wall (Permit access to the ASD panel.)

____ (2) West end of the 3B Switchgear Bus:

- On the West end of the 3B Switchgear, place a barrier from the Northwest corner of the 3B Switchgear to the South wall.
- On the North side (rear) of the 3B Switchgear, place a barrier at the East end of the 3M MCC that extends to the 3B Switchgear.
- On the North side (rear) of the 3B Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 3AB01, 3AB02, 3AB03, and 3AB04 (four signs total).

   b. In the 3B 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 3C23B (old Sequencer Cabinet) located on the North wall of the 3B 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 3AB04 cubicle door.

____ c. In the 3A 4 kV Bus Room, place a Protected Equipment sign on the 3AA04 cubicle door.

   d. Perform the following in the U3 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

   (1) Install barriers at the following locations:

____ • In front and rear sections of 3B 480V LC

____ • In front and rear sections of 3D 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

ATTACHMENT 12
(Page 5 of 6)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 6

4. (Cont'd)

e. Install barriers at the following entry doors to 3B EDG Rooms:

____ (1) Door 072-1

____ (2) Door 072-2

____ (3) Vital area door 3EDG3131 to the 3B EDG radiator area

____ (4) Door 074-1 to the 3B EDG Day Tank Room

f. **IF** the 3B ICW or CCW pump is unavailable, **THEN** ensure the 3D Bus is aligned to the 3B Bus, and install barriers at the following entry doors to 3D 4 kV Bus Room:

____ (1) Door 134-1

____ (2) Door 134-2

g. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected / operating train:

____ (1) 3B RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 3B CCW Pump

OR

____ ii. 3C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 3B ICW Pump

OR

____ ii. 3C ICW Pump

____ 5. In the CCW Room, install barriers around the CCW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ____________________

____ 6. Install barriers at the top of the stairway to the running protected RHR Pump Room (10 ft).

____ a. Record RHR Pump Room protected ____________________

ATTACHMENT 12
(Page 6 of 6)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 6

____ 7 Install barriers on the South end of 2 of 3 CCW HXs.

____ a. Record HXs protected ___________________

____ 8 At the Intake, install barriers around the ICW Pump whose 4 kV power supply is protected above.

____ a. Record pump protected ___________________

____ 9. In the Control Room, behind the southernmost 3C04 section of Vertical Panel A that contains the Lockout Relay Reset buttons, place a barrier and Protected Train sign across 3C04 section (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 10 **IF** applicable, **THEN** ensure unnecessary Protected Train postings have been removed using Attachment 23, Unit 3 Protected Train De-Posting Checklist, as a guide.

____ 11. **IF** any Protected Equipment Posting is required to be removed, **THEN** review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be concurrently removed. (N/A if no Protected Equipment Postings are being removed.)

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
______________________________	________________
______________________________	________________
______________________________	________________

REVIEWED BY:____ Date:__________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 13
(Page 1 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 7 RCS DEFUELED

NOTE

- *The steps in this attachment may be performed in any order.*
- *All postings are NOT intended to provide physical barriers; rather, to provide information and heightened awareness.*
- *If the operating train is swapped, or if components within a train are swapped, Protected Equipment postings should be placed or removed as necessary to maintain the postings and equipment status consistent. The new alignment should be posted prior to de-posting the previously protected equipment.*
- *Attachment 23, Unit 3 Protected Train De-Posting Checklist, should be prepared prior to entering the field to change Protected Train postings and may be performed concurrently with this attachment.*
- *If a deviation in the specified method for posting is required, then obtain SRO approval using Attachment 25, Protected Equipment Posting Deviations, prior to implementing the deviation.*
- *See Figure 6 for Protected Equipment sign format and content guidance.*

1. **IF** offsite power is from the Startup Transformer, **THEN** perform the following:

   a. In the switchyard, install barriers around the Startup Transformer bay as follows:

____ (1) Install a barrier on the East side of the bay facing East.

____ (2) Install a barrier on the North side facing North.

____ (3) Install a barrier on the West side facing West.

____ (4) Install a barrier on the South side facing South.

____ b. At the Startup Transformer, install barriers around the Startup Transformer.

2. **IF** offsite power is from backfeed, **THEN** perform the following:

   a. In the switchyard, install barriers around the Main Transformer bay as follows:

____ (1) Install a barrier on the East side of the bay facing East.

____ (2) Install a barrier on the North side facing North.

____ (3) Install a barrier on the West side facing West.

____ (4) Install a barrier on the South side facing South.

____ b. At the Main and Aux Transformers, install barriers around the Main and Aux Transformers.

ATTACHMENT 13
(Page 2 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 7 RCS DEFUELED

3. **<u>IF</u>** 3A Train is the designated operating train, **<u>THEN</u>** post signs and/or barriers as follows:

   a. Install barriers in the 3A Switchgear Bus Room at the following locations:

____ (1) East side of the 3A Switchgear Bus from the North wall to the South wall.

____ (2) West end of the 3A Switchgear Bus:

- On the West end of the 3A Switchgear, place a barrier from the Northwest corner of the 3A Switchgear to the South wall (allow access to LP34).
- On the North side (rear) of the 3A Switchgear, place a barrier between the 3L MCC and 3A Sequencer (3C23A-1) that extends to the 3A Switchgear.
- On the North side (rear) of the 3A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 3AA01, 3AA02, 3AA03, 3AA04, 3AA05, and 3AA06 (six signs total).

   b. In the 3A 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 3C23A (old Sequencer Cabinet) located on the North wall of the 3A 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 3AA04 cubicle door.

____ c. In the 3B 4 kV Bus Room, place a Protected Equipment sign on the 3AB04 Cubicle door.

ATTACHMENT 13
(Page 3 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 7 RCS DEFUELED

3. (Cont'd)

d. Perform the following in the U3 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

(1) Install barriers at the following locations:

____ • In front and rear sections of 3A 480V LC

____ • In front and rear sections of 3C 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

(3) **IF** load centers are cross-tied, **THEN** install barriers at the following locations:

____ • In front and rear sections of 3B 480V LC

____ • In front and rear sections of 3D 480V LC

____ (4) **IF** the 3A SFP Cooling Pump is supplied from 3C 480V LC, **THEN** place a Protected Train sign on 480V LC Breaker 30309, 3A SFP Cooling Pump.

e. Install barriers at the following entry doors to 3A EDG Rooms:

____ (1) Door 073-1

____ (2) Door 072-2

____ (3) Door 131-1 to the 3A EDG radiator area

____ (4) Door 075-1to the 3A EDG Day Tank Room

f. Post 3A MCC 480V MCC Vital Section as follows:

____ (1) At the 3A Vital MCC, starting from the North end, place a magnetic Protected Equipment sign on the first and second cabinet door.

g. **IF** the 3A ICW or CCW pump is unavailable, **THEN** ensure the 3D Bus is aligned to the 3A Bus, and install barriers at the following entry doors to 3D 4 kV Bus Room:

____ (1) Door 134-1

____ (2) Door 134-2

ATTACHMENT 13
(Page 4 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 7 RCS DEFUELED

3. (Cont'd)

h. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

(1) Select one: (N/A pump not operating)

____ i. 3A CCW Pump

OR

____ ii. 3C CCW Pump

(2) Select one: (N/A pump not operating)

____ i. 3A ICW Pump

OR

____ ii. 3C ICW Pump

ATTACHMENT 13
(Page 5 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 7 RCS DEFUELED

4. **IF** 3B Train is the designated operating train, **THEN** post signs and/or barriers as follows:

   a. Install barriers in the 3B 4 kV Bus Room at the following locations:

____ (1) East side of the 3B Switchgear Bus from the North wall to the South wall (Permit access to the ASD panel.)

____ (2) West end of the 3B Switchgear Bus:

- On the West end of the 3B Switchgear, place a barrier from the Northwest corner of the 3B Switchgear to the South wall.
- On the North side (rear) of the 3B Switchgear, place a barrier at the East end of the 3M MCC that extends to the 3B Switchgear.
- On the North side (rear) of the 3B Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 3AB01, 3AB02, 3AB03, and 3AB04 (four signs total).

   b. In the 3B 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 3C23B (old Sequencer Cabinet) located on the North wall of the 3B 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 3AB04 cubicle door.

____ c. In the 3A 4 kV Bus Room, place a Protected Equipment sign on the 3AA04 Cubicle Door.

ATTACHMENT 13
(Page 6 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 7 RCS DEFUELED

4. (Cont'd)

d. Perform the following in the U3 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

(1) Install barriers at the following locations:

____ • In front and rear sections of 3B 480V LC

____ • In front and rear sections of 3D 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

(3) **IF** the load centers are cross-tied, **THEN** install barriers at the following locations:

____ • In front and rear sections of 3A 480V LC

____ • In front and rear sections of 3C 480V LC

___ (4) **IF** the 3A SFP Cooling Pump is supplied from 3C 480V LC, **THEN** place a Protected Train sign on 480V LC Breaker 30309, 3A SFP Cooling Pump.

e. Install barriers at the following entry doors to 3B EDG Rooms:

____ (1) Door 072-1

____ (2) Door 072-2

____ (3) Vital area door 3EDG3131 to the 3B EDG radiator area

____ (4) Door 074-1 to the 3B EDG Day Tank Room.

f. **IF** 3B ICW or CCW pump is unavailable, **THEN** ensure the 3D Bus is aligned to the 3B Bus, and install barriers at the following entry doors to 3D 4 kV Bus Room:

____ (1) Door 134-1

____ (2) Door 134-2

ATTACHMENT 13
(Page 7 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 7 RCS DEFUELED

4. (Cont'd)

g. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

(1) Select one: (N/A pump not operating)

____ i. 3B CCW Pump

OR

____ ii. 3C CCW Pump

(2) Select one: (N/A pump not operating)

____ i. 3B ICW Pump

OR

____ ii. 3C ICW Pump

____ 5. In the CCW Room, install barriers around the CCW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ________________________

____ 6. Install barriers on the South end of 1 of 3 CCW HXs.

____ a. Record HXs protected________________________

____ 7. At the SFP pump and HX Room, install a barrier at the entry door.

____ 8. At the Intake, install barriers around the ICW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ________________________

____ 9. **IF** offsite power is from backfeed, **THEN** place a Protected Equipment sign at the safeguards racks to protect the Aux Transformer breaker.

a. 3QR42

b. 3QR43

c. 3QR44

d. 3QR45

ATTACHMENT 13
(Page 8 of 8)

UNIT 3 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 7 RCS DEFUELED

____ 10. Place a Protected Equipment sign on 480V LC Breaker Cubicle 40201, SFP Cooling Pumps 3B.

____ 11. **IF** the 3A SFP Cooling Pump is powered from a temporary source, **THEN** place a Protected Train sign on the temporary source breaker.

____ (1) Record breaker protected ______________________

____ 12. **IF** the RWST is one of the two credited sources of makeup water to the Spent Fuel Pit, **THEN** place a magnetic Stop sign on RWST purification pump breaker 30788 (U3 outage).

____ 13. **IF** Primary Water is one of the two credited sources of makeup water to the Spent Fuel Pit, **THEN** place a magnetic Stop sign on one of the following Primary Water Pump breakers: 0885 (3A), 30664 (3B), 0884 (4A), 40664 (4B).

a. Record the breaker protected ______________________

____ 14. **IF** the CVCS HUT is one of two credited sources of makeup water to the Spent Fuel Pit, **THEN** place a magnetic Stop sign on CVCS HUT recirculation pump breaker, 0853.

____ 15. In the Control Room, behind the southernmost 3C04 section of Vertical Panel A that contains the Lockout Relay Reset buttons, place a barrier and Protected Train sign across 3C04 section (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 16. **IF** applicable, **THEN** ensure unnecessary Protected Train postings have been removed using Attachment 23, Unit 3 Protected Train De-Posting Checklist, as a guide.

____ 17. **IF** any Protected Equipment Posting is required to be removed, **THEN** review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be concurrently removed. (N/A if not Protected Equipment Postings are being removed.)

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
______________________________	________________
______________________________	________________
______________________________	________________

REVIEWED BY:____ Date:__________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 14
(Page 1 of 7)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

NOTES

- *The steps in this attachment may be performed in any order.*
- *All postings are NOT intended to provide physical barriers; rather, to provide information and heightened awareness.*
- *If the operating train is swapped, or if components within a train are swapped, Protected Equipment postings should be placed or removed as necessary to maintain the postings and equipment status consistent. The new alignment should be posted prior to de-posting the previously protected equipment.*
- *Attachment 24, Unit 4 Protected Train De-Posting Checklist, should be prepared prior to entering the field to change Protected Train postings and may be performed concurrently with this attachment.*
- *If a deviation in the specified method for posting is required, then obtain SRO approval using Attachment 25, Protected Equipment Posting Deviations, prior to implementing the deviation.*
- *See Figure 6 for Protected Equipment sign format and content guidance.*

1. **IF** offsite power is from the Startup Transformer, **THEN** perform the following:
   a. In the switchyard, install barriers around the Startup Transformer bay as follows:
      ____ (1) Install a barrier on the East side of the bay facing East.
      ____ (2) Install a barrier on the North side facing North.
      ____ (3) Install a barrier on the West side facing West.
      ____ (4) Install a barrier on the South side facing South.
   ____ b. At the Startup Transformer, install barriers around the Startup Transformer.
2. **IF** offsite power is from backfeed, **THEN** perform the following:
   ____ a. In the switchyard, install barriers around the Main Transformer bay as follows:
      ____ (1) Install a barrier on the East side of the bay facing East.
      ____ (2) Install a barrier on the North side facing North.
      ____ (3) Install a barrier on the West side facing West.
      ____ (4) Install a barrier on the South side facing South.
   ____ b. At the Main and Aux Transformers, install barriers around the Main and Aux Transformers.

ATTACHMENT 14
(Page 2 of 7)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

3. **IF** 4A Train is the designated operating train, **THEN** post signs and/or barriers as follows:

a. Install barriers in the 4A 4 kV Bus Room at the following locations:

____ (1) East side of the 4A Switchgear Bus from the North wall to the South wall.

____ (2) West end of the 4A Switchgear Bus:

- On the West end of the 4A Switchgear, place a barrier from the Northwest corner of the 4A Switchgear to the South wall (allow access to LP44).
- On the North side (rear) of the 4A Switchgear, place a barrier between the 4L MCC and 4A Sequencer (4C23A-1) that extends to the 4A Switchgear.
- On the North side (rear) of the 4A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 4AA01, 4AA02, 4AA03, 4AA04, 4AA05, and 4AA06 (six signs total).

b. Perform the following in the U4 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

(1) Install barriers at the following locations:

____ • In front and rear sections of 4A 480V LC

____ • In front and rear sections of 4C 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

c. Install barriers at the following entry doors to 4A EDG Rooms:

____ (1) Door 138-1

____ (2) Door 133-2

____ (3) Door 141-1 to the 4A EDG DOTP area

____ (4) Door 138-2

____ (5) Door 140-1

____ (6) Door 139-2

ATTACHMENT 14
(Page 3 of 7)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

3. (Cont'd)

d. **IF** the 4A ICW or CCW pump is unavailable, **THEN** ensure the 4D Bus is aligned to 4A Bus, and install barriers at the following entry doors to 4D 4 kV Bus Room:

____ (1) Door 139-1

____ (2) Door 139-2

____ (3) Door 135-2

e. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 4A RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 4A CCW Pump

OR

____ ii. 4C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 4A ICW Pump

OR

____ ii. 4C ICW Pump

ATTACHMENT 14
(Page 4 of 7)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

4. **IF** 4B Train is the designated operating train, **THEN** post signs and/or barriers as follows:

   a. Install barriers in the 4B 4 kV Bus Room at the following locations:

____ (1) East side of the 4B Switchgear Bus from the North wall to the South wall (Permit access to the ASD panel.)

____ (2) West end of the 4B Switchgear Bus:

- On the West end of the 4B Switchgear, place a barrier from the Northwest corner of the 4B Switchgear to the South wall.
- On the North side (rear) of the 4B Switchgear, place a barrier at the East end of the 4M MCC that extends to the 4B Switchgear.
- On the North side (rear) of the 4B Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 4AB01, 4AB02, 4AB03, and 4AB04 (four signs total).

   b. Perform the following in the U4 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

____ (1) Install barriers at the following locations:

____ • In front and rear sections of 4B 480V LC

____ • In front and rear sections of 4D 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

   c. Install barriers at the following entry doors to 4B EDG Rooms:

____ (1) Door 133-1

____ (2) Door 133-2

____ (3) Door 136-1 to the 4B EDG DOTP area

____ (4) Door 133-3

____ (5) Door 135-2

____ (6) Door 135-1

____ (7) Door 134-2

ATTACHMENT 14
(Page 5 of 7)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

4. (Cont'd)

d. **IF** the 4B ICW or CCW pump is unavailable, **THEN** ensure the 4D Bus is aligned to 4B Bus, and install barriers at the following entry doors to 4D 4 kV Bus Room:

____ (1) Door 139-1

____ (2) Door 139-2

____ (3) Door 135-2

e. In the Control Room, place unique Information Tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 4B RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 4B CCW Pump

OR

____ ii. 4C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 4B ICW Pump

OR

____ ii. 4C ICW Pump

5. In the 4A 4 kV Bus Room, install signs as follows:

____ a. Place a Protected Equipment sign on the front of 4C23A (old Sequencer Cabinet) located on the North wall of the 4A 4 kV Bus Room.

____ b. Place a Protected Equipment sign on the 4AA04 cubicle door.

ATTACHMENT 14
(Page 6 of 7)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

6. Perform the following in the 4B 4 kV Bus Room:

____ a. Place a Protected Equipment sign on the front of 4C23B (old Sequencer Cabinet) located on the North wall of the 4B 4 kV Bus Room.

____ b. Place a Protected Equipment sign on the 4AB04 cubicle door.

____ 7. In the CCW Room, install barriers around the CCW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ___________________

____ 8. Install barriers at the top of stairway to running protected RHR Pump Room (10 ft)

____ a. Record RHR Pump Room protected ___________________

____ 9. Install barriers on the North end of 2 of 3 CCW HXs.

____ a. Record HXs protected ___________________

____ 10. At the Intake, install barriers around the ICW Pump whose 4 kV power supply is protected above.

____ a. Record pump protected ___________________

____ 11. In the Control Room, behind the southernmost 4C04 section of Vertical Panel A that contains the Lockout Relay Reset buttons, place a barrier and Protected Train sign across 4C04 section (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 12. **IF** applicable, **THEN** ensure unnecessary Protected Train Postings have been removed using Attachment 24, Unit 4 Protected Train De-Posting Checklist, as a guide.

ATTACHMENT 14
(Page 7 of 7)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 1

____ 13. **IF** any Protected Equipment Posting is required to be removed, **THEN** review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be concurrently removed. (N/A if not Protected Equipment Postings are being removed.)

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
______________________________	________________
______________________________	________________
______________________________	________________

REVIEWED BY:____ Date:_________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 15
(Page 1 of 5)

UNIT 4 PROTECTED EQUIPMENT POSTING DURING ENCLOSURE 2 AND 5 (PRESSURIZER DRAINED <10%)

NOTES

- *The steps in this attachment may be performed in any order.*
- *All postings are NOT intended to provide physical barriers; rather, to provide information and heightened awareness.*
- *If the operating train is swapped, or if components within a train are swapped, Protected Equipment postings should be placed or removed as necessary to maintain the postings and equipment status consistent. The new alignment should be posted prior to de-posting the previously protected equipment.*
- *Attachment 24, Unit 4 Protected Train De-Posting Checklist, should be prepared prior to entering the field to change Protected Train postings and may be performed concurrently with this attachment.*
- *If a deviation in the specified method for posting is required, then obtain SRO approval using Attachment 25, Protected Equipment Posting Deviations, prior to implementing the deviation.*
- *See Figure 6 for Protected Equipment sign format and content guidance.*

1. **IF** offsite power is from the Startup Transformer, **THEN** perform the following:

   a. In the switchyard, install barriers around the Startup Transformer bay as follows:

   ____ (1) Install a barrier on the East side of the bay facing East.

   ____ (2) Install a barrier on the North side facing North.

   ____ (3) Install a barrier on the West side facing West.

   ____ (4) Install a barrier on the South side facing South.

   ____ b. At the Startup Transformer, install barriers around the Startup Transformer.

2. **IF** offsite power is from backfeed, **THEN** perform the following:

   a. In the switchyard, install barriers around the Main Transformer bay as follows:

   ____ (1) Install a barrier on the East side of the bay facing East.

   ____ (2) Install a barrier on the North side facing North.

   ____ (3) Install a barrier on the West side facing West.

   ____ (4) Install a barrier on the South side facing South.

   ____ b. At the Main and Aux Transformers, install barriers around the Main and Aux Transformers.

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UNIT 4 PROTECTED EQUIPMENT POSTING
DURING ENCLOSURE 2 AND 5 (PRESSURIZER DRAINED <10%)

3. Install barriers in the 4A and 4B 4 kV Bus Rooms as follows:

a. Install barriers in the 4A 4 kV Bus Room at the following locations:

____ (1) East side of the 4A Switchgear Bus from the North wall to the South wall.

____ (2) West end of the 4A Switchgear Bus:

- On the West end of the 4A Switchgear, place a barrier from the Northwest corner of the 4A Switchgear to the South wall (allow access to LP44).
- On the North side (rear) of the 4A Switchgear, place a barrier between the 4L MCC and 4A Sequencer (4C23A-1) that extends to the 4A Switchgear.
- On the North side (rear) of the 4A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 4AA01, 4AA02, 4AA03, 4AA04, 4AA05, and 4AA06 (six signs total).

b. Install barriers in the 4B 4 kV Bus Room at the following locations:

____ (1) East side of the 4B Switchgear Bus from the North wall to the South wall (Permit access to the ASD panel.)

____ (2) West side of the 4B Switchgear Bus from the North wall to the South wall.

4. Perform the following in the U4 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

a. Install barriers at the following locations:

____ • In front of and rear sections 4A 480V LC

____ • In front and rear sections of 4B 480V LC

____ • In front and rear sections of 4C 480V LC

____ • In front and rear sections of 4D 480V LC

____ b. Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

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UNIT 4 PROTECTED EQUIPMENT POSTING DURING ENCLOSURE 2 AND 5 (PRESSURIZER DRAINED <10%)

5. Install barriers at the following entry doors to 4A and 4B EDG Rooms:

____ a. Door 138-1

____ b. Door 133-1

____ c. Door 141-1 to the 4A EDG DOTP area

____ d. Door 136-1 to the 4B EDG DOTP area

____ e. Door 138-2

____ f. Door 133-3

6. In the 4A 4 kV Bus Room, install signs as follows:

____ a. Place a Protected Equipment sign on the front of 4C23A (old Sequencer Cabinet) located on the North wall of the 4A 4 kV Bus Room.

____ b. Place a Protected Equipment sign on the 4AA04 cubicle door.

7. In the 4B 4 kV Bus Room, install signs as follows:

____ a. Place a Protected Equipment sign on the front of 4C23B (old Sequencer Cabinet) located on the North wall of the 4B 4 kV Bus Room.

____ b. Place a Protected Equipment sign on the 4AB04 cubicle door.

ATTACHMENT 15
(Page 4 of 5)

UNIT 4 PROTECTED EQUIPMENT POSTING
DURING ENCLOSURE 2 AND 5 (PRESSURIZER DRAINED <10%)

8. **IF** 4C CCW pump, or 4C ICW pump, is required to support operability of either RHR train (i.e., any A or B ICW/CCW pump is unavailable), **THEN** install barriers at the following entry doors to 4D 4 kV Bus Room:

____ a. Door 139-1

____ b. Door 139-2

____ c. Door 135-2

____ 9. In the CCW Room, install barriers around the CCW pumps whose 4 kV power supplies were protected above.

____ a. Record pumps protected ______________________

____ 10. Install barriers at the top of stairway to the 4A RHR Pump Room (10 ft).

____ 11. Install barriers at the top of stairway to the 4B RHR Pump Room (10 ft).

____ 12. Install barriers on the North end of 2 of 3 CCW HXs.

____ a. Record HXs protected ______________________

____ 13. At the Intake, install barriers around the ICW Pump whose 4 kV power supplies were protected above.

____ a. Record pumps protected ______________________

14. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected / operating train: (N/A pumps not operating)

____ a. 4A RHR Pump

____ b. 4B RHR Pump

____ c. 4A CCW Pump

____ d. 4B CCW Pump

____ e. 4C CCW Pump

____ f. 4A ICW Pump

____ g. 4B ICW Pump

____ h. 4C ICW Pump

____ i. Record operating train ______________________

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UNIT 4 PROTECTED EQUIPMENT POSTING
DURING ENCLOSURE 2 AND 5 (PRESSURIZER DRAINED <10%)

____ 15. In the Control Room, place a barrier and Protected Train sign behind the southernmost section of the 4C04 section of Vertical Panel A (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 16. **IF** applicable, **THEN** ensure unnecessary Protected Train Postings have been removed using Attachment 24, Unit 4 Protected Train De-Posting Checklist, as a guide.

____ 17. **IF** any Protected Equipment Posting is required to be removed, **THEN** review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be concurrently removed. (N/A if no Protected Equipment Postings are being removed.)

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
______________________________	________________
______________________________	________________
______________________________	________________

REVIEWED BY:____ Date:__________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 16
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UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

NOTES

- *The steps in this attachment may be performed in any order.*
- *All postings are NOT intended to provide physical barriers; rather, to provide information and heightened awareness.*
- *If the operating train is swapped, or if components within a train are swapped, Protected Equipment postings should be placed or removed as necessary to maintain the postings and equipment status consistent. The new alignment should be posted prior to de-posting the previously protected equipment.*
- *Attachment 24, Unit 4 Protected Train De-Posting Checklist, should be prepared prior to entering the field to change Protected Train postings and may be performed concurrently with this attachment.*
- *If a deviation in the specified method for posting is required, then obtain SRO approval using Attachment 25, Protected Equipment Posting Deviations, prior to implementing the deviation.*
- *See Figure 6 for Protected Equipment sign format and content guidance.*

1. **IF** offsite power is from the Startup Transformer, **THEN** perform the following:

   a. In the switchyard, install barriers around the Startup Transformer bay as follows:

____ (1) Install a barrier on the East side of the bay facing East.

____ (2) Install a barrier on the North side facing North.

____ (3) Install a barrier on the West side facing West.

____ (4) Install a barrier on the South side facing South.

____ b. At the Startup Transformer, install barriers around the Startup Transformer.

2. **IF** offsite power is from backfeed, **THEN** perform the following:

   a. In the switchyard, install barriers around the Main Transformer bay as follows:

____ (1) Install a barrier on the East side of the bay facing East.

____ (2) Install a barrier on the North side facing North.

____ (3) Install a barrier on the West side facing West.

____ (4) Install a barrier on the South side facing South.

____ b. At the Main and Aux Transformers, install barriers around the Main and Aux Transformers.

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UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

3. **IF** 4A train is the designated operating train, **THEN** post signs and/or barriers as follows:

a. Install barriers in the 4A 4 kV Bus Room at the following locations:

____ (1) East side of the 4A Switchgear Bus from the North wall to the South wall.

____ (2) West end of the 4A Switchgear Bus:

- On the West end of the 4A Switchgear, place a barrier from the Northwest corner of the 4A Switchgear to the South wall (allow access to LP44).
- On the North side (rear) of the 4A Switchgear, place a barrier between the 4L MCC and 4A Sequencer (4C23A-1) that extends to the 4A Switchgear.
- On the North side (rear) of the 4A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 4AA01, 4AA02, 4AA03, 4AA04, 4AA05, and 4AA06 (six signs total).

b. In the 4A 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 4C23A (old Sequencer Cabinet) located on the North wall of the 4A 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 4AA04 cubicle door.

____ c. In the 4B 4 kV Bus Room, place a Protected Equipment sign on the 4AB04 cubicle door.

d. **IF** the 480V LCs are split, **THEN:**

____ (1) Install barriers in front and rear sections of 4A and 4C 480V LCs (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers).

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

____ (3) **IF** the reactor core is less than fully loaded **AND** the 4C 480V LC is required to supply SFP Cooling, **THEN** place a magnetic Stop sign on 480V LC Breaker Cubicle 40309, SFP Cooling Pumps (4P212A/B).

ATTACHMENT 16
(Page 3 of 9)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

3. (Cont'd)

e. Install barriers at the following entry doors to 4A EDG Rooms:

____ (1) Door 138-1

____ (2) Door 133-2

____ (3) Door 141-1 to the 4A EDG DOTP area

____ (4) Door 138-2

____ (5) Door 140-1

____ (6) Door 139-2

f. **IF** the 4A ICW or CCW pump is unavailable, **THEN** ensure the 4D Bus is aligned to the 4A Bus, and install barriers at the following entry doors to 4D 4 kV Bus Room:

____ (1) Door 139-1

____ (2) Door 139-2

____ (3) Door 135-2

____ g. Install barriers at the top of stairway to the 4A RHR Pump Room.

h. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 4A RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 4A CCW Pump

OR

____ ii. 4C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 4A ICW Pump

OR

____ ii. 4C ICW Pump

ATTACHMENT 16

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

4. **IF** 4B Train is the designated operating train, **THEN** post signs and/or barriers as follows:

   a. Install barriers in the 4B 4 kV Bus Room at the following locations:

____ (1) East side of the 4B Switchgear Bus from the North wall to the South wall (Permit access to the ASD panel.)

____ (2) West end of the 4B Switchgear Bus:

- On the West end of the 4B Switchgear, place a barrier from the Northwest corner of the 4B Switchgear to the South wall.
- On the North side (rear) of the 4B Switchgear, place a barrier at the East end of the 4M MCC that extends to the 4B Switchgear.
- On the North side (rear) of the 4B Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 4AB01, 4AB02, 4AB03, and 4AB04 (four signs total).

   b. In the 4B 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 4C23B (old Sequencer Cabinet) located on the North wall of the 4B 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 4AB04 cubicle door.

   c. **IF** the 480V LCs are split, **THEN**:

____ (1) Install barriers in front and rear sections of 4B and 4D 480V LCs (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers).

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

ATTACHMENT 16
(Page 5 of 9)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

4. (Cont'd)

d. Install barriers at the following entry doors to 4B EDG Rooms:

____ (1) Door 133-1

____ (2) Door 133-2

____ (3) Door 136-1 to the 4B EDG DOTP area

____ (4) Door 133-3

____ (5) Door 135-2

____ (6) Door 134-2

____ (7) Door 135-1

e. **IF** the 4B ICW or CCW pump is unavailable, **THEN** ensure the 4D Bus is aligned to the 4B Bus, and install barriers at the following entry doors to 4D 4 kV Bus Room:

____ (1) Door 139-1

____ (2) Door 139-2

____ (3) Door 135-2

f. **IF** the reactor core is less than fully loaded, **THEN** perform the following:

(1) **IF** 4C 480V LC is fed from 4A 4 kV Bus, **THEN** post signs and/or barriers as follows:

a) Install barriers in the 4A 4 kV Bus Room at the following locations:

____ 1) East side of the 4A Switchgear Bus from the North wall to the South wall.

____ 2) West end of the 4A Switchgear Bus:

- On the West end of the 4A Switchgear, place a barrier from the Northwest corner of the 4A Switchgear to the South wall (allow access to LP44).
- On the North side (rear) of the 4A Switchgear, place a barrier between the 4L MCC and 4A Sequencer (4C23A-1) that extends to the 4A Switchgear.
- On the North side (rear) of the 4A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 4AA01, 4AA02, 4AA03, 4AA04, 4AA05, and 4AA06 (six signs total).

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UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

4.f.(1) (Cont'd)

b) In the 4A 4 kV Bus Room, install signs as follows:

____ 1) Place a Protected Equipment sign on the front of 4C23A (old Sequencer Cabinet) located on the North wall of the 4A 4 kV Bus Room.

c) Install barriers at the following locations in the Unit 4 480V Load Center Rooms:

____ 1) Install barriers in front and rear sections of 4A and 4C 480V LCs (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers).

____ 2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

____ 3) Place a Protected Train sign on 480V LC Breaker 40309, 4A SFP Cooling Pump.

ATTACHMENT 16
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UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

4.f.(1) (Cont'd)

d) Install barriers at the following entry doors to 4A EDG Rooms:

____ 1) Door 138-1

____ 2) Door 141-1 to the 4A EDG DOTP area

____ 3) Door 138-2

____ 4) Door 139-2

____ g. In the 4A 4 kV Bus Room, place a Protected Equipment sign on the 4AA04 cubicle door.

____ h. Install barriers at the top of stairway to the 4B RHR Pump Room.

i. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 4B RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 4B CCW Pump

OR

____ ii. 4C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 4B ICW Pump

OR

____ ii. 4C ICW Pump

ATTACHMENT 16
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UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

5. **IF** the 480V LCs are cross-tied, **THEN** post signs and/or barriers as follows:

   a. Install barriers at the following locations in the Unit 4 480V Load Center Rooms:

____ (1) Install barriers in front and rear sections of 4A, 4B and 4C, 4D 480V LCs (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers).

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

____ (3) **IF** the reactor core is less than fully loaded **AND** the 4C 480V LC is required to supply SFP cooling, **THEN** place a Protected Train sign on 480V LC Breaker 40309, 4A SFP Cooling Pump.

____ 6. In the CCW Room, install barriers around the CCW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ______________________

____ 7. Install barriers on the North end of 2 of 3 CCW HXs.

____ a. Record HXs protected ______________________

8. **IF** the reactor core is less than fully loaded, **THEN** perform the following:

____ a. Install a barrier at the SFP Pump and HX Room entry door.

____ b. Place a Protected Train sign on the 480V LC Breaker Cubicle 30201, 4B Spent Fuel Pool Cooling Pump.

____ c. **IF** the 4A SFP Cooling Pump is powered from a temporary source, **THEN** place a Protected Train sign on the temporary source breaker.

____ (1) Record breaker protected ______________________

____ 9. At the Intake, install barriers around the ICW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ______________________

ATTACHMENT 16
(Page 9 of 9)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 3 AND 4 CAVITY FLOODED >23' ABOVE THE VESSEL FLANGE

____ 10. **IF** offsite power is from backfeed, **THEN** place a Protected Equipment sign at the Safeguards racks to protect the Aux Transformer breaker.

a. 4QR42

b. 4QR43

c. 4QR44

d. 4QR45

____ 11. **IF** the RWST is one of the two credited sources of makeup water to the Spent Fuel Pit, **THEN** place a magnetic Stop sign on RWST purification pump breaker 40788 (U4 outage).

____ 12. **IF** Primary Water is one of the two credited sources of makeup water to the Spent Fuel Pit, **THEN** place a magnetic Stop sign on one of the following Primary Water Pump breakers: 0885 (3A), 30664 (3B), 0884 (4A), 40664 (4B).

a. Record the breaker protected ______________________

____ 13. **IF** the CVCS HUT is one of two credited sources of makeup water to the Spent Fuel Pit, **THEN** place a magnetic Stop sign on CVCS HUT recirculation pump breaker, 0853.

____ 14. In the Control Room, behind the southernmost 4C04 section of Vertical Panel A that contains the Lockout Relay Reset buttons, place a barrier and Protected Train sign across 4C04 section (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 15. **IF** applicable, **THEN** ensure unnecessary Protected Train postings have been removed using Attachment 24, Unit 4 Protected Train De-Posting Checklist, as a guide.

____ 16. **IF** any Protected Equipment Posting is required to be removed, **THEN** review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be concurrently removed. (N/A if no Protected Equipment Postings are being removed.)

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
____________________________	________________
____________________________	________________
____________________________	________________

REVIEWED BY:____ Date:_________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 17

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 5 (PRESSURIZER FILLED >10%)

NOTES

- *The steps in this attachment may be performed in any order.*
- *All postings are NOT intended to provide physical barriers; rather, to provide information and heightened awareness.*
- *If the operating train is swapped, or if components within a train are swapped, Protected Equipment postings should be placed or removed as necessary to maintain the postings and equipment status consistent. The new alignment should be posted prior to de-posting the previously protected equipment.*
- *Attachment 24, Unit 4 Protected Train De-Posting Checklist, should be prepared prior to entering the field to change Protected Train postings and may be performed concurrently with this attachment.*
- *If a deviation in the specified method for posting is required, then obtain SRO approval using Attachment 25, Protected Equipment Posting Deviations, prior to implementing the deviation.*
- *See Figure 6 for Protected Equipment sign format and content guidance.*

1. **IF** offsite power is from the Startup Transformer, **THEN** perform the following:

   a. In the switchyard, install barriers around the Startup Transformer bay as follows:

____ (1) Install a barrier on the East side of the bay facing East.

____ (2) Install a barrier on the North side facing North.

____ (3) Install a barrier on the West side facing West.

____ (4) Install a barrier on the South side facing South.

____ b. At the Startup Transformer, install barriers around the Startup Transformer.

2. **IF** offsite power is from backfeed, **THEN** perform the following:

   a. In the switchyard, install barriers around the Main Transformer bay as follows:

____ (1) Install a barrier on the East side of the bay facing East.

____ (2) Install a barrier on the North side facing North.

____ (3) Install a barrier on the West side facing West.

____ (4) Install a barrier on the South side facing South.

____ b. At the Main and Aux Transformers, install barriers around the Main and Aux Transformers.

ATTACHMENT 17
(Page 2 of 6)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 5 (PRESSURIZER FILLED >10%)

3. **IF** 4A Train is the designated operating train, **THEN** post signs and/or barriers as follows:

   a. Install barriers at in the 4A 4 kV Bus Room at the following locations:

____ (1) East side of the 4A Switchgear Bus from the North wall to the South wall.

____ (2) West end of the 4A Switchgear Bus:

- On the West end of the 4A Switchgear, place a barrier from the Northwest corner of the 4A Switchgear to the South wall (allow access to LP44).
- On the North side (rear) of the 4A Switchgear, place a barrier between the 4L MCC and 4A Sequencer (4C23A-1) that extends to the 4A Switchgear.
- On the North side (rear) of the 4A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 4AA01, 4AA02, 4AA03, 4AA04, 4AA05, and 4AA06 (six signs total).

   b. In the 4A 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 4C23A (old Sequencer Cabinet) located on the North wall of the 4A 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 4AA04 cubicle door.

____ c. In the 4B 4 kV Bus Room, place a protected equipment on the 4AB04 cubicle door.

   d. Perform the following in the U4 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

   (1) Install barriers at the following locations:

____ • In front and rear sections of 4A 480V LC

____ • In front and rear sections of 4C 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

ATTACHMENT 17
(Page 3 of 6)

UNIT 4 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 5 (PRESSURIZER FILLED >10%)

3. (Cont'd)

e. Install barriers at the following entry doors to 4A EDG Rooms:

____ (1) Door 138-1

____ (2) Door 133-2

____ (3) Door 141-1 to the 4A EDG DOTP area

____ (4) Door 138-2

____ (5) Door 140-1

____ (6) Door 139-2

____ f. Install barriers at the top of stairway to the 4A RHR Pump Room (10 ft).

g. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 4A RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 4A CCW Pump

OR

____ ii. 4C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 4A ICW Pump

OR

____ ii. 4C ICW Pump

ATTACHMENT 17
(Page 4 of 6)

UNIT 4 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 5 (PRESSURIZER FILLED >10%)

4. **IF** 4B Train is the designated operating train, **THEN** post signs and/or barriers as follows:

   a. Install barriers in the 4B 4 kV Bus Room at the following locations:

____ (1) East side of the 4B Switchgear Bus from the North wall to the South wall (Permit access to the ASD panel.)

____ (2) West end of the 4B Switchgear Bus:

- On the West end of the 4B Switchgear, place a barrier from the Northwest corner of the 4B Switchgear to the South wall.
- On the North side (rear) of the 4B Switchgear, place a barrier at the East end of the 4M MCC that extends to the 4B Switchgear.
- On the North side (rear) of the 4B Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 4AB01, 4AB02, 4AB03, and 4AB04 (four signs total).

   b. In the 4B 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 4C23B (old Sequencer Cabinet) located on the North wall of the 4B 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 4AB04 cubicle door.

____ c. In the 4A 4 kV Bus Room, place a protected equipment on the 4AA04 cubicle door.

   d. Perform the following in the U4 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

   (1) Install barriers at the following locations:

____ • In front and rear sections of 4B 480V LC

____ • In front and rear sections of 4D 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

ATTACHMENT 17
(Page 5 of 6)

UNIT 4 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 5 (PRESSURIZER FILLED >10%)

4. (Cont'd)

e. Install barriers at the following entry doors to 4B EDG Rooms:

____ (1) Door 133-1

____ (2) Door 133-2

____ (3) Door 136-1 to the 4B EDG DOTP area

____ (4) Door 133-3

____ (5) Door 135-2

____ (6) Door 134-2

____ (7) Door 135-1

____ f. Install barriers at the top of stairway to the 4B RHR Pump Room (10 ft).

g. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 4B RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 4B CCW Pump

OR

____ ii. 4C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 4B ICW Pump

OR

____ ii. 4C ICW Pump

ATTACHMENT 17
(Page 6 of 6)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 5 (PRESSURIZER FILLED >10%)

5. **IF** the 4C CCW or 4C ICW Pump is running and required for operability of the protected RHR train, **THEN** install barriers at the following entry doors to the 4D 4 kV Bus Room.

____ a. Door 139-1

____ b. Door 139-2

____ c. Door 135-2

____ 6. In the CCW Room, install barriers around the CCW Pump whose 4 kV power supply is protected above.

____ a. Record pump protected ___________________

____ 7. Install barriers on the North end of 2 of 3 CCW HXs.

____ a. Record HXs protected ___________________

____ 8. At the Intake, install barriers around the ICW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ___________________

____ 9. In the Control Room, behind the southernmost 4C04 section of Vertical Panel A that contains the Lockout Relay Reset buttons, place a barrier and Protected Train sign across 4C04 section (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 10. **IF** applicable, **THEN** ensure unnecessary Protected Train Postings have been removed using Attachment 24, Unit 4 Protected Train De-Posting Checklist, as a guide.

____ 11. **IF** any Protected Equipment Posting is required to be removed, **THEN** review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be concurrently removed. (N/A if no Protected Equipment Postings are being removed.)

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
______________________________	________________
______________________________	________________
______________________________	________________

REVIEWED BY:____ Date:__________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 18
(Page 1 of 6)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 6

NOTES

- *The steps in this attachment may be performed in any order.*
- *All postings are NOT intended to provide physical barriers; rather, to provide information and heightened awareness.*
- *If the operating train is swapped, or if components within a train are swapped, Protected Equipment postings should be placed or removed as necessary to maintain the postings and equipment status consistent. The new alignment should be posted prior to de-posting the previously protected equipment.*
- *Attachment 24, Unit 4 Protected Train De-Posting Checklist, should be prepared prior to entering the field to change Protected Train postings and may be performed concurrently with this attachment.*
- *If a deviation in the specified method for posting is required, then obtain SRO approval using Attachment 25, Protected Equipment Posting Deviations, prior to implementing the deviation.*
- *See Figure 6 for Protected Equipment sign format and content guidance.*

1. **IF** offsite power is from the Startup Transformer, **THEN** perform the following:

   a. In the switchyard, install barriers around the Startup Transformer bay as follows:

   ____ (1) Install a barrier on the East side of the bay facing East.

   ____ (2) Install a barrier on the North side facing North.

   ____ (3) Install a barrier on the West side facing West.

   ____ (4) Install a barrier on the South side facing South.

   ____ b. At the Startup Transformer, install barriers around the Startup Transformer.

2. **IF** offsite power is from backfeed, **THEN** perform the following:

   a. In the switchyard, install barriers around the Main Transformer bay as follows:

   ____ (1) Install a barrier on the East side of the bay facing East.

   ____ (2) Install a barrier on the North side facing North.

   ____ (3) Install a barrier on the West side facing West.

   ____ (4) Install a barrier on the South side facing South.

   ____ b. At the Main and Aux Transformers, install barriers around the Main and Aux Transformers.

ATTACHMENT 18
(Page 2 of 6)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 6

3. **IF** 4A Train is the designated operating train, **THEN** post signs and/or barriers as follows:

   a. Install barriers in the 4A 4 kV Bus Room at the following locations:

____ (1) East side of the 4A Switchgear Bus from the North wall to the South wall.

____ (2) West end of the 4A Switchgear Bus:

- On the West end of the 4A Switchgear, place a barrier from the Northwest corner of the 4A Switchgear to the South wall (allow access to LP44).
- On the North side (rear) of the 4A Switchgear, place a barrier between the 4L MCC and 4A Sequencer (4C23A-1) that extends to the 4A Switchgear.
- On the North side (rear) of the 4A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 4AA01, 4AA02, 4AA03, 4AA04, 4AA05, and 4AA06 (six signs total).

   b. In the 4A 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 4 (old Sequencer Cabinet) located on the North wall of the 4A 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 4AA04 cubicle door.

____ c. In the 4B 4 kV Bus Room place a Protected Equipment sign on the 4AB04 cubicle door.

   d. Perform the following in the U4 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

   (1) Install barriers at the following locations:

____ • In front and rear sections of 4A 480V LC

____ • In front and rear sections of 4C 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

ATTACHMENT 18
(Page 3 of 6)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 6

3. (Cont'd)

e. Install barriers at the following entry doors to 4A EDG Rooms:

____ (1) Door 138-1

____ (2) Door 133-2

____ (3) Door 141-1 to the 4A EDG DOTP area

____ (4) Door 138-2

____ (5) Door 140-1

____ (6) Door 139-2

f. **IF** the 4A ICW or CCW pump is unavailable, **THEN** ensure the 4D Bus is aligned to the 4A Bus, and install barriers at the following entry doors to 4D 4 kV Bus Room:

____ (1) Door 139-1

____ (2) Door 139-2

____ (3) Door 135-2

g. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 4A RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 4A CCW Pump

OR

____ ii. 4C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 4A ICW Pump

OR

____ ii. 4C ICW Pump

ATTACHMENT 18
(Page 4 of 6)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 6

4. **IF** 4B Train is the designated operating train, **THEN** post signs and/or barriers as follows:

a. Install barriers in the 4B 4 kV Bus Room at the following locations:

____ (1) East side of the 4B Switchgear Bus from the North wall to the South wall (Permit access to the ASD panel.)

____ (2) West end of the 4B Switchgear Bus:

- On the West end of the 4B Switchgear, place a barrier from the Northwest corner of the 4B Switchgear to the South wall.
- On the North side (rear) of the 4B Switchgear, place a barrier at the East end of the 4M MCC that extends to the 4B Switchgear.
- On the North side (rear) of the 4B Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 4AB01, 4AB02, 4AB03, and 4AB04 (four signs total).

b. In the 4B 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 4C23B (old Sequencer Cabinet) located on the North wall of the 4B 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 4AB04 cubicle door.

____ c. In the 4A 4 kV Bus Room place a Protected Equipment sign on the 4AA04 cubicle door.

d. Perform the following in the U4 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

(1) Install barriers at the following locations:

____ • In front and rear sections of 4B 480V LC

____ • In front and rear sections of 4D 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

ATTACHMENT 18
(Page 5 of 6)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 6

4. (Cont'd)

e. Install barriers at the following entry doors to 4B EDG Rooms:

____ (1) Door 133-1

____ (2) Door 133-2

____ (3) Door 136-1 to the 4B EDG DOTP area

____ (4) Door 133-3

____ (5) Door 135-2

____ (6) Door 134-2

____ (7) Door 135-1

f. **IF** the 4B ICW or CCW pump is unavailable, **THEN** ensure the 4D Bus is aligned to the 4B Bus, and install barriers at the following entry doors to 4D 4 kV Bus Room:

____ (1) Door 139-1

____ (2) Door 139-2

____ (3) Door 135-2

g. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

____ (1) 4B RHR Pump

(2) Select one: (N/A pump not operating)

____ i. 4B CCW Pump

OR

____ ii. 4C CCW Pump

(3) Select one: (N/A pump not operating)

____ i. 4B ICW Pump

OR

____ ii. 4C ICW Pump

ATTACHMENT 18
(Page 6 of 6)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 6

____ 5. In the CCW Room, install barriers around the CCW Pump whose 4 kV power supply is protected above.

____ a. Record pump protected ___________________

____ 6. Install barriers at the top of the stairway to the running protected RHR Pump Room (10 ft).

____ a. Record RHR Pump Room protected ___________________

____ 7. Install barriers on the North side of 2 of 3 CCW HXs.

____ a. Record HXs protected ___________________

____ 8. At the Intake, install barriers around the ICW Pump whose 4 kV power supply is protected above.

____ a. Record pump protected ___________________

____ 9. In the Control Room, behind the southernmost 4C04 section of Vertical Panel A that contains the Lockout Relay Reset buttons, place a barrier and Protected Train sign across 4C04 section (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 10. **IF** applicable, **THEN** ensure unnecessary Protected Train Postings have been removed using Attachment 24, Unit 4 Protected Train De-Posting Checklist, as a guide.

____ 11. **IF** any Protected Equipment Posting is required to be removed, **THEN** review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be concurrently removed. (N/A if no Protected Equipment Postings are being removed.)

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
______________________________	________________
______________________________	________________
______________________________	________________

REVIEWED BY:____ Date:__________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 19

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 7 RCS DEFUELED

NOTES

- *The steps in this attachment may be performed in any order.*
- *All postings are NOT intended to provide physical barriers; rather, to provide information and heightened awareness.*
- *If the operating train is swapped, or if components within a train are swapped, Protected Equipment postings should be placed or removed as necessary to maintain the postings and equipment status consistent. The new alignment should be posted prior to de-posting the previously protected equipment.*
- *Attachment 24, Unit 4 Protected Train De-Posting Checklist, should be prepared prior to entering the field to change Protected Train postings and may be performed concurrently with this attachment.*
- *If a deviation in the specified method for posting is required, then obtain SRO approval using Attachment 25, Protected Equipment Posting Deviations, prior to implementing the deviation.*
- *See Figure 6 for Protected Equipment sign format and content guidance.*

1. **IF** offsite power is from the Startup Transformer, **THEN** perform the following:
   a. In the switchyard, install barriers around the Startup Transformer bay as follows:
____ (1) Install a barrier on the East side of the bay facing East.
____ (2) Install a barrier on the North side facing North.
____ (3) Install a barrier on the West side facing West.
____ (4) Install a barrier on the South side facing South.
____ b. At the Startup Transformer, install barriers around the Startup Transformer.
2. **IF** offsite power is from backfeed, **THEN** perform the following:
   a. In the switchyard, install barriers around the Main Transformer bay as follows:
____ (1) Install a barrier on the East side of the bay facing East.
____ (2) Install a barrier on the North side facing North.
____ (3) Install a barrier on the West side facing West.
____ (4) Install a barrier on the South side facing South.
____ b. At the Main and Aux Transformers, install barriers around the Main and Aux Transformers.

ATTACHMENT 19
(Page 2 of 8)

UNIT 4 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 7 RCS DEFUELED

3. **IF** 4C 480V LC is fed from 4A 4 kV Bus, **THEN** post signs and/or barriers as follows:

a. Install barriers in the 4A 4 kV Bus Room at the following locations:

____ (1) East side of the 4A Switchgear Bus from the North wall to the South wall.

____ (2) West end of the 4A Switchgear Bus:

- On the West end of the 4A Switchgear, place a barrier from the Northwest corner of the 4A Switchgear to the South wall (allow access to LP44).
- On the North side (rear) of the 4A Switchgear, place a barrier between the 4L MCC and 4A Sequencer (4C23A-1) that extends to the 4A Switchgear.
- On the North side (rear) of the 4A Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 4AA01, 4AA02, 4AA03, 4AA04, 4AA05, and 4AA06 (six signs total).

b. In the 4A 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 4C23A (old Sequencer Cabinet) located on the North wall of the 4A 4 kV Bus Room.

NOTE

The C Bus tie breaker cubicle contains an HGA relay that if mechanically agitated could cause a bus lockout.

____ (2) Place a Protected Equipment sign on the 4AA09 cubicle door.

____ (3) Place a Protected Equipment sign on the 4AA04 cubicle door.

____ c. In the 4B 4 kV Bus Room, place a Protected Equipment sign on the 4AB04 Cubicle Door.

ATTACHMENT 19
(Page 3 of 8)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 7 RCS DEFUELED

3. (Cont'd)

d. Perform the following in the U4 480V Load Center Rooms (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers):

(1) Install barriers at the following locations:

____ • In front and rear sections of 4A 480V LC

____ • In front and rear sections of 4C 480V LC

____ (2) Install Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

(3) **IF** load centers are cross-tied, **THEN** install barriers at the following locations:

____ • In front and rear sections of 4B 480V LC

____ • In front and rear sections of 4D 480V LC

____ (4) **IF** the 4A SFP Cooling Pump is supplied from 4C 480V LC, **THEN** place a Protected Train sign on 480V LC Breaker 40309, 4A SFP Cooling Pump.

e. Install barriers at the following entry doors to 4A EDG Rooms:

____ (1) Door 138-1

____ (2) Door 133-2

____ (3) Door 141-1 to the 4A EDG DOTP area

____ (4) Door 138-2

____ (5) Door 140-1

____ (6) Door 139-2

f. **IF** the 4A ICW or CCW pump is unavailable, **THEN** ensure the 4D Bus is aligned to the 4A Bus, and install barriers at the following entry doors to 4D 4 kV Bus Room:

____ (1) Door 139-1

____ (2) Door 139-2

____ (3) Door 135-2

ATTACHMENT 19
(Page 4 of 8)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 7 RCS DEFUELED

3. (Cont'd)

g. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

(1) Select one: (N/A pump not operating)

____ i. 4A CCW Pump

OR

____ ii. 4C CCW Pump

(2) Select one: (N/A pump not operating)

____ i. 4A ICW Pump

OR

____ ii. 4C ICW Pump

4. **IF** 4B is the designated operating train, **THEN** post signs and/or barriers as follows:

a. Install barriers in the 4B 4 kV Bus Room at the following locations:

____ (1) East side of the 4B Switchgear Bus from the North wall to the South wall (Permit access to the ASD panel.)

____ (2) West end of the 4B Switchgear Bus:

- On the West end of the 4B Switchgear, place a barrier from the Northwest corner of the 4B Switchgear to the South wall.
- On the North side (rear) of the 4B Switchgear, place a barrier at the East end of the 4M MCC that extends to the 4B Switchgear.
- On the North side (rear) of the 4B Switchgear, place a magnetic Protected Equipment sign on the rear of cubicles 4AB01, 4AB02, 4AB03, and 4AB04 (four signs total).

ATTACHMENT 19
(Page 5 of 8)

UNIT 4 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 7 RCS DEFUELED

4. (Cont'd)

b. In the 4B 4 kV Bus Room, install signs as follows:

____ (1) Place a Protected Equipment sign on the front of 4C23B (old Sequencer Cabinet) located on the North wall of the 4B 4 kV Bus Room.

____ (2) Place a Protected Equipment sign on the 4AB04 cubicle door.

____ c. In the 4A 4 kV Bus Room, place a Protected Equipment sign on the 4AA04 Cubicle Door.

d. Install barriers at the following locations in the Unit 4 480V Load Center Rooms:

____ (1) Install barriers in front of the 4B and 4D 480V LCs.

____ (2) Install Protected Equipment signs at the 4B and 4D Undervoltage Relay Panels located on the South wall of the 480V Load Center Rooms.

____ (3) **IF** the Load Centers are cross-tied, **THEN**:

- Install barriers in front and rear sections of the 4A and 4C 480V LCs (Magnetic signs may be used in place of barriers on rear sections of applicable Load Centers).
- Install Protected Equipment signs at the 4A and 4C Undervoltage Relay Panels located on the South wall of the 480V Load Center Rooms.

____ (4) **IF** the 4A SFP Cooling Pump is supplied from the 4C 480V LC, **THEN** place a Protected Train sign on 480V LC Breaker 40309, 4A SFP Cooling Pump.

ATTACHMENT 19
(Page 6 of 8)

UNIT 4 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 7 RCS DEFUELED

4. (Cont'd)

e. Install barriers at the following entry doors to 4B EDG Rooms:

____ (1) Door 133-1

____ (2) Door 133-2

____ (3) Door 136-1 to the 4B EDG DOTP area

____ (4) Door 133-3

____ (5) Door 135-2

____ (6) Door 134-2

____ (7) Door 135-1

f. **IF** the 4B ICW or CCW pump is unavailable, **THEN** ensure the 4D Bus is aligned to the 4B Bus, and install barriers at the following entry doors to 4D 4 kV Bus Room:

____ (1) Door 139-1

____ (2) Door 139-2

____ (3) Door 135-2

g. In the Control Room, place unique Information tags on the following pump control switches identifying them as the protected/operating train:

(1) Select one: (N/A pump not operating)

____ i. 4B CCW Pump

OR

____ ii. 4C CCW Pump

(2) Select one: (N/A pump not operating)

____ i. 4B ICW Pump

OR

____ ii. 4C ICW Pump

ATTACHMENT 19
(Page 7 of 8)

UNIT 4 PROTECTED EQUIPMENT POSTINGS DURING ENCLOSURE 7 RCS DEFUELED

____ 5. In the CCW Room, install barriers around the CCW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ______________________

____ 6. Install barriers on the North end of 1 of 3 CCW HXs.

____ a. Record HXs protected ______________________

____ 7. At the SFP pump and HX Room, install a barrier at the entry door.

____ 8. **IF** the 4A SFP Cooling Pump is powered from a temporary source, **THEN** place a Protected Train sign on the temporary source breaker.

____ a. Record breaker protected ______________________

____ 9. Place a magnetic Stop sign on 480 V LC Breaker Cubicle 30201, 4B Spent Fuel Pool Cooling Pump.

____ 10. **IF** offsite power is from backfeed, **THEN** place a Protected Equipment sign at the Safeguards racks to protect the Aux Transformer breaker.

a. 4QR42

b. 4QR43

c. 4QR44

d. 4QR45

____ 11. At the Intake, install barriers around the ICW pump whose 4 kV power supply is protected above.

____ a. Record pump protected ______________________

____ 12. **IF** the RWST is one of the two credited sources of makeup water to the Spent Fuel Pit, **THEN** place a magnetic Stop sign on RWST purification pump breaker 40788 (U4 outage).

____ 13. **IF** Primary Water is one of the two credited sources of makeup water to the Spent Fuel Pit, **THEN** place a magnetic Stop sign on one of the following Primary Water Pump breakers: 0885 (3A), 30664 (3B), 0884 (4A), 40664 (4B).

a. Record the breaker protected ______________________

ATTACHMENT 19
(Page 8 of 8)

UNIT 4 PROTECTED EQUIPMENT POSTINGS
DURING ENCLOSURE 7 RCS DEFUELED

____ 14. **IF** the CVCS HUT is one of two credited sources of makeup water to the Spent Fuel Pit, **THEN** place a magnetic Stop sign on CVCS HUT recirculation pump breaker, 0853.

____ 15. In the Control Room, behind the southernmost 4C04 section of Vertical Panel A that contains the Lockout Relay Reset buttons, place a barrier and Protected Train sign across 4C04 section (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 16. **IF** applicable, **THEN** ensure unnecessary Protected Train Postings have been removed using Attachment 24, Unit 4 Protected Train De-Posting Checklist, as a guide.

____ 17. **IF** any Protected Equipment Posting is required to be removed, **THEN** review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be concurrently removed. (N/A if not Protected Equipment Postings are being removed.)

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
______________________________	________________
______________________________	________________
______________________________	________________

REVIEWED BY:____ Date:__________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 20
(Page 1 of 5)

UNIT 3 PROTECTED EQUIPMENT POSTINGS RESTORATION

____ 1. Ensure Unit 3 RCS temperature is above 200 deg.

NOTE

The remainder of this attachment may be completed in any order.

2. In switchyard, perform the following:

   a. In the Startup Transformer bay, ensure the following barriers are removed:

____ (1) Barrier on the East side of the bay facing East.

____ (2) Barrier on the North side facing North.

____ (3) Barrier on the West side facing West.

____ (4) Barrier on the South side facing South.

   b. In the main transformer bay, ensure the following barriers are removed:

____ (1) Barrier on the East side of the bay facing East.

____ (2) Barrier on the North side facing North.

____ (3) Barrier on the West side facing West.

____ (4) Barrier on the South side facing South.

____ 3. At the Startup Transformer, ensure all barriers around the Startup Transformer are removed.

____ 4. At the Main and Aux Transformers, ensure all barriers around the Main and Aux Transformers are removed.

ATTACHMENT 20
(Page 2 of 5)

UNIT 3 PROTECTED EQUIPMENT POSTINGS RESTORATION

5. At the 4 kV Bus Rooms, perform the following:

   a. Ensure barriers and/or signs are removed from the following entry locations:

____ (1) East side of the 3A Switchgear Bus from the North wall to the South wall.

____ (2) West end of the 3A Switchgear Bus:

- On the West end of the 3A Switchgear, from the Northwest corner of the 3A Switchgear to the South wall.
- On the North side (rear) of the 3A Switchgear, between the 3L MCC and 3A Sequencer (3C23A-1) that extends to the 3A Switchgear.
- On the North side (rear) of the 3A Switchgear, magnetic Protected Equipment sign on the rear of cubicles 3AA01, 3AA02, 3AA03, 3AA04, 3AA05, and 3AA06 (six signs total).

____ (3) East side of the 3B Switchgear Bus from the North wall to the South wall.

____ (4) West end of the 3B Switchgear Bus:

- On the West end of the 3B Switchgear, from the Northwest corner of the 3B Switchgear to the South wall.
- On the North side (rear) of the 3B Switchgear, East end of the 3M MCC that extends to the 3B Switchgear.
- On the North side (rear) of the 3B Switchgear, magnetic Protected Equipment sign on the rear of cubicles 3AB01, 3AB02, 3AB03, and 3AB04 (four signs total).

   b. In the 3A 4 kV Bus Room, ensure Protected Equipment signs and barriers are removed at the following locations:

____ (1) Cubicle door 3AA04

____ (2) 3C23A (old sequencer panel)

   c. In the 3B 4 kV Bus Room, ensure Protected Equipment signs and barriers are removed at the following locations:

____ (1) Cubicle door 3AB04

____ (2) 3C23B (old sequencer panel)

ATTACHMENT 20
(Page 3 of 5)

UNIT 3 PROTECTED EQUIPMENT POSTINGS RESTORATION

6. At the 480V Load Center Rooms, perform the following:

   a. Ensure barriers removed from the following locations:

____ (1) In front and rear sections of 3A, 3B and 3C, 3D 480V LCs.

____ (2) Remove Protected Equipment signs at their respective undervoltage relay panels located on the South wall of the 480V Load Center Rooms.

____ (3) At 480V LC Breaker Cubicle 30309, SFP Cooling Pump, ensure the Protected Train sign is removed.

____ (4) At 480V LC Breaker Cubicle 40201, 3B Spent Fuel Cooling Pump, ensure the Protected Train sign is removed.

7. At the EDG Rooms ensure barriers are removed from the following entry doors:

____ a. Door 073-1

____ b. Door 072-2

____ c. Door 131-1 to the 3A EDG radiator area

____ d. Door 075-1to the 3A EDG Day Tank Room

____ e. Door 072-1

____ f. Vital area door 3EDG3131 to the 3B EDG radiator area

____ g. Door 074-1 to the 3B EDG Day Tank Room

ATTACHMENT 20
(Page 4 of 5)

UNIT 3 PROTECTED EQUIPMENT POSTINGS RESTORATION

8. Remove 3A MCC 480V MCC Vital Section as follows:

____ a. At the 3A Vital MCC starting from the North end, magnetic Protected Equipment sign on the first and second cabinet door.

9. At the 3D 4 kV Bus Room, ensure barriers at the following entry doors are removed:

____ a. Door 134-1

____ b Door 134-2

____ 10. In the Control Room, ensure any Information tags on the RHR, CCW, or ICW pump control switches for designated operating and protected trains are removed.

____ 11. In the Control Room, ensure any Protected Equipment signs are removed from Safeguards Racks 3QR42 / 43 / 44 / 45.

____ 12. In the Control Room, behind the southernmost 3C04 section of Vertical Panel A that contains the Lockout Relay Reset buttons, place a barrier and Protected Train sign across 3C04 section (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 13. In the CCW Room, ensure all barriers around the CCW pumps are removed.

____ 14. At the RHR Pump Rooms, ensure all barriers to 3A and 3B RHR pumps are removed.

____ 15. In the CCW Room, ensure all barriers around CCW HXs are removed.

____ 16. At the Intake, ensure all barriers around the ICW pumps are removed.

____ 17. At the U3 SFP Pump Room, ensure all barriers are removed from the entrance door and SFP Cooling Heat Exchanger.

____ 18. **IF** the 3A SFP Cooling Pump was powered from a temporary source, **THEN** ensure the Protected Train sign is removed from the temporary source breaker.

____ a. Record breaker de-posted. ______________________

___ 19. Ensure magnetic Stop signs are removed from the following locations:

__ a. The RWST purification pump breakers: 30788, 407788.

__ b. The Primary Water Pumps breakers: 0885, 30664, 0884, 40664.

__ c. The CVCS HUT recirculation pump breaker: 0853.

ATTACHMENT 20
(Page 5 of 5)

UNIT 3 PROTECTED EQUIPMENT POSTINGS RESTORATION

____ 20. Review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be removed.

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
____________________________	________________
____________________________	________________
____________________________	________________

REVIEWED BY:____ Date:_________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 21
(Page 1 of 4)

UNIT 4 PROTECTED EQUIPMENT POSTINGS RESTORATION

____ 1. Ensure Unit 4 RCS temperature is above 200 deg.

NOTE

The remainder of this attachment may be completed in any order.

2. In switchyard, perform the following:

   a. In the startup transformer bay, ensure the following barriers are removed:

____ (1) Barrier on the East side of the bay facing East.

____ (2) Barrier on the North side facing North.

____ (3) Barrier on the West side facing West.

____ (4) Barrier on the South side facing South.

   b. In the main transformer bay, ensure the following barriers are removed:

____ (1) Barrier on the East side of the bay facing East.

____ (2) Barrier on the North side facing North.

____ (3) Barrier on the West side facing West.

____ (4) Barrier on the South side facing South.

____ 3. At the startup transformer, ensure all barriers around the startup transformer are removed.

____ 4. At the main and aux transformers, ensure all barriers around the main and aux transformers are removed.

ATTACHMENT 21
(Page 2 of 4)

UNIT 4 PROTECTED EQUIPMENT POSTINGS RESTORATION

5. At the 4 kV Bus Rooms, perform the following:

a. Ensure barriers are removed from the following entry locations:

____ (1) East side of 4A Switchgear Bus from North to South wall.

____ (2) West end of the 4A Switchgear Bus:

- On the West end of the 4A Switchgear, from the Northwest corner of the 4A Switchgear to the South wall.
- On the North side (rear) of the 4A Switchgear, between the 4L MCC and 4A Sequencer (4C23A-1) that extends to the 4A Switchgear.
- On the North side (rear) of the 4A Switchgear, magnetic Protected Equipment sign on the rear of cubicles 4AA01, 4AA02, 4AA03, 4AA04, 4AA05, and 4AA06 (six signs total).

____ (3) East side of 4B Switchgear Bus from North to South wall.

____ (4) West end of the 4B Switchgear Bus:

- On the West end of the 4B Switchgear, from the Northwest corner of the 4B Switchgear to the South wall.
- On the North side (rear) of the 4B Switchgear, East end of the 4M MCC that extends to the 4B Switchgear.
- On the North side (rear) of the 4B Switchgear, magnetic Protected Equipment sign on the rear of cubicles 4AB01, 4AB02, 4AB03, and 4AB04 (four signs total).

b. In the 4A 4 kV Bus Room, ensure Protected Equipment signs are removed from the following cubicle doors:

____ (1) Cubicle door 4AA04

____ (2) 4C23A (old sequencer panel)

c. In the 4B 4 kV Bus Room, ensure Protected Equipment signs are removed from the following cubicle doors:

____ (1) Cubicle door 4AB04

____ (2) 4C23B (old sequencer panel)

ATTACHMENT 21
(Page 3 of 4)

UNIT 4 PROTECTED EQUIPMENT POSTINGS RESTORATION

6. At the 480V Load Center Rooms, perform the following:

   a. Ensure the following barriers and/or signs removed from the following locations:

____ (1) In front and rear sections of 4A, 4B, and 4C, 4D 480V LCs.

____ (2) Remove Protected Equipment signs at the respective undervoltage relay panels located at the South wall of the 480V Load Center Rooms.

____ (3) 480V LC Breaker Cubicle 40309, SFP Cooling Pump, ensure the Protected Train sign is removed.

____ (4) At 480V LC Breaker Cubicle 30201, 4B Spent Fuel Cooling Pump, ensure Protected Train sign is removed.

7. At the EDG Rooms, ensure barriers are removed from the following entry doors:

____ a. Door 138-1

____ b. Door 133-2

____ c. Door 141-1 to the 4A EDG DOTP area

____ d. Door 138-2

____ e. Door 139-1

____ f. Door 139-2

____ g. Door 133-1

____ h. Door 136-1 to the 4B EDG DOTP area

____ i. Door 133-3

____ j. Door 135-2

____ k. Door 134-2

____ l. Door 140-1

____ 8. In the Control Room, ensure any Information Tags on the RHR, CCW, or ICW pump control switches for designated operating and protected trains are removed.

ATTACHMENT 21
(Page 4 of 4)

UNIT 4 PROTECTED EQUIPMENT POSTINGS RESTORATION

____ 9. In the Control Room, ensure any Protected Equipment signs are removed from Safeguards Racks 4QR42 / 43 / 44 / 45.

____ 10. In the Control Room, behind the southernmost 4C04 section of Vertical Panel A that contains the Lockout Relay Reset buttons, place a barrier and Protected Train sign across 4C04 section (prevent inadvertent actuation of 4kV Bus Lockout Relays).

____ 11. In the CCW Room, ensure all barriers around the CCW pumps are removed.

____ 12. At the RHR Pump Rooms, ensure all barriers to 4A and 4B RHR pumps are removed.

____ 13. In the CCW Room, ensure all barriers around CCW HXs are removed.

____ 14. At the Intake, ensure all barriers around the ICW pumps are removed.

____ 15. At door to the U4 SFP Pump Room, ensure all barriers are removed from the entrance door and SFP Cooling Heat Exchanger.

____ 16. **<u>IF</u>** the 4A AFP Cooling Pump was powered from a temporary source, **<u>THEN</u>** ensure the Protected Train sign is removed from the temporary power source breaker.

____ a. Record breaker de-posted __________.

17. Ensure magnetic Stop signs are removed from the following locations:

____ a. The RWST purification pump breakers: 30788, 407788.

____ b. The Primary Water Pumps breakers: 0885, 30664, 0884, 40664.

____ c. The CVCS HUT recirculation pump breaker: 0853.

____ 18. Review Attachment 25, Protected Equipment Posting Deviations, to determine if any posting deviations are required to be removed.

Date/Time Completed:____________/____________

PERFORMED BY (Print)	INITIALS
______________________________	________________
______________________________	________________
______________________________	________________

REVIEWED BY:____ Date:__________________
Shift Manager or Senior Operator at the Controls Designee

ATTACHMENT 22
(Page 1 of 2)

CONTAINMENT CLOSURE TESTING

NOTES

- *This enclosure provides guidance to ensure containment closure time limits can be met each outage prior to entering a period of high risk with a short duration estimated to RCS boil in the event core cooling is lost.*
- *Actual containment closure test of the Equipment Hatch must be performed if the Hatch is to remain open when time to boil in the RCS is less than 30 minutes. For any other penetration where a vent path from containment to the outside atmosphere is open and an exception is documented in Attachment 3, the method of testing may either be actual closure or simulated closure as determined by the Operations Manager.*
- *In addition to this closure test, the Outage Manager should consult OCC staff to determine if any emergent/new activities could block the equipment hatch or issues with equipment (e.g., Polar Crane) are known that could potentially prevent or challenge meeting Fast Closure of the Equipment Hatch at any time throughout the duration of the High Risk period to be entered. If these conditions exist, the appropriate contingencies, with approval of the Operations Manager, must be put in place to ensure the requirements of Enclosure 13 can be met or the Equipment Hatch must be closed with 4 bolts installed or fast-closure rollup door. (Ref commitment SOER 09-01)*

CONTAINMENT CLOSURE TEST GUIDANCE

a. Test must be performed prior to entering the period of high risk and shall meet the containment closure time limits listed in Enclosure 13 or the estimated time to boil on the RCS, whichever is less. Use Figure 1, Typical Heat Up Rates w/Vessel Full; Figure 2, Loss of RHR Cooling at Mid-Loop Operations; Figure 3, Loss of RHR Cooling at 2.5 Feet Below Reactor Vessel Flange Operations Or Figure 4, Typical RCS Heat Up Rates for Reduced Inventory for the estimated time to boil based on the most conservative expected plant conditions (E.g. if draining to 1-1/2 to 2-1/2 feet below the flange, use Figure 3, Loss Of RHR Cooling At 2.5 Feet Below Reactor Vessel Flange Operations).

b. An actual closure of containment will require that the test be performed with penetrations free from cables and other temporary impairment that are normally utilized during outages. It is not the intent of this test to damage any equipment. The OCC Manager or Outage Manager will verify that conditions for the test to be performed are satisfactory.

c. Observer has been assigned to verify results at the Personnel Hatch and the Equipment Hatch. All other penetrations shall be reported as complete by the assigned designee as listed on Attachment 3.

d. Initiation of the containment closure test will be from the Control Room, directed by Operations, with a page announcement to commence containment closure testing.

- The clock will start for the Equipment Hatch (actual closure) with the announcement and end when (1) the last of the four bolts are installed or (2) the fast-closure rollup door has been closed.
- The clock will start for any remaining penetrations (actual or simulated closure) when the announcement is made and end when the penetrations is reported closed by the designee or assigned observer.

ATTACHMENT 22
(Page 2 of 2)

CONTAINMENT CLOSURE TESTING

e. If a Satisfactory Closure time is not achieved for the applicable shift during the shift's Containment Closure Test, the test should be re-performed at least two additional times for that shift. The test is considered Satisfactory if closure times are acceptable either during the first Containment Closure Test or during any two consecutive tests. This additional testing may be waived by the Shift Outage Director with Shift Manager concurrence.

f. Any penetrations that fail to meet the containment closure time limits pursuant to step e. above shall be closed prior to entering the High Risk plant condition.

g. A minimum of one Satisfactory Containment Closure Test for each shift is required for all penetrations that are to remain Open and the Closure Test results shall be verified satisfactory by the Shift Manager or Risk Assessment Team Lead prior to entering Enclosure 2.

h. Performance of the Containment Closure Test and the results should be logged in the Outage Unit Narrative Log, including any Closure Test waivers.

ATTACHMENT 23
(Page 1 of 2)

UNIT 3 PROTECTED TRAIN DE-POSTING CHECKLIST

Directions:

1. In Column (1), place a check mark for area / item that is posted for the new Protected Train using applicable Attachment of 0-ADM-051, Outage Risk Assessment and Control.

2. In Column (3), write N/A for all rows in Column (1) that have a check mark.

3. Using Column (3), remove Protected Train Postings for items in Column (3) that do not have N/A, and initial Column (3) for removal.

Column (1) Place check mark for Protected Train items required by Attachment ______	Column (2) Protected Train Area / Item	Column (3) Remove Protected Train Postings that are not Protected Train Equipment
	U3 Startup Transformer Switchyard Bay	
	U3 Main Transformer Switchyard Bay	
	U3 Startup Transformer	
	U3 Main/Auxiliary Transformer	
	3QR42/43/44/45 (Backfeed only)	
	3A 4KV Swgr Room	
	3A Swgr Rm Old Sequencer (3C23A)	
	3AA04 (Pot XFMR Cubicle)	
	3A / 3C Load Centers (front and rear section)	
	3A / 3C Load Center UV Panels	
	3A Vital MCC	
	3A EDG Rooms (EDG, Day Tk, Radiator Rms)	
	3B 4KV Swgr Room	
	3B Swgr Rm Old Sequencer (3C23B)	
	3AB04 (Pot Xmfr Cubicle)	
	3B / 3D Load Centers (front and rear section)	
	3B / 3D Load Center UV Panels	
	3B EDG Rooms (EDG, Day Tk, Radiator Rms)	
	3D 4KV (if 3C ICW or CCW Pps Prot)	
	3A RHR Pump Room	
	3B RHR Pump Room	
	3A CCW HX	
	3B CCW HX	
	3C CCW HX	

ATTACHMENT 23
(Page 2 of 2)

UNIT 3 PROTECTED TRAIN DE-POSTING CHECKLIST

Directions:

1. In Column (1), place a check mark for area / item that is posted for the new Protected Train using applicable Attachment of 0-ADM-051, Outage Risk Assessment and Control.
2. In Column (3), write N/A for all rows in Column (1) that have a check mark.
3. Using Column (3), remove Protected Train Postings for items in Column (3) that do not have N/A and initial Column (3) for removal.

Column (1) Place check mark for Protected Train items required by Attachment _____	**Column (2)** **Protected Train Area / Item**	**Column (3) Remove Protected Train Postings that are not Protected Train Equipment**
	3A CCW Pump	
	3B CCW Pump	
	3C CCW Pump	
	3A ICW Pump	
	3B ICW Pump	
	3C ICW Pump	
	3A Tn CR Switches (RHR, CCW, ICW Pps)	
	3B Tn CR Switches (RHR, CCW, ICW Pps)	
	3C04 section Vertical Panel “A”	
	SFP HX Rm Door (Leave Guarded Sign)	
	30309 (3A SFP Pp)	
	40201 (3B SFP Pp)	
	30788 (U3 RWST Purif Pp)	
	0885 (3A Primary Water Pump)	
	30664 (3B Primary Water Pump)	
	0884 (4A Primary Water Pump)	
	40664 (4B Primary Water Pump)	
	0853 (CVCS HUT Recirc Pp)	

ATTACHMENT 24
(Page 1 of 2)

UNIT 4 PROTECTED TRAIN DE-POSTING CHECKLIST

Directions:

1. In Column (1), place a check mark for area / item that is posted for the new Protected Train using applicable Attachment of 0-ADM-051, Outage Risk Assessment and Control.
2. In Column (3), write N/A for all rows in Column (1) that have a check mark.
3. Using Column (3), remove Protected Train postings for items in Column (3) that do not have N/A, and initial Column (3) for removal.

Column (1) Place check mark for Protected Train items required by Attachment _____	**Column (2) Protected Train Area / Item**	**Column (3) Remove Protected Train Postings that are not Protected Train Equipment**
	U4 Startup Transformer Switchyard Bay	
	U4 Main Transformer Switchyard Bay	
	U4 Startup Transformer	
	U4 Main/Auxiliary Transformer	
	4QR42/43/44/45 (Backfeed only)	
	4A 4KV Swgr Room	
	4A Swgr Rm Old Sequencer (4C23A)	
	4AA04 (Pot XFMR Cubicle)	
	4A / 4C Load Centers (front and rear section)	
	4A / 4C Load Center UV Panels	
	4A Vital MCC	
	4A EDG Rooms (EDG, Day Tk, Radiator Rms)	
	4B 4KV Swgr Room	
	4B Swgr Rm Old Sequencer (4C23B)	
	4AB04 (Pot Xmfr Cubicle)	
	4B / 4D Load Centers (front and rear section)	
	4B / 4D Load Center UV Panels	
	4B EDG Rooms (EDG, Day Tk, Radiator Rms)	
	4D 4KV (if 4C ICW or CCW Pps Prot)	
	4A RHR Pump Room	
	4B RHR Pump Room	
	4A CCW HX	
	4B CCW HX	
	4C CCW HX	

ATTACHMENT 24
(Page 2 of 2)

UNIT 3 PROTECTED TRAIN DE-POSTING CHECKLIST

Directions:

1. In Column (1), place a check mark for area / item that is posted for the new Protected Train using applicable Attachment of 0-ADM-051, Outage Risk Assessment and Control.

2. In Column (3), write N/A for all rows in Column (1) that have a check mark.

3. Using Column (3), remove Protected Train Postings for items in Column (3) that do not have N/A, and initial Column (3) for removal.

Column (1) Place check mark for Protected Train items required by Attachment _____	Column (2) Protected Train Area / Item	Column (3) Remove Protected Train Postings that are not Protected Train Equipment
	4A CCW Pump	
	4B CCW Pump	
	4C CCW Pump	
	4A ICW Pump	
	4B ICW Pump	
	4C ICW Pump	
	4A Tn CR Switches (RHR, CCW, ICW Pps)	
	4B Tn CR Switches (RHR, CCW, ICW Pps)	
	4C04 section Vertical Panel “A”	
	SFP HX Rm Door (Leave Guarded Sign)	
	40309 (4A SFP Pp)	
	30201 (4B SFP Pp)	
	40788 (U4 RWST Purif Pp)	
	0885 (3A Primary Water Pump)	
	30664 (3B Primary Water Pump)	
	0884 (4A Primary Water Pump)	
	40664 (4B Primary Water Pump)	
	0853 (CVCS HUT Recirc Pp)	

ATTACHMENT 25
(Page 1 of 2)

PROTECTED EQUIPMENT POSTING DEVIATIONS

Directions: In the table below, list any posting that differs from the method specified for Protected Equipment postings, including any additional postings used. When the Protected Equipment posting is longer required, then initial and date for removal. Use additional sheets if necessary.

List the Attachment Number for Posting Deviation (e.g. Att. 9)	List how posting deviates from the method specified (be specific, including step number and posting location so that posting can be removed later)	SRO authorization to deviate from method specified by the Attachment – Signature and Date	Posting Deviation installed – Initial and Date	Posting Deviation removed – Initial and Date

ATTACHMENT 25
(Page 2 of 2)

PROTECTED EQUIPMENT POSTING DEVIATIONS

List the Attachment Number for Posting Deviation (e.g. Att. 9)	List how posting deviates from the method specified (be specific, including step number and posting location so that posting can be removed later)	SRO authorization to deviate from method specified by the Attachment – Signature and Date	Posting Deviation installed – Initial and Date	Posting Deviation removed – Initial and Date

PERFORMED BY (Print)	INITIALS	VERIFIED BY (Print)	INITIALS
____________________	________	____________________	________
____________________	________	____________________	________
____________________	________	____________________	________
____________________	________	____________________	________
____________________	________	____________________	________
____________________	________	____________________	________

FINAL PAGE

L-17-1 NRC Exam

JPM SRO A2

JPM TITLE: Determine Required Action for CCW Test

JPM NUMBER: 02030038300 **REV.** 2-1

TASK NUMBER(S) / TASK TITLE(S): 02030038300/
Evaluate And Direct Tech Specs Required Actions Due To CCW System Out Of Spec/Service Conditions

K/A NUMBERS: 2.2.12 **K/A VALUE:** SRO 4.1

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☐ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [x]

EVALUATION LOCATION:

In-Plant:	[ ]	Control Room:	[ ]
Simulator:	[ ]	Classroom:	[x]
Lab:	[ ]	Other:	[ ]

Time for Completion: 15 Minutes Time Critical: No

Alternate Path [NRC]: No

Alternate Path [INPO]: No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/02/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**08/01/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/03/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**08/01/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☒
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: None

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
2-0	Formatting	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
2-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17

Required Materials:	• HANDOUT 3-OSP-030.1 • Technical Specifications
General References:	• 3-OSP-030.1, Component Cooling Water Pump Inservice Test • Technical Specifications
Task Standards:	• Demonstrate knowledge of surveillance procedures • Determine that IST acceptance criteria for the 3A CCW Pump are not met, the pump is inoperable, and Technical Specification LCO 3.7.2.a Action b is required

NOTE: Additional references available upon request.

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

Initial Conditions:

- Units 3 and 4 are both in Mode 1 at 100% power, with no equipment OOS, and in their normal electrical alignments.
- An inservice test for the 3A CCW Pump has just been completed, per 3-OSP-030.1 (Component Cooling Water Pump Inservice Test).

Initiating Cue:

You are directed to perform Step 7.1.32 of 3-OSP-030.1 and determine the following:

<u>1. Is the pump operable? (Circle the correct answer):</u> Yes No

<u>2. Justify your operability determination utilizing the evaluated parameters of 3-OSP-030.1. (If none, mark none):</u>

<u>3. List Applicable Technical Specification and required action(s) (If none, mark none):</u>

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required materials.**
Standard:	Obtain required materials.
Evaluator Cue:	Provide examinee with marked-up copy of 3-OSP-030.1 (Component Cooling Water Pump Inservice Test), through Section 7.1.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y or N_ (SEQ-2)**	**Review the 3A CCW Pump bearing casing vibration data:** • Pump Outboard Horizontal Vibration
Standard:	Examinee reviews value for 3A CCW Pump outboard horizontal vibration and confirms that it is in the Required Action Range.
Evaluator Note:	3A CCW Pump outboard horizontal vibration (0.76652 in/sec) exceeds 0.700 in/sec. Identification of either Seq-2 **OR** Seq-3 are critical but **NOT** both.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y or N_ (SEQ-3)**	**Review the 3A CCW Pump bearing casing vibration data:** • Pump Outboard Vertical Vibration
Standard:	Examinee reviews value for 3A CCW Pump outboard vertical vibration and confirms that it is in the Required Action Range.
Evaluator Note:	3A CCW Pump outboard vertical vibration (0.69980 in/sec) exceeds 0.440 in/sec. Identification of either Seq-2 **OR** Seq-3 are critical but **NOT** both.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _N_ (SEQ-4)**	**Review the 3A CCW Pump bearing casing vibration data:** • Pump Inboard Vertical Vibration
Standard:	Examinee reviews value for 3A CCW Pump inboard vertical vibration and confirms that it is in the Alert Range.
Evaluator Note:	3A CCW Pump inboard vertical vibration (0.38970 in/sec) exceeds 0.211 in/sec, but not 0.507 in/sec.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_(SEQ-5)**	**Review the 3A CCW Pump total head data.**
Standard:	Examinee reviews value for 3A CCW Pump total head and confirms that it is in the Required Action Range.
Evaluator Note:	3A CCW Pump total head (78.0 psid) is less than 78.3 psid.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_(SEQ-6)**	**Determine that the inservice test is unsatisfactory and declare the 3A CCW Pump inoperable.**
Standard:	Determine that the inservice test is unsatisfactory and declare the 3A CCW Pump inoperable.
Performance:	**SATISFACTORY _______ UNSATISFACTORY _______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-7)**	**Identify the appropriate Technical Specification LCO (3.7.2.a) and action statement (b).**
Standard:	Identify the appropriate Technical Specification LCO (3.7.2.a) and action statement (b).
Evaluator Note:	• LCO 3.7.2.a – The CCW System shall be operable, with three CCW pumps. • Applicability – Modes 1, 2, 3, and 4. • Action b – With only one CCW pump operable or with two CCW pumps operable but not from independent power supplies, restore two pumps from independent power supplies to operable status within 72 hours or be in hot standby within the next 6 hours and in cold shutdown within the following 30 hours.
Performance:	**SATISFACTORY _______ UNSATISFACTORY ______**
Comments:	

Terminating Cues: **When the examinee completes Step 7, state "This completes the JPM."**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

Initial Conditions:

- Units 3 and 4 are both in Mode 1 at 100% power, with no equipment OOS, and in their normal electrical alignments.
- An inservice test for the 3A CCW Pump has just been completed, per 3-OSP-030.1 (Component Cooling Water Pump Inservice Test).

Initiating Cue:

You are directed to perform Step 7.1.32 of 3-OSP-030.1 and determine the following:

1. Is the pump operable? (Circle the correct answer): Yes No

2. Justify your operability determination utilizing the evaluated parameters of 3-OSP-030.1. (If none, mark none):

3. List Applicable Technical Specification and required action(s) (If none, mark none):

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

TURNOVER SHEET

Initial Conditions:

- Units 3 and 4 are both in Mode 1 at 100% power, with no equipment OOS, and in their normal electrical alignments.
- An inservice test for the 3A CCW Pump has just been completed, per 3-OSP-030.1 (Component Cooling Water Pump Inservice Test).

Initiating Cue:

You are directed to perform Step 7.1.32 of 3-OSP-030.1, list any equipment deficiencies, determine pump operability, and identify any applicable Technical Specification action(s).

1. Is the pump operable? (Circle the correct answer): Yes No

2. Justify your operability determination utilizing the evaluated parameters of 3-OSP-030.1. (If none, mark none):

3A CCW Pump Outboard Horizontal Vibration is within the Required Action Range.

3A CCW Pump Outboard Vertical Vibration is within of the Required Action Range.

3A CCW Pump Total Head is within the Required Action Range

May also state but not require

3A CCW Pump Inboard Vertical Vibration is within the Alert Range.

3. List Applicable Technical Specification and required action(s) (If none, mark none):

LCO 3.7.2.a – The CCW System shall be operable, with three CCW pumps.

Action b – With only one CCW pump operable or with two CCW pumps operable but not from independent power supplies, restore two pumps from independent power supplies to operable status within 72 hours or be in hot standby within the next 6 hours and in cold shutdown within the following 30 hours.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Florida Power & Light Company

This procedure may be affected by a T.C. (Temporary Change) Verify information prior to use.
Date verified today Initials S

Turkey Point Nuclear Plant

Unit 3

3-OSP-030.1

CAUTION

Performance of this procedure may affect core reactivity.

Title:

Component Cooling Water Pump Inservice Test

(Continuous Use)

Safety Related Procedure

Responsible Department:	Engineering
Revision Number:	12
Issue Date:	3/29/14
Revision Approval Date:	3/24/14

PCRs *09-0429, 08-3722, 09-3816, 10-1264, 10-1438, 10-0941, 572869, 581178, 592163, 1639818, 1704203, 1743409, 1794825, 1832346, 1922962, 1932416, 1860780*
ECs *273225*

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TABLE OF CONTENTS

1.0 PURPOSE

1.1 This procedure provides instructional guidance for the inservice testing or post maintenance pump test of the Component Cooling Water Systems to meet the surveillance requirements of References 2.1.1 and 2.1.2.

1.2 This procedure performs the required Group A tests of the Component Cooling Water pumps in accordance with the ASME OM Code, Subsection ISTB.

1.3 This procedure performs the required valve exercise tests in accordance with the ASME OM Code, Subsection ISTC.

2.0 REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS

2.1 References

2.1.1 Technical Specifications

1. Section 4.0.5
2. Section 3.7.2

2.1.2 FSAR

1. Section 6, Engineered Safety Features
2. Section 9, Auxiliary and Emergency Systems

2.1.3 Operating Diagrams

1. 5613-M-3030, Sht 1, 2, 3, 4, and 5, Unit 3 Component Cooling Water System

2.1.4 Operating Procedures

1. 0-ADM-215, Plant Surveillance Tracking Program
2. 0-ADM-737, Post Maintenance Testing
3. 3-NOP-030, Component Cooling Water System
4. 3-OP-050, Residual Heat Removal System
5. 0-OSP-200.1, Schedule of Plant Checks and Surveillances

2.1.5 Miscellaneous Documents (i.e., PC/Ms, Correspondence)

1. Condition Report 95-935
2. JPN-PTN-SENP-95-026, Rev 2, Safety Evaluation for CCW Flow Balance and Post-Accident Alignment Requirements to Support Current and Uprated Conditions
3. Fourth Ten-Year Inservice Inspection Interval Inservice Testing Program for Pumps and Valves

2.1.5 (Cont'd)

4. CR 02-0121, PM 02-03-002, Incorporate Acceptance Criteria into all procedures used to Test Pumps in the IST Program.

5. EC 273225, Restore Automatic Actuation of Third ECC

2.1.6 Regulatory Guidelines

1. ASME OM Code 1998 Edition through 2000 Addenda, Subsection ISTB, Inservice Testing of Pumps in Light-Water Reactor Nuclear Power Plants

2. ASME OM Code 1998 Edition through 2000 Addenda, Subsection ISTC, Inservice Testing of Valves in Light-Water Reactor Nuclear Power Plants

2.2 Records Required

2.2.1 The date, time and section completed shall be entered in the Unit Narrative Log. Also, problems encountered while performing the procedure should be entered; i.e., malfunctioning equipment, delays due to changes in plant conditions, etc.

2.2.2 Prior to routing to QA Records, completed Subsections 7.1, 7.2 and 7.3 and Attachment 1 shall be routed to the IST Coordinator for analysis and evaluation.

2.2.3 Completed copies of the below listed items document compliance with Technical Specification surveillance requirements and shall be transmitted to QA Records for retention in accordance with Quality Assurance Records Program requirements:

1. Subsection 7.1
2. Subsection 7.2
3. Subsection 7.3
4. Attachment 1
5. Attachment 2

2.3 Commitment Documents

2.3.1 FPL letter from T. F. Plunkett to NRC L-90-389 dated November 13, 1990 LER 250-90-021, CCW System Split Header Configuration.

2.3.2 JPN-PTN-SENP-95-026, Safety Evaluation for CCW Flow Balance and Post Accident Alignment Requirements to Support Current and Uprated Conditions (LER 250/95-006)

2.3.3 FPL letter from T.O. Jones to NRC L-2003-226 dated September 17, 2003, LER 2003-009-00, Component Cooling Water System Configuration Outside Technical Specifications

3.0 **PREREQUISITES**

3.1 The Component Cooling Water System is aligned for normal operation per 3-NOP-030, Component Cooling Water System.

3.2 No major activities are in progress or planned that would affect the ability to perform this test.

3.3 All instruments and control devices are in service for the CCW System operation with no surveillances required and no outstanding PWOs, clearances, or Temporary System Alterations that affect system operability as per the following:

3.3.1 0-ADM-215 Plant Surveillance Tracking Program and 0-OSP-200.1, Schedule of Plant Checks and Surveillances. (No surveillances have exceeded the date required on the surveillance use of grace sheet.)

3.3.2 Temporary System Alterations (TSA) Log

3.3.3 Clearance Log

3.3.4 Out-of-Service Log

3.4 The test equipment required to perform this test is available.

3.5 Notifications have been made to ensure this test has been included in planning per 0-ADM-215, Plant Surveillance Tracking Program.

3.6 The 3A, 3B, and 3C Component Cooling Water Heat Exchangers are in service. [Commitment - Step 2.3.2]

3.7 Component Cooling Water Pumps 3A, 3B, and 3C are operable (except where test is performed following pump maintenance).

3.8 All Unit 3 Emergency Containment Coolers are operable.

3.9 Both Emergency Diesel Generators are operable.

3.10 Unit 3 is in Mode 1, 2, or 3 prior to commencing this test.

4.0 PRECAUTIONS/LIMITATIONS

4.1 The Shift Manager shall be notified immediately if any acceptance criteria are not met or any malfunction or abnormal conditions occur. This information shall also be recorded in the Remarks Section of the applicable attachment.

4.2 A dedicated operator shall be assigned to assist with this test to restore the system to normal at the direction of the test coordinator or the Shift Manager in the case of an emergency, abnormal temperatures associated with the CCW System, or any other reason to abort the test.

4.3 The CCW System shall be operable with two CCW pumps aligned to independent 4160 Volt power supplies, a third CCW pump aligned to either of those 4160 Volt power supplies and 3 CCW Heat Exchangers in Modes 1 through 4. When CCW Pump 3B is not operable and Subsection 7.2 is being performed to demonstrate operability of CCW Pump 3B, the 3D 4160V Bus shall be aligned to 3B 4160V Bus.

4.4 With the CCW System headers split in Modes 1 through 4, either the 3B or 3C CCW pump must remain operable to ensure Technical Specification 3.7.2, Limiting Condition for Operation, is met. This requirement is based on two CCW Heat Exchangers along with the 3B and 3C CCW pumps being aligned to the B CCW header. [Commitment – Step 2.3.3]

4.5 CCW flowrate through any one CCW heat exchanger shall not exceed 6840 gpm, as indicated by FI-3-613A and FI-3-613B. (Refer to JPN-PTN-SENP-95-026.)

4.6 CCW pump operation at less than 3235 gpm per pump should be minimized.

4.7 During operation of two pumps with the headers cross-tied, ECC single unit operation should be avoided to prevent unacceptable high flow through the ECC.

4.8 System alignments should be performed as specified to prevent unintentional or accidental isolation of components.

4.9 Pump operation shall be maintained within the limits as specified in the body of the procedure.

4.10 After a pump has been replaced, a new set or sets of reference values shall be determined from the results of the first inservice test. When a reference value or set of values may have been affected by repair or routine servicing of the pump, a new reference value or set of reference values shall be determined or the previous value reconfirmed by an inservice test run prior to returning the pump to normal service.

4.11 When performing valve manipulations for splitting the CCW Headers, the applicable Technical Specification action statement for one inoperable emergency containment cooler and one RHR Heat Exchanger should be entered. Refer to Technical Specifications for appropriate LCO requirements. [Commitment - Step 2.3.1]

4.12 Swapping of the CCW pumps should be performed in accordance with 3-NOP-030, Component Cooling Water System.

4.13 RCP Thermal Barrier Cooling Water Low Flow (A-1/3) and RCP Motor Bearing Cooling Water Low Flow (H-9/5) may be received when either MOV-3-749A or MOV-3-749B is open or during the operation of an ECC outlet valve with only one CCW pump running on the aligned header. No operability concern exists.

4.14 3A CCW pump should be tested first if 3B and 3C CCW pumps are operable. This will avoid unnecessary valve manipulations if another CCW pump is to be tested.

4.15 In the event of a valid SI signal, MOV-3-749A and MOV-3-749B shall be returned to the CLOSED position, CCW headers cross-tied as soon as practical, and the control switch for the 3A ECC placed in the required position.

5.0 SPECIAL TOOLS/EQUIPMENT

5.1 Calibrated Vibration Instrument and Probe

6.0 ACCEPTANCE CRITERIA

6.1 The required actions as a function of the measured pump test parameter are as follows for all tests except a reference value test which will establish new ranges.

Test Parameter	Required Actions
In the Acceptable Range	• Test is SAT.
In the Alert Range	• Generate CR. • Double the testing frequency.
In the Required Action Range	• Declare the pump inoperable. • Generate WR to correct deficiency. • Generate CR to determine maintenance rule implications.

6.2 The IST Coordinator or designee shall provide appropriate pump acceptance criteria.

6.3 When new reference values are being determined, the test data shall be evaluated and deviations between the previous and new set of reference values identified and verification that the new values represent acceptable pump operation shall be documented. (See Attachment 1.)

7.0 PROCEDURE

CAUTION

If CCW Pump 3A is to be tested following a satisfactory test of CCW Pump 3B or 3C, ensure the CCW System is cross-tied to preclude an auto start signal of the idle CCW pump.

7.1 CCW Pump 3A Test

INITIALS
CK'D VERIF

Date/Time Started: today / 3 hours ago

S ___ 7.1.1 Obtain permission from the Shift Manager to perform this test.

S ___ 7.1.2 Inform the RO of the intent to test the CCW Pump 3A.

7.1.3 Indicate below the reason for performing this test

✓ Quarterly Group A Pump IST Test
___ Increased Surveillance
___ Reference Value Test
___ Biannual Comprehensive Test
___ Other (Specify)___
___ Post Maintenance Test (WO #) ___
___ Maintenance Performed: ___

7.1.4 Record the test equipment numbers and calibration due dates below:

Instrument	Test Equipment No.	Cal Due Date
CCW Pump 3A Suct. Press	IST-3-40	current
CCW Pump 3A Disch. Press	IST-3-45	current
A CCW Header Flow	FI-3-613A	current
B CCW Header Flow	FI-3-613B	current
Vibration Instrument	T 957 A	current
Vibration Probe	T 957 5A	current

S X 7.1.5 Verify the calibrations of all Test Instruments are current.

INITIALS
CK'D VERIF

7.1.6 Open or verify open the following valves:

CK'D	VERIF	Item
S		1. CCW Pump A Inlet, 3-701A
S		2. CCW Pump A Discharge, 3-703A
S		3. CCW Pump B Inlet, 3-701B
S		4. CCW Pump B Discharge, 3-703B
S		5. CCW Pump C Inlet, 3-701C
S		6. CCW Pump C Discharge, 3-703C
S		7. CCW Hx A Inlet, 3-712A
S		8. CCW Hx A Outlet, 3-713A
S		9. CCW Hx B Inlet, 3-712B
S		10. CCW Hx B Outlet, 3-713B
S		11. CCW Hx C Inlet, 3-712C
S		12. CCW Hx C Outlet, 3-713C
S		13. CCW Pump Suction Hdr Sectionalizing, 3-787B
S		14. CCW Pump Discharge Hdr Sectionalizing, 3-787D
S		15. CCW Hx Outlet Hdr Sectionalizing, 3-787G
S		16. CCW Hx Outlet Hdr Sectionalizing, 3-787H
S		17. CCW Hx Outlet Hdr Sectionalizing, 3-787E
S		18. CCW Pump Discharge Sectionalizing, 3-787C

INITIALS
CK'D VERIF

S 7.1.7 Verify three heat exchangers are in service.

NOTES

- Verification that CCW Pump 3A total flow is greater than or equal to 8000 gpm satisfies the full-stroke exercise requirement for the CCW Pump 3A Discharge Check Valve, 3-702A.
- To prevent exceeding the maximum flowrates on the CCW Heat Exchangers, the number of operating CCW pumps should be one less than the number of operable CCW Heat Exchangers.

7.1.8 Perform the full-stroke exercise of CCW Pump 3A Discharge Check Valve, 3-702A, as follows:

S 1. Verify that the 3A, 3B, and 3C Emergency Containment Coolers are not running.

S 2. Verify closed CCW to RHR HX 3A Isol Vlv, MOV-3-749A.

S 3. Verify closed CCW to RHR HX 3B Isol Vlv, MOV-3-749B.

S 4. Start or verify CCW Pump 3A running in accordance with 3-NOP-030, Component Cooling Water System.

S 5. Stop or verify not running CCW Pump 3B.

S 6. Stop or verify not running CCW Pump 3C.

7. Obtain CCW Pump 3A total flow as follows:

FI-3-613A/ERDADS	0	gpm
FI-3-613B/ERDADS	6500	gpm
CCW Pump 3A Total Flow =	6500	gpm

N/A 8. Verify total flow is greater than or equal to 8000 gpm. (N/A if 8000 gpm cannot be obtained.)

INITIALS
CK'D VERIF

7.1.8 (Cont'd)

9. **IF** 8000 gpm cannot be obtained, **THEN** perform the following:

S — a. Manually throttle open CCW to RHR HX 3B Isol Vlv, MOV-3-749B to obtain a total CCW Header flow of 8000 gpm.

S — b. Record CCW Pump 3A total flow as follows:

FI-3-613A/ERDADS	0	gpm
FI-3-613B/ERDADS	8050	gpm
CCW Pump 3A Total Flow =	8050	gpm

S — c. Verify total flow is greater than or equal to 8000 gpm.

S X d. Close CCW to RHR HX 3B Isol Vlv, MOV-3-749B, using the control switch.

7.1.9 Open or verify open the following valves:

S — 1. CCW Pump A Suction Pressure Root Vlv to PI-3-1095A and IST-3-40, 3-701D

S — 2. IST-3-40 Isol, 3-701R

S — 3. IST-3-45 Isol, 3-704F

7.1.10 Vent CCW Pump 3A suction (IST-3-40) pressure gauges as follows:

S — 1. Verify IST-3-40 Vent Valve, 3-1012, closed.

S — 2. Uncap IST-3-40 Vent Valve, 3-1012.

S — 3. Vent IST-3-40 by opening IST-3-40 Vent Valve, 3-1012, until a steady stream of water is emitted.

S X 4. Close IST-3-40 Vent Valve, 3-1012.

S X 5. Replace cap on IST-3-40 Vent Valve, 3-1012.

6. Record suction pressure (IST-3-40) 49.5 psig.

INITIALS
CK'D VERIF

CAUTION

Total Flow on CCW Header A shall not exceed 6500 gpm during this test.

7.1.11 Perform the following to verify or align the Charging Pumps, Spent Fuel Pit Hx, Non-Regen Hx, and Seal Water Hx to the **A** CCW Header:

S 1. Open or verify open CCW Hdr **A** Supply to Charging Pumps, Spent Fuel Pit Hx, Non-Regen Hx, and Seal Water Hx, 3-835F.

S 2. Open or verify open CCW Hdr **A** Return from Charging Pumps, Spent Fuel Pit Hx, Non-Regen Hx, and Seal Water Hx, 3-835G.

S 3. Close or verify closed CCW Hdr **B** Return from Charging Pumps, Spent Fuel Pit Hx, Non-Regen Hx, and Seal Water Hx, 3-835H

S 4. Close or verify closed CCW Hdr **B** Supply to Charging Pumps, Spent Fuel Pit Hx, Non-Regen Hx, and Seal Water Hx, 3-835E.

CAUTION

MOV-3-749A shall be closed prior to splitting CCW Headers.

7.1.12 Verify RHR is **NOT** required for cooldown, **THEN** perform the following steps:

S 1. Verify RCS temperature is greater than 350°F.

S 2. Verify closed MOV-3-749A.

S 3. Verify closed MOV-3-749B.

INITIALS
CK'D VERIF

NOTE

To prevent exceeding the maximum flowrates on the CCW Heat Exchangers, the number of operating CCW pumps should be one less than the number of operable CCW Heat Exchangers.

7.1.13 Align the CCW Pump 3A to the **A** Header and CCW Pumps 3B and 3C to the **B** CCW header as follows:

S 1. Open or verify open CCW Pump Suction Hdr Sectionalizing, 3-787B.

S 2. Open or verify open CCW Pump Discharge Hdr Sectionalizing, 3-787D.

S 3. Open or verify open CCW Hx Outlet Hdr Sectionalizing, 3-787G.

S 4. Open or verify open CCW Hx Outlet Hdr Sectionalizing, 3-787H.

S 5. Start or verify CCW Pump 3A running in accordance with 3-NOP-030, Component Cooling Water System.

S 6. Start or verify CCW Pump 3B or 3C running in accordance with 3-NOP-030, Component Cooling Water System.

S 7. Stop or verify the other CCW Pump (3B or 3C) aligned to the **B** header is not running.

S 8. Notify the Shift Manager that the following Substeps 7.1.13.9 and 7.1.13.10 will place the Unit in a Technical Specification action statement for the **3A** ECC and **3A** RHR Hx being inoperable **AND** should be logged in the EOOS Logbook. (N/A if notified during performance of Subsection 7.2 or 7.3.)

S 9. Close or verify closed CCW Hx Outlet Hdr Sectionalizing, 3-787E.

S 10. Close or verify closed CCW Pump Discharge Sectionalizing, 3-787C.

INITIALS
CK'D VERIF

7.1.13 (Cont'd)

NOTE

*The Shift Manager shall be notified for appropriate action if **A** CCW Header flowrate is greater than 6500 gpm.*

S — 11. Start the 3A ECC.

S — 12. Verify **A** CCW Header flowrate, as indicated on a CCW Hdr flow indicator, FI-3-613A, is less than 6500 gpm.

S — 7.1.14 Manually throttle open 3A RHR Hx Comp Cooling Outlet, MOV-749A, to obtain 6500 gpm flowrate indicated on A CCW Hdr Flow, FI-3-613A.

S — 7.1.15 Record the time 6500 gpm flowrate was established. one hour ago AM/PM

S — 7.1.16 Verify 5 minutes have elapsed since 6500 gpm flowrate was established.

S — 7.1.17 Verify open CCW Pump **A** Discharge Pressure Root Valve to PI-3-640A and IST-3-45, 3-704A, just prior to recording CCW Pump 3A operating data (Step 7.1.19) to ensure adequate communications with the respective flow stream.

7.1.18 Record the following CCW Pump 3A operating data:

1.	A CCW Header Flowrate, FI-3-613A	6500 gpm
2.	Pump Suction Pressure, IST-3-40	49.5 psig
3.	Pump Discharge Pressure, IST-3-45	127.5 psig
4.	Pump Inboard Seal Leakage	15 drops/min
5.	Pump Outboard Seal Leakage	14 drops/min
6.	Pump Motor Amps (Control Room Panel)	48 amps

INIT

NOTE

Mounting pads are installed at all points and should be used with a magnet mounted accelerometer.

S 7.1.19 Record the following bearing casing vibration data below at the designated points as shown in Enclosure 1:

1. Pump Outboard Horizontal Vibration — 0.76652 in/sec
   - [ ] Acceptable Range: Less than or equal to 0.300 in/sec
   - [ ] Alert Range: Greater than 0.300 to 0.700 in/sec
   - [x] Required Action Range: Greater than 0.700 in/sec

2. Pump Outboard Vertical Vibration — 0.69980 in/sec
   - [ ] Acceptable Range: Less than or equal to 0.183 in/sec
   - [ ] Alert Range: Greater than 0.183 to 0.440 in/sec
   - [x] Required Action Range: Greater than 0.440 in/sec

3. Pump Outboard (Axial) Vibration — 0.06675 in/sec
   - [x] Acceptable Range: Less than or equal to 0.171 in/sec
   - [ ] Alert Range: Greater than 0.171 to 0.412 in/sec
   - [ ] Required Action Range: Greater than 0.412 in/sec

4. Pump Inboard Horizontal Vibration — 0.10250 in/sec
   - [x] Acceptable Range: Less than or equal to 0.262 in/sec
   - [ ] Alert Range: Greater than 0.262 to 0.630 in/sec
   - [ ] Required Action Range: Greater than 0.630 in/sec

5. Pump Inboard Vertical Vibration — 0.38970 in/sec
   - [ ] Acceptable Range: Less than or equal to 0.211 in/sec
   - [x] Alert Range: Greater than 0.211 to 0.507 in/sec
   - [ ] Required Action Range: Greater than 0.507 in/sec

INIT			
S	6.	Motor Inboard Horizontal	0.10650 in/sec
S	7.	Motor Inboard Vertical	0.04382 in/sec
S	8.	Motor Outboard Horizontal	0.06944 in/sec
S	9.	Motor Outboard Vertical	0.03119 in/sec
S	10.	Motor Outboard Axial	0.03125 in/sec

INITIALS
CK'D VERIF

7.1.20 Calculate pump differential pressure (dP) as follows:

Pump Discharge Pressure IST-3-45	-	Pump Suction Pressure IST-3-40	=	Pump Differential Pressure
127.5 psig	-	49.5 psig	=	78.0 psid

S 7.1.21 Compare the Pump Total Head to the Acceptance Criteria. (N/A if reference value test.)

S a. **IF** this is a Group A test and **NOT** a reference value test, **THEN** check the range which applies for the Total Pump Head:

- ☐ Acceptable Range: 78.3 psid to 95.7 psid
- ☒ Required Action Range: Less than 78.3 psid or greater than 95.7 psid

N/A b. **IF** this is a Comprehensive test and **NOT** a reference value test, **THEN** check the range which applies for the Total Pump Head:

- ☐ Acceptable Range: 80.91 psid to 89.61 psid
- ☐ Alert Level Range: 78.3 psid to less than 80.91 psid
- ☐ Required Action Range: Less than 78.3 psid or greater than 89.61 psid

N/A 7.1.22 **IF** this is a reference value test, **THEN** complete Attachment 1 and have the test data/results evaluated by the IST Coordinator or designee to ensure they are reasonable and represent acceptable pump operation prior to declaring pump operable.

S 7.1.23 Verify all data obtained has been reviewed by an operator **NOT** present during the test.

7.1.24 Close or verify closed, the following valves to isolate the IST gauges:

S W 1. IST-3-40 Isol, 3-701R

S W 2. IST-3-45 Isol, 3-704F

7.1.25 Open or verify open, the following valves to ensure the Pump Instrumentation gauges are in service:

S 1. PI-3-1095A Isol, 3-701P

S 2. PI-3-1095A and IST-3-40 Isol, 3-701D

S 3. PI-3-640A Isol, 3-704E

INITIALS
CK'D VERIF

NOTE

Although closing MOV-3-749A may cause RV-3-747A to lift (indicated by the sound of flow through the bypass line around MOV-3-749A), the relief valve should close and flow through the bypass line should stop when the CCW System is restored to its normal alignment (or before this point).

7.1.26 Restore CCW A Header as follows:

S ___ 1. Close 3A RHR Hx Comp Cooling Outlet, MOV-749A, with the Control Switch.

S ___ 2. **IF** RV-3-747A opens when MOV-3-749A is closed, **THEN** write a CR to document the condition.

S ___ 3. Stop the 3A ECC by placing the control switch STOP.

S ✓ 4. Place the control switch for 3A ECC in AUTO.

S ___ 5. Verify 3A RHR Hx Comp Cooling Outlet MOV-749A, closed.

S ___ 7.1.27 Return RHR System to required configuration using 3-OP-050, Residual Heat Removal System **OR** as required by the remainder of this procedure.

NOTE

To avoid unnecessary valve manipulations if another CCW pump is to be tested at this time, the following restoration steps (Steps 7.1.28, 7.1.29, and 7.1.30) should be omitted and marked N/A.

7.1.28 Restore the CCW System to normal configuration as follows:

S ✓ 1. Open or verify open, CCW Hx Outlet Hdr Sectionalizing, 3-787E.

S ✓ 2. Open or verify open, CCW Hx Outlet Hdr Sectionalizing, 3-787G.

S ✓ 3. Open or verify open, CCW Pump Discharge Sectionalizing, 3-787C.

S ✓ 4. Open or verify open, CCW Pump Discharge Sectionalizing, 3-787D.

INITIALS
CK'D VERIF

7.1.29 Perform the closure test of CCW Pump **3A** Discharge Check Valve, 3-702A as follows:

S 1. Verify open CCW Pump Discharge Sectionalizing Valve, 3-787C.

S 2. Verify open CCW Pump Discharge Sectionalizing Valve, 3-787D.

S 3. Verify running or start CCW Pump 3B or 3C in accordance with 3-NOP-030, Component Cooling Water System.

S 4. Stop or verify CCW Pump 3A, OFF.

S 5. **IF** RV-3-747A remains open after the second running CCW pump is stopped, **THEN** contact Engineering immediately.

NOTE

Verification that CCW Pump 3A is not rotating satisfies the exercise closure test of CCW Pump 3A Discharge Check Valve, 3-702A.

S 6. Observe no rotation of the CCW Pump 3A shaft to verify closure of CCW Pump **3A** Discharge Check Valve, 3-702A.

7.1.30 Re-align the non-essential loads to the **B** CCW header as follows: (Mark N/A if not applicable)

S X 1. Open CCW Hdr B Supply to Charging Pumps, Spent Fuel Pit Hx, Non-Regen Hx, and Seal Water Hx, 3-835E.

S X 2. Open CCW Hdr B Return from Charging Pumps, Spent Fuel Pit Hx, Non-Regen Hx, and Seal Water Hx, 3-835H.

S X 3. Close CCW Hdr A Return from Charging Pumps, Spent Fuel Pit Hx, Non-Regen Hx, and Seal Water Hx, 3-835G.

S X 4. Close CCW Hdr A Supply to Charging Pumps, Spent Fuel Pit Hx, Non-Regen Hx, and Seal Water Hx, 3-835F.

S 7.1.31 Obtain names and initials of all personnel involved in test performance thus far in the PERFORMED BY blanks of this subsection.

INITIALS
CK'D VERIF

NOTE

If another pump test is required, the applicable subsection should be started at this time to prevent prolonged system operation with the test configuration.

7.1.32 Complete the following:

Testing of CCW Pump 3A and related valves is complete and tested components are

Satisfactory __________ Unsatisfactory __________

____ 7.1.33 Inform the RO that the testing of CCW Pump 3A and related valves (Subsection 7.1) is complete **AND** to log the test as specified in Subsection 2.2.

____ 7.1.34 Notify the Shift Manager of completion of the CCW Pump 3A test and the results of the data analysis.

____ 7.1.35 Verify Log entries specified in Subsection 2.2, have been recorded.

REMARKS:____

Date/Time Completed: today / now

PERFORMED BY (Print)	INITIALS
Operator #1	5
Operator #2	4

REVIEWED BY: ______________________ *Shift Manager* __________ *Date*

REVIEWED BY: ______________________ *IST Coordinator* __________ *Date*

L-17-1 NRC Exam

JPM SRO A3

JPM TITLE: Approve a Liquid Waste Release Permit

JPM NUMBER: 02061051101 **REV.** 1-1

TASK NUMBER(S) / TASK TITLE(S): 02061051100 / Approve Liquid Waste Release Permits

K/A NUMBERS: 2.3.6 **K/A VALUE:** SRO 3.8

Justification (FOR K/A VALUES <3.0): N/A

TASK APPLICABILITY:
☐ **RO** ☒ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** ☐ **OTHER:** _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: ☐ Perform: X

EVALUATION LOCATION:

In-Plant:		Control Room:	
Simulator:		Other:	X
Lab:			

Time for Completion: 20 Minutes Time Critical: No

Alternate Path [NRC]: No

Alternate Path [INPO]: No

Developed by:	**Val Miklausich** Instructor/Developer	**07/27/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**08/02/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**08/01/17** Date
Approved by:	**Mark Wilson** Training Supervision	**08/03/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**08/01/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☒
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☐	☐	☒
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

N/A

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
1-0	Formatting	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
1-1	Validation Comments	NRC Prep Week	N/A	Miklausich	10/3/17
				Wilson	10/5/17

Required Materials:	• HANDOUT 0-NOP-061.11A • HANDOUT 0-NCOP-003
General References:	• 0-NOP-061.11A, Controlled Liquid Release from Recycle Monitor Tank A • 0-NCOP-003, Preparation of Liquid Release Permits • Offsite Dose Calculation Manual
Task Standards:	• Identify the requirements that must be met to perform a liquid release when Process Radiation Monitor R-18 is out of service • Given a completed Liquid Release Permit, recognize various conditions that invalidate the permit

NOTE: Additional references available upon request.

HAND JPM BRIEFING SHEET TO EXAMINEE AT THIS TIME

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

INITIAL CONDITIONS:

- A liquid release will be initiated from Recycle Monitor Tank A, with Process Radiation Monitor R-18 out of service for maintenance.
- Equivalent sampling per the Offsite Dose Calculation Manual is available.
- Recycle Monitor Tank A has been recirculated, sampled, and analyzed, and a Radioactive Liquid Release Permit has been generated.
- 0-NOP-061.11A, Controlled Liquid Release from Recycle Monitor Tank A, is complete through Step 4.1.1.1.

INITIATING CUE:

- The Shift Manager directs you to review the Radioactive Liquid Release Permit for completeness and accuracy.
- Identify any procedural requirements that must be met prior to commencing the release, if any.

  Procedural Requirements, if any (if none, mark none):

  ____

  ____

  ____

  ____

  Radioactive Liquid Release Permit issues, if any (if none, mark none):

  ____

  ____

  ____

  ____

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: ___________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically, cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Yes" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain required reference materials.**
Standard:	Obtain 0-NCOP-003, Preparation of Liquid Release Permits (Attachments 1 & 5), and 0-NOP-061.11A, Controlled Liquid Release from Recycle Monitor Tank A.
Evaluator Cue:	• Provide examinee with the following handouts: • HANDOUT 0-NOP-061.11A • HANDOUT 0-NCOP-003 • If requested, provide examinee with the following: • Offsite Dose Calculation Manual • 0-NCOP-003, Preparation of Liquid Release Permits
Performance:	**SATISFACTORY ______ UNSATISFACTORY _____**
Comments:	

Performance Step: **Critical _Y_ (SEQ-2)**	**Identify any procedural requirements that must be met prior to commencing the release, with R-18 out of service.**
Standard:	Identify the following requirements: • At least two independent samples must be analyzed, per the ODCM sampling/analysis program. • At least two technically qualified members of the facility staff must independently verify the release rate calculations. • At least two technically qualified members of the facility staff must independently verify the discharge valve lineup. • A jumper must be installed from terminal 20 to terminal 16 on K850-QR-66 to temporarily defeat the R-18/RCV-018 interlock and permit operation of RCV-018. • Shift Manager permission must be obtained prior to initiating the unmonitored release.
Evaluator Note:	These requirements are stipulated in: • Section 2 (Radioactive Liquid Effluents) of the ODCM, in Control 2.1 (Radioactive Liquid Effluent Monitoring Instrumentation, Functionality, and Alarm/Trip Setpoints) and Control 2.2 (Concentrations in Radioactive Liquid Effluents) • Section 2.2 (Limitations) of 0-NOP-061.11A
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-3)**	**Review the Radioactive Liquid Release Permit for completeness and accuracy.**
Standard:	Recognize the following issues on the Radioactive Liquid Release Permit and determine that it is invalid/incomplete: • The value for "Radioactive Analysis – Specific Activity (Liquid)" in Part I exceeds 1 x 10^{-4} µCi/ml and the requisite analysis approval by the Radiochemist (or designee) in Part III is missing. • The value for "Total Estimated Dose after this Release" exceeds 0.25 mR/month, which is the Administrative Release Limit. • Two signatures are required in the "Permit Prepared by" block in Part III, but only one is present.
Evaluator Note:	• The Radiochemist (or designee) approval in Part III is stipulated in the permit and Step 2.1.2 of 0-NOP-061.11A. • The requirement for two signatures in the "Permit Prepared by" block in Part III is stipulated in Step 7.3.7 of 0-NCOP-003.
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Terminating Cue: **When the examinee completes Step 3, state "This completes the JPM."**

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

Stop Time: ___________

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET

INITIAL CONDITIONS:

- A liquid release will be initiated from Recycle Monitor Tank A, with Process Radiation Monitor R-18 out of service for maintenance.
- Equivalent sampling per the Offsite Dose Calculation Manual is available.
- Recycle Monitor Tank A has been recirculated, sampled, and analyzed, and a Radioactive Liquid Release Permit has been generated.
- 0-NOP-061.11A, Controlled Liquid Release from Recycle Monitor Tank A, is complete through Step 4.1.1.1.

INITIATING CUE:

- The Shift Manager directs you to review the Radioactive Liquid Release Permit for completeness and accuracy.
- Identify any procedural requirements that must be met prior to commencing the release, if any.

Procedural Requirements, if any (if none, mark none):

____

____

____

____

Radioactive Liquid Release Permit issues, if any (if none, mark none):

____

____

____

____

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

ATTACHMENT 1
(Page 1 of 1)

RADIOACTIVE LIQUID RELEASE PERMIT

FLORIDA POWER AND LIGHT CO **TURKEY POINT PLANT** **RADIOACTIVE LIQUID RELEASE PERMIT**	LRP No. L-2017-015 DATE:

Monitor Tank ☒ A ☐ B — Waste Monitor Tank ☐ A ☐ B ☐ C — Volume to be Released 10000 Gals.

Part I - Pre-Release Data and Calculations

Radiochemical Analysis - Specific Activity (Liquid)	4.339E-3 µCi/ml
Calculated Activity to be Released	1.642E5 µCi
Estimated Dose for this Release	6.896E-3 mR
Month-to-date dose prior to this Release	2.460E-1 mR
Total Estimated Dose after this Release	2.529E-1 mR
Administrative Release Limit	0.25 mR/month
Σ C/EC — Σ C/EC ≤ 1.0	9.566E-2
Dissolved Gas Activity after dilution $<2 \times 10^{-4}$ µCi/ml	0 µCi/ml
Expected R-18/19 Countrate	2.854E3 CPM

Part II - Limits

R-18/19 Background =CPM (2.420E3) R-18/19 Warning =CPM (5.708E3)	R-18/19 Setpoint = CPM (4.000E4)
Max. Release Flow Rate 100 GPM	Min. No. of CW Pumps one
Recirc. Start Time 12 hours ago	Sample Time 6 hours ago
Recirc. Pump Disch Press 70 psig	Recirculation Pump Flowrate: N/A GPM

Notes:
Minimum 2 hr recirc. time when using 1 inch mini-recirc. on WMTs.

Part III - Authorization and Approvals:

The approval of the analysis by the Radiochemist (or designee) shall be obtained if the Specific Activity in Part 1 is greater than or equal to 1×10^{-4} µCi/ml. The Shift Manager shall review and sign Attachment 5 ensuring that the tank recirculated was the same tank that was sampled and that the permit was generated for the correct tank.

Permit Prepared by	[signature]	Technician
Analysis Approved by	N/A	Radiochemistry Supervisor
Release Approved by		SM

Part IV - Release Data

Release Performed By		
No. of Circ. Water pumps in service	Units 1 and 2	Units 3 and 4
Release Date:	Release Start Time:____________	Release Stop Time:__________
R-18 (or R-19) Readings every 15 min from the start of the release		
Recorder/Meter Readings (CPM)	Maximum	Average
Flow Rate (Estimate) GPM	Level before %	Level after %

ATTACHMENT 5
(Page 1 of 1)

TANK RECIRCULATION AND SAMPLING VERIFICATION SHEET

I have verified that the A-MT tank was placed on recirculation at 12 hours ago (TIME) on today (DATE) with a flowrate of N/A gpm (for WMT) OR a recirculation pump discharge pressure of 70 psig (for MT).

NOTE

Ensure Monitor Tank (MT) minimum recirc time of 2 hours if pump discharge pressure is less than or equal to 70 psig. If pump discharge pressure is greater than 70 psig, then determine minimum recirc time using Attachment 1 of CY-TP-104-0045. If Waste Monitor Tank (WMT) pump flow indicator is NOT in service, then minimum recirc time is 2 hours. If pump flow indicator is in service, them minimum recirc time is calculated as follows:

5000 gal/flow rate gpm = time (minutes)

This was verified by <u>all</u> of the following methods:

a. Valve lineup

b. Logbook entries

c. Review of applicable procedure

I have sampled the A-MT tank in accordance with (circle one):

CY-TP-104-0045 CY-TP-104-0047

This tank was sampled at 6 hours ago (TIME) on today (DATE) and was verified to be recirculated One tank volume prior to sampling.

Chemistry Technician:	[signature]	XXXX XXXX	today
	(Signature)	*(Print)*	*(Date)*
Shift Manager or Designee:	[signature]	XXXX XXXX	today/now
	(Signature)	*(Print)*	*(Date/Time)*

FINAL PAGE

FPL	**TURKEY POINT PLANT** **NORMAL OPERATING PROCEDURE** SAFETY RELATED **CONTINUOUS USE**	Procedure No. **0-NOP-061.11A** Revision No. **1B**

Title:

CONTROLLED LIQUID RELEASE FROM RECYCLE MONITOR TANK A

Responsible Department: OPERATIONS

Special Considerations:

This is an Upgraded Procedure. Initial use should include increased awareness because of potential technical and/or sequential changes to the procedure. After initial use of this procedure, provide comments back to the Procedure Upgrade Project.

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED todays date INITIAL JD

Revision	Approved By	Approval Date
0	Steve Murano	03/09/10
1B	Sam Shafer	06/03/14

UNIT #	
DATE	
DOCT	PROCEDURE
DOCN	0-NOP-061.11A
SYS	
STATUS	COMPLETED
REV	1B
# OF PGS	

REVISION SUMMARY	
Rev. No.	**Description**
1B	**PCR 1967308, 06/03/14, Adam Lefcourt** Swap order of Steps 31 and 32 on Attachment 1 Page 10 of 10 and update procedure references.
1A	**PCR 1885460, 07/03/13, Shaun Matthews** Editorial to correct nomenclature inconsistencies.
1	**PCR 10-1859, 05/28/10, J. Mesa** Added Precaution, Notes and Steps in order to address and implement changes incorporated in 0-EPIP-20101, Duties of Emergency Coordinator.
0	**PCR 09-2498, 03/09/10, GT Slaby** New upgraded procedure replacing Sections 1.0 thru 4.0, 5.1, 5.2, 6.0 and, 7.0 of 0-OP-061.11, revised 4/2/04 C1. As a group with 0-NOP-061.11A thru 0-NOP-061.11E, will supersede 0-OP-061.11 in its entirety. Deleted QA Pages and references to them throughout. Logging the activity satisfies all QA record requirements. Deleted logging statements throughout. The requirements on what to log are covered in Conduct of Operations, 0-ADM-200 and Operations Narrative Logbooks, 0-ADM-204. Deleted Precautions and Limitations that were generic in nature and could be considered as training aids. Moved Precautions, Limitations, and Prerequisites that did not apply to every section to the individual sections that they do apply. Split procedure into attachments for field use and body for Control Room use. Split procedure into two sections, placing a release with R-18 inoperable as an Infrequent Operation. Also split attachments for R-18 operable/inoperable to simplify IV requirements. Expanded instructions for FI-1064, WST COND PMP FLOW IND, inoperable to prevent reoccurrence similar to one described in CR# 2009-7590. Replaced example thumbwheel settings with values typically found in 0-PMI-067.5 and the Liquid Release Permit. **PCR 09-2508** Cancels 0-OP-061.11.

TABLE OF CONTENTS

1.0 PURPOSE

This procedure provides instructions for making a controlled release of the contents of Recycle Monitor Tank A to Circulating Water.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Precautions

1. The SNPO shall perform the release only upon receipt of an approved Radioactive Liquid Release Permit, and a completed Recirculation and Sampling Verification Sheet from 0-NCOP-003, Preparation of Liquid Release Permits, that is reviewed and signed by the Shift Manager.

2. Approval by the Radiochemist or designee is required for controlled discharge of waste tanks whose contents contain a total non-gas isotopic activity of greater than or equal to 1.0 E-4 microCuries/ml.

3. Process Radiation Monitor R-18 should be in service and frequently observed during the release to assure count rate is **NOT** approaching the R-18 Warning Limit as stated on the Liquid Release Permit.

4. If R-18 count rate exceeds the expected R-18 WARN limit, the release shall be terminated until the cause determined.

5. If R-18 count rate exceeds R-18 ALARM setpoint, release shall be terminated and Chemistry shall verify ODCM Limits **NOT** exceeded.

6. If there are **NO** Circulating Water Pumps operating, liquid effluent shall **NOT** be released from the plant.

7. A release that exceeds the R-18 Warn **OR** HIGH ALARM setpoints requires the SM to be notified to consult 0-EPIP-20101, Duties of Emergency Coordinator.

2.2 Limitations

1. At least one Circulating Water Pump on Unit 3 or Unit 4 shall be operating. The Liquid Release Permit may require more than one Circulating Water Pump operating.

2. If PRMS R-18 is **NOT** operable, effluent releases may continue provided that prior to initiating a release:

   A. At least two independent samples are analyzed per ODCM 2.1.1.

   B. At least two technically qualified members of the Facility Staff independently verify the release rate calculations per ODCM 2.1.1.

   C. At least two technically qualified members of the Facility Staff independently verify discharge line valve alignment per ODCM 2.1.1.

   D. A jumper installed from Terminal 20 to Terminal 16 on K850-QR-66, to temporarily defeat the R-18/RCV-018 interlock and permit operation of RCV-018.

   E. SM permission is obtained prior to initiating the unmonitored release.

3.0 PREREQUISITES

- **ENSURE** Process Monitor R-18 is operable or equivalent sampling per Offsite Dose Calculation Manual 2.1 is available. JD
- **ENSURE** Circulating Water System is in service per 3(4)-NOP-010, Circulating Water System. JD
- **ENSURE** Laundry Drain System is aligned per 0-NOP-061.10, Waste Disposal System Laundry Drain System. JD
- **ENSURE** Waste Disposal System is aligned per 0-NOP-061.13, Waste Disposal System - Transferring Water to Portable Demineralizer Skid for Processing. JD
- **ENSURE** FI-1064, WST COND PMP FLOW IND, is operable or flow estimation per Offsite Dose Calculation Manual 2.1 is available. JD
- **ENSURE** power available to the applicable Radwaste Discharge to Seal Well solenoid valves:
  - 3P09-15 for SV-3-1413 and SV-3-1414 JD
  - 4P09-15 for SV-4-1413 and SV-4-1414 JD

End of Section 3.0

4.0 NORMAL OPERATIONS

4.1 Startup

4.1.1 Unit 3 RCO Actions for Initiating a Controlled Liquid Release

1. IF PRMS channel R-18 is out of service OR **NOT** operable, THEN **GO TO** Section 5.1, Controlled Liquid Release with R-18 Not Operable.

2. **ENSURE** receipt of approved Radioactive Liquid Release Permit and Tank Recirculation and Sampling Verification attachment of 0-NCOP-003, Preparation of Liquid Release Permits.

   A. **REVIEW** Radioactive Liquid Release Permit.

   B. **CHECK** Recycle Monitor Tank A specified on Release Permit.

   C. **RECORD** Radioactive Liquid Release Permit Number and Date/Time started on Attachment 1, Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable.

3. **ADJUST** PRMS R-18 HIGH ALARM and WARN setpoints as follows:

   A. **SLIDE** R-18 drawer out to gain access to thumbwheels.

NOTE

- Thumbwheel switches used to select setpoints are configured as follows:
  - Forward Switch Setting = digit
  - Middle Switch Setting = decimal and digit
  - Rear Switch Setting = exponent
- Examples:
  - Forward 4, Middle 0, Rear 4 equals to 4.0 X 10^4 or 40 Kcpm
  - Forward 2, Middle 5, Rear 4 equals to 2.5 X 10^4 or 25 Kcpm
- Thumbwheel switch settings allow for only two significant digits. Values on the Radioactive Liquid Release Permit may have more significant digits. Rounding down provides conservative setpoints.
- A release that exceeds the R-18 Warn OR HIGH ALARM setpoints requires the SM to be notified to consult 0-EPIP-20101, Duties of the Emergency Coordinator.

   B. **POSITION** HIGH ALARM setpoint thumbwheels to R-18 Limit Setpoint specified on Radioactive Liquid Release Permit.

4.1.1 Unit 3 RCO Actions for Initiating a Controlled Liquid Release (continued)

3. (continued)

C. **POSITION** WARN setpoint thumbwheels to R-18 Warning Limit specified on Radioactive Liquid Release Permit.

D. **CLOSE** R-18 drawer.

E. Simultaneously **PRESS** HIGH ALARM AND **CHECK** digital display CPM indication equals R-18 Limit Setpoint specified on Radioactive Liquid Release Permit. ______

______ IV

F. Simultaneously **PRESS** WARN AND **CHECK** digital display CPM indication equals Warning Limit specified on Radioactive Liquid Release Permit. ______

______ IV

G. Simultaneously **PRESS** SOURCE CHECK AND **CHECK** digital display CPM indication responds to source.

4. **ENSURE** number of operating Circulating Water Pumps is equal to or greater than minimum specified on Radioactive Liquid Release Permit AND **RECORD** total number operating on Permit.

5. **ENSURE** Independent Verifications complete.

End of Section 4.1.1

4.2 Operation

1. **PROVIDE** the following to SNPO:
   - Radioactive Liquid Release Permit
   - Attachment 1, Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable

2. **REQUEST** SNPO commence controlled release from Recycle Monitor Tank A.

3. WHEN notified by SNPO release is in progress, THEN **PERFORM** the following every 15 minutes until release is terminated:

   A. **RECORD** R-18 reading.

   B. **CHECK** R-18 count rate has **NOT** exceeded Warning Limit.

   C. IF indication approaches Warning Limit, THEN **NOTIFY** SNPO AND SM.

4. WHEN notified by SNPO that release is complete, THEN:

   A. **OBTAIN** completed Attachment 1, Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable, from SNPO.

   B. **PERFORM** Section 4.3.

End of Section 4.2

4.3 Shutdown

1. IF Process Radiation Monitor R-18 HIGH ALARM setpoint was adjusted in Section 4.1.1, Step 3, THEN **RESET** R-18 HIGH ALARM setpoint by performing the following:

   A. **SLIDE** R-18 drawer forward to gain access to thumbwheel switches.

NOTE

- Thumbwheel switches used to select setpoints are configured as follows:
  - Forward switch setting = digit
  - Middle switch setting = decimal and digit
  - Rear switch setting = exponent
- Examples:
  - Forward 2, Middle 5, Rear 4 equals 2.5 X 10^4 or 25 Kcpm
  - Forward 4, Middle 0, Rear 4 equals 4.0 X 10^4 or 40 Kcpm
  - The R-18 HIGH ALARM setpoint is the Unusual Event EAL threshold value in 0-EPIP-20101, Duties of the Emergency Coordinator.

   B. **POSITION** HIGH ALARM setpoint thumbwheels to setting of 1.6 X 10^4 cpm. ______

   ______ IV

   C. **POSITION** WARN ALARM setpoint thumbwheels to setting of 1.0 X 10^4 cpm. ______

   ______ IV

   D. **CLOSE** R-18 drawer.

   E. Simultaneously **PRESS** HIGH ALARM AND **CHECK** digital display CPM indication equals HIGH ALARM setpoint of 1.6 X 10^4 cpm.

   F. IF R-18 HIGH ALARM OR WARN LIGHT is ON, THEN **NOTIFY** the SM to consult 0-EPIP-20101, Duties of the Emergency Coordinator.

End of Section 4.3

5.0 INFREQUENT OPERATIONS

5.1 Controlled Liquid Release with R-18 Not Operable

5.1.1 Unit 3 RCO Actions for Initiating Controlled Liquid Release, with R-18 Not Operable

1. Obtain SM permission.

2. **ENSURE** receipt of approved Radioactive Liquid Release Permit and Tank Recirculation and Sampling Verification Sheet Attachment of 0-NCOP-003, Preparation of Liquid Release Permits.

   A. **REVIEW** Radioactive Liquid Release Permit.

   B. **CHECK** Recycle Monitor Tank A specified on Radioactive Liquid Release Permit.

   C. **RECORD** Radioactive Liquid Release Permit Number and Date/Time started on Attachment 2, Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable. ______

   ______ IV

3. IF Process Radiation Monitor Channel R-18 is out of service due to failure or maintenance, causing a trip signal to be generated, THEN:

   A. **REQUEST** I&C Maintenance install jumper from Terminal 20 to Terminal 16 on K850-R-18 in QR-66.

   ______ I&C

   ______ IV

   B. **HANG** Caution Tag is hung on Drawer R-18 to alert the operator(s) of the installed jumper. ______

   ______ IV

4. **ENSURE** number of operating Circulating Water Pumps is equal to or greater than minimum specified on Radioactive Liquid Release Permit AND **RECORD** total number operating on Permit.

5.1.1 Unit 3 RCO Actions for Initiating Controlled Liquid Release, with R-18 Not Operable (continued)

NOTE

ODCM requirements for independent samples and release rate calculation verifications are confirmed by two Chemistry Department signatures in the PREPARED BY block of the Radioactive Liquid Release Permit.

5. **CHECK** ODCM requirements complete. _______

_______ IV

6. **ENSURE** Independent Verifications complete.

7. **PROVIDE** the following to the SNPO:

   - Radioactive Liquid Release Permit
   - Attachment 2, Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable

8. **REQUEST** SNPO commence controlled release from Recycle Monitor Tank A.

End of Section 5.1.1

5.1.2 Unit 3 RCO Actions for Terminating a Controlled Liquid Release, with R-18 Not Operable

1. WHEN notified liquid release is complete, THEN **OBTAIN** completed attachment from SNPO.

2. **REQUEST** I&C Maintenance remove jumper from Terminal 20 to Terminal 16 on K850-R-18 in QR-66.

_______ I&C

_______ IV

3. **REMOVE** Caution Tag hung on Drawer R-18. _______

_______ IV

End of Section 5.1.2

5.2 Flushing R-18 with Service Water

> **NOTE**
>
> This section is performed by request of Chemistry, RCO, or SM.

1. **ENSURE** the following valves CLOSED:
   - 4743, WCT PUMP DISCH SAMPLE VALVE
   - 4761, WHT/LWT TO DISCH CANAL
   - 1805, LIQUID RELEASE MANUAL RECIRC TO RWB
   - 4745, WCT PUMP RECIRC
2. **ENSURE** 4749, LIQUID RELEASE STOP VALVE, LOCKED CLOSED.
3. **ATTACH** temporary water hose from 70-189, SERVICE WATER FLUSH VALVE, to hose connection at 4738, WASTE COND TKS DRAIN.
4. **UNLOCK** AND **OPEN** 4738, WASTE COND TKS DRAIN.
5. **OPEN** 4742B, B WASTE CONDENSATE PUMP B DISCHARGE VALVE.
6. **OPEN** 4748, WCT PUMP RELEASE VALVE.
7. **OPEN** 4747, WASTE COND PUMPS AND MONITOR TANKS PUMP DISCH TO WHT.
8. **OPEN** 70-189, SERVICE WATER FLUSH VALVE.

> **NOTE**
>
> R-18 should **NOT** be flushed for longer than 7 minutes.

9. **FLUSH** R-18 with Service Water <u>until</u> any of the following conditions are met:
   - Background count rate returns to normal
   - Maximum of 7 minutes elapse

5.2 Flushing R-18 with Service Water (continued)

10. WHEN R-18 flush is complete, THEN:

A. **CLOSE** 70-189.

B. **CLOSE** AND **LOCK** 4738, WASTE COND TKS DRAIN. ______

______ IV

C. **CLOSE** 4742B.

D. **CLOSE** 4748.

E. **CLOSE** 4747.

11. **REMOVE** temporary hose installed in Section 5.2, Step 3 AND **STORE** in assigned area. ______

______ IV

End of Section 5.2

6.0 RECORDS

1. Completed pages of the below listed items constitute Quality Assurance Records and shall be transmitted to QA Records for retention in accordance with Quality Assurance Records Program:

- Attachment 1, Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable
- Attachment 2, Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable

2. Completed copies of the below listed items, shall be retained in the Shift Manager file until the next performance of that section or attachment.

- Attachment 1, Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable
- Attachment 2, Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable

3. The date, time, and section completed shall be logged in the Unit Narrative Log.

4. Any problems encountered while performing the procedure should be logged in the Unit Narrative Log (i.e., malfunctioning equipment, delays due to changes in plant conditions, etc.).

7.0 REFERENCES AND COMMITMENTS

7.1 References

7.1.1 Implementing

1. 0-ADM-213, Technical Specification Related Equipment and Risk Significant SSC Out-Of Service Logbook
2. 0-NCOP-003, Preparation of Liquid Release Permits
3. 3(4)-NOP-010, Circulating Water System
4. 0-NOP-061.10, Waste Disposal System - Laundry Drain System
5. 0-NOP-061.13, Waste Disposal System - Transferring Water to Portable Demineralizer Skid for Processing
6. Offsite Dose Calculation Manual

7.1.2 Developmental

1. 5610-M-3046, Sheet 4 - CVCS, Boron Recycle System
2. 5610-M-3061, Sheet 4 - Waste Disposal System Liquid, Polishing Demineralizer
3. 5610-M-3061, Sheet 8 - Waste Disposal System Liquid, Waste Monitor Tanks
4. 5613-M-3010, Sheet 1 - Circulating Water
5. 0-PMI-067.5, Process Radiation Monitoring System Channel R-18 Calibration Procedure
6. Memorandum JPE-PTPO-85-1209, Dated Nov. 7, 1985, Item 27
7. PC/M 88-264, PRMS Rate Meter Output
8. PC/M 96-047, Replacement of FT-1064 with Addition of an Isolation and Drain Valve
9. DRM-200 (V-6) Digital Ratemeter Operation and Maintenance Manual, Z0889

7.1.3 Management Directives

None

7.2 <u>Commitments</u>

None

ATTACHMENT 1
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable
(Page 1 of 10)

LIQUID RELEASE PERMIT NUMBER: ____________________ **DATE/TIME:** _______/_______

REMARKS:

PERSONNEL PERFORMING MANIPULATIONS	
PRINTED NAME	**INITIALS**

COMMENCEMENT OF RELEASE			
DATE RELEASE STARTED:	(MM/DD/YY): / /	TIME RELEASE STARTED:	(HH:MM, 24 HR CLOCK): :
RELEASE STARTED BY:	PRINTED NAME / SIGNATURE:		

COMPLETION OF RELEASE			
DATE RELEASE COMPLETED:	(MM/DD/YY): / /	TIME RELEASE COMPLETED:	(HH:MM, 24 HR CLOCK): :
RELEASE COMPLETED BY:	PRINTED NAME / SIGNATURE:		

REVIEW OF RELEASE			
RELEASE REVIEWED BY:	PRINTED NAME / SIGNATURE:	DATE:	(MM/DD/YY): / /

ATTACHMENT 1
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable
(Page 2 of 10)

1. **REVIEW** Radioactive Liquid Release Permit.
2. **CHECK** Recycle Monitor Tank A specified on Release Permit.
3. IF Recycle Monitor Tank A OR B is on recirculation, THEN **STOP** Monitor Tank Pump per 0-NOP-061.10, Waste Disposal System - Laundry Drain System.
4. **COMPLETE** Table 1, Recycle Monitor Tank A Pre-Release Alignment:

Table 1
Recycle Monitor Tank A Pre-Release Alignment

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION REQUIRED	ALIGNED BY
MONITOR TANK ROOM			
1305	LAUNDRY WASTE WATER FILTER TO BA MONITOR TANK A ISOL VALVE	CLOSED	
1306	MONITOR TANK PUMP A OUTLET TO RAD WASTE BUILDING	CLOSED	
1307	MONITOR TANK PUMP B OUTLET TO RAD WASTE BUILDING	CLOSED	
1249B	MONITOR TANK PUMPS DISCH LOCAL SAMPLE	CLOSED	
1804	MONITOR TANK PUMP DISCH TO WHT DISCH HDR	CLOSED	
4748	WCT PUMP RELEASE VALVE	CLOSED	
4747	WASTE COND PUMPS AND MONITOR TANKS PUMP DISCH TO WHT	CLOSED	
4745	WCT PUMP RECIRC	CLOSED	
4761	WHT/LWT TO DISCH CANAL	CLOSED	

ATTACHMENT 1
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable
(Page 3 of 10)

4. (continued)

Table 1
Recycle Monitor Tank A Pre-Release Alignment

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION REQUIRED	ALIGNED BY
MONITOR TANK ROOM			
1805	LIQUID RELEASE MANUAL RECIRC TO RWB	CLOSED	
4743	WCT PUMP DISCH SAMPLE VALVE	CLOSED	
1279	MONITOR TANK PUMP RECIRC TO MONITOR TANK A STOP	CLOSED	
1283	MONITOR TANK PUMP RECIRC TO MONITOR TANK B STOP	CLOSED	
4749	STOP VALVE BEFORE RCV-018 WASTE TO DISCHARGE	LOCKED CLOSED	
4798	ISOLATION VALVE FOR FT-1064	OPEN	
4799	DRAIN VALVE FOR FT-1064	CLOSED	

ATTACHMENT 1
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable
(Page 4 of 10)

5. IF using P206A Monitor Tank Pump A for release, THEN **COMPLETE** Table 2.

Table 2
Recycle Monitor Tank A Release Via P206A Monitor Tank Pump A

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION REQUIRED	ALIGNED BY
MONITOR TANK ROOM			
1282	MONITOR TANK A OUTLET VALVE	OPEN	
1288	MONITOR TANK PUMP A SUCTION	OPEN	
1290	MONITOR TANK PUMP A DISCHARGE	OPEN	
1303	MONITOR TANK CROSS CONNECTION	CLOSED	
1281	MONITOR TANK B OUTLET	CLOSED	
1279	MONITOR TANK PUMP RECIRC TO MONITOR TANK A STOP	THROTTLE ½ turn OPEN	
WASTE BORON PANEL - SOUTH			
P206A	MONITOR TANK PUMP A TANK SELECTOR SWITCH	MT-A	

ATTACHMENT 1
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable
(Page 5 of 10)

6. IF using P206B Monitor Tank Pump B for release, THEN **COMPLETE** Table 3:

Table 3
Recycle Monitor Tank A Release Via P206B Monitor Tank Pump B

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION REQUIRED	ALIGNED BY
MONITOR TANK ROOM			
1281	MONITOR TANK B OUTLET	CLOSED	
1282	MONITOR TANK A OUTLET VALVE	OPEN	
1303	MONITOR TANK CROSS CONNECTION	OPEN	
1292	MONITOR TANK PUMP B SUCTION	OPEN	
1294	MONITOR TANK PUMP B DISCHARGE	OPEN	
1290	MONITOR TANK PUMP A DISCHARGE	CLOSED	
1279	MONITOR TANK PUMP RECIRC TO MONITOR TANK A STOP	THROTTLE ½ turn OPEN	
WASTE BORON PANEL - SOUTH			
P206B	MONITOR TANK PUMP B TANK SELECTOR SWITCH	MT-A	

7. **START** Monitor Tank Pump aligned in Attachment 1, Step 5 or Attachment 1, Step 6.

8. **OPEN** RCV-018, WASTE DISCHARGE LINE VALVE.

ATTACHMENT 1
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable
(Page 6 of 10)

9. **UNLOCK** AND **OPEN** 4749, STOP VALVE BEFORE RCV-018 WASTE TO DISCHARGE.

10. Slowly **OPEN** 1296, MONITOR TANK PUMP TO WASTE DISPOSAL SYSTEM, until FI-1064, WST COND PMP FLOW IND, indicates release flow rate specified on Radioactive Liquid Release Permit.

11. **NOTIFY** U3 RCO Recycle Monitor Tank A release has commenced.

NOTE

If FI-1064, WST COND PMP FLOW IND, is out of service, the release may continue provided an estimate of the release flow rate is made every 4 hours during the release, per ODCM Action 2.1.3.

12. IF at any time, FI-1064, WST COND PMP FLOW IND, is out of service, THEN:

A. **NOTIFY** Chemistry estimates of release flow rate are required every four hours during the release per ODCM Action 2.1.3.

B. **NOTIFY** RCO to log entry in Equipment Out-Of-Service Logbook per 0-ADM-213, Technical Specification Related Equipment and Risk Significant SSC Out-Of-Service Logbook.

13. **RECORD** the following on Radioactive Liquid Release Permit and SNPO Log Book:

- Start time
- Tank level
- Release flow rate

ATTACHMENT 1
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable
(Page 7 of 10)

NOTE

An R-18 Warning Limit may be exceeded due to a miscalculation on the Liquid Release Permit, an incorrect thumbwheel adjustment, rapid manipulation of Valve 1296, or other factors associated with high activity. All data should be evaluated prior to the re-issuance of the Liquid Release Permit.

14. **REQUEST** RCO monitor R-18 to ensure both the following:

- R-18 responds to the liquid release.
- R-18 count rate does **NOT** exceed the Warning Limit.

NOTE

Release time for Recycle Monitor Tanks should be approximately 2 hours.

15. **MONITOR** waste tank levels to ensure Recycle Monitor Tank A level lowers, and all other waste tank levels **NOT** changing unexpectedly.

NOTE

Valve 1279, MONITOR TANK PUMP RECIRC TO MONITOR TANK A STOP, throttled ½ turn OPEN, should prevent Recycle Monitor Tank Pump cavitation, however, if the pump exhibits cavitation characteristics, 1279 should be throttled while maintaining a recirculation flowpath.

16. **MONITOR** operating Monitor Tank Pump for cavitation.

A. IF cavitation is evident, THEN **ADJUST** 1279, MONITOR TANK PUMP RECIRC TO MONITOR TANK A STOP position, while maintaining a recirculation flowpath.

17. IF at any time, R-18 count rate exceeds the Warning Limit, THEN:

A. **STOP** Monitor Tank Pump used for release.

B. **GO TO** Attachment 1, Step 19 to terminate the release.

18. WHEN Recycle Monitor Tank A level lowers to between 15% and 10%, THEN **STOP** Monitor Tank Pump used for release.

INITIAL

ATTACHMENT 1
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable
(Page 8 of 10)

19. **RECORD** the following on the Radioactive Liquid Release Permit:
    - Stop time
    - Tank level
    - Required R-18 count rate data
20. **CLOSE** AND **LOCK** 4749, STOP VALVE BEFORE RCV-018 WASTE TO DISCHARGE. _______ _______ IV
21. **CLOSE** RCV-018, WASTE DISCHARGE LINE VALVE. _______ _______ IV
22. **CLOSE** 1296, MONITOR TANK PUMP TO WASTE DISPOSAL SYSTEM. _______ _______ IV
23. **ENSURE** Monitor Tank Pump used for release, STOPPED.
24. **CLOSE** 1279, MONITOR TANK PUMP RECIRC TO MONITOR TANK A STOP.
25. **ENSURE** 1282, MONITOR TANK A OUTLET VALVE, CLOSED.
26. **ENSURE** 1303, MONITOR TANK CROSS CONNECTION, CLOSED.
27. **ENSURE** 1290, MONITOR TANK PUMP A DISCHARGE, OPEN.

ATTACHMENT 1
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable
(Page 9 of 10)

28. **FLUSH** R-18 with Service Water as follows:

A. **ATTACH** temporary hose from 70-189, SERVICE WATER FLUSH VALVE, to hose connection at 4738, WASTE COND TKS DRAIN.

B. **UNLOCK** AND **OPEN** 4738, WASTE COND TKS DRAIN.

C. **OPEN** 4742B, B WASTE CONDENSATE PUMP B DISCHARGE VALVE.

D. **OPEN** 4748, WCT PUMP RELEASE VALVE.

E. **OPEN** 4747, WASTE COND PUMPS AND MONITOR TANKS PUMP DISCH TO WHT.

F. **OPEN** 70-189, SERVICE WATER FLUSH VALVE.

NOTE
R-18 should **NOT** be flushed for longer than 7 minutes.

G. **CONTINUE** flushing R-18 with Service Water until any of the following conditions are met:

- Background count rate returns to normal
- Maximum of 7 minutes elapse

H. WHEN R-18 flush is complete, THEN:

(1) **CLOSE** 70-189.

(2) **CLOSE** AND **LOCK** 4738, WASTE COND TKS DRAIN. _______

____
IV

(3) **CLOSE** 4742B.

(4) **CLOSE** 4748.

(5) **CLOSE** 4747.

INITIAL

ATTACHMENT 1
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Operable
(Page 10 of 10)

28. (continued)

I. **REMOVE** temporary hose installed in Attachment 1, Step 28.A AND **STORE** in assigned area. _______

____
IV

29. **RETURN** completed Radioactive Liquid Release Permit to Hot Chemistry Lab.

30. **INFORM** U3 RCO of completion of the liquid release.

31. **LOG** completion of the release in the Narrative Logs.

32. **RETURN** this procedure to the Control Room.

ATTACHMENT 2
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable
(Page 1 of 10)

LIQUID RELEASE PERMIT NUMBER: ____________________ **DATE/TIME:** ______/______

REMARKS: ____

PERSONNEL PERFORMING MANIPULATIONS	
PRINTED NAME	**INITIALS**

COMMENCEMENT OF RELEASE			
DATE RELEASE STARTED:	(MM/DD/YY): / /	TIME RELEASE STARTED:	(HH:MM, 24 HR CLOCK): :
RELEASE STARTED BY:	PRINTED NAME / SIGNATURE:		

COMPLETION OF RELEASE			
DATE RELEASE COMPLETED:	(MM/DD/YY): / /	TIME RELEASE COMPLETED:	(HH:MM, 24 HR CLOCK): :
RELEASE COMPLETED BY:	PRINTED NAME / SIGNATURE:		

REVIEW OF RELEASE			
RELEASE REVIEWED BY:	PRINTED NAME / SIGNATURE:	DATE:	(MM/DD/YY): / /

ATTACHMENT 2
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable
(Page 2 of 10)

1. **REVIEW** Radioactive Liquid Release Permit.

2. **CHECK** Recycle Monitor Tank A specified on Release Permit.

3. IF Recycle Monitor Tank A OR B is on recirculation, THEN **STOP** Monitor Tank Pump per 0-NOP-061.10, Waste Disposal System - Laundry Drain System.

4. **COMPLETE** Table 4, Recycle Monitor Tank A Pre-Release Alignment:

Table 4
Recycle Monitor Tank A Pre-Release Alignment

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY
MONITOR TANK ROOM				
1305	LAUNDRY WASTE WATER FILTER TO BA MONITOR TANK A ISOL VALVE	CLOSED		
1306	MONITOR TANK PUMP A OUTLET TO RAD WASTE BUILDING	CLOSED		
1307	MONITOR TANK PUMP B OUTLET TO RAD WASTE BUILDING	CLOSED		
1249B	MONITOR TANK PUMPS DISCH LOCAL SAMPLE	CLOSED		
1804	MONITOR TANK PUMP DISCH TO WHT DISCH HDR	CLOSED		
4748	WCT PUMP RELEASE VALVE	CLOSED		
4747	WASTE COND PUMPS AND MONITOR TANKS PUMP DISCH TO WHT	CLOSED		

ATTACHMENT 2
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable
(Page 3 of 10)

4. (continued)

Table 4
Recycle Monitor Tank A Pre-Release Alignment

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY
MONITOR TANK ROOM				
4745	WCT PUMP RECIRC	CLOSED		
4761	WHT/LWT TO DISCH CANAL	CLOSED		
1805	LIQUID RELEASE MANUAL RECIRC TO RWB	CLOSED		
4743	WCT PUMP DISCH SAMPLE VALVE	CLOSED		
1279	MONITOR TANK PUMP RECIRC TO MONITOR TANK A STOP	CLOSED		
1283	MONITOR TANK PUMP RECIRC TO MONITOR TANK B STOP	CLOSED		
4749	STOP VALVE BEFORE RCV-018 WASTE TO DISCHARGE	LOCKED CLOSED		
4798	ISOLATION VALVE FOR FT-1064	OPEN		
4799	DRAIN VALVE FOR FT-1064	CLOSED		

ATTACHMENT 2
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable
(Page 4 of 10)

5. IF using P206A Monitor Tank Pump A, THEN **COMPLETE** Table 5:

Table 5
Recycle Monitor Tank A Release Via P206A Monitor Tank Pump A

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY
MONITOR TANK ROOM				
1282	MONITOR TANK A OUTLET VALVE	OPEN		
1303	MONITOR TANK CROSS CONNECTION	CLOSED		
1288	MONITOR TANK PUMP A SUCTION	OPEN		
1290	MONITOR TANK PUMP A DISCHARGE	OPEN		
1281	MONITOR TANK B OUTLET	CLOSED		
1279	MONITOR TANK PUMP RECIRC TO MONITOR TANK A STOP	THROTTLE ½ turn OPEN		
WASTE BORON PANEL - SOUTH				
P206A	MONITOR TANK PUMP A TANK SELECTOR SWITCH	MT-A		

ATTACHMENT 2
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable
(Page 5 of 10)

6. IF using P206B Monitor Tank Pump B, THEN **COMPLETE** Table 6:

Table 6
Recycle Monitor Tank A Release Via P206B Monitor Tank Pump B

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY
MONITOR TANK ROOM				
1281	MONITOR TANK B OUTLET	CLOSED		
1282	MONITOR TANK A OUTLET VALVE	OPEN		
1303	MONITOR TANK CROSS CONNECTION	OPEN		
1292	MONITOR TANK PUMP B SUCTION	OPEN		
1294	MONITOR TANK PUMP B DISCHARGE	OPEN		
1290	MONITOR TANK PUMP A DISCHARGE	CLOSED		
1279	MONITOR TANK PUMP RECIRC TO MONITOR TANK A STOP	THROTTLE ½ turn OPEN		
WASTE BORON PANEL - SOUTH				
P206B	MONITOR TANK PUMP B TANK SELECTOR SWITCH	MT-A		

7. **START** Monitor Tank Pump aligned in Attachment 2, Step 5 or Attachment 2, Step 6.

ATTACHMENT 2
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable
(Page 6 of 10)

NOTE

ODCM requirements for independent samples and release rate calculation verifications are confirmed by two Chemistry Department signatures in PREPARED BY block of Liquid Release Permit.

8. **CHECK** ODCM requirements complete. _______

_______ IV

9. **OPEN** RCV-018, WASTE DISCHARGE LINE VALVE. _______

_______ IV

10. **UNLOCK** AND **OPEN** 4749, STOP VALVE BEFORE RCV-018 WASTE TO DISCHARGE. _______

_______ IV

11. **ENSURE** Verifications complete.

12. Slowly **OPEN** 1296, MONITOR TANK PUMP TO WASTE DISPOSAL SYSTEM, until FI-1064, WST COND PMP FLOW IND, indicates release flow rate specified on Radioactive Liquid Release Permit.

13. **NOTIFY** U3 RCO Recycle Monitor Tank A release has commenced.

ATTACHMENT 2
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable
(Page 7 of 10)

NOTE

If FI-1064, WST COND PMP FLOW IND, is out of service, the release may continue provided an estimate of the release flow rate is made every 4 hours during the release, per ODCM Action 2.1.3.

14. IF at any time FI-1064, WST COND PMP FLOW IND, is out of service, THEN:

A. **NOTIFY** Chemistry estimates of release flow rate are required every four hours during the release per ODCM Action 2.1.3.

B. **NOTIFY** RCO to log entry in Equipment Out-Of-Service Logbook per 0-ADM-213, Technical Specification Related Equipment and Risk Significant SSC Out-Of-Service Logbook.

15. **RECORD** the following on Radioactive Liquid Release Permit and SNPO Log:

- Start time
- Tank level
- Release flow rate

NOTE

Release time for Recycle Monitor Tanks should be approximately 2 hours.

16. **MONITOR** waste tank levels to ensure Recycle Monitor Tank A level lowers, and all other waste tank levels **NOT** changing unexpectedly.

ATTACHMENT 2
Controlled Liquid Release from Recycle Monitor Tank A
with R-18 Not Operable
(Page 8 of 10)

> **NOTE**
>
> Valve 1279, MONITOR TANK PUMP RECIRC TO MONITOR TANK A STOP, throttled ½ turn OPEN should prevent Recycle Monitor Tank Pump cavitation, however, if pump exhibits cavitation characteristics, 1279 should be throttled while maintaining a recirculation flowpath.

17. **MONITOR** Monitor Tank Pump for cavitation.

    A. IF cavitation is evident, THEN **ADJUST** 1279, MONITOR TANK PUMP RECIRC TO MONITOR TANK A STOP position, while maintaining a recirculation flowpath.

18. WHEN Recycle Monitor Tank A level between 15% and 10%, THEN **STOP** Monitor Tank Pump, used for release.

19. **RECORD** the following on Radioactive Liquid Release Permit:

    - Stop time
    - Tank level

20. **CLOSE** AND **LOCK** 4749, STOP VALVE BEFORE RCV-018 WASTE TO DISCHARGE. _______

    ____
    IV

21. **CLOSE** RCV-018, WASTE DISCHARGE LINE VALVE. _______

    ____
    IV

INITIAL

ATTACHMENT 2
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable
(Page 9 of 10)

22. **CLOSE** 1296, MONITOR TANK PUMP TO WASTE DISPOSAL SYSTEM. _______

____
IV

23. **ENSURE** Monitor Tank Pump used for release, STOPPED.

24. **CLOSE** 1279, MONITOR TANK PUMP RECIRC TO MONITOR TANK A STOP.

25. **ENSURE** 1282, MONITOR TANK A OUTLET VALVE, CLOSED.

26. **ENSURE** 1303, MONITOR TANK CROSS CONNECTION, CLOSED.

27. **ENSURE** 1290, MONITOR TANK PUMP A DISCHARGE, OPEN.

28. **FLUSH** R-18 with Service Water as follows:

    A. **ATTACH** temporary hose from 70-189, SERVICE WATER FLUSH VALVE, to hose connection at 4738, WASTE COND TKS DRAIN.

    B. **UNLOCK** AND **OPEN** 4738, WASTE COND TKS DRAIN.

    C. **OPEN** 4742B, B WASTE CONDENSATE PUMP B DISCHARGE VALVE.

    D. **OPEN** 4748, WCT PUMP RELEASE VALVE.

    E. **OPEN** 4747, WASTE COND PUMPS AND MONITOR TANKS PUMP DISCH TO WHT.

    F. **OPEN** 70-189, SERVICE WATER FLUSH VALVE.

NOTE

R-18 should **NOT** be flushed longer than 7 minutes.

    G. **FLUSH** R-18 with Service Water for a maximum of 7 minutes.

ATTACHMENT 2
Controlled Liquid Release from Recycle Monitor Tank A with R-18 Not Operable
(Page 10 of 10)

28. **(continued)**

H. WHEN R-18 flush is complete, THEN:

(1) **CLOSE** 70-189.

(2) **CLOSE** AND **LOCK** 4738, WASTE COND TKS DRAIN. _______

____
IV

(3) **CLOSE** 4742B.

(4) **CLOSE** 4748.

(5) **CLOSE** 4747.

I. **REMOVE** temporary hose installed in Attachment 2, Step 28.A AND **STORE** in assigned area. _______

____
IV

29. **RETURN** completed Radioactive Liquid Release Permit to Hot Chemistry Lab.

30. **INFORM** U3 RCO of completion of liquid release.

31. **RETURN** this attachment to the Control Room.

32. **LOG** completion of release in SNPO Log Book.

L-17-1 NRC Exam

JPM SRO A4

JPM TITLE: Issue PARs and Determine Evacuation Route

JPM NUMBER: 02001013400 **REV.** 1-0

TASK NUMBER(S) / TASK TITLE(S): 02001013400
Make Emergency Notifications

K/A NUMBERS: 2.4.44 **K/A VALUE:** 4.4

Justification (FOR K/A VALUES <3.0):

TASK APPLICABILITY:
☐ RO ☒ SRO ☐ STA ☐ Non-Lic ☐ SRO CERT ☐ OTHER: _____

APPLICABLE METHOD OF TESTING: Simulate/Walkthrough: [ ] Perform: [x]

EVALUATION LOCATION: In-Plant: [ ] Control Room: [ ]

Simulator: [ ] Other: Classroom [x]

Lab: [ ]

Time for Completion: 15 Minutes Time Critical: Yes

Alternate Path [NRC]: No

Alternate Path [INPO]: No

Developed by:	**Val Miklausich** Instructor/Developer	**10/03/17** Date
Reviewed by:	**Tim Hodge** Instructor (Instructional Review)	**10/04/17** Date
Validated by:	**Mike Murphy** SME (Technical Review)	**10/05/17** Date
Approved by:	**Mark Wilson** Training Supervision	**10/05/17** Date
Approved by:	**Mike Murphy** Training Program Owner	**10/05/17** Date

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

ALL STEPS IN THIS CHECKLIST ARE TO BE PERFORMED PRIOR TO USE.

REVIEW STATEMENTS	YES	NO	N/A
1. Are all items on the signature page filled in correctly?	☒	☐	☐
2. Has the JPM been reviewed and validated by SMEs?	☒	☐	☐
3. Can the required conditions for the JPM be appropriately established in the simulator if required?	☐	☐	☒
4. Do the performance steps accurately reflect trainee's actions in accordance with plant procedures?	☒	☐	☐
5. Is the standard for each performance item specific as to what controls, indications and ranges are required to evaluate if the trainee properly performed the step?	☒	☐	☐
6. Has the completion time been established based on validation data or incumbent experience?	☒	☐	☐
7. If the task is time critical, is the time critical portion based upon actual task performance requirements?	☒	☐	☐
8. Is the job level appropriate for the task being evaluated if required?	☒	☐	☐
9. Is the K/A appropriate to the task and to the licensee level if required?	☒	☐	☐
10. Is justification provided for tasks with K/A values less than 3.0?	☐	☐	☒
11. Have the performance steps been identified and classified (Critical / Sequence / Time Critical) appropriately?	☒	☐	☐
12. Have all special tools and equipment needed to perform the task been identified and made available to the trainee?	☒	☐	☐
13. Are all references identified, current, accurate, and available to the trainee?	☒	☐	☐
14. Have all required cues (as anticipated) been identified for the evaluator to assist task completion?	☒	☐	☐
15. Are all critical steps supported by procedural guidance? (e.g., if licensing, EP or other groups were needed to determine correct actions, then the answer should be NO.)	☒	☐	☐
16. If the JPM is to be administered to an LOIT student, has the required knowledge been taught to the individual prior to administering the JPM? TPE does not have to be completed, but the JPM evaluation may not be valid if they have not been taught the required knowledge.	☒	☐	☐

All questions/statements must be answered "YES" or "N/A" or the JPM is not valid for use. If all questions/statements are answered "YES" or "N/A," then the JPM is considered valid and can be performed as written. The individual(s) performing the initial validation shall sign and date the cover sheet.

Protected Content: (CAPRs, corrective actions, licensing commitments, etc. associated with this material)

{C001}

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER / SUPERVISOR	DATE / DATE
0-0	New JPM	L-17-1 NRC Exam	N/A	N/A	N/A
				N/A	N/A
1-0	Validation Comments	NRC Prep Week	N/A	N/A	N/A
				N/A	N/A

Required Materials:	• 0-EPIP-20101, Duties of Emergency Coordinator • 0-EPIP-20134, Offsite Notifications and Protective Action Recommendations • HANDOUT F444 • HANDOUT F439
General References:	• 0-EPIP-20101, Duties of Emergency Coordinator • 0-EPIP-20134, Offsite Notifications and Protective Action Recommendations • F444, Guidance for Determining Protective Action Recommendations (PARS) • F439, Florida Nuclear Plant Emergency Notification Form
Task Standards:	• Determine appropriate Protective Action Recommendations. • Determine appropriate Evacuation Route.

NOTE: Additional references available upon request.

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

DURING THE JPM, ENSURE PROPER SAFETY PRECAUTIONS, FME, AND/OR RADIOLOGICAL CONCERNS AS APPLICABLE ARE FOLLOWED.

TURNOVER SHEET (1 OF 2)

Initial Conditions:

- Unit 3 has declared a General Emergency.
- Emergency Classification FG1 has just been declared.
- You are the Emergency Coordinator in the Unit 3 Control Room.

Current Unit 3 Conditions:

- Unit 3 is in Mode 3.
- The Reactor tripped due to a LOCA in the Containment.
- The crew has been in 3-EOP-FR-C.2, Response to Degraded Core Cooling, for 20 minutes.
- All RCPs are OFF.
- Sump Levels are responding as anticipated.
- RCS Pressure is 42 psig.
- One Train of Safety Injection has actuated.
- HHSI flow is 100 gpm.
- CETs are 800°F and rising.
- RVLMS Head and Plenum levels indicates zero.
- Containment High Range Radiation Monitors are reading 1.5 E5 R/Hr.
- Containment Operating Floor Radiation Monitor RI-3-1402B is Off-Scale LOW.
- Containment Pressure is 42 psig and rising slowly.
- One ECC is operating.
- Neither Train of Containment Spray has actuated.
- Containment Temperature is 230°F.
- No radioactive release is in progress.
- Wind speed is 10 mph.
- Wind direction is from 172°.

Initiating Cues:

1. Evaluate current plant conditions, determine the appropriate Protective Action Recommendations, and complete the supplied Florida Nuclear Plant Emergency Notification Form, F439
2. Determine and list the appropriate site evacuation route (if applicable)

Provide notification to the evaluator (i.e. raise your hand) when the Florida Nuclear Plant Emergency Notification Form is ready to be transmitted.

Part of this JPM is Time Critical.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

TURNOVER SHEET (2 OF 2)

Evacuation Route (if applicable):

____

____

____

____

____

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

JPM PERFORMANCE INFORMATION

Start Time: __________

NOTE: When providing "Evaluator Cues" to the examinee, care must be exercised to avoid prompting the examinee. Typically cues are only provided when the examinee's actions warrant receiving the information (i.e., the examinee looks or asks for the indication).

NOTE: Critical steps are marked with a "Y" below the performance step number. Failure to meet the standard for any critical step shall result in failure of this JPM.

Performance Step: **Critical _N_ (SEQ-1)**	**Obtain Required Materials**
Standard:	Obtain copies of: 0-EPIP-20101, Duties of Emergency Coordinator 0-EPIP-20134, Offsite Notifications and Protective Action Recommendations HANDOUT F444 HANDOUT F439
Performance:	**SATISFACTORY ______ UNSATISFACTORY ______**
Comments:	

Performance Step: **Critical _Y_ (SEQ-2)**	**Determine Protective Action Recommendations**
Standard:	Uses current plant status information to complete F439, Emergency Notification Form within **15 minutes**.
Evaluator Note:	Record time of evaluator notification: Start Time: _______ End Time: _______ Refer to KEY for detailed information. Critical Steps will be marked RED.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	

Performance Step: **Critical _Y_ (SEQ-3)**	**Determine Appropriate Evacuation Route, 0-EPIP-20101:** **NOTE** Primary Evacuation Point is the Florida City Substation located approximately 7 miles West of Turkey Point on Palm Drive. The Alternate Evacuation Point is on Levee 31 access Road approximately 5 miles Southwest of Turkey Point.
Standard:	Evaluates current wind direction of 172° and uses 0-EPIP-20101, Duties of Emergency Coordinator, notes to determine evacuation route to be Florida City Substation located approximately 7 miles West of Turkey Point on Palm Drive.
Evaluator Note:	Only identification of the primary evacuation route is critical.
Performance:	**SATISFACTORY _____ UNSATISFACTORY _____**
Comments:	

Terminating Cues: When the examinee turns in their answer state, “This completes the JPM.”

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator

Stop Time: __________

KEY

FLORIDA NUCLEAR PLANT EMERGENCY NOTIFICATION FORM

Online Verification: ☐ STATE ☐ MIAMI-DADE COUNTY ☐ MONROE COUNTY

*1. A. ☒ This Is A Drill B. ☐ This Is An Actual Event

2. A. Date ___/___/___ *B. Contact Time:__________ C. Reported by: Name__________

D. Message Number: 1__________ E. Reported From: ☒ Control Room ☐ TSC ☐ EOF

F. ☒ Initial/New Classification OR ☐ Update Notification

*3. SITE A. ☐ ~~Crystal River UNIT 3~~ B. ☐ ~~St. Lucie UNIT 1~~ C. ☐ ~~St. Lucie UNIT 2~~

D. ☒ Turkey Point UNIT 3 E. ☐ Turkey Point UNIT 4

*4. EMERGENCY CLASSIFICATION: A. ☐ Notification Of Unusual Event B. ☐ Alert C. ☐ Site Area Emergency D. ☒ General Emergency

*5. A. ☒ EMERGENCY DECLARATION: B. ☐ EMERGENCY TERMINATION Date: TODAY Time: NOW

*6. REASON FOR EMERGENCY DECLARATION:** A. ☒ EAL Number: FG1 OR B. ☐ Description__________

7. ADDITIONAL INFORMATION OR UPDATE: A. ☐ None OR B. ☐ Description__________

*8. WEATHER DATA: A. Wind direction from 172 degrees. B. Downwind Sectors Affected RAB

*9. RELEASE STATUS: A. ☒ None (Go to Item 11) B. ☐ In Progress C. ☐ Has occurred, but stopped (go to Item 11)

10. RELEASE SIGNIFICANCE CATEGORY (at the Site Boundary)

A. ☐ Under evaluation B. ☐ Release within Normal Operating Limits (Tech Specs)

C. ☐ Non-Significant (Fraction of PAG Range) D. ☐ PAG Range (Protective Actions required)

E. ☐ Liquid release (no actions required)

*11. UTILITY RECOMMENDED PROTECTIVE ACTIONS FOR THE PUBLIC:

A. ☐ No recommended actions at this time. B. ☒ The utility recommends the following protective actions:

EVACUATE ZONES: NOT APPLICABLE OR

SHELTER ZONES: NOT APPLICABLE

Miles	Evacuate Sectors	Shelter Sectors	Monitor & Prepare Sectors
0 - 2	ALL	NONE	NONE
2 - 5	RAB	NONE	ALL REMAINING
5 - 10	NONE	NONE	ALL

AND consider issuance of potassium iodide (KI)

If form is completed in the Control Room, go to item 15. If completed in the TSC or EOF, continue with item 12.

12. PLANT CONDITIONS:

A. Reactor Shutdown? ☐ YES ☐ NO B. Core Adequately Cooled? ☐ YES ☐ NO

C. Containment Intact? ☐ YES ☐ NO D. Core Condition: ☐ Stable ☐ Degrading

13. WEATHER DATA: A. Wind Speed__________mph B. Stability Class__________

14. ADDITIONAL RELEASE INFORMATION: A. ☐ Not applicable (Go to Item 15)

Distance	Projected Thyroid Dose (CDE) for 1 Hour	Projected Total Dose (TEDE) for 1 Hour
1 Mile (Site Boundary)	B.__________mRem	C.__________mRem
2 Miles	D.__________mRem	E.__________mRem
5 Miles	F.__________mRem	G.__________mRem
10 Miles	H.__________mRem	I.__________mRem

15. (Do not read to State) EC or RM Approval Signature SIGNATURE Date XX/XX/XX Time XXXX

MESSAGE RECEIVED BY: Name__________ Date___/___/___ Time__________

** IF EMERGENCY CLASS ESCALATION IS KNOWN TO BE NECESSARY AND A NEW NOTIFICATION FORM WILL BE TRANSMITTED WITHIN 15 MINUTES, THEN YOU MAY GO TO EC/RM APPROVAL SIGNATURE LINE.

* ITEMS ARE EVALUATED FOR NRC PERFORMANCE INDICATORS (PIs)

Examinee: ______________________ **Evaluator:** ______________________

☐ **RO** ☐ **SRO** ☐ **STA** ☐ **Non-Lic** ☐ **SRO CERT** **Date:** ______________________

☐ **LOIT RO** ☐ **LOIT SRO**

PERFORMANCE RESULTS: **SAT:** ☐ **UNSAT:** ☐

Remediation required: **YES** ☐ **NO** ☐

COMMENTS/FEEDBACK: (Comments shall be made for any steps graded unsatisfactory).

EXAMINER NOTE: ENSURE ALL EXAM MATERIAL IS COLLECTED AND PROCEDURES CLEANED, AS APPROPRIATE.

EVALUATOR'S SIGNATURE: ____

NOTE: Only this page needs to be retained in examinee's record if completed satisfactorily. If unsatisfactory performance is demonstrated, the entire JPM should be retained.

TURNOVER SHEET (1 OF 2)

Initial Conditions:

- Unit 3 has declared a General Emergency.
- Emergency Classification FG1 has just been declared.
- You are the Emergency Coordinator in the Unit 3 Control Room.

Current Unit 3 Conditions:

- Unit 3 is in Mode 3.
- The Reactor tripped due to a LOCA in the Containment.
- The crew has been in 3-EOP-FR-C.2, Response to Degraded Core Cooling, for 20 minutes.
- All RCPs are OFF.
- Sump Levels are responding as anticipated.
- RCS Pressure is 42 psig.
- One Train of Safety Injection has actuated.
- HHSI flow is 100 gpm.
- CETs are 800°F and rising.
- RVLMS Head and Plenum levels indicates zero.
- Containment High Range Radiation Monitors are reading 1.5 E5 R/Hr.
- Containment Operating Floor Radiation Monitor RI-3-1402B is Off-Scale LOW.
- Containment Pressure is 42 psig and rising slowly.
- One ECC is operating.
- Neither Train of Containment Spray has actuated.
- Containment Temperature is 230°F.
- No radioactive release is in progress.
- Wind speed is 10 mph.
- Wind direction is from 172°.

Initiating Cues:

1. Evaluate current plant conditions, determine the appropriate Protective Action Recommendations, and complete the supplied Florida Nuclear Plant Emergency Notification Form, F439
2. Determine and list the appropriate site evacuation route (if applicable)

Provide notification to the evaluator (i.e. raise your hand) when the Florida Nuclear Plant Emergency Notification Form is ready to be transmitted.

Part of this JPM is Time Critical.

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

TURNOVER SHEET (2 OF 2)

Evacuation Route (if applicable):

____

____

____

____

____

NOTE: Ensure the turnover sheet that was given to the examinee is returned to the evaluator.

FLORIDA NUCLEAR PLANT EMERGENCY NOTIFICATION FORM

Online Verification: ☐ STATE ☐ MIAMI-DADE COUNTY ☐ MONROE COUNTY

*1. A. ☒ This Is A Drill B. ☐ This Is An Actual Event

2. A. Date ___/___/___ *B. Contact Time:____________ C. Reported by: Name______________________________

D. Message Number:1__________________ E. Reported From: ☒ Control Room ☐ TSC ☐ EOF

F. ☒ Initial/New Classification OR ☐ Update Notification

*3. SITE A. ☐ ~~Crystal River UNIT 3~~ B. ☐ ~~St. Lucie UNIT 1~~ C. ☐ ~~St. Lucie UNIT 2~~

D. ☒ Turkey Point UNIT 3 E. ☐ Turkey Point UNIT 4

*4. EMERGENCY CLASSIFICATION: A. ☐ Notification Of Unusual Event B. ☐ Alert

C. ☐ Site Area Emergency D. ☒ General Emergency

*5. A. ☒ EMERGENCY DECLARATION: B. ☐ EMERGENCY TERMINATION Date: ___TODAY______ Time: NOW______

*6. REASON FOR EMERGENCY DECLARATION:** A. ☒ EAL Number:FG1_________ OR B. ☐ Description________________

7. ADDITIONAL INFORMATION OR UPDATE: A. ☐ None OR B. ☐ Description______________________________

*8. WEATHER DATA: A. Wind direction from 172_______degrees. B. Downwind Sectors Affected RAB__________

*9. RELEASE STATUS: A. ☒ None (Go to Item 11) B. ☐ In Progress C. ☐ Has occurred, but stopped (go to Item 11)

10. RELEASE SIGNIFICANCE CATEGORY (at the Site Boundary)

A. ☐ Under evaluation B. ☐ Release within Normal Operating Limits (Tech Specs)

C. ☐ Non-Significant (Fraction of PAG Range) D. ☐ PAG Range (Protective Actions required)

E. ☐ Liquid release (no actions required)

*11. UTILITY RECOMMENDED PROTECTIVE ACTIONS FOR THE PUBLIC:

A. ☐ No recommended actions at this time. B. ☒ The utility recommends the following protective actions:

EVACUATE ZONES:NOT APPLICABLE OR	Miles	Evacuate Sectors	Shelter Sectors	Monitor & Prepare Sectors
SHELTER ZONES:NOT APPLICABLE	0 - 2	ALL	NONE	NONE
	2 - 5	RAB	NONE	ALL REMAINING
	5 - 10	NONE	NONE	ALL

AND consider issuance of potassium iodide (KI)

If form is completed in the Control Room, go to item 15. If completed in the TSC or EOF, continue with item 12.

12. PLANT CONDITIONS:

A. Reactor Shutdown? ☐ YES ☐ NO B. Core Adequately Cooled? ☐ YES ☐ NO

C. Containment Intact? ☐ YES ☐ NO D. Core Condition: ☐ Stable ☐ Degrading

13. WEATHER DATA: A. Wind Speed__________mph B. Stability Class_________

14. ADDITIONAL RELEASE INFORMATION: A. ☐ Not applicable (Go to Item 15)

Distance	Projected Thyroid Dose (CDE) for 1 Hour	Projected Total Dose (TEDE) for 1 Hour
1 Mile (Site Boundary)	B.________________mRem	C.________________mRem
2 Miles	D. ________________mRem	E.________________mRem
5 Miles	F.________________mRem	G.________________mRem
10 Miles	H.________________mRem	I.________________mRem

15. (Do not read to State) EC or RM Approval SignatureSIGNATURE______________________ DateXX/XX/XX____ TimeXXXX___

MESSAGE RECEIVED BY: Name____ Date___/___/_____ Time________

** IF EMERGENCY CLASS ESCALATION IS KNOWN TO BE NECESSARY AND A NEW NOTIFICATION FORM WILL BE TRANSMITTED WITHIN 15 MINUTES, THEN YOU MAY GO TO EC/RM APPROVAL SIGNATURE LINE.

* ITEMS ARE EVALUATED FOR NRC PERFORMANCE INDICATORS (PIs)

FLORIDA NUCLEAR PLANT EMERGENCY NOTIFICATION FORM
METEOROLOGICAL WORKSHEET

SECTOR REFERENCE:

The chart below can be used to determine sectors affected by a radiological release, through comparison with wind direction from the meteorological recorders in the Control Room.

If the wind direction is directly on the edge of two sectors (e.g., 11°, 33°, 56°, etc.), an additional sector should be added to the protective action recommendations. For example, if the wind direction is from 78°, then the affected sectors for PARs should be L, M, N and P.

SECTOR INFORMATION:

WIND SECTOR	WIND FROM	DEGREES	WIND TOWARD	SECTORS AFFECTED
[A]	N	348-11	S	HJK
[B]	NNE	11-33	SSW	JKL
[C]	NE	33-56	SW	KLM
[D]	ENE	56-78	WSW	LMN
[E]	E	78-101	W	MNP
[F]	ESE	101-123	WNW	NPQ
[G]	SE	123-146	NW	PQR
[H]	SSE	146-168	NNW	QRA
[J]	S	168-191	N	RAB
[K]	SSW	191-213	NNE	ABC
[L]	SW	213-236	NE	BCD
[M]	WSW	236-258	ENE	CDE
[N]	W	258-281	E	DEF
[P]	WNW	281-303	ESE	EFG
[Q]	NW	303-326	SE	FGH
[R]	NNW	326-348	SSE	GHJ

STABILITY CLASSIFICATION REFERENCE:

Either ERDADS or the below chart can be used to determine atmospheric stability classification for notification to the State of Florida. Primary method is from ΔT via the South Dade (60 meter) tower. Backup method is from Sigma Theta via the Ten Meter Tower. If neither meteorological tower is available, Stability Classification shall be determined using data from National Weather Service (See 0-EPIP-20126, Off-site Dose Calculations).

CLASSIFICATION OF ATMOSPHERIC STABILITY:

Stability Classification	Pasquill Categories	Primary Delta T (°F)	Backup Sigma Theta Range (Degrees)
Extremely unstable	A	$\Delta T \leq -1.7$	$ST \geq 22.5$
Moderately unstable	B	$-1.7 < \Delta T \leq -1.5$	$22.5 > ST \geq 17.5$
Slightly unstable	C	$-1.5 < \Delta T \leq -1.4$	$17.5 > ST \geq 12.5$
Neutral	D	$-1.4 < \Delta T \leq -0.5$	$12.5 > ST \geq 7.5$
Slightly stable	E	$-0.5 < \Delta T \leq +1.4$	$7.5 > ST \geq 3.8$
Moderately stable	F	$+1.4 < \Delta T \leq +3.6$	$3.8 > ST \geq 2.1$
Extremely stable	G	$+3.6 < \Delta T$	$2.1 > ST$

Meteorological information needed to fill out the Florida Nuclear Plant Emergency Notification Form is available from the Dose Calculation Worksheet (0-EPIP-20126). The Worksheet shall be filled out by Chemistry and given to the Emergency Coordinator.

FLORIDA NUCLEAR PLANT EMERGENCY NOTIFICATION FORM

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D. Message Number:1__________ E. Reported From: ☒ Control Room ☐ TSC ☐ EOF

F. ☒ Initial/New Classification OR ☐ Update Notification

*3. SITE A. ☐ ~~Crystal River UNIT 3~~ B. ☐ ~~St. Lucie UNIT 1~~ C. ☐ ~~St. Lucie UNIT 2~~

D. ☒ Turkey Point UNIT 3 E. ☐ Turkey Point UNIT 4

*4. EMERGENCY CLASSIFICATION: A. ☐ Notification Of Unusual Event B. ☐ Alert

C. ☐ Site Area Emergency D. ☒ General Emergency

*5. A. ☒ EMERGENCY DECLARATION: B. ☐ EMERGENCY TERMINATION Date: TODAY Time: NOW

*6. REASON FOR EMERGENCY DECLARATION:** A. ☒ EAL Number:FG1_____ OR B. ☐ Description__________

7. ADDITIONAL INFORMATION OR UPDATE: A. ☐ None OR B. ☐ Description__________

*8. WEATHER DATA: A. Wind direction from ______degrees. B. Downwind Sectors Affected ______

*9. RELEASE STATUS: A. ☐ None (Go to Item 11) B. ☐ In Progress C. ☐ Has occurred, but stopped (go to Item 11)

10. RELEASE SIGNIFICANCE CATEGORY (at the Site Boundary)

A. ☐ Under evaluation B. ☐ Release within Normal Operating Limits (Tech Specs)

C. ☐ Non-Significant (Fraction of PAG Range) D. ☐ PAG Range (Protective Actions required)

E. ☐ Liquid release (no actions required)

*11. UTILITY RECOMMENDED PROTECTIVE ACTIONS FOR THE PUBLIC:

A. ☐ No recommended actions at this time. B. ☐ The utility recommends the following protective actions:

EVACUATE ZONES:NOT APPLICABLE OR

SHELTER ZONES:NOT APPLICABLE

Miles	Evacuate Sectors	Shelter Sectors	Monitor & Prepare Sectors
0 - 2			
2 - 5			
5 - 10			

AND consider issuance of potassium iodide (KI)

If form is completed in the Control Room, go to item 15. If completed in the TSC or EOF, continue with item 12.

12. PLANT CONDITIONS:

A. Reactor Shutdown? ☐ YES ☐ NO B. Core Adequately Cooled? ☐ YES ☐ NO

C. Containment Intact? ☐ YES ☐ NO D. Core Condition: ☐ Stable ☐ Degrading

13. WEATHER DATA: A. Wind Speed______mph B. Stability Class______

14. ADDITIONAL RELEASE INFORMATION: A. ☐ Not applicable (Go to Item 15)

Distance	Projected Thyroid Dose (CDE) for 1 Hour	Projected Total Dose (TEDE) for 1 Hour
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5 Miles	F.________mRem	G.________mRem
10 Miles	H.________mRem	I.________mRem

15. (Do not read to State) EC or RM Approval Signature________________ Date___/___/___ Time______

MESSAGE RECEIVED BY: Name________________ Date___/___/___ Time______

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[C]	NE	33-56	SW	KLM
[D]	ENE	56-78	WSW	LMN
[E]	E	78-101	W	MNP
[F]	ESE	101-123	WNW	NPQ
[G]	SE	123-146	NW	PQR
[H]	SSE	146-168	NNW	QRA
[J]	S	168-191	N	RAB
[K]	SSW	191-213	NNE	ABC
[L]	SW	213-236	NE	BCD
[M]	WSW	236-258	ENE	CDE
[N]	W	258-281	E	DEF
[P]	WNW	281-303	ESE	EFG
[Q]	NW	303-326	SE	FGH
[R]	NNW	326-348	SSE	GHJ

STABILITY CLASSIFICATION REFERENCE:

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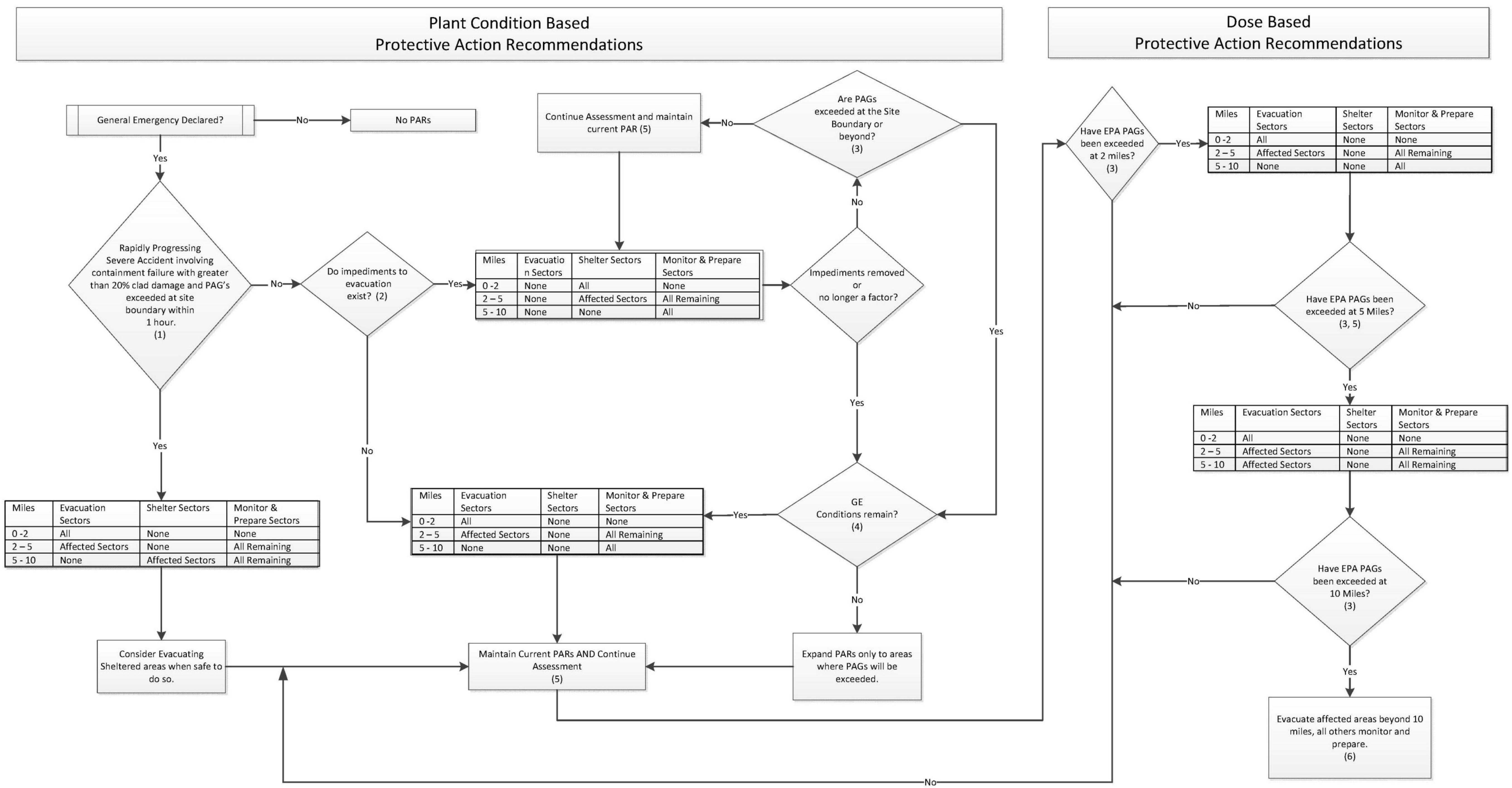
Extremely stable	G	$+3.6 < \Delta T$	$2.1 > ST$

Meteorological information needed to fill out the Florida Nuclear Plant Emergency Notification Form is available from the Dose Calculation Worksheet (0-EPIP-20126). The Worksheet shall be filled out by Chemistry and given to the Emergency Coordinator.

ATTACHMENT 3
(Page 1 of 7)
GUIDANCE FOR DETERMINING PROTECTIVE ACTION RECOMMENDATIONS (PARS)



Miles	Evacuation Sectors	Shelter Sectors	Monitor & Prepare Sectors
0 -2	All	None	None
2 – 5	Affected Sectors	None	All Remaining
5 - 10	None	Affected Sectors	All Remaining

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2 – 5	None	Affected Sectors	All Remaining
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Notes:

(1) A rapidly progressing severe incident is a General Emergency (GE) with rapid loss of containment integrity (emergency action levels indicate containment barrier loss) and loss of ability to cool the core. This path is used for scenarios in which containment integrity can be determined as bypassed or immediately lost during a GE with core damage (e.g., Conditions are met for EAL FG1). Specifically, containment high radiation indicates greater than 20% clad damage (CHRRMS reading 2.2E+4 R/hr), and a release in progress that results in PAGs being exceeded at the site boundary within 1 hour. If this scenario can not be immediately confirmed, assume it is not taking place and answer "No" to this decision block.

(2) Impediments to evacuation: (a) In a hostile-action-based GE (armed attack) within an area vital to plant operations such that plant operators can not mitigate the ongoing event, the initial recommendation should be to Shelter In Place (SIP) rather than evacuation. (b) In the event of short duration release (puff) of less than 2 hours, SIP should be recommended. Impediments such as when the resources necessary for evacuation are not in place, severe weather, or road impairment should be addressed by the Offsite Response Organization (ORO) due to their knowledge of the circumstances. If this scenario can not be immediately confirmed, assume impediments to evacuation do not exist.

(3) EPA Protective Action Guides (PAGs) are 1.0 REM TEDE or 5.0 REM CDE.

(4) GE Conditions Remain: If the plant has mitigated the conditions that caused the original GE declaration (e.g., core cooling is restored), expanding the PAR to evacuate downwind sectors upon completion of the initial staged evacuation may not be necessary. However, **if any GE emergency action levels are still met (e.g., EALs that are different than the condition that caused the initial GE declaration)**, expansion of the PAR to the downwind sectors may be appropriate. If the plant restores core cooling, it must still perform a radiological assessment to identify the extent of contamination, if any. If surveys or dose projections reveal areas under no protective action direction where protective action guidelines (PAGs) could be exceeded, the members of the public in those areas should be evacuated or sheltered, as appropriate.

(5) Continue Assessments: Radiological and meteorological assessments should be continued and evacuation considered for any areas where dose projections or field measurements indicate that PAGs may be exceeded. Communications with the public should be maintained while protective actions are in effect. **Additionally, changes in wind direction may indicate that if a release begins, it would affect different downwind sectors. If a licensee believes that containment may fail, it should pursue the expansion of PARs.**

(6) If protective action guidelines are exceeded beyond 10 miles, protective actions should be recommended to the offsite response organizations. The licensee should assist in determining the appropriate areas where protective actions should be implemented.

Shelter in Place (SIP) means that instructions are given to members of the public to remain indoors, turn off heating or air conditioning (as appropriate for the region and season), close windows, monitor communications channels, and prepare to evacuate.

Monitor and Prepare: The instruction to monitor and prepare is intended to engage the population within the plume exposure pathway emergency planning zone, inform them of the emergency, and advise them that they should monitor the situation and prepare for the possibility of evacuation, SIP, or other protective actions. If an evacuation is underway, officials should ask members of the public who are not directed to evacuate to remain off the roadways to allow the evacuation to proceed.

GUIDANCE FOR DETERMINING
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BASED ON MANUAL DOSE CALCULATIONS

RELEASE DURATION LESS THAN OR EQUAL TO 2 HOURS (PUFF RELEASE)

Total Dose TEDE **OR** Thyroid Dose CDE	≥ 1000mRem ≥ 5000 mRem
0-2 Miles Use 1 Mi. Value	S(ALL)
2-5 Miles Use 2 Mi. Value	S(AS) + M(AR)
5-10 Miles Use 5 Mi. Value	M(ALL)
Beyond 10 Miles Use the 5-10 Miles row above and the 10 mile Dose Value	

RELEASE DURATION GREATER THAN OR EQUAL TO 2 HOURS

Total Dose TEDE **OR** Thyroid Dose CDE	≥ 1000mRem ≥ 5000 mRem
0-2 Miles Use 1 Mi. Value	E(ALL)
2-5 Miles Use 2 Mi. Value	E(AS) + M(AR)
5-10 Miles Use 5 Mi. Value	E(AS) + M(AR)
Beyond 10 Miles Use the 5-10 Miles row above and the 10 mile Dose Value	See table for PAGs exceeded at 5 miles under Dose Based Protective Action Recommendations on Flow Chart.

RELEASE RESULTING IN PAGs BEING EXCEEDED AT THE SITE BOUNDARY WITHIN 1 HOUR (RAPIDLY PROGRESSING SEVERE ACCIDENT)

Total Dose TEDE **OR** Thyroid Dose CDE	≥ 1000mRem ≥ 5000 mRem
0-2 Miles Use 1 Mi. Value	E(ALL)
2-5 Miles Use 2 Mi. Value	E(AS) + M(AR)
5-10 Miles Use 5 Mi. Value	S(AS) + M(AR)
Beyond 10 Miles Use the 5-10 Miles row above and the 10 mile Dose Value	

SUMMARY

Miles	Plant Condition PARs	Projected Total Dose (TEDE) PARs	Projected Thyroid Dose (CDE) PARs	Most Conservative PARs
0-2 Miles				
2-5 Miles				
5-10 Miles				

LEGEND OF ABBREVIATIONS

S – Shelter In Place
E – Evacuate
M - Monitor & Prepare

ALL – All Sectors
AR – All Remaining sectors
AS – Affected Sectors (Downwind plus 2 adjoining sectors)

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C A U T I O N

Previously issued PARs, unless found to be less conservative, are to remain in effect until the source of the threat is clearly under control.

FPL is required to provide county and state governmental authorities with recommendations for protective action to be taken by the public during radiological emergencies at the Turkey Point Nuclear Plant. The responsible authorities are the State Division of Emergency Management (DEM), Miami-Dade County Office of Emergency Management, and Monroe County Office of Emergency Management.

Protective Action Recommendations (PARs) should be made utilizing all of the available data. This includes plant status, off-site dose projections, and/or field monitoring data. The more conservative recommendations should be made.

Starting at the top left of the PARs flowchart, answer the General Emergency question. If the answer is Yes, continue on through the flowchart following the arrows, and answering the questions in the remaining blocks. The top half of the flowchart is used to determine PARs based on Plant Conditions and any impediments to evacuation. Record the PARs based on Plant Conditions in column (a) of the PAR Formulation Table in Attachment 1 of 0-EPIP-1102, Duties of the Recovery Manager.

The bottom half of the PARs flowchart is used to determine PARs based on Off-Site Dose Projections.

To determine PARs based on Off-Site Dose Projections using data obtained from RASCAL/URI, locate the results highlighted in red indicating that EPA PAGs are projected to be exceeded for Total Dose (TEDE) and/or Thyroid Dose (CDE) for 2, 5, and 10 miles. Record the associated PARs indicated on the flowchart in column (b) TEDE and column (c) CDE of the PAR Formulation Table in Attachment 1 of 0-EPIP-1102, Duties of the Recovery Manager.

To determine PARs based on Off-Site Dose Projections using data obtained using manual dose calculations, find the blocks that correspond to the TEDE and CDE at 2, 5, and 10 miles on the Dose Calculation Worksheet (Attachment 4) of 0-EPIP-20126, Off-Site Dose Calculations - Manual Method. For doses that are projected to exceed EPA PAGs (1.0 Rem TEDE or 5.0 Rem CDE), record the associated PARs indicated on the flowchart in column (b) TEDE and column (c) CDE of the PAR Formulation Table in Attachment 1 of 0-EPIP-1102, Duties of the Recovery Manager.

In determining PARs, both plant conditions AND off-site doses must be considered for all PARs. If a release has not occurred, then issue PARs based on Plant conditions. Otherwise, compare the Plant Condition based PARs to the Off-Site Dose based PARs recorded in the PAR Formulation Table in Attachment 1 of 0-EPIP-1102, Duties of the Recovery Manager, and select the most conservative PARS for each distance. Record these PARs in the PARs to Issue Table in Attachment 1 of 0-EPIP-1102, Duties of the Recovery Manager.

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Due to the large political and legal ramifications of these recommendations and the potential impact on FPL, the following guidelines, format, and content should be used.

(1) If the emergency has not been classified as a General Emergency and the off-site doses are LESS THAN 500 mRem Total Dose (TEDE) or 1,000 mRem Thyroid Dose (CDE) at 1 mile over the projected duration of the release, no protective action is recommended. When reporting to DEM and other off-site agencies who inquire, this should be reported in a manner similar to the following:

Based on our urgent assessment of all the information now available to us, Florida Power & Light Company recommends that you consider taking the following protective actions - Monitor & Prepare. This recommendation may change in the future, but we can not now say when it may change or what the change may be.

(2) When available, both plume calculation and off-site monitoring results should be evaluated when making protective action recommendations. If significant discrepancies exist between field monitoring results and plume dispersion calculations, then the discrepancy should be reviewed, and the appropriate value should be selected in the determination of protective action recommendations.

(3) Thyroid Dose (CDE) Limits for PARs are based on adult thyroid. These limits are consistent with EPA Guidelines based on the following criteria:

a. Uncertainty and potential errors associated with age specific parameters, and

b. Level of conservatism in the adult values.

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GUIDANCE FOR THE USE OF POTASSIUM IODIDE (KI) – A THYROID BLOCKING AGENT

1. The EOF RP Manager in consultation with the TSC RP Supervisor will determine the need to dispense Potassium Iodide (KI) based upon a projected or actual thyroid Committed Dose Equivalent (CDE) of greater than or equal to 5 rem. (The thyroid CDE of greater than or equal to 5 rem is based on the FDA recommended threshold for ingestion of KI by pregnant and lactating women).

2. The TSC RP Supervisor and the OSC RP Supervisor will coordinate KI distribution once a decision for use has been determined.

3. The TSC RP Supervisor is responsible for KI distribution to personnel in the Unit 3 and 4 Control Room and the TSC and Field Monitoring Teams and to Security personnel not assigned to the OSC.

4. The OSC RP Supervisor is responsible for distribution in the OSC.

5. KI should be administered and ingested within 2 hours after the determination is made that thyroid CDE is greater than or equal to 5 rem.

6. When KI is issued, thyroid intakes will be estimated by whole body counts.

7. Administering KI after an uptake may limit thyroid CDE depending on time after exposure.

8. Caution emergency response personnel of potential KI side effects if they are allergic to shellfish or iodide. Emergency response personnel who know they have such allergies should be replaced in lieu of directing them to ingest KI.

   a. KI should not be given to:

      - Individuals with known iodine sensitivity
      - Individuals with certain skin disorders (e.g. dermatitis herpetiformis, and hypocomplementemic or urticaria vasculitis)

   b. KI should be used with caution by individuals with thyroid disease (e.g. multinodular goiter, Graves disease, or autoimmune thyroiditis) especially if dosing extends beyond a few days.

   c. KI may be given (one dose is advised) to pregnant and lactating women.

   d. The following conditions should not be considered evidence of a KI allergy:

      - Anaphylactoid reactions to radiocontrast media
      - Allergic contact dermatitis from iodine-containing antibacterial preparations
      - Allergy to seafood

   e. The following side effects may be experienced by personnel following KI administration:

      - Skin Rash
      - Gastro-Intestinal discomfort
      - Allergic reaction to inactive ingredients or components of the specific KI formulation used

   * Sicherer SH. Risk of severe allergic reactions from the use of potassium iodide for radiation emergencies. J Allergy Clin lmmunol. 2004 Dec; 114(6): 1395-7. [PubMed Citation]

9. All KI tablets are stored in the RP kits in the Unit 3 and 4 Control Room, TSC, OSC, and Field Monitoring Team Kits.