TALEN ENERGY

LOC29
NRC INITIAL LICENSE EXAM

Administrative JPM
SRO EP

TEAM SUSQUEHANNA.
Generating Excellence

SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Post-Scenario Emergency Event Classification and Emergency Notification Report

JPM#: LOC 29 SRO EP JPM   Revision: 0   Date: 07/17/2017

Applicability: ☒ SRO

Setting: Simulator

NUREG–1123 E/APE / Sys Generic   K/A Number 2.4.41   K/A Importance 4.6

Alternate Path: ☐ YES ☒ NO   Time Critical ☒ YES ☐ NO   Validation Time (min): 15

Testing Method: ☐ Simulate   ☒ Perform

Author: Michael Wilcox   Date: 07/17/2017

Operations Review: Collin Breitman   Date: 12/4/17

Validated: Michael Wilcox   Date: 11/10/17

Approval: Jeffrey Dills   Date: 12/7/17
Nuclear Training Supervisor

Examinee Name: ______________________________   ____________________
Last, First MI   Employee Number

Exam Date: ____________________   Exam Duration (Min): ____________________

Evaluation Result: ☐ Satisfactory   ☐ Unsatisfactory

Evaluator: ____________________   ____________________
Name   Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. EP-PS-100, CR Emergency Director (revision 35)

B. EP-RM-004, EAL CLASSIFICATION BASES (Revision 12)

C. EP-PS-001, EMERGENCY PLANNING FORMS AND SUPPLEMENTARY INSTRUCTIONS (Revision 14)

III. TASK CONDITIONS

Each examinee evaluated in the SRO position for a scenario will be required to classify the event once the scenario concludes. Task Conditions for each scenario are based on the scenario itself.

IV. INITIATING CUE

Based on current plant status and the events that have just occurred, determine if the conditions warranted emergency classification. If so, determine the appropriate emergency classification and as Emergency Director, complete any associated notification form(s) in accordance with the applicable procedures for activation of the Emergency Plan. This is a time critical task. Your time starts now.

V. TASK STANDARD

Classify the event at the appropriate level on the correct EAL and complete the Emergency Notification Report.

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the Initiating Cue.
- Ensure that a copy of EP-RM-004, EP-PS-100 and blank ENR and PAR forms are available.

EVALUATOR NOTE

This is a TIME CRITICAL JPM.

EVALUATOR CUE

Record JPM start time: __________

Step	Action	Standard	Eval	Comments
1	**Obtains** copy of EP-PS-100, Emergency Director, Control Room and EP–RM–004, EAL Classification Bases.	Obtains copy of EP-PS-100, Emergency Director, Control Room and EP–RM–004, EAL Classification Bases.	S/U	
2	Refers to classification matrix.	Selects the correct Table.	S/U	
*3	Chooses appropriate emergency action level.	Declares the correct event level per the JPM key for the scenario within 15 minutes of start time.	S/U	
4	Determines appropriate procedure section.	Identifies the appropriate procedure attachment for the event classification of EP-PS-100.	S/U	
*5	Documents and communicates the Emergency Classification.	Announces the following: • I am assuming duties of the Emergency Director • [Event] declared based on [EAL summary] • Time and Date of Classification	S/U	
6	If not performed earlier appoints an Emergency Plan Communicator.	Appoints an Emergency Plan Communicator and instructs communicator to immediately perform EP-PS-126, E-Plan Communicator.	S/U	

7	If not performed earlier, appoints an NRC communicator.	Appoints an NRC Communicator and instructs communicator to perform EP-PS-135, NRC Communicator.	S/U	
*8	Initiates an ENR form.	Performs the following: • Refers to ENR Form under Att I and IF necessary EP–PS-001-4 for instructions on filling out the form • Line 1, places checkmark in THIS IS A DRILL box	S/U	

EVALUATOR NOTE
The time recorded on Line 3 of the ENR form is compared to the start time recorded at the beginning of the JPM to determine if the examinee is successful in meeting the 15 minute event declaration requirement of the JPM.

*9	Completes Line 3 of the ENR	Performs the following: • Places checkmark in the correct event box	S/U	
10	Completes Line 4 of the ENR	Performs the following: • Records declaration time and date	S/U	
*11	Completes Line 5 of the ENR	Performs the following: • Records EAL in Classification Description	S/U	
*12	Completes Line 6 of the ENR	Performs the following: • Refers to EP-PS-001-48 Att. NN for guidance in determining if there is a radiological release in progress due to the event • Places checkmark in release box as appropriate	S/U	
13	Completes Line 7 of the ENR	Performs the following: • Records wind direction, wind speed.	S/U	
14	Determines no PARs	Selects box for No Protective Action Recommendations at this time.	S/U	

15	Approves the ENR.	Signs the ENR and records the current date and time.	S/U	
16	Provides the ENR to the Emergency Plan Communicator.	Performs the following: • Provides the approved ENR to the Emergency Plan Communicator. • Reviews the ENR with the Communicator • Directs the Communicator to complete the notification within 15 minutes of the event declaration time	S/U	

EVALUATOR CUE
Record JPM stop time: __________

EVALUATOR CUE
That completes the JPM.

EVALUATOR NOTE
Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw

10. Verify the JPM reflects the most current revision of the procedure.

Procedure	EP-RM-004	Rev	13
Procedure	EP-PS-100	Rev	35
Procedure	EP-PS-001	Rev	14

Mpw 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor: ____________________ Date: __________

Instructor: ____________________ Date: __________

REVISION SUMMARY

JOB PERFORMANCE MEASURE

Revision	Description/Purpose of Revision
0	Modified from 00.EP.1132.180 to support being used with different scenarios.

********JPM KEY Do not provide to applicant********

Scenario	Classification	EAL	Release
1	Site Area Emergency	FS1.1	Yes
2	Site Area Emergency	RS1.1, RS1.2, FS1.1, or RG1.2	Yes
3	Alert	SA6.1	No
4	Alert	FA1.1	No
5	Site Area Emergency	FS1.1	Yes

EVALUATOR

INITIATING CUE

Based on current plant status and the events that have just occurred, determine if the conditions warranted emergency classification. If so, determine the appropriate emergency classification and as Emergency Director, complete any associated notification form(s) in accordance with the applicable procedures for activation of the Emergency Plan. This is a time critical task. Your time starts now.

EXAMINEE

INITIATING CUE

Based on current plant status and the events that have just occurred, determine if the conditions warranted emergency classification. If so, determine the appropriate emergency classification and as Emergency Director, complete any associated notification form(s) in accordance with the applicable procedures for activation of the Emergency Plan. This is a time critical task. Your time starts now.

TALEN ENERGY

LOC29
NRC INITIAL LICENSE EXAM

Administrative JPM
RO-SRO COO1

TEAM SUSQUEHANNA. *Generating Excellence*

SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Implement On-Site Class 1E Operability Test for Inoperable Diesel Generator

JPM#: 24.SO.1475.002 Revision: 2 Date: 07/17/2017

Applicability: ☒ RO ☒ SRO

Setting: Simulator

NUREG–1123 E/APE / Sys G K/A Number 2.1.31 K/A Importance 4.6/4.3

Alternate Path: ☐ YES ☒ NO Time Critical ☐ YES ☒ NO Validation Time (min): 25/40

Testing Method: ☐ Simulate ☒ Perform

Author: Michael Wilcox Date: 07/17/17

Operations Review: Collin Breitman Date: 12/4/17

Validated: Michael Wilcox Date: 11/27/17

Approval: Jeffrey Dills Date: 12/7/17
Nuclear Training Supervisor

Examinee Name: ____________________ ____________________
Last, First MI Employee Number

Exam Date: ____________________ Exam Duration (Min): ____________________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator: ____________________ ____________________
Name Signature

Comments:

JPM REVISION SUMMARY
24.SO.1475.002

Revision	Description/Purpose of Revision
0	New JPM
1	Revised for current revision of procedure. Revalidation not required, no changes to critical steps/sequence and no change of procedure direction/intent.
2	Revise for TQ procedures, minor editorial corrections. Renumbered from 24.AD.1475.001.

REQUIRED TASK INFORMATION
24.SO.1475.002

1. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

2. REFERENCES

A. SO-024-013, Offsite Power Source And Onsite Class 1E Operability Test

B. TS 3.8.1, AC SOURCES - OPERATING

C. TS 3.1.7, STANDBY LIQUID CONTROL SYSTEM

3. TASK CONDITIONS

Units 1 and 2 are operating at rated power in the normal electrical lineup.

All equipment is operable except as noted:

- Unit 2 SLC Pump 2A is inoperable. It failed to develop the required discharge pressure during performance of SO-253-003. Unit 2 has entered TS 3.1.7 Condition B for the inoperable SLC pump.
- Diesel Generator E is unavailable due to a scheduled overhaul in progress.

Diesel Generator A has just experienced a malfunction. A fitting on the fuel oil system failed, resulting in a fuel oil leak. The leak has been isolated. Diesel Generator A is being maintained in LOCAL until the fuel oil leak can be cleaned up.

4. INITIATING CUE

All Examinee

Perform SO-024-013, Offsite Power Source And Onsite Class 1E Operability Test, for an inoperable Diesel Generator A.

SRO Examinee

Identify and perform, or specify the method of performing, any applicable Technical Specification Required Actions.

5. TASK STANDARD

RO

Performs SO-024-013, Offsite Power Source And Onsite Class 1E Operability Test.

SRO

Performs SO-024-013 and determines that Unit 2 must enter TS 3.1.7 Condition C after 4 hours for 2 SLC subsystems inoperable. Determines that within 24 hours either a common cause failure determination is required to be complete, or Diesel Generators B, C, and D must be tested in accordance with SO-024-001.

Examinee ______________________

Step	Action	Standard	Eval	Comments
EVALUATOR INSTRUCTIONS • Marking a step as UNSAT requires written comments on respective step. • Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *. • The time clock starts when the candidate acknowledges the Initiating Cue. • This JPM may be performed in the simulator. Reset to any IC with the normal electrical distribution lineup. The simulator may be left in FREEZE for performance of this JPM. • Ensure Unit 1 and 2 Technical Specifications are available. • Ensure a copy of SO-024-013 is available to provide to the examinee when requested.				
EVALUATOR CUE Record JPM start time: __________				
1	**Identifies** governing procedure and obtain controlled copy.	Obtains controlled copy of SO-024-013.	S / U	
2	**Verifies** prerequisites are satisfied.	Performs the following from review of the Task Conditions: • Observes Units 1 and 2 in Mode 1 • Observes no maintenance or testing is in progress that would conflict with performance of SO-024-013 • Observes only 1 DG is inoperable, no reportability is required	S / U	
3	**Records** operational conditions of both units.	On Attachment A, PROCEDURE DATA RECORD, item 5.1, records Mode 1 as AS-FOUND Unit 1 and Unit 2 Operational Condition and initials.	S / U	
4	**Records** Plant Condition(s) which requires performance of this surveillance.	On Attachment A, PROCEDURE DATA RECORD, item 5.2, performs the following and initials each: • Records YES for 5.2.a Loss of D/G A • Records NO for all others	S / U	
5	**Records** operable Diesel Generators aligned for standby automatic operation.	On Step 5.3.1 of SO-024-013, circles Diesel Generators B, C and D , and NOT A or E.	S / U	

Step	Action	Standard	Eval	Comments
6	**Confirms** breaker alignment for inoperable Diesel Generator.	From the cue sheet or as observed in the simulator, determines the following breakers are CLOSED at 0C653; and initials, signs and records date and time on Checksheet #2 of Attachment C: • SU XFMR 10 TO BUS 10 BKR 0A10301 • SU XFMR 20 TO BUS 20 BKR 0A10401 • SU BUS 10 TO XFMR 101 BKR 0A10306 • SU BUS 10 TO XFMR 111 BKR 0A10312 • SU BUS 20 TO XFMR 201 BKR 0A10406 • SU BUS 20 TO XFMR 211 BKR 0A10412 • XFMR 101 TO BUS 1A BKR 1A20101 • XFMR 111 TO BUS 1C BKR 1A20301 • XFMR 211 TO BUS 1B BKR 1A20209 • XFMR 201 TO BUS 1D BKR 1A20409 • XFMR 101 TO BUS 2A BKR 2A20101 • XFMR 111 TO BUS 2C BKR 2A20301 • XFMR 211 TO BUS 2B BKR 2A20209 • XFMR 201 TO BUS 2D BKR 2A20408	S / U	
7	**Verifies** all ESS buses are energized.	Determines power is available for all Unit 1 and Unit 2 ESS Buses.	S / U	
*8	**Confirms** systems and equipment redundant to systems and equipment supported by Diesel Generator A are operable.	Performs the following on Attachment D of SO-024-013: • Records NO for Unit 2 SLC Pump 2A OPERABLE • Records YES for all other systems and equipment OPERABLE for Units 1 and 2	S / U	
9	**Evaluates** common cause failure.	Informs Unit Supervisor to determine how to comply with Step 5.3.2.b.2 (common-mode failure determination).	S / U	

Examinee ______________________

<table>
<tr><th>Step</th><th>Action</th><th>Standard</th><th>Eval</th><th>Comments</th></tr>
<tr><td colspan="5"><u>EVALUATOR CUE</u>
(For the RO examinee) The SRO will determine how to perform Step 5.3.2.b.2. Continue with the SO. The SRO will record whether Acceptance Criteria 2 of Attachment A is met.</td></tr>
<tr><td>10</td><td>Notifies Unit Supervisor to review requirements of LCO 3.8.1.b.2

Evaluator Role Play: (5.3.3.b) As the Unit Supervisor, acknowledge reports from the operator.</td><td>Notifies Unit Supervisor of the following:
• Equipment on Attachment D of SO-024-013 should not be impaired without meeting the requirements of TS 3.8.1 Required Action B.2</td><td>S / U</td><td></td></tr>
<tr><td>*11</td><td>Records on-site Class 1E distribution system breaker alignment and power availability is acceptable.</td><td>On Attachment A of SO-024-013, records YES for Acceptance Criteria 1 and initials.</td><td>S / U</td><td></td></tr>
<tr><td colspan="5"><u>EVALUATOR CUE</u>

If needed, instruct the operator that an SRO is performing Acceptance criteria 2 (as stated above) and to continue on to Acceptance Criteria 3.</td></tr>
<tr><td>*12</td><td>Records systems/equipment are not operable as required for Diesel Generator A inoperable.</td><td>On Attachment A of SO-024-013, records NO for Acceptance Criteria 3 and initials.</td><td>S / U</td><td></td></tr>
<tr><td>13</td><td>Notifies Shift Supervision of Acceptance Criteria not met.</td><td>Notifies Unit Supervisor that SO-024-013 Acceptance Criteria is not met.</td><td>S / U</td><td></td></tr>
<tr><td colspan="5"><u>EVALUATOR CUE</u>
(For the RO examinee) That completes the JPM.</td></tr>
<tr><td>*14</td><td>Evaluates common cause failure.</td><td>Determines that within 24 hours EITHER of the following actions must be performed:
• Determine cause of diesel generator inoperability and ensuring it does not represent a common mode/generic failure mechanism for remaining diesel generators
• Test Diesel Generators B, C and D in accordance with SO-024-001
(SRO applicants may have noted how this step would be completed on RO portion.)</td><td>S / U</td><td></td></tr>
</table>

Step	Action	Standard	Eval	Comments
*15	**Identifies** applicable REQUIRED ACTIONS are in effect	On Attachment A of SO-024-013, REQUIRED ACTIONS, performs the following and initials each: • Marks YES for both Unit 1 and Unit 2 for U1 LCO 3.8.1 being in effect. • Marks YES for both Unit 1 and Unit 2 for U2 LCO 3.8.1 being in effect.	S / U	
*16	**Identifies** applicable TS Required Actions and Completion Times for inoperable Unit 2 SLC Pump 2A. **Evaluator Cue:** If required, inform the operator SLC Pump 2B is expected to be returned to operable within 6 hours of discovering the EDG is inoperable. Determine additional tech spec requirements, if any.	Performs the following: • Identifies Unit 2 SLC Pump 2B must be declared inoperable within 4 hours per TS 3.8.1 Required Action B.2 • Determines that within 8 hours of declaring Unit 2 SLC Pump 2B inoperable, either SLC Pump 2A must be restored OPERABLE, or Diesel Generator A must be restored OPERABLE	S / U	

EVALUATOR CUE
Record JPM stop time: __________

EVALUATOR NOTE
That completes the JPM.

EVALUATOR:
Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?

VALIDATION CHECKLIST

NOTE:	All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.
Mpw	10. Verify the JPM reflects the most current revision of the procedure.

Procedure	SO-024-013	Rev	23
Procedure	TS 3.8.1	Rev	5
Procedure	TS 3.1.7	Rev	4

Mpw	11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A	12. If the JPM cannot be performed as written, then revise as necessary and revalidate.
Mpw	13. When JPM is validated, sign and date JPM cover page.

JPM Handout (Evaluator Copy)

TASK CONDITIONS

Units 1 and 2 are operating at rated power in the normal electrical lineup.

All equipment is operable except as noted:

- Unit 2 SLC Pump 2A is inoperable. It failed to develop the required discharge pressure during performance of SO-253-003. Unit 2 has entered TS 3.1.7 Condition B for the inoperable SLC pump.
- Diesel Generator E is unavailable due to a scheduled overhaul in progress.

Diesel Generator A has just experienced a malfunction. A fitting on the fuel oil system failed, resulting in a fuel oil leak. The leak has been isolated. Diesel Generator A is being maintained in LOCAL until the fuel oil leak can be cleaned up.

INITIATING CUE

Perform SO-024-013, Offsite Power Source And Onsite Class 1E Operability Test, for an inoperable Diesel Generator A.

Additional SRO Only Handout (EVALUATOR)

INITIATING CUE

Identify and perform, or specify the method of performing, any applicable Technical Specification Required Actions.

<u>JPM Handout</u> (All Applicants)

TASK CONDITIONS

Units 1 and 2 are operating at rated power in the normal electrical lineup.

All equipment is operable except as noted:

- Unit 2 SLC Pump 2A is inoperable. It failed to develop the required discharge pressure during performance of SO-253-003. Unit 2 has entered TS 3.1.7 Condition B for the inoperable SLC pump.
- Diesel Generator E is unavailable due to a scheduled overhaul in progress.

Diesel Generator A has just experienced a malfunction. A fitting on the fuel oil system failed, resulting in a fuel oil leak. The leak has been isolated. Diesel Generator A is being maintained in LOCAL until the fuel oil leak can be cleaned up.

INITIATING CUE

Perform SO-024-013, Offsite Power Source And Onsite Class 1E Operability Test, for an inoperable Diesel Generator A. Keep the SRO informed of any needed action, if any.

Additional SRO Only Handout

INITIATING CUE

Identify and perform, or specify the method of performing, any applicable Technical Specification Required Actions.

PROCEDURE COVER SHEET

SUSQUEHANNA NUCLEAR, LLC PROCEDURE	
OFFSITE POWER SOURCE AND ONSITE CLASS 1E OPERABILITY TEST ADHERENCE LEVEL: CONTINUOUS USE	6/8/2017 SO-024-013 Revision 23 Page 1 of 27 Unit 0

QUALITY CLASSIFICATION:	APPROVAL CLASSIFICATION:
(X) QA Program ( ) Non-QA Program	(X) Plant ( ) Non-Plant ( ) Instruction

EFFECTIVE DATE: ______________

PERIODIC REVIEW FREQUENCY: N/A

PERIODIC REVIEW DUE DATE: N/A

RECOMMENDED REVIEWS:

Procedure Owner: C Shift

Responsible Supervisor: Shift Manager-C Shift

Responsible FUM: Manager-Nuclear Operations

Responsible Approver: Manager-Nuclear Operations

PROCEDURE REVISION SUMMARY

1. Removed references to opposite division RHR pump in first step of Attachments D-G.

TABLE OF CONTENTS

ATTACHMENTS

1. PURPOSE AND SCOPE

1.1 Purpose

1.1.1 To demonstrate compliance with LCO 3.8.1 in event of a loss of an Offsite Power Source or loss of a Diesel Generator (DG) which is aligned for Standby Automatic Operation in operational Condition 1, 2, or 3.

1.2 Scope

1.2.1 This surveillance also provides verification of correct breaker alignments and indicated power availability between operable Offsite Power Sources and the Onsite Class 1E Distribution System every seven days per SR 3.8.1.1.

1.2.2 Upon declaring one of the required DGs INOPERABLE this surveillance demonstrates that the three remaining required DGs are operable for Standby Automatic Operation per the following:

a. The required DGs must be demonstrated OPERABLE per one of the following methods:

- DGs are not INOPERABLE due to a common cause failure
- Have successfully completed requirements of SR 3.8.1.7 within 24 hours prior to declaring a DG INOPERABLE
- Have successfully completed requirements of SR 3.8.1.7 within 24 hours from declaring a DG INOPERABLE

b. Verifying all required systems, subsystems, trains, components and devices that depend on the remaining aligned DGs as a source of emergency power are also operable, to provide assurance that a loss of offsite power event will not result in a complete loss of safety function of critical systems during the period one of the DGs is INOPERABLE.

1.2.3 Operable Diesel Generators refers to DGs aligned for Standby Automatic Operation.

1.2.4 The number of Offsite Power Sources and number of DGs required to be OPERABLE for a given operational condition is determined by consulting Technical Specifications.

1.2.5 This procedure does not operate any plant components and therefore does not require Independent Verification.

2. REFERENCES AND COMMITMENTS

2.1 Performance References

2.1.1 LCO 3.8.1

2.1.2 LS-1010, Reportability Resource Manual

2.1.3 SO-024-001, Monthly Diesel Generator Operability Test

2.2 Developmental References

2.2.1 Electrical Schematics E-1, Unit 1 & 2 Single Line Diagram Station

2.2.2 Electrical Schematics E-2, Single Line Diagram Synchronizing

2.2.3 Electrical Schematics E-23, Common Schematic Meter & Relay Diagram 4.16KV System Diesel Generator E K GHD 1706 GH/EDG 1563 As Built For System 003 005 024 Scheme No 0G0419

2.2.4 Electrical Schematics E-102, Schematic Diagram 13.8KV Bus 0A106 & 0A107 Tie Circuit Breaker 0A10502 Control

2.2.5 Electrical Schematics E-103, Schematic Diagram 4.16KV Bus 2A Auxiliary Relay Control 2A201 Diesel Generator E Aligned For Diesel Generator A

2.2.6 Electrical Schematics E-105, Unit 2 Schematic Diagram 4.16KV Bus 2C Diesel Generator Circuit Breaker Control

2.2.7 FSAR Section 8.3.1.3 and 8.3.1.4

2.2.8 IOM 183

2.2.9 IOM 213

2.2.10 NDAP-QA-0722, Surveillance Testing Program

2.2.11 OP-003-001, 13.8KV Common Electrical Equipment

2.2.12 OP-024-001, Diesel Generators

2.2.13 OP-024-004, Transfer and Test Mode Operations of Diesel Generator E

2.2.14 OP-054-001, Emergency Service Water System

2.3 Commitments

2.3.1 None

3. PRECAUTIONS AND LIMITATIONS

3.1 Precautions

3.1.1 None

3.2 Limitations

3.2.1 Either Unit 1 or Unit 2 in Operational Mode 1, 2 or 3.

4. PREREQUISITES

☐ 4.1 **VERIFY** no maintenance **OR** testing will be performed that could conflict with the completion of this test.

☐

> **NOTE**
>
> LS-1010, Reportability Resource Manual (RRM), Establishing Reporting Guidelines, Item 5.1, refers to reporting requirements when the minimum number of three required DGs are not available to safely shutdown the plant.

☐ 4.2 **IF** two or more required DGs aligned for Standby Automatic Operation are found to be INOPERABLE during performance of this surveillance,

☐ **THEN SUBMIT** report **PER** 10CFR50.72(b)(3)(v) and (vi).

5. INSTRUCTIONS

5.1 **RECORD** the following on Attachment A, Data Form, Procedure Data Record section:

☐ • Operational condition of both units

☐ • Plant Condition(s) which require performance of this surveillance

5.2 **IF required, Demonstrate Operability of Remaining AC Power Sources with Loss of One Source of Offsite Power**

5.2.1 **DEMONSTRATE** operability of the remaining AC sources by performing the following LCO 3.8.1 A requirements:

a. **PERFORM** the following within one hour of offsite power source declared INOPERABLE **AND** every eight hours thereafter:

☐ • **VERIFY** proper breaker alignment **PER** applicable column on Attachment B, Checksheet 1.

☐ • At Panel 0C653, **CHECK** white power available lights are on for all eight ESS Buses.

☐ b. Within 24 hours, **ENSURE** requirements of LCO 3.8.1 A.2 are satisfied.

5.3 **IF required, Demonstrate Operability of Remaining AC Power Sources with One Required DG INOPERABLE**

☐ 5.3.1 **RECORD** (Circle) remaining OPERABLE DGs aligned for Standby Automatic Operation.

A B C D E (E D/G subbing for _____)

5.3.2 **DEMONSTRATE** operability of the remaining AC sources by performing the following LCO 3.8.1 B requirements:

a. **PERFORM** the following within one hour of DG being declared INOPERABLE **AND** every eight hours thereafter:

☐ • **VERIFY** proper breaker alignment **PER** Attachment C, Checksheet 2.

☐ • At Panel 0C653, **CHECK** white power available lights are on for all eight ESS Buses.

5.3.2 (continued)

b. **IF** this is the first performance of this SO following a required D/G being declared INOP,

(1) Within 4 hours, **PERFORM** the following for applicable INOPERABLE DG:

☐ • Attachment D, Diesel Generator A INOP System/Equipment Checksheet

☐ • Attachment E, Diesel Generator B INOP System/Equipment Checksheet

☐ • Attachment F, Diesel Generator C INOP System/Equipment Checksheet

☐ • Attachment G, Diesel Generator D INOP System/Equipment Checksheet

(2) Within 24 hours, **PERFORM** one of the following for each DG recorded in step 5.3.1:

☐ (a) **DETERMINE** if DGs are INOPERABLE due to a common cause failure by determining the cause of the inoperability

☐ **AND ENSURE** it does **NOT** represent a common mode/generic failure mechanism for remaining DGs.

OR

☐ (b) **ENSURE** DGs have successfully completed the requirements of SR 3.8.1.7 within the previous 24 hours of entering required actions for an INOPERABLE DG.

OR

5.3.2.b(2) (continued)

(c) **TEST** OPERABLE DGs **PER** the following:

- ☐ SO-024-001A, Monthly Diesel Generator A Operability Test
- ☐ SO-024-001B, Monthly Diesel Generator B Operability Test
- ☐ SO-024-001C, Monthly Diesel Generator C Operability Test
- ☐ SO-024-001D, Monthly Diesel Generator D Operability Test
- ☐ SO-024-001E, Monthly Diesel Generator E Operability Test

5.3.3 **PERFORM** the following:

a. **REFER TO** the following Attachments for redundant equipment required to be maintained OPERABLE:

- ☐ Attachment D, Diesel Generator A INOP System/Equipment Checksheet
- ☐ Attachment E, Diesel Generator B INOP System/Equipment Checksheet
- ☐ Attachment F, Diesel Generator C INOP System/Equipment Checksheet
- ☐ Attachment G, Diesel Generator D INOP System/Equipment Checksheet

5.3.3 (continued)

☐

> **NOTE**
>
> Redundant equipment shall not be impaired without meeting the requirements of LCO 3.8.1B.2.

☐ b. **ENSURE** requirements of LCO 3.8.1B.2 are met

AND

MAINTAIN listing of required redundant equipment on the following:

☐ • Unit 1 **AND** Unit 2 Supervisors turnover sheet

☐ • USW turnover sheet

5.4 **Test Completion**

5.4.1 **ENSURE** the following complete (as applicable):

☐ • Attachment A, Data Form

☐ • Attachment B, Checksheet 1 (one Offsite Source INOP)

☐ • Attachment C, Checksheet 2 (D/G INOP)

☐ • Attachment D, Diesel Generator A INOP System/Equipment Checksheet

☐ • Attachment E, Diesel Generator B INOP System/Equipment Checksheet

☐ • Attachment F, Diesel Generator C INOP System/Equipment Checksheet

☐ • Attachment G, Diesel Generator D INOP System/Equipment Checksheet

☐ 5.4.2 **NOTIFY** Shift Supervision test is complete.

☐ 5.4.3 **FORWARD** surveillance to Shift Supervision for review.

6. ACCEPTANCE CRITERIA

6.1 **REVIEW** Acceptance Criteria in Attachment A, Data Form.

6.1.1 **IF** Acceptance Criteria **NOT** met,

THEN COMPLETE Attachment A, Required Actions Section.

7. RECORDS

- Attachment A, Data Form
- Attachment B, Checksheet 1
- Attachment C, Checksheet 2
- Attachment D, Diesel Generator A INOP System/Equipment Checksheet
- Attachment E, Diesel Generator B INOP System/Equipment Checksheet
- Attachment F, Diesel Generator C INOP System/Equipment Checksheet
- Attachment G, Diesel Generator D INOP System/Equipment Checksheet

DATA FORM

OFFSITE POWER SOURCE AND ONSITE
CLASS 1E OPERABILITY TEST

ACCEPTANCE CRITERIA		ACCEPTABLE	INITIALS
1.. U1 & U2 SR 3.8.1.1 Onsite class 1E Distribution System breaker alignment is correct with indicated power availability.		YES/NO (Checksheets Attached)	_______
2. U1 & U2 SR 3.8.1.7 Diesel Generator (A) (B) (C) (D) (E) starts from ambient and accelerates to frequency ≥ 58.8 Hz with voltage ≥ 3793 Volts in ≤10 seconds	DG A	YES/NO/NA	_______
	DG B	YES/NO/NA	_______
	DG C	YES/NO/NA	_______
	DG D	YES/NO/NA	_______
	DG E	YES/NO/NA	_______
3. U1 & U2 LCO 3.8.1 Diesel Generator INOP System/Equipment Checksheets complete and all systems/equipment operable as required		YES/NO/NA (Checksheets Attached)	_______

PROCEDURE DATA RECORD	AS FOUND	INITIALS
1. Unit 1 Operational Condition	_________	_______
Unit 2 Operational Condition	_________	_______
2. Plant Condition(s) requiring performance of this surveillance:		
a. Loss of DG A or DG E if substituted (LCO 3.8.1.b)	YES/NO	_______
b. Loss of DG B or DG E if substituted (LCO 3.8.1.b)	YES/NO	_______
c. Loss of DG C or DG E if substituted (LCO 3.8.1.b)	YES/NO	_______
d. Loss of DG D or DG E if substituted (LCO 3.8.1.b)	YES/NO	_______
e. Loss of Offsite Circuit Div 1 (LCO 3.8.1.a)	YES/NO	_______
f. Loss of Offsite Circuit Div 2 (LCO 3.8.1.a)	YES/NO	_______

REQUIRED ACTIONS	APPLICABLE		INITIALS
	Unit 1	Unit 2	
1. **ENSURE** the following is in effect as applicable:			
a. U1 LCO 3.8.1	YES/NO	YES/NO	_______
b. U2 LCO 3.8.1	YES/NO	YES/NO	_______

REMARKS:

Shift Supervision: ____________________ ____________________ ____________

Print Signature Date

CHECKSHEET 1

☐

NOTE

- This Checksheet ensures proper alignment/availability of the remaining OPERABLE offsite power supply circuit. Breakers in the INOPERABLE offsite circuit may be CLOSED/AVAILABLE, but their status does not impact the remaining OPERABLE circuit.
- Circle each breaker position/status as it is confirmed.
- AVAILABLE indicates that the breaker is RACKED IN & OPEN with CONTROL POWER AVAILABLE.

Column 1 (T-10 Source INOP)		**Column 2 (T-20 Source INOP)**	
1. Loss of SUB 10 2. Loss of T-10 or 0A10301 3. Loss of T-101 or 0A10306 4. Loss of T-111 or 0A10312 5. Loss of Norm/Alt T-10 supplies to two or more 4kV busses		1. Loss of SUB 20 2. Loss of T-20 or 0A10401 3. Loss of T-201 or 0A10406 4. Loss of T-211 or 0A10412 5. Loss of Norm/Alt T-20 supplies to two or more 4kV busses	
Breaker	**Position/Status**	**Breaker**	**Position/Status**
0A10401	CLOSED	0A10301	CLOSED
0A10406	CLOSED	0A10306	CLOSED
0A10412	CLOSED	0A10312	CLOSED
1A20109	CLOSED / AVAILABLE	1A20101	CLOSED / AVAILABLE
1A20309	CLOSED / AVAILABLE	1A20301	CLOSED / AVAILABLE
1A20209	CLOSED / AVAILABLE	1A20201	CLOSED / AVAILABLE
1A20409	CLOSED / AVAILABLE	1A20401	CLOSED / AVAILABLE
2A20109	CLOSED / AVAILABLE	2A20101	CLOSED / AVAILABLE
2A20308	CLOSED / AVAILABLE	2A20301	CLOSED / AVAILABLE
2A20209	CLOSED / AVAILABLE	2A20201	CLOSED / AVAILABLE
2A20408	CLOSED / AVAILABLE	2A20401	CLOSED / AVAILABLE

____________________ / ____________________

Performed By / Time Completed

CHECKSHEET 2

VERIFY the following breakers are CLOSED at Panel 0C653:

		INITIALS
1.	SU XFMR 10 TO BUS 10 BKR 0A10301	________
2.	SU XFMR 20 TO BUS 20 BKR 0A10401	________
3.	SU BUS 10 TO XFMR 101 BKR 0A10306	________
4.	SU BUS 10 TO XFMR 111 BKR 0A10312	________
5.	SU BUS 20 TO XFMR 201 BKR 0A10406	________
6.	SU BUS 20 TO XFMR 211 BKR 0A10412	________
7.	XFMR 101 TO BUS 1A BKR 1A20101	________
8.	XFMR 111 TO BUS 1C BKR 1A20301	________
9.	XFMR 211 TO BUS 1B BKR 1A20209	________
10.	XFMR 201 TO BUS 1D BKR 1A20409	________
11.	XFMR 101 TO BUS 2A BKR 2A20101	________
12.	XFMR 111 TO BUS 2C BKR 2A20301	________
13.	XFMR 211 TO BUS 2B BKR 2A20209	________
14.	XFMR 201 TO BUS 2D BKR 2A20408	________

________________________________ / ________________________________

Performed By / Time Completed

DIESEL GENERATOR A INOP SYSTEM/EQUIPMENT CHECKSHEET

	UNIT 1		UNIT 2		COMMON	
SYSTEM EQUIPMENT	OPERABLE	INITIALS	OPERABLE	INITIALS	OPERABLE	INITIALS
RHR (DIV 2)	YES/NO	_______	YES/NO	_______		
B CORE SPRAY LOOP	YES/NO	_______	YES/NO	_______		
B ESW LOOP					YES/NO	_______
B RHRSW LOOP	YES/NO	_______	YES/NO	_______		
DIV 2 ESW PH HVAC					YES/NO	_______
DIV 2 CS HVAC CONSISTING OF: • COMPUTER ROOM FLOOR COOLING SYSTEM. • CONTROL STRUCTURE H&V SYSTEM. • CONTROL ROOM FLOOR COOLING SYSTEM. • CONTROL STRUCTURE CHILLED WATER SYSTEM. • SBGT EQUIPMENT ROOM VENTILATION SYSTEM. • BATTERY ROOM EXHAUST SYSTEM. • CREOASS					YES/NO	_______
B REACTOR BLDG RECIRCULATION FAN					YES/NO	_______
B EMERG SWGR RM CLR	YES/NO	_______	YES/NO	_______		
B DX UNIT			YES/NO	_______		
B RCIC ROOM COOLER	YES/NO	_______	YES/NO	_______		
B HPCI ROOM COOLER	YES/NO	_______	YES/NO	_______		
A SBLC INJECTION PUMP	YES/NO	_______	YES/NO	_______		

VERIFY FOLLOWING AC LOAD GROUPS OPERABLE:

	UNIT 1			UNIT 2		
	BUS/PANEL	OPERABLE	INITIALS	BUS/PANEL	OPERABLE	INITIALS
LOAD GROUP CHANNEL B						
4160 SWITCHGEAR	1A202	YES/NO	_______	2A202	YES/NO	_______
480 LOAD CENTER	1B220	YES/NO	_______	2B220	YES/NO	_______
480 MCCs	1B226	YES/NO	_______	2B226	YES/NO	_______
	1B227	YES/NO	_______	2B227	YES/NO	_______
COMMON 480 MCCs	0B526	YES/NO	_______			
	0B527	YES/NO	_______			
208/120 INSTRUMENT BUS	1Y226	YES/NO	_______	2Y226	YES/NO	_______
LOAD GROUP CHANNEL C						
4160 SWITCHGEAR	1A203	YES/NO	_______	2A203	YES/NO	_______
480 LOAD CENTER	1B230	YES/NO	_______	2B230	YES/NO	_______
480 MCCs	1B236	YES/NO	_______	2B236	YES/NO	_______
	1B237	YES/NO	_______	2B237	YES/NO	_______
COMMON 480 MCCs	0B536	YES/NO	_______			
	0B136	YES/NO	_______			
208/120 INSTRUMENT BUS	1Y236	YES/NO	_______	2Y236	YES/NO	_______
480 SWING BUS	1B219	YES/NO	_______	2B219	YES/NO	_______

LOAD GROUP CHANNEL D

	UNIT 1 BUS/PANEL	UNIT 1 OPERABLE	INITIALS	UNIT 2 BUS/PANEL	UNIT 2 OPERABLE	INITIALS
4160 SWITCHGEAR	1A204	YES/NO	_______	2A204	YES/NO	_______
480 LOAD CENTER	1B240	YES/NO	_______	2B240	YES/NO	_______
480 MCCs	1B246	YES/NO	_______	2B246	YES/NO	_______
	1B247	YES/NO	_______	2B247	YES/NO	_______
COMMON 480 MCCs	0B546	YES/NO	_______			
	0B146	YES/NO	_______			
208/120 INSTRUMENT BUS	1Y246	YES/NO	_______	2Y246	YES/NO	_______
480 SWING BUS	1B229	YES/NO	_______	2B229	YES/NO	_______

DIESEL GENERATOR E, WHEN ALIGNED TO CLASS 1E SYSTEM:

480 MCC	0B565	YES/NO/NA	_______

Reviewed By
Shift Supervision: ______________________ ______________________ ____________
Print Signature Date

SYSTEM EQUIPMENT	UNIT 1 OPERABLE	UNIT 1 INITIALS	UNIT 2 OPERABLE	UNIT 2 INITIALS	COMMON OPERABLE	COMMON INITIALS
RHR (DIV 1)	YES/NO	_______	YES/NO	_______		
A CORE SPRAY LOOP	YES/NO	_______	YES/NO	_______		
A ESW LOOP					YES/NO	_______
A RHRSW LOOP	YES/NO	_______	YES/NO	_______		
DIV 1 ESW PH HVAC					YES/NO	_______
DIV 1 CS HVAC CONSISTING OF: • COMPUTER ROOM FLOOR COOLING SYSTEM. • CONTROL STRUCTURE H&V SYSTEM. • CONTROL ROOM FLOOR COOLING SYSTEM. • CONTROL STRUCTURE CHILLED WATER SYSTEM. • SBGT EQUIPMENT ROOM VENTILATION SYSTEM. • BATTERY ROOM EXHAUST SYSTEM. • CREOASS					YES/NO	_______
A REACTOR BLDG RECIRCULATION FAN					YES/NO	_______
A EMERG SWGR RM CLR	YES/NO	_______	YES/NO	_______		
A DX UNIT			YES/NO	_______		
A RCIC ROOM COOLER	YES/NO	_______	YES/NO	_______		
B HPCI ROOM COOLER	YES/NO	_______	YES/NO	_______		

VERIFY FOLLOWING AC LOAD GROUPS OPERABLE:

	UNIT 1			UNIT 2		
	BUS/PANEL	OPERABLE	INITIALS	BUS/PANEL	OPERABLE	INITIALS
LOAD GROUP CHANNEL A						
4160 SWITCHGEAR	1A201	YES/NO	_______	2A201	YES/NO	_______
480 LOAD CENTER	1B210	YES/NO	_______	2B210	YES/NO	_______
480 MCCs	1B216	YES/NO	_______	2B216	YES/NO	_______
	1B217	YES/NO	_______	2B217	YES/NO	_______
COMMON 480 MCCs	0B516	YES/NO	_______			
	0B517	YES/NO	_______			
208/120 INSTRUMENT BUS	1Y216	YES/NO	_______	2Y216	YES/NO	_______
LOAD GROUP CHANNEL C						
4160 SWITCHGEAR	1A203	YES/NO	_______	2A203	YES/NO	_______
480 LOAD CENTER	1B230	YES/NO	_______	2B230	YES/NO	_______
480 MCCs	1B236	YES/NO	_______	2B236	YES/NO	_______
	1B237	YES/NO	_______	2B237	YES/NO	_______
COMMON 480 MCCs	0B536	YES/NO	_______			
	0B136	YES/NO	_______			
208/120 INSTRUMENT BUS	1Y236	YES/NO	_______	2Y236	YES/NO	_______
480 SWING BUS	1B219	YES/NO	_______	2B219	YES/NO	_______

LOAD GROUP CHANNEL D

	UNIT 1			UNIT 2		
	BUS/PANEL	OPERABLE	INITIALS	BUS/PANEL	OPERABLE	INITIALS
4160 SWITCHGEAR	1A204	YES/NO	______	2A204	YES/NO	______
480 LOAD CENTER 1B240	1B240	YES/NO	______	2B240	YES/NO	______
480 MCCs	1B246	YES/NO	______	2B246	YES/NO	______
	1B247	YES/NO	______	2B247	YES/NO	______
COMMON 480 MCCs	0B546	YES/NO	______			
	0B146	YES/NO	______			
208/120 INSTRUMENT BUS	1Y246	YES/NO	______	2Y246	YES/NO	______
480 SWING BUS	1B229	YES/NO	______	2B229	YES/NO	______
DIESEL GENERATOR E, WHEN ALIGNED TO CLASS 1E SYSTEM:						
480 MCC	0B565	YES/NO/NA	______			

Reviewed By
Shift Supervision: ______________________ ______________________ ____________

Print | Signature | Date

DIESEL GENERATOR C INOP SYSTEM/EQUIPMENT CHECKSHEET

	UNIT 1		UNIT 2		COMMON	
SYSTEM EQUIPMENT	OPERABLE	INITIALS	OPERABLE	INITIALS	OPERABLE	INITIALS
RHR (DIV 2)	YES/NO	______	YES/NO	______		
B CORE SPRAY LOOP	YES/NO	______	YES/NO	______		
B ESW LOOP					YES/NO	______
B RHRSW LOOP	YES/NO	______	YES/NO	______		
DIV 2 CS HVAC CONSISTING OF:					YES/NO	______
• COMPUTER ROOM FLOOR COOLING SYSTEM. • CONTROL STRUCTURE H&V SYSTEM. • CONTROL ROOM FLOOR COOLING SYSTEM. • CONTROL STRUCTURE CHILLED WATER SYSTEM. • SBGT EQUIPMENT ROOM VENTILATION SYSTEM. • BATTERY ROOM EXHAUST SYSTEM. • CREOASS						
B EMERG SWGR RM CLR	YES/NO	______	YES/NO	______		
B DX UNIT			YES/NO	______		
B SBGT FAN, TRAIN					YES/NO	______
A RCIC ROOM COOLER	YES/NO	______	YES/NO	______		
B SBLC INJECTION PUMP	YES/NO	______	YES/NO	______		

VERIFY FOLLOWING AC LOAD GROUPS OPERABLE:

	UNIT 1 BUS/PANEL	UNIT 1 OPERABLE	UNIT 1 INITIALS	UNIT 2 BUS/PANEL	UNIT 2 OPERABLE	UNIT 2 INITIALS
LOAD GROUP CHANNEL A						
4160 SWITCHGEAR	1A201	YES/NO	______	2A201	YES/NO	______
480 LOAD CENTER	1B210	YES/NO	______	2B210	YES/NO	______
480 MCCs	1B216	YES/NO	______	2B216	YES/NO	______
	1B217	YES/NO	______	2B217	YES/NO	______
COMMON 480 MCCs	0B516	YES/NO	______			
	0B517	YES/NO	______			
208/120 INSTRUMENT BUS	1Y216	YES/NO	______	2Y216	YES/NO	______
480 SWING BUS	1B219	YES/NO	______	2B219	YES/NO	______
LOAD GROUP CHANNEL B						
4160 SWITCHGEAR	1A202	YES/NO	______	2A202	YES/NO	______
480 LOAD CENTER	1B220	YES/NO	______	2B220	YES/NO	______
480 MCCs	1B226	YES/NO	______	2B226	YES/NO	______
	1B227	YES/NO	______	2B227	YES/NO	______
COMMON 480 MCCs	0B526	YES/NO	______			
	0B527	YES/NO	______			
208/120 INSTRUMENT BUS	1Y226	YES/NO	______	2Y226	YES/NO	______

LOAD GROUP CHANNEL D

	UNIT 1 BUS/PANEL	UNIT 1 OPERABLE	INITIALS	UNIT 2 BUS/PANEL	UNIT 2 OPERABLE	INITIALS
4160 SWITCHGEAR	1A204	YES/NO	_______	2A204	YES/NO	_______
480 LOAD CENTER	1B240	YES/NO	_______	2B240	YES/NO	_______
480 MCCs	1B246	YES/NO	_______	2B246	YES/NO	_______
	1B247	YES/NO	_______	2B247	YES/NO	_______
COMMON 480 MCCs	0B546	YES/NO	_______			
	0B146	YES/NO	_______			
208/120 INSTRUMENT BUS	1Y246	YES/NO	_______	2Y246	YES/NO	_______
480 SWING BUS	1B229	YES/NO	_______	2B229	YES/NO	_______
DIESEL GENERATOR E, WHEN ALIGNED TO CLASS 1E SYSTEM:						
480 MCC	0B565	YES/NO/NA	_______			

Reviewed By
Shift Supervision: ______________________ ______________________ ___________
Print Signature Date

DIESEL GENERATOR D INOP SYSTEM/EQUIPMENT CHECKSHEET

	UNIT 1		UNIT 2		COMMON	
SYSTEM EQUIPMENT	OPERABLE	INITIALS	OPERABLE	INITIALS	OPERABLE	INITIALS
RHR (DIV 1)	YES/NO	______	YES/NO	______		
A CORE SPRAY LOOP	YES/NO	______	YES/NO	______		
A ESW LOOP					YES/NO	______
A RHRSW LOOP	YES/NO	______	YES/NO	______		
DIV 1 CS HVAC CONSISTING OF: • COMPUTER ROOM FLOOR COOLING SYSTEM. • CONTROL STRUCTURE H&V SYSTEM. • CONTROL ROOM FLOOR COOLING SYSTEM. • CONTROL STRUCTURE CHILLED WATER SYSTEM. • SBGT EQUIPMENT ROOM VENTILATION SYSTEM. • BATTERY ROOM EXHAUST SYSTEM. • CREOASS					YES/NO	______
A EMERG SWGR RM CLR	YES/NO	______	YES/NO	______		
A DX UNIT			YES/NO	______		
A SBGT FAN, TRAIN					YES/NO	______
A HPCI ROOM COOLER	YES/NO	______	YES/NO	______		

VERIFY FOLLOWING AC LOAD GROUPS OPERABLE:

	UNIT 1			UNIT 2		
	BUS/PANEL	OPERABLE	INITIALS	BUS/PANEL	OPERABLE	INITIALS
LOAD GROUP CHANNEL A						
4160 SWITCHGEAR	1A201	YES/NO	_______	2A201	YES/NO	_______
480 LOAD CENTER	1B210	YES/NO	_______	2A210	YES/NO	_______
480 MCCs	1B216	YES/NO	_______	2B216	YES/NO	_______
	1B217	YES/NO	_______	2B217	YES/NO	_______
COMMON 480 MCCs	0B516	YES/NO	_______			
	0B517	YES/NO	_______			
208/120 INSTRUMENT BUS	1Y216	YES/NO	_______	2Y216	YES/NO	_______
LOAD GROUP CHANNEL B						
4160 SWITCHGEAR	1A202	YES/NO	_______	2A202	YES/NO	_______
480 LOAD CENTER	1B220	YES/NO	_______	2B220	YES/NO	_______
480 MCCs	1B226	YES/NO	_______	2B226	YES/NO	_______
	1B227	YES/NO	_______	2B227	YES/NO	_______
COMMON 480 MCCs	0B526	YES/NO	_______			
	0B527	YES/NO	_______			
208/120 INSTRUMENT BUS	1Y226	YES/NO	_______	2Y226	YES/NO	_______
480 SWING BUS	1B229	YES/NO	_______	2B229	YES/NO	_______

LOAD GROUP CHANNEL C

		UNIT 1			UNIT 2	
	BUS/PANEL	OPERABLE	INITIALS	BUS/PANEL	OPERABLE	INITIALS
4160 SWITCHGEAR	1A203	YES/NO	______	2A203	YES/NO	______
480 LOAD CENTER	1B230	YES/NO	______	2B230	YES/NO	______
480 MCCs	1B236	YES/NO	______	2B236	YES/NO	______
	1B237	YES/NO	______	2B237	YES/NO	______
COMMON 480 MCCs	0B536	YES/NO	______			
	0B136	YES/NO	______			
208/120 INSTRUMENT BUS	1Y236	YES/NO	______	2Y236	YES/NO	______
480 SWING BUS	1B219	YES/NO	______	2B219	YES/NO	______

DIESEL GENERATOR E, WHEN ALIGNED TO CLASS 1E SYSTEM:

480 MCC	0B565	YES/NO/NA	______

Reviewed By
Shift Supervision: ____________________ ____________________ __________
Print Signature Date

TALEN ENERGY

LOC29
NRC INITIAL LICENSE EXAM

Administrative JPM
RO-SRO RC

TEAM SUSQUEHANNA. *Generating Excellence*

<u>EXAMINATION MATERIAL</u>

Do not leave unattended without ensuring materials are secured in accordance with training procedures.

SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Radiological Requirements for Operator Work in High Radiation Areas

JPM#: LOC 29 RC JPM   Revision: 0   Date: 06/29/2017

Applicability: ☒ RO ☒ SRO

Setting: Classroom

NUREG–1123 E/APE / Sys Generic   K/A Number 2.3.7   K/A Importance 3.5/3.6

Alternate Path: ☒ YES ☐ NO   Time Critical ☐ YES ☒ NO   Validation Time (min): 15/20

Testing Method: ☐ Simulate   ☒ Perform

Author: Michael Wilcox   Date: 06/29/2017

Operations Review: Collin Breitman   Date: 12/4/17

Validated: Michael Wilcox   Date: 11/27/17

Approval: Jeffrey Dills   Date: 12/7/17
Nuclear Training Supervisor

Examinee Name: ______________________________   ______________________
Last, First MI   Employee Number

Exam Date: ____________________   Exam Duration (Min):____________________

Evaluation Result: ☐ Satisfactory   ☐ Unsatisfactory

Evaluator:________________________   ________________________
Name   Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. NDAP-QA-0625, Personnel Exposure Monitoring

B. NDAP-QA-0626, RCAs & RWPs

C. NDAP-QA-0627, Contamination Control

III. TASK CONDITIONS

Unit 1 is operating at 100% power

A small steam leak has developed in the RCIC Room. Entry into the room is still permissible.

Neither RCIC room cooler is functioning

Stay times have been evaluated to be in excess of 1 hour.

Entry into the room is required to assist Maintenance with repairing a RCIC Room Cooler.

An updated survey map is provided by RP.

Your current year-to-date exposure is 1800 mRem TEDE.

You have not received any dose extension this year.

You will be performing Moderate Work for a total of 45 minutes at the lower RCIC Room Cooler

IV. INITIATING CUE

Address the radiological aspects of performing this work, and record your findings on the provided scorecard per NDAP-QA-0625, NDAP-QA-0626, and NDAP-QA-0627.

V. TASK STANDARD

Radiological Requirements have been determined. SRO also determines requirements for dose extension.

INFORMATION FOR EVALUATOR				
• Marking a step as UNSAT requires written comments on respective step. • Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *. • The time clock starts when the candidate acknowledges the Initiating Cue. • Ensure that a copy of NDAP-QA-0625, 0626, and 0627 are available.				
EVALUATOR CUE Record JPM start time: __________				
Step	Action	Standard	Eval	Comments
1	Obtain copy of reference procedure.	Obtain copies of procedures from examiner.	S/U	
2*	Addresses radiological stress aspects of working in RCIC Room:	Determines radiological classification of area: **HIGH RADIATION AREA**	S/U	
3*	Answers question 2 on score card	Determines highest dose rate in the room and location: **600 mRem/hr in northern part of room** *(right side of survey map near RCIC turbine)*	S/U	
4*	Answers question 3 on score card	Determines dose rate at the work location: **500 mRem/hr**	S/U	
5*	Answers question 4 on score card	Determines highest contamination level in the room and location: **8,000 dpm/100cm^2 at circle 5**	S/U	
6*	Answers question 5 on score card	Determines contamination level the work location: **5,000 dpm/100cm^2**	S/U	
7*	Answers question 6 on score card	Determines expected dose for job: 500mrem/hr(45min)(1hr/60min) **375 mRem**	S/U	
8*	Determines dose extension required	Determines annual exposure will exceed 2000 mRem local dose limit(1800 mRem + 375 mRem = 2175 mRem > 2000 mRem)	S/U	

EVALUATOR CUE Provide candidate with SRO only cue sheet.				
9*	**SRO Only –** Locates NDAP-QA-0625 attachment A	References NDAP-QA-0625 and determines attachment A (NDAP-QA-0625-1) is the required form for the dose extension (Candidate may also select Attachment B, ALARA Review)	S/U	
10*	**SRO Only –** Determines required approvals for dose extension	Identifies required approvals as individual's Functional Unit Manager/Supervisor, Radiation Protection Manager. **Note:** There are two options for dose extensions. If the SRO determines to use the extension up to 3000 mrem TEDE, approvals will be as keyed. If the SRO determines to use the "other" extension, and specifies a value less than 3000 mrem TEDE, the ALARA supervisor approval will also be required. The Plant Manager approval is NOT required in either case.	S/U	
EVALUATOR CUE Record JPM stop time: __________				
EVALUATOR CUE That completes the JPM.				
EVALUATOR NOTE Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE
00.EP.1132.180

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw

10. Verify the JPM reflects the most current revision of the procedure.

Procedure	NDAP-QA-0625	Rev	18
Procedure	NDAP-QA-0626	Rev	47
Procedure	NDAP-QA-0627	Rev	47

Mpw 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor: ______________________ Date: ____________

Instructor: ______________________ Date: ____________

REVISION SUMMARY

JOB PERFORMANCE MEASURE

Revision	Description/Purpose of Revision
0	New JPM

EVALUATOR

TASK CONDITIONS

- Unit 1 is operating at 100% power
- A small steam leak has developed in the RCIC Room. Entry into the room is still permissible.
- Neither RCIC room cooler is functioning
- Stay times have been evaluated to be in excess of 1 hour.
- Entry into the room is required to assist Maintenance with repairing a RCIC Room Cooler.
- An updated survey map is provided by RP.
- Your current year-to-date exposure is 1800 mRem TEDE.
- You have not received any dose extension this year.
- You will be performing Moderate Work for a total of 45 minutes at the lower RCIC Room Cooler

INITIATING CUE

Address the radiological aspects of performing this work, and record your findings on the provided scorecard per NDAP-QA-0625, NDAP-QA-0626, and NDAP-QA-0627.

NOTE: THIS IS THE EXAMINER SCORECARD.

DO NOT PROVIDE TO THE CANDIDATE.

1.	
Classify the room based on radiation level (check one):	☐ Radiation Area ☑ **High Radiation Area** ☐ Locked High Radiation Area ☐ Very High Radiation Area
2.	
What is the highest dose rate in the RCIC room and the location? **600 mRem/hr in northern part of room** *(right side of survey map)*	
3.	
What is the dose rate at the work location? **500 mRem/hr**	
4.	
What is the highest contamination level in the RCIC room and the location? **8,000 dpm/100cm^2 at circle 5**	
5.	
What is the contamination level at the work location? **5,000 dpm/100cm^2**	
6.	
What is the expected dose for the duration of the job? **375 mRem**	
7.	
Is a dose extension required? ☐ No ■ **Yes**	

NOTE: THIS IS THE EXAMINER SCORECARD.

DO NOT PROVIDE TO THE CANDIDATE.

1.
If NO dose extension is required, answer question 2 below, only. If a dose extension IS required, answer questions 3 and 4 below, only.
2.
Designate expected margin to dose limit upon completion of the job. **N/A**
3.
Identify the form and the procedure section required to be completed for the dose extension. **NDAP-QA-0625 Attachment A** also known as **NDAP-QA-0625-1** **Procedure section 5.5**
4.
Check all appropriate boxes below for the approvals required for this dose extension. ☑ **Functional Unit Manager/Supervisor** ☑ **Radiation Protection Manager** ☐ ALARA Supervisor ☐ Plant Manager

EXAMINEE

TASK CONDITIONS

- Unit 1 is operating at 100% power
- A small steam leak has developed in the RCIC Room. Entry into the room is still permissible.
- Neither RCIC room cooler is functioning
- Stay times have been evaluated to be in excess of 1 hour.
- Entry into the room is required to assist Maintenance with repairing a RCIC Room Cooler.
- An updated survey map is provided by RP.
- Your current year-to-date exposure is 1800 mRem TEDE.
- You have not received any dose extension this year.
- You will be performing Moderate Work for a total of 45 minutes at the lower RCIC Room Cooler

INITIATING CUE

Address the radiological aspects of performing this work, and record your findings on the provided scorecard per NDAP-QA-0625, NDAP-QA-0626, and NDAP-QA-0627.

SUSQUEHANNA SES - AREA SURVEY MAP

UNIT 1	REACTOR BUILDING	ELEV. 645	RCIC	ROOM I-12

RWP# 2018-0027 Routine Survey? (Circle one) YES NO H2: ______ scfm Rx PWR 100 %

DATE: 3-5-18 TIME: 0700 SURVEY BY: John Jones

RAD. INST. RO-2A HP # 0004 CAL DUE: 6-15-18 SOURCE CHECK SAT. SS

AIR SAMPLER N/A HP # N/A CAL DUE: N/A ACTIVITY: N/A µCi / cc

CONTAM. INST. L 177 HP # 0024 CAL DUE: 8-22-18 EFF. 10 % BKG. 150 cpm

SMEAR RESULTS (dpm / 100 cm^2)

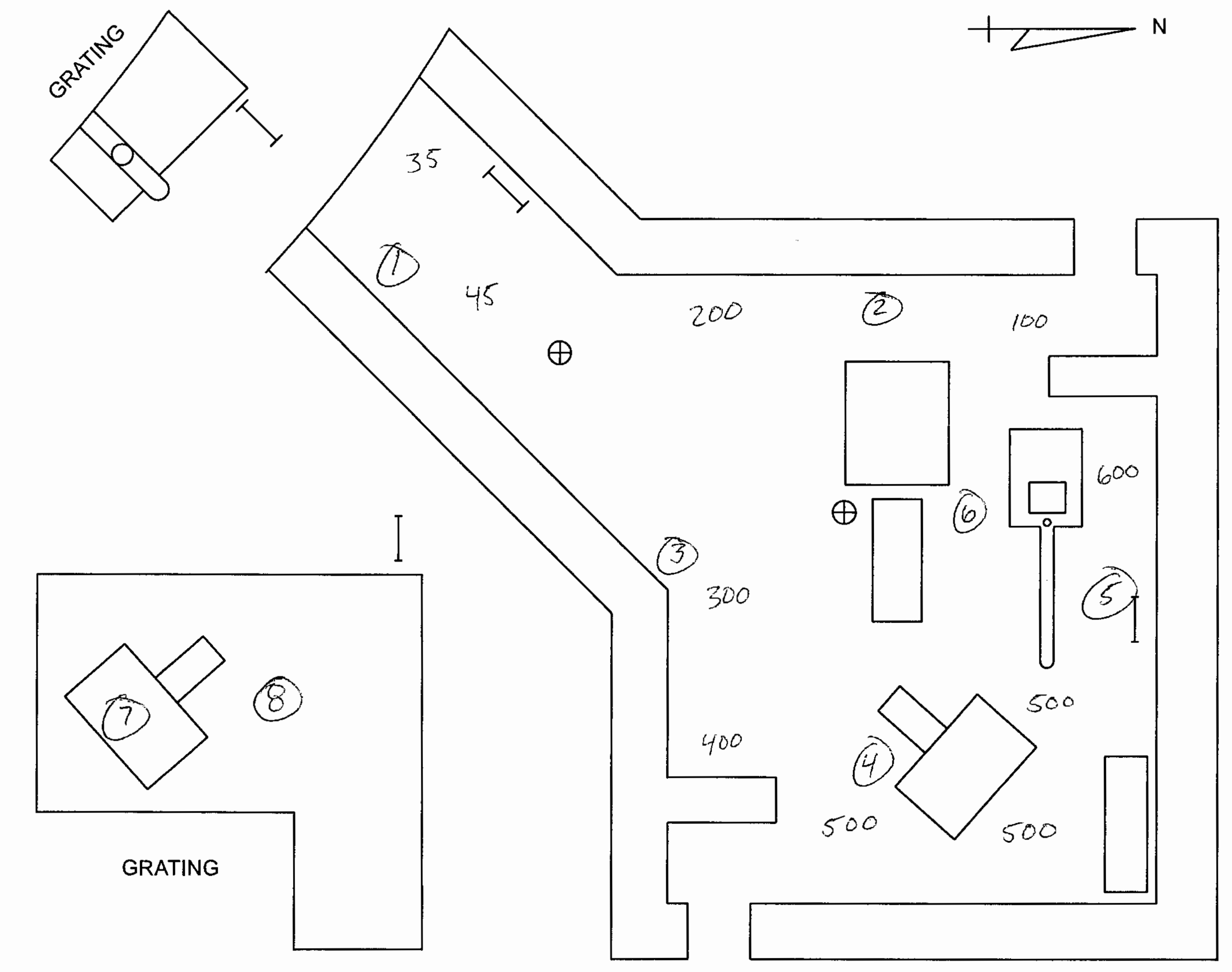
1. <1K FLOOR	5. 8000 FLOOR	9.
2. 1400 FLOOR	6. 4500 FLOOR	10.
3. 2500 FLOOR	7. <1K	11.
4. 5000 FLOOR	8. <1K FLOOR	12.
		13.
14.	15.	16.
17.	18.	

REASON FOR SURVEY: RCIC ROOM COOLER REPAIR

RAD READINGS IN mR/hr SMEAR LOCATIONS CIRCLED $\frac{\text{CONTACT DOSE RATE}}{\text{GENERAL AREA DOSE RATE}}$

β⁻ = BETA DOSE RATE (mRAD/hr) Ⓜ = LARGE AREA SMEAR (ccpm)

---- = RAD TAPE -X-X-X = RAD TAPE & ROPE XXXX = RAD ROPE @ = A/S LOCATION



REVIEWED: [signature] Health Physics 3-5-18 Date

PP&L FORM 3104 (5-25-2010 Rev. 1)

J \ HP \ SURVEY MAPS \ U-1 RX 645 MAPS \ MAP 12

Scorecard

Answer the following when performing this task:
1.
Classify the room based on radiation level (check one): ☐ Radiation Area ☐ High Radiation Area ☐ Locked High Radiation Area ☐ Very High Radiation Area
2.
What is the highest dose rate in the RCIC room and the location?
3.
What is the dose rate at the work location?
4.
What is the highest contamination level in the RCIC room and the location?
5.
What is the contamination level at the work location?
6.
What is the expected dose for the duration of the job?
7.
Is a dose extension required? ☐ No ☐ Yes

SRO Only Handout

Cue:

"(Operator's name), If no extension is required, identify the expected margin to the dose limit upon completion of the task. If an extension is required, identify the form required to be completed for the dose extension and the levels of approval needed for the dose extension. Record your findings on the scorecard below."

SRO Only Scorecard

Answer the following when performing this task:
1.
If NO dose extension is required, answer question 2 below, only. If a dose extension IS required, answer questions 3 and 4 below, only.
2.
Designate expected margin to dose limit upon completion of the job.
3.
Identify the form and the procedure section required to be completed for the dose extension.
4.
Check all appropriate boxes below for the approvals required for this dose extension. ☐ Functional Unit Manager/Supervisor ☐ Radiation Protection Manager ☐ ALARA Supervisor ☐ Plant Manager

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JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Complete Aborted Evolution Log

JPM#: 00.AD.21017.001 Revision: 0 Date: 06/27/2017

Applicability: ☒ RO

Setting: Classroom

NUREG–1123 E/APE / Sys G K/A Number 2.1.20 K/A Importance 4.6

Alternate Path: ☐ YES ☒ NO Time Critical ☐ YES ☒ NO Validation Time (min): 15

Testing Method: ☐ Simulate ☒ Perform

Author: Michael Wilcox Date: 06/27/17

Operations Review: [signature] Date: 12/4/17

Validated: Michael Wilcox Date: 11/27/17

Approval: [signature] Date: 12/12/17
Nuclear Training Supervisor

Examinee Name: ______________________ ______________
Last, First MI Employee Number

Exam Date: ______________ Exam Duration (Min): ______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator: ______________________ ______________________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
00.AD.21017.001

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

- OP-133-001 Chemical Addition to Turbine Building Chilled Water System marked up to step 2.5.10 (2.5.10 only circled, not slashed)
- OP-AD-002 Standards for Shift Operation

III. TASK CONDITIONS

- Unit 1 is in Mode 1
- All Plant Equipment required for Mode 1 is in operation
- Turbine Building Chilled Water System in Service
- The Turbine building NPO is performing a Chemical Addition to Turbine Building Chilled Water System IAW OP-133-001 Section 2.5.
- During step 2.5.10 TB Chilled Wtr Chem Add Tank In valve 188003 could not be opened. Maintenance will not be available until dayshift tomorrow to support opening the 188003 valve.
- You are the Unit 1 PCOP

IV. INITIATING CUE

Complete the necessary administrative tasks to turn this information over to the on-coming shift, in accordance with OP-AD-002, Standards for Shift Operations. Include any forms and actions, as required. Use below space if needed.

V. TASK STANDARD

Aborted Evolution Control Log identifies TB Chilled Wtr Chem Add Tank Out In valve 188003 could not be opened. Unit 1 turbine bldg. NPO, and Control Room Supervisor notified to make turnover sheet entries referencing the Aborted evolution. Plant operator turnover sheet entry referencing the Aborted evolution is made.

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the Initiating Cue.
- This JPM can be performed in the simulator, classroom or other similar environment.
- Mark-up a copy of OP-133-001 filled out up to step 2.5.10 (2.5.10 only circled, not slashed).
- Replacement pages for JPM: Section 5.7 of OP-AD-002 and blank Aborted Evolution Control Log (AECL) OP-AD-002-3 Attachment B

EVALUATOR CUE

Record JPM start time: __________

Step	Action	Standard	Eval	Comments
1	**Identifies** governing procedure and obtain controlled copy.	Obtains controlled copy of OP-AD-002, Standards for shift operations.	S/U	
2	**Selects** the correct procedure section to perform. OP-AD-002 Section 5.7	Performs OP-AD-002 section 5.7, Aborted Evolution Control Log (AECL)	S/U	
*3	**Completes** OP-AD-002 Attachment B	Completes Attachment B as follows: • Line 1; Date, Time, and name. • Line 2; System number 133 and system name Turbine Building Chilled Water System • *Line 3; Procedure number OP-133-001, Revision 38, step 2.5.10 • *Line 4; TB Chilled Wtr Chem Add Tank In valve 188003 could not be opened	S/U	

EVALUATOR NOTE

Due to the nature of this JPM, the information provided by the candidate in the next 2 steps may vary from the information scripted in the STANDARD column. Evaluator judgment may need to be applied to information provided by the candidate.

Step	Action	Standard	Eval	Comments
4	**Completes** OP-AD-002 Att B cont'd	• Line 5, Ensure FME controls are in place • Line 6, notes to resume procedure OP-133-001 beginning at step 2.5.10 • Line7, Left Blank	S/U	

*6	**Documents** AECL data	• Each AECL activity shall be referenced on the Turnover Sheet of the Operator performing the evolution and be reviewed as part of the Turnover process until such time as the AECL is no longer required, or in control o Referenced on the US turnover sheet o Referenced on the TB NPO Turnover sheet	S/U	
7	**Notifies** Unit Supervisor	Informs Unit Supervisor and TB NPO to: • Reference the aborted evolution IAW the AECL form • Review the AECL as part of the turnover to the oncoming shift	S/U	

EVALUATOR CUE
Role-play as US and/or Turbine building NPO to acknowledge the report

EVALUATOR CUE
Record JPM stop time: __________

EVALUATOR CUE
That completes the JPM.

EVALUATOR NOTE
Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE
00.AD.21017.001

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw

10. Verify the JPM reflects the most current revision of the procedure.

Procedure	OP-133-001	Rev	38
Procedure	OP-AD-002	Rev	63
Procedure		Rev	

Mpw 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor:______________________ Date: __________

Instructor:______________________ Date: __________

REVISION SUMMARY

JOB PERFORMANCE MEASURE
00.AD.21017.001

Revision	Description/Purpose of Revision
0	New JPM, Replaced 00.AD.038.001

EVALUATOR COPY:

TASK CONDITIONS

- Unit 1 is in Mode 1
- All Plant Equipment required for Mode 1 is in operation
- Turbine Building Chilled Water System in Service
- The Turbine building NPO is performing a Chemical Addition to Turbine Building Chilled Water System IAW OP-133-001 Section 2.5.
- During step 2.5.10 TB Chilled Wtr Chem Add Tank In valve 188003 could not be opened. Maintenance will not be available until dayshift tomorrow to support opening the 188003 valve.
- You are the Unit 1 PCOP

INITIATING CUE

Complete the necessary administrative tasks to turn this information over to the on-coming shift, in accordance with OP-AD-002, Standards for Shift Operations. Include any forms and actions, as required. Use below space if needed.

EXAMINEE COPY:

TASK CONDITIONS

- Unit 1 is in Mode 1
- All Plant Equipment required for Mode 1 is in operation
- Turbine Building Chilled Water System in Service
- The Turbine building NPO is performing a Chemical Addition to Turbine Building Chilled Water System IAW OP-133-001 Section 2.5.
- During step 2.5.10 TB Chilled Wtr Chem Add Tank In valve 188003 could not be opened. Maintenance will not be available until dayshift tomorrow to support opening the 188003 valve.
- You are the Unit 1 PCOP

INITIATING CUE

Complete the necessary administrative tasks to turn this information over to the on-coming shift, in accordance with OP-AD-002, Standards for Shift Operations. Include any forms and actions, as required. Use below space if needed.

Attachment B, Aborted Evolution Control Log

1. Date __________ Time __________ Initiated by ______________________

2 System:

Number _________ Name ____

3. Evolution aborted at:

Procedure Number ________________ Rev. __________ Step _____________

4. Reason procedure stopped or equipment in abnormal alignment.

____

____

____

5. Task(s) to accomplish prior to restart/alignment.

____

____

____

6 Suggestions/cautions for restart/realignment.

____

____

____

7. Plant/System realigned to normal configuration or procedure restarted

__________ ________ ____________________
DATE TIME SIGNATURE

2.5 CHEMICAL ADDITION TO TURBINE BUILDING CHILLED WATER SYSTEM (CONTINUOUS USE)

2.5.1 Prerequisites

a. Turbine Bldg Chilled Water System in operation in accordance with section 2.1 of this procedure.

b. Chemistry Group has determined type and amount of chemicals to be added.

2.5.2 Precautions

a. Know location of nearest operable eyewash and emergency shower station.

b. Wear proper protective clothing and/or eye protection when applicable.

c. Using system water for mixing chemicals or draining system water will cause Expansion Tank level and system pressure to lower.

d. Due to possible chemical incompatibilities only one chemical shall be added to the system at one time. If more than one chemical appears on the Chemistry Action Request (CAR), the additions may be performed sequentially with a 10 minute (minimum) wait period between chemical additions to flush the Add Tank.

e. TB Chilled Wtr Chem Add Tnk 1T124 is an FME Zone 1 per NDAP-QA-0512, when cover/lid is open. If foreign material is introduced into this tank/vessel it cannot be easily located and removed. Refer to FME Hard Card for details.

2.5.3 **Obtain** following required personal protective equipment from the shift tool box:

a. Neoprene gloves

b. Safety goggles

c. Face shield

d. Apron

e. Respiratory protection if adequate ventilation does not exist.

☑ 2.5.4 **Depressurize** TB Chilled Wtr Chem Add Tnk 1T124 by **Cracking Open** TB Chilled Wtr Chem Add Tnk Drn 188012 so as to minimize amount drained.

☑ 2.5.5 **WHEN** depressurized, **Close** TB Chilled Wtr Chem Add Tnk Drn 188012.

☑ 2.5.6 **Remove** chemical addition cover on top of Chemical Addition Tank 1T124.

☑ 2.5.7 **Cycle** TB Chilled Wtr Chem Add Tnk Drn 188012 as needed to ensure sufficient empty volume for chemicals to be added.

☑ 2.5.8 **Add** chemicals to Chemical Addition Tank 1T124.

☑ 2.5.9 **Mix** chemicals with a paddle until chemicals are dissolved.

☐ 2.5.10 **Fill** Chemical Addition Tank 1T124 completely using TB Chilled Wtr Chem Add Tnk In 188003.

☐ 2.5.11 **Replace** chemical addition cover on top of Chemical Addition Tank 1T124.

☐ 2.5.12 **Adjust** Expansion Tank 1T123 level and pressure as necessary in accordance with section 2.5 of this procedure.

☐ 2.5.13 **Open** TB Chilled Wtr Chem Add Tnk In 188003.

☐ 2.5.14 **Slowly Open** TB Chilled Wtr Chem Add Tnk Out 188011 to establish flowrate of 8-9 gpm on FI-18806.

☐ 2.5.15 **Allow** chemicals to be added for at least 10 minutes.

☐ 2.5.16 **Close** TB Chilled Wtr Chem Add Tnk Out 188011.

☐ 2.5.17 **Close** TB Chilled Wtr Chem Add Tnk In 188003.

5.5.2b (continued)

(2) **NOT** identified as a specific skill of the craft action; **ENSURE** positive control must be achieved by performing either:

THEN ACHIEVE positive control by performing either:

- Procedure Revision per NDAP-QA-0004, Procedure Revision Process.
- Risk based decisions per NDAP-QA-1902, Integrated Risk Management and NDAP-00-0333, Operational Decision Making Process.

5.6 Paperwork Control in Contaminated Areas

NOTE

A working copy of only those pages necessary shall be used in the contaminated area.

5.6.1 **CONTROL** working copy **PER** NDAP-QA-0627, Radioactive Contamination Control.

5.6.2 **AFTER** leaving the contaminated area,

THEN TRANSCRIBE information from working copy to a record copy.

5.6.3 **IF** working copy is contaminated,

THEN DISPOSE of **PER** Health Physics procedures.

5.6.4 **IF** working copy is **NOT** contaminated,

THEN DISPOSE of the working copy in appropriate receptacle.

5.7 Aborted Evolution Control Log

5.7.1 **IF** ANY of the following:

- An evolution is aborted prior to completion **AND** will **NOT** be resumed prior to shift turnover.
- Equipment is left in an abnormal lineup **AND** additional information is essential to the on-coming shift.

THEN COMPLETE Attachment B, Aborted Evolution Control Log (Form OP-AD-002-3).

5.7.2 **REFERENCE** each Aborted Evolution Control Log (AECL) activity on the Turnover Sheet of the Operator performing the evolution,

AND

REVIEW as part of the turnover process until such time as the AECL is no longer required, or in control.

5.7.3 **REFERENCE** each Aborted Evolution Control Log (AECL) activity on Unit Supervisor turnover sheet.

AND

Affected Plant Operator Turnover Sheet

5.7.4 Unit Supervisor **MAINTAIN** Aborted Evolution Control Log (AECL) Form in the Control Room with a copy on the Plant Operator Turnover.

5.7.5 During shift turnover, off-going **AND** on-coming Unit Supervisor **AND** Plant Operator SHALL **REVIEW** AECL sheets.

- AECL sheets are reviewed until system restoration or procedure restart is completed.

5.7.6 Upon system/equipment restoration **OR** procedure restart completed forward AECL sheets to the Ops Clerk.

- The OPS clerk shall retain the AECL sheets for 14 days then destroy.

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EXAMINATION MATERIAL

Do not leave unattended without ensuring materials are secured in accordance with training procedures.

SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Authorize Bypassing the Rod Block Monitor In Accordance With NDAP-QA-0338

JPM#: 00.AD.1021.101 Revision: 0 Date: 07/17/2017

Applicability: ☒ SRO

Setting: Classroom

NUREG–1123 E/APE / Sys G K/A Number 2.1.37 K/A Importance 4.6

Alternate Path: ☐ YES ☒ NO Time Critical ☐ YES ☒ NO Validation Time (min): 20

Testing Method: ☐ Simulate ☒ Perform

Author: Michael Wilcox Date: 07/17/17

Operations Review: Collin Bostma Date: 12/4/17

Validated: Michael Wilcox Date: 11/27/17

Approval: ______________ Date: 12/12/17
Nuclear Training Supervisor

Examinee Name: ______________________ ______________
Last, First MI Employee Number

Exam Date: ______________ Exam Duration (Min): ______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator: ______________ ______________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
00.AD.1021.101

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. NDAP-QA-0338, Reactivity Management and Controls Program

B. AR-103-001 (C04), RBM UPSCALE OR INOP ROD BLOCK

C. TS 3.3.2.1, Control Rod Block Instrumentation

D. TRM 3.2.1, Core Operating Limits Report

III. TASK CONDITIONS

- A plant startup is in progress on Unit 1. Reactor Power is 30%.
- Control Rod withdrawals are in progress.
- When PCOM selected Rod 10-43, the RBM UPSCALE OR INOP ROD BLOCK, AR-103-001 (C04), annunciator alarmed.
- Rod 10-43 is at position 04.
- It has been determined that Rod Block Monitor A has a Critical Self Test Fault.
- All external inputs to the Rod Block Monitor A have been determined to be valid.
- Reactor Engineer reports that MCPR is 1.7.

IV. INITIATING CUE

1. Determine if Rod Block Monitor A can be bypassed
2. Identify any applicable Technical Specification LCO Required Actions and Completion Times.

V. TASK STANDARD

Complete the Reactivity Control System Bypass Authorization Form, determine that bypassing the Rod Block Monitor is allowed, Tech Spec action 3.3.2.1 action A.1 is required.

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the Initiating Cue.
- Ensure the following material is available to support performance of this JPM:
  NDAP-QA-0338
  NDAP-QA-0338, Attachment A
  Unit 1 TS 3.3.2.1
  Unit 1 TRM (COLR)
  AR-103-001 (C04), RBM UPSCALE OR INOP ROD BLOCK

EVALUATOR CUE

Record JPM start time: ___________

Step	Action	Standard	Eval	Comments
1	**Verifies** NDAP–QA–0338 is governing procedure and obtains controlled copy.	Controlled copy of NDAP–QA–0338 obtained.	S/U	
2	**Completes** NDAP-QA-0338, Attachment A.	Reviews NDAP-QA-0338, Section 6.4.1.f and Attachment A.	S/U	
3	**Enters** initiating condition data.	Enters the following data for Initiating Condition: • Rod ID 10-43 • Notch 04 • Unit 1 • Circle RBM Channel A • Power Level 30 percent • Date/Time	S/U	
4	**Determines** if reactor power is <28%.	Places checkmark in “NO” Box, from Task Conditions Reactor Power is 30%.	S/U	

*5	**Determines** if Rod Block Monitor A is providing a valid rod block per TRM 3.2 Table 7.2-1.	Performs the following: • Refers to Table 7.2-1 and cue sheet • Determines Rod Block is being generated due to the Critical Self Test Fault, not as a result of exceeding a Table 7.2-1 setpoint • Places a checkmark in the "NO" Box	S/U	
*6	**Determines** if inputs to the Rod Block Monitor A are valid.	Refer to provided task conditions, and place a checkmark in the "NO" Box.	S/U	
7	**Contacts** I&C to repair the Rod Block Monitor A	Contacts I&C to investigate and repair the Rod Block Monitor A failure.	S/U	
<u>EVALUATOR CUE</u> I&C has been contacted.				
*8	**Determines** if RBM is required to be OPERABLE	Performs the following: • Refers to TS LCO 3.3.2.1, Table 3.3.2.1-1 for Functions 1.a. – 1.d., and associated footnotes. • Refers to TRM 3.2 COLR, Table 7.2.–2 • Determines that MCPR is below the value specified in the COLR and that 2 channels of RBM are required	S/U	
*9	**Determines** Technical Specification impact of bypassing RBM.	Determines that LCO 3.3.2.1 Condition A, Required Action A.1 requires RBM A channel to be restored to operable within 24 hours.	S/U	

*10	**Authorizes** bypassing Rod Block Monitor A.	Performs the following: • Determines that Rod Block Monitor A can be bypassed. • Signs, dates, and enters time on Attachment A in the "Shift Supervision Authorization To bypass the RBM channel" block on the lower right-hand side of the page, and enters current time/date.	S/U	

EVALUATOR CUE
Record JPM stop time: __________

EVALUATOR CUE
That completes the JPM.

EVALUATOR NOTE
Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE
00.AD.1021.101

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw 10. Verify the JPM reflects the most current revision of the procedure.

Procedure	NDAP-QA-0338	Rev	26
Procedure	AR-103-001	Rev	55
Procedure	TS 3.3.2.1	Rev	3
Procedure	TRM 3.2.1	Rev	17

Mpw 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor:______________________ Date: ____________

Instructor:______________________ Date: ____________

REVISION SUMMARY

JOB PERFORMANCE MEASURE
00.AD.1021.101

Revision	Description/Purpose of Revision
0	New JPM, Replaced 00.AD.038.001
2	Revise for latest JPM procedure revision, eliminate MCPR LCO requirement
3	Ensures failed control rod is at notch position 04

EVALUATOR COPY:

TASK CONDITIONS

- A plant startup is in progress on Unit 1. Reactor Power is 30%.
- Control Rod withdrawals are in progress.
- When PCOM selected Rod 10-43, the RBM UPSCALE OR INOP ROD BLOCK, AR-103-001 (C04), annunciator alarmed.
- Rod 10-43 is at position 04.
- It has been determined that Rod Block Monitor A has a Critical Self Test Fault.
- All external inputs to the Rod Block Monitor A have been determined to be valid.
- Reactor Engineer reports that MCPR is 1.7.

INITIATING CUE

1. Determine if Rod Block Monitor A can be bypassed
2. Identify any applicable Technical Specification LCO Required Actions and Completion Times.

EXAMINEE COPY:

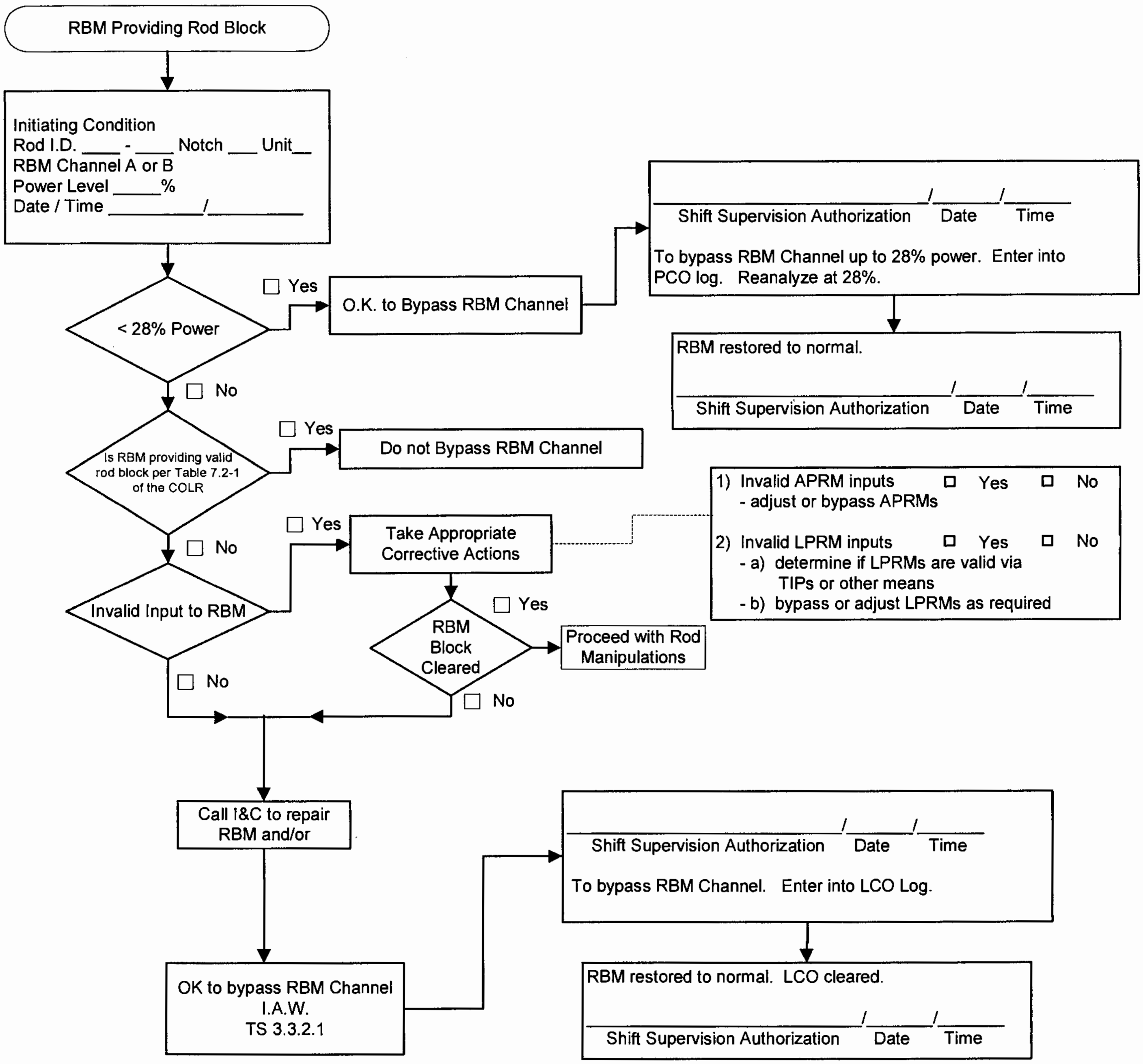
TASK CONDITIONS

- A plant startup is in progress on Unit 1. Reactor Power is 30%.
- Control Rod withdrawals are in progress.
- When PCOM selected Rod 10-43, the RBM UPSCALE OR INOP ROD BLOCK, AR-103-001 (C04), annunciator alarmed.
- Rod 10-43 is at position 04.
- It has been determined that Rod Block Monitor A has a Critical Self Test Fault.
- All external inputs to the Rod Block Monitor A have been determined to be valid.
- Reactor Engineer reports that MCPR is 1.7.

INITIATING CUE

1. Determine if Rod Block Monitor A can be bypassed
2. Identify any applicable Technical Specification LCO Required Actions and Completion Times.

REACTIVITY CONTROL SYSTEM BYPASS AUTHORIZATION FORM (RBM)



LOC29
NRC INITIAL LICENSE EXAM

Administrative JPM
RO-SRO EC

EXAMINATION MATERIAL

Do not leave unattended without ensuring materials are secured in accordance with training procedures.

SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Describe RPS Response to APRM Upscale Votes Using Prints

JPM#: 78.AD.3675.101 Revision: 1 Date: 07/17/2017

Applicability: ☒ RO ☒ SRO

Setting: Classroom

NUREG–1123 E/APE / Sys G K/A Number 2.2.41 K/A Importance 3.5 / 3.9

Alternate Path: ☐ YES ☒ NO Time Critical ☐ YES ☒ NO Validation Time (min): 25

Testing Method: ☐ Simulate ☒ Perform

Author: Michael Wilcox Date: 07/17/17

Operations Review: Collin Breitman Date: 12/4/17

Validated: Michael Wilcox Date: 11/27/17

Approval: Jeffrey Dills Date: 12/12/17
Nuclear Training Supervisor

Examinee Name: ______________________ ______________________
Last, First MI Employee Number

Exam Date: ______________________ Exam Duration (Min): ______________________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator: ______________________ ______________________
Name Signature

Comments:

JPM REVISION SUMMARY
78.AD.3675.101

Revision	Description/Purpose of Revision
0	New JPM
1	Added additional SRO cue sheet, changed to all APRM Voters

REQUIRED TASK INFORMATION
78.AD.3675.101

1. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

2. REFERENCES

A. M1-C72-22, Elementary Diagram – Reactor Protection System, Sheets 6, 11, and 12

B. TS 3.3.1.1, Reactor Protection System (RPS) Instrumentation

3. TASK CONDITIONS

Units 1 and 2 are operating at rated power.

4. INITIATING CUE

A condition has occurred on Unit 1 resulting in all APRM Voters providing an upscale trip signal. You may mark the provided prints and/or write the explanation on this sheet. Using the provided prints, identify the electrical components that contribute to de-energizing Division 1 RPS scram solenoids and how they change state.

5. TASK STANDARD

Identifies electrical components that actuate from APRM Voter upscale votes to cause RPS scram. The SRO also determines the technical specification impact of a Voter failing to trip RPS.

Examinee ____________________

Step	Action	Standard	Eval	Comments
EVALUATOR INSTRUCTIONS • Marking a step as UNSAT requires written comments on respective step. • Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *. • The time clock starts when the candidate acknowledges the Initiating Cue. • This JPM may be performed in a classroom. • Ensure Unit 1 and 2 Technical Specifications are available. • Ensure sufficient copies of RPS elementary diagrams are available to provide to the examinee. This must include M1-C72-22 sheets 6, 11, and 12 as a minimum.				
EVALUATOR CUE Record JPM start time: __________				
1	**Identifies** governing reference and obtain controlled copy.	Obtains controlled copy of RPS elementary diagrams from the evaluator.	S / U	
EVALUATOR NOTE The following components in JPM steps 2-8, may be identified by either marking on the electrical print or writing the electrical print number and location on the response sheet.				
*2	**Identifies** APRM Voter #1 contacts K1X and K1Y on elementary diagram M1-C72-22 sheet 6.	Identifies APRM Voter #1 contacts K1X and K1Y on elementary diagram M1-C72-22 sheet 6 (near locations J-3 and J-5, respectively).	S / U	
*3	**Identifies** relays K12A and K12E on elementary diagram M1-C72-22 sheet 6.	Identifies relays K12A and K12E on elementary diagram M1-C72-22 sheet 6 (near locations L-3 and L-5, respectively).	S / U	
*4	**Identifies** contacts K12A and K12E on elementary diagram M1-C72-22 sheet 11.	Identifies contacts K12A and K12E on elementary diagram M1-C72-22 sheet 11 (near locations H-2 and J-2, respectively).	S / U	
*5	**Identifies** relays K14A and K14E on elementary diagram M1-C72-22 sheet 11.	Identifies relays K14A and K14E on elementary diagram M1-C72-22 sheet 11 (near location K-2).	S / U	

Examinee ____________________

Step	Action	Standard	Eval	Comments
*6	**Identifies** contacts K14A and K14E on elementary diagram M1-C72-22 sheet 12.	Identifies contacts K14A and K14E on elementary diagram M1-C72-22 sheet 12 (near locations, A-9, B-13, A-10, and B-12, respectively).	S / U	
EVALUATOR NOTE In the following step, the examinee does not have to identify all pilot solenoids/relays on this sheet, as long as a representative sample is identified and some indication is given that there are multiple solenoids/relays.				
*7	**Identifies** pilot solenoids for trip system A scram valves on elementary diagram M1-C72-22 sheet 12.	Identifies pilot solenoids/relays for trip system A scram valves on elementary diagram M1-C72-22 sheet 12 (near locations C-9, C-10, C-12, and C-13).	S / U	
*8	**Describes** how APRM Voter #1 upscale vote results in de-energized pilot scram solenoid valves.	Describes the following: • Upscale vote causes contacts K1X and K1Y to open. • This causes relays K12A and K12E to de-energize. • This causes contacts K12A and K12E to open. • This causes relays K14A and K14E to de-energize. • This causes contacts K14A and K14E to open. • This causes one pilot solenoid/relay to de-energize at each HCU.	S / U	
EVALUATOR CUE (For the RO examinee) This completes the JPM. (For the SRO examinee) Provide the SRO examinee with the additional SRO Only cue sheet.			S / U	
*9	**Determines** applicable Technical Specification	Determines Tech Spec 3.3.1.1 applies	S / U	

Step	Action	Standard	Eval	Comments
*10	**Determines** Technical Specification required actions.	Determines that the applicable RPS channel or trip system must be placed in a trip condition within 12 hours. Note: Table 3.3.1.1-1 function 2e requires that 2 Voters be operable for each RPS channel. With APRM Voter #1 inoperable, condition A applies, requiring the associated RPS channel be placed in a trip condition within 12 hours or associated trip system in trip within 12 hours.	S / U	

EVALUATOR CUE
Record JPM stop time: __________

EVALUATOR NOTE
That completes the JPM.

EVALUATOR:
Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?

EVALUATOR COPY:

TASK CONDITIONS

Units 1 and 2 are operating at rated power.

INITIATING CUE

A condition has occurred on Unit 1 resulting in all APRM Voters providing an upscale trip signal. Using the provided prints, identify the electrical components that contribute to de-energizing Division 1 RPS scram solenoids.

EXAMINEE COPY:

TASK CONDITIONS

Units 1 and 2 are operating at rated power.

INITIATING CUE

A condition has occurred on Unit 1 resulting in all APRM Voters providing an upscale trip signal. Using the provided prints, identify the electrical components that contribute to de-energizing Division 1 RPS scram solenoids.

SRO ONLY - EVALUATOR COPY

TASK CONDITIONS

Unit 2 is at rated power.

Maintenance has determined APRM Voter #1 has failed and will not produce a vote to trip RPS.

INITIATING CUE

Determine the technical specification impact on this failure and identify the required actions and completion times, if any.

SRO ONLY - EXAMINEE COPY

TASK CONDITIONS

Unit 2 is at rated power.

Maintenance has determined APRM Voter #1 has failed and will not produce a vote to trip RPS.

INITIATING CUE

Determine the technical specification impact on this failure and identify the required actions and completion times, if any.

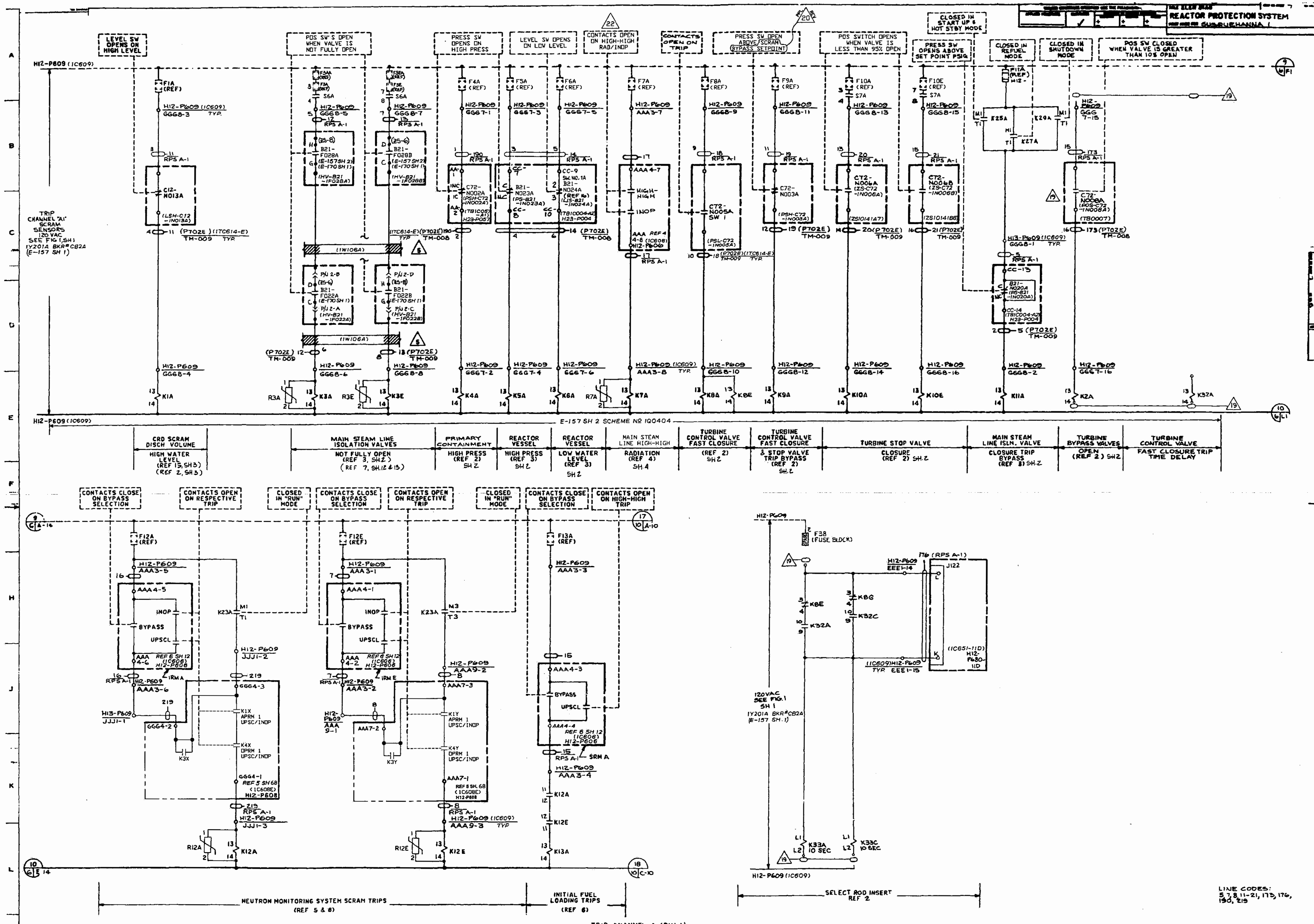
VALIDATION CHECKLIST

NOTE:	All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.
Mpw	10. Verify the JPM reflects the most current revision of the procedure.

Procedure	M1-C72-22 Sh 6	Rev	20
Procedure	M1-C72-22 Sh 11	Rev	10
Procedure	M1-C72-22 Sh 12	Rev	13
Procedure	TS 3.3.1.1	Rev	4

Mpw	11. Pilot the JPM.
	For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.
	For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).
N/A	12. If the JPM cannot be performed as written, then revise as necessary and revalidate.
Mpw	13. When JPM is validated, sign and date JPM cover page.



UNIT 1

REV	DESCRIPTION	APPROVED
20	INCORPORATED DCN 2007-0302	DRAWING APPROVAL ATTACHED TO NIMS MEDIA AS "APPROVAL HISTORY"

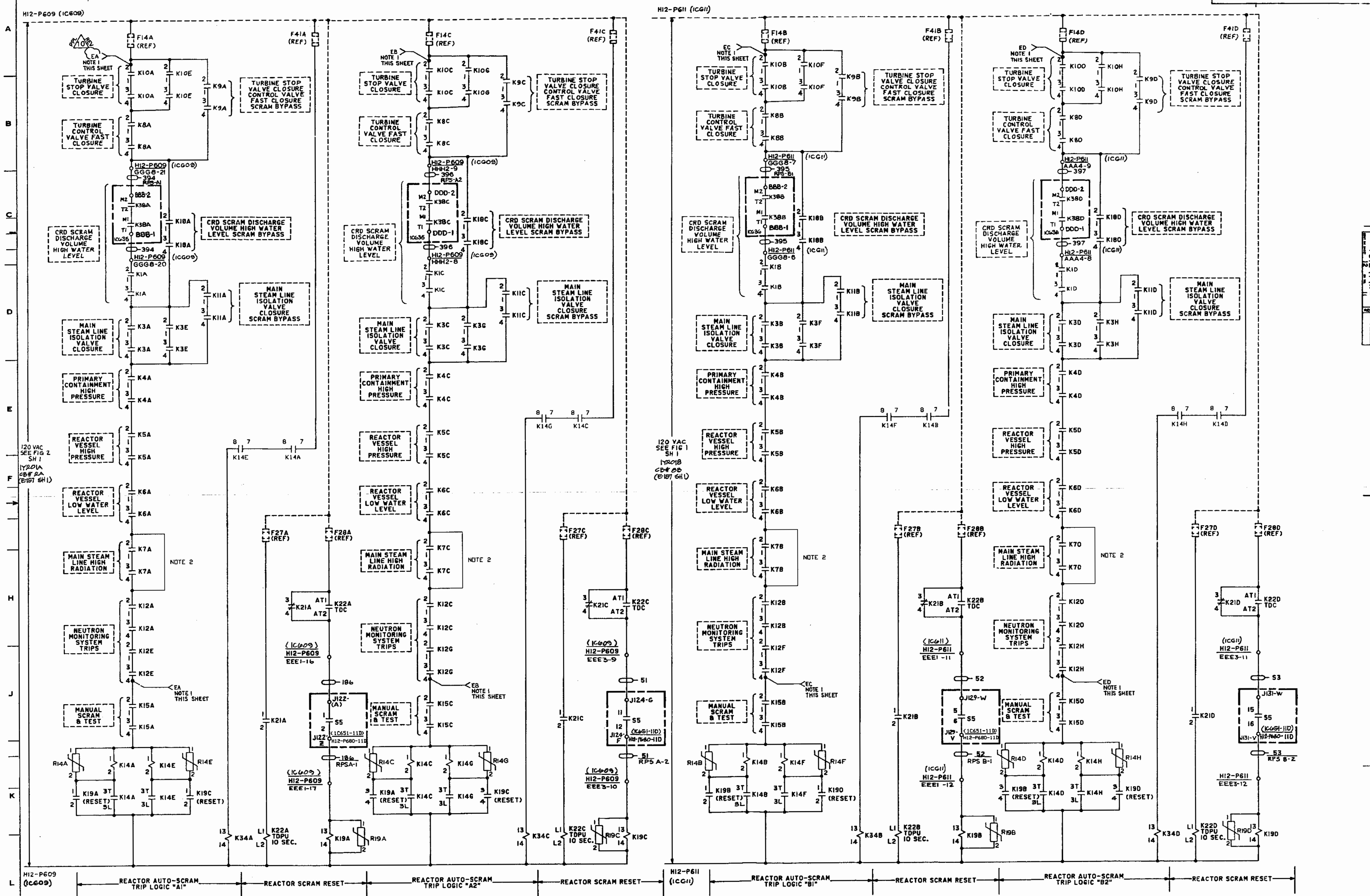
PPL DRAWING NO.	SHEET NO.	REV.
FF122610	2206	20
A/E DRAWING NO. M1-C72-22	SHEET NO. 6	

191E414WJ

C I

GENERAL ELECTRIC 791E414WJ

ELEM DIAG
REACTOR PROTECTION SYSTEM
FIRST MADE FOR SUSQUEHANNA 1



LINE CODES
51-53, 186, 394-397

NOTES:

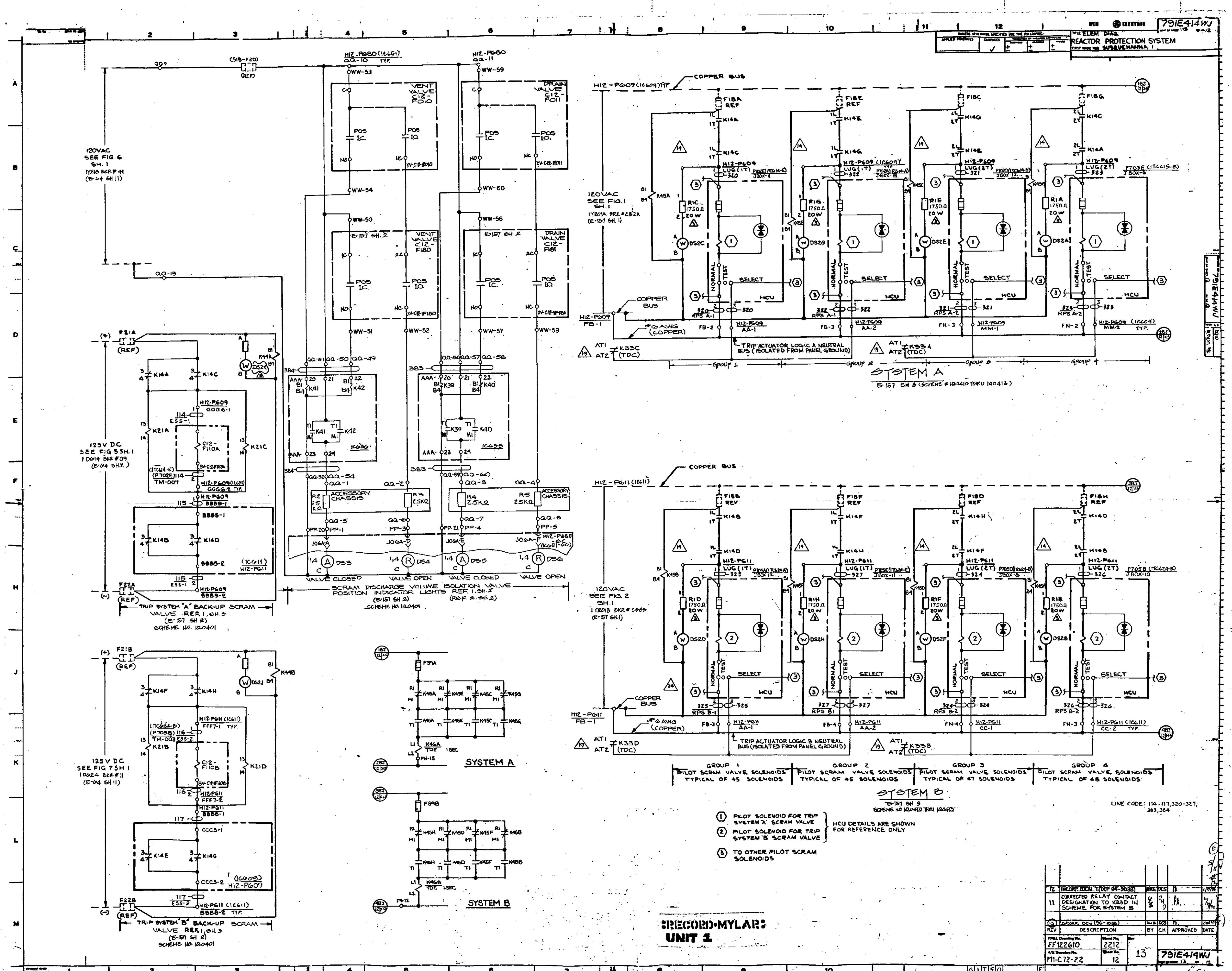
1. JACK PAIRS JUMPERED PER ES PROCEDURE.
2. RPS TRIP FUNCTION ELIMINATED PER DCP 294805 ANNUNCIATION AND COMPUTER INPUT FUNCTIONS REMAIN OPERABLE.

UNIT 1

REV	DESCRIPTION	APPROVALS
10	REVISED AS INDICATED PER RESOLUTION OF EWR 510778	DRAWING APPROVAL ATTACHED TO NIMS MEDIA AS "APPROVAL HISTORY"

PPL Drawing No.	Sheet No.	Rev
FF122610	2211	10
A/E Drawing No. M1-C72-22	11	

791E414WJ 12 CI


ELEM DIAG
REACTOR PROTECTION SYSTEM
SUSQUEHANNA 1
791E414WJ
COPPER BUS
120VAC SEE FIG 6 SH. 1
125V DC SEE FIG 5 SH. 1
125V DC SEE FIG 7 SH 1
120VAC SEE FIG. 1 SH. 1
120VAC SEE FIG. 2 SH. 1
VENT VALVE C12-F010
DRAIN VALVE C12-F011
VENT VALVE C12-F180
DRAIN VALVE C12-F181
ACCESSORY CHASSIS
VALVE CLOSED
VALVE OPEN
SCRAM DISCHARGE VOLUME ISOLATION VALVE POSITION INDICATOR LIGHTS REF. 1, SH. 2
TRIP SYSTEM "A" BACK-UP SCRAM VALVE REF. 1, SH. 3
TRIP SYSTEM "B" BACK-UP SCRAM VALVE REF. 1, SH. 3
TRIP ACTUATOR LOGIC A NEUTRAL BUS (ISOLATED FROM PANEL GROUND)
TRIP ACTUATOR LOGIC B NEUTRAL BUS (ISOLATED FROM PANEL GROUND)
SYSTEM A
SYSTEM B
GROUP 1
GROUP 2
GROUP 3
GROUP 4
PILOT SCRAM VALVE SOLENOIDS TYPICAL OF 45 SOLENOIDS
PILOT SCRAM VALVE SOLENOIDS TYPICAL OF 45 SOLENOIDS
PILOT SCRAM VALVE SOLENOIDS TYPICAL OF 47 SOLENOIDS
PILOT SCRAM VALVE SOLENOIDS TYPICAL OF 48 SOLENOIDS
SELECT
HCU
NORMAL
TEST
1 PILOT SOLENOID FOR TRIP SYSTEM "A" SCRAM VALVE
2 PILOT SOLENOID FOR TRIP SYSTEM "B" SCRAM VALVE
HCU DETAILS ARE SHOWN FOR REFERENCE ONLY
3 TO OTHER PILOT SCRAM SOLENOIDS
LINE CODE: 114-117, 320-327, 383, 384
RECORD MYLAR
UNIT 1
CORRECTED RELAY CONTACT DESIGNATION TO K33D IN SCHEME FOR SYSTEM B
REV
DESCRIPTION
BY
CH
APPROVED
DATE
FF122610
2212
M1-C72-22
12
13

TALEN ENERGY

LOC29
NRC INITIAL LICENSE EXAM

Simulator JPM A

TEAM SUSQUEHANNA
Generating Excellence

EXAMINATION MATERIAL
Do not leave unattended without ensuring materials are secured in accordance with training procedures.

SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Drain MSIV Leakage to Main Condenser Post-LOCA

JPM#: 84.OP.24668.152 Revision: 0 Date: 06/13/2017

Applicability: ☒ RO ☒ SRO

Setting: Simulator

NUREG–1123 E/APE / Sys 239001 K/A Number A4.02 K/A Importance 3.2/3.2

Alternate Path: ☐ YES ☒ NO Time Critical ☐ YES ☒ NO Validation Time (min): 10

Testing Method: ☐ Simulate ☒ Perform

Author: Michael Wilcox Date: 06/13/2017

Operations Review: Collin Breitman Date: 12/4/17

Validated: Michael Wilcox Date: 11/21/17

Approval: Jeffrey Dillls Date: 12/7/17
Nuclear Training Supervisor

Examinee Name: ______________________ ______________________
Last, First MI Employee Number

Exam Date: ______________ Exam Duration (Min): ______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator: ______________________ ______________________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
84.OP.24668.152

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP-184-001, MAIN STEAM SYSTEM

III. TASK CONDITIONS

- A loss of coolant accident has occurred.
- A LOCA signal was first received 25 minutes ago.
- The MSIVs are closed

IV. INITIATING CUE

Drain MSIV leakage to the Main Condenser IAW OP-184-001, section 2.4

V. TASK STANDARD

Drain MSIV leakage to the Main Condenser

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
84.OP.24668.152

NOTE:	It is permissible to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

Setup the simulator with the following conditions:

- Reactor scrammed.
- Drywell pressure >1.00 psig.
- MSIVs closed.

IC for LOC 29 NRC exam is 392.

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the initiating cue.
- This JPM must be performed in the simulator. Reset to exam-specific IC-_392__, or configure the simulator per the Simulator Setup Instructions.
- Have a copy of OP-184-001 Section 2.4.

BOOTH OPERATOR CUE

When student is ready to begin the JPM and the evaluator indicates, place the simulator in RUN.

EVALUATOR CUE

Record JPM start time: __________

Step	Action	Standard	Eval	Comments
1	**Identifies** governing procedure and obtain controlled copy.	**Obtains** a controlled copy of OP-184-001 from evaluator. Selects Section 2.4. Reviews procedure as necessary	S / U	
2	Lineup Primary Flowpath as follows: Open or Confirm OPEN Mn Steam Line Warmup HV-141F020 (1C601).	**Observes** HV-141F020 red light on, amber light off	S / U	
3*	Open Mn Stm Line Drain To Cdsr HV-141F021 (1C601).	**Opens** HV-141F021 by depressing OPEN pushbutton.	S / U	
4*	Close Mn Stm SJAE Iso HV-10107 (1C668).	**Closes** HV-10107 by depressing CLOSE pushbutton.	S / U	
5*	Close SSE Mn Stm Sup HV-10109 (1C668).	**Closes** HV-10109 by depressing CLOSE pushbutton.	S / U	
6*	Close RFPT Mn Stm Sup Iso HV-10111 (1C668).	**Closes** HV-10111 by depressing CLOSE pushbutton.	S / U	

EVALUATOR NOTE / CUE That completes the JPM.	
EVALUATOR CUE Record JPM stop time: __________	
EVALUATOR NOTE Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?	

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE
84.OP.24668.152

NOTE:	All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw

10. Verify the JPM reflects the most current revision of the procedure.

Procedure	OP-184-001	Rev	38
Procedure		Rev	
Procedure		Rev	

Mpw 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor: ______________________ Date: ____________

Instructor: ______________________ Date: ____________

REVISION SUMMARY

JOB PERFORMANCE MEASURE
84.OP.24668.152

Revision	Description/Purpose of Revision
0	Created from JPM 84.OP.001.152 R1. Reformatted to the Vision template.

EVALUATOR COPY:

TASK CONDITIONS

- A loss of coolant accident has occurred.
- A LOCA signal was first received 25 minutes ago.
- The MSIVs are closed

INITIATING CUE

Drain MSIV leakage to the Main Condenser IAW OP-184-001, section 2.4

EXAMINEE COPY:

TASK CONDITIONS

- A loss of coolant accident has occurred.
- A LOCA signal was first received 25 minutes ago.
- The MSIVs are closed

INITIATING CUE

Drain MSIV leakage to the Main Condenser IAW OP-184-001, section 2.4

2.4 DRAINING MSIV LEAKAGE TO MAIN CONDENSER POST LOCA

2.4.1 Prerequisites

- ☐ a. AC Power available in accordance with OP-105-001 (480V)
- ☐ b. At least one MSIV in each line closed.
- ☐ c. Loss of Coolant Accident (LOCA) condition exists.

2.4.2 Precautions

None

☐ NOTE (1):	All operations are performed within the Control Room at Panels 1C601 or 1C668 as indicated.
☐ NOTE (2):	This lineup is to be completed at least 20 minutes after the LOCA signal according to the designed 4KV Bus Loading Scheme. Actual implementation will be directed by EP-PS-102.
☐ NOTE (3):	This Lineup takes advantage of the large volume in the Steam Lines and Condenser to provide hold-up and plate-out of fission products that may leak from the MSIVs.
☐ NOTE (4):	The Primary Flowpath is the one used in the Radiological Analysis.

2.4.3 **Lineup** Primary Flowpath as follows:

- ☐ a. **Open** or **Confirm OPEN** Mn Steam Line Warmup HV-141F020 (1C601).
- ☐ b. **Open** Mn Stm Line Drain To Cdsr HV-141F021 (1C601).
- ☐ c. **Close** Mn Stm SJAE Iso HV-10107 (1C668).
- ☐ d. **Close** SSE Mn Stm Sup HV-10109 (1C668).
- ☐ e. **Close** RFPT Mn Stm Sup Iso HV-10111 (1C668).

☐

NOTE:	If the primary flowpath cannot be established (HV-141F021 not open), then the following normally open secondary flowpaths are confirmed open. This secondary flowpaths is acceptable in the event of HV-141F021 failure to open.

2.4.4 <u>IF</u> HV-141F021 cannot be **OPENED**, <u>**THEN**</u> **Confirm** following Valves **OPEN**:

☐ a. MSL A Drip Leg Orificed Drain (HV-10112A2).

☐ b. MSL B Drip Leg Orificed Drain (HV-10112B2).

☐ c. MSL C Drip Leg Orificed Drain (HV-10112C2).

☐ d. MSL D Drip Leg Orificed Drain (HV-10112D2).

☐ e. MSL Bypass Header Drip Leg Orificed Drain (HV-10108B).

☐ f. MSL Drain Line Orificed Drain (141F033).

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Simulator JPM B

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JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Swap Feedwater Level Control

JPM#: 45.OP.23984.101 Revision: 0 Date: 06/15/2017

Applicability: ☒ RO

Setting: Simulator

NUREG–1123 E/APE / Sys 259002 K/A Number A4.01 K/A Importance 3.8/3.6

Alternate Path: ☐ YES ☒ NO Time Critical ☐ YES ☒ NO Validation Time (min):20

Testing Method: ☐ Simulate ☒ Perform

Author: Michael Wilcox Date: 06/15/2017

Operations Review: Collin Breitman Date: 12/4/17

Validated: Michael Wilcox Date: 11/21/17

Approval: Jeffrey Dills Date: 12/7/17
Nuclear Training Supervisor

Examinee Name: ______________________ ______________
Last, First MI Employee Number

Exam Date: ______________ Exam Duration (Min):______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator:______________________ ______________________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
45.OP.23984.101

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP-145-001, RFP and RFP Lube Oil System

III. TASK CONDITIONS

- Feedwater level control is in automatic.
- Feedwater level control is selected to Narrow Range level A to support I&C work.
- I&C has requested Feedwater level control be swapped to NRLB BIASED to support continued work.
- All prerequisites have been met

IV. INITIATING CUE

Swap Feedwater level control from Narrow Range level A to NRLB BIASED IAW OP-145-001 section 2.21.

V. TASK STANDARD

Feedwater level control swapped from Narrow Range level A to NRLB BIASED per OP-145-001.

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
45.OP.23984.101

NOTE:	It is permissible to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

1. **Reset** the simulator to IC-_20_.
2. **Other** actions

Setup the simulator with the following conditions:

- Reactor operating at 95%.
- Feedwater level control in automatic, 3-element control with level manually selected to Narrow Range level A.
- Narrow Range level A overridden to indicate >1" higher than Narrow Range level B and C using the following malfunction:

IMF cmfTD04_PDTC321N004A f:2

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the initiating cue.
- This JPM must be performed in the simulator. Reset to exam-specific IC-___, or configure the simulator per the Simulator Setup Instructions.
- Have a copy of OP-145-001 section 2.21

BOOTH OPERATOR CUE

When student is ready to begin the JPM and the evaluator indicates, place the simulator in RUN.

EVALUATOR CUE

Record JPM start time: __________

Step	Action	Standard	Eval	Comments
1	**Identifies** governing procedure and obtain controlled copy.	Obtains a controlled copy of OP-145-001 from evaluator. Selects Section 2.21. Reviews procedure as necessary.	S / U	
2	Perform either of following Steps as required: • Step 2.21.4 - IF restoring FWLC System to AUTO SELECT • Step 2.21.5 - IF Manually selecting a FWLC Level input.	**Proceeds** to step 2.21.5.	S / U	
3	IF desired to Manually select a FWLC Level input: Ensure Shift Supervision has authorized Manual Level Input Selection.	**Determines** Shift Supervision has authorized operation based on initial conditions / initiating cue.	S / U	
4*	Touch FWLC SELECT button, to open FWLC Selection overlay.	**Depresses** FWLC SELECT button or FWLC select area of HMI screen to bring up HS-C32-1S01 MANUAL LEVEL INPUT SELECTION overlay.	S / U	

<table>
<tr><td colspan="5"><u>EVALUATOR NOTE</u>
The same HMI overlay screen can be brought up by touching the FWLC select area. This action would also satisfy this critical step. This action may be repeated later as the candidate switches between HMI screens/overlays.</td></tr>
<tr><td>5</td><td>Perform either of following Steps as applicable:
• Step 2.21.5.d - IF Level Channel to be selected is reading within +/- 1” of the Selected Level on FW Master Controller LIC-C32-1R600.
• Step 2.21.5.e - IF Level Channel to be selected is not reading within +/- 1” of the Selected Level on FW Master Controller LIC-C32-1R600.</td><td>Observes indicated level for Narrow Range A and B.

Determines difference between Narrow Range A and NRLB BIASED level is >1”.

Proceeds to step 2.21.5.e.</td><td>S / U</td><td></td></tr>
<tr><td>6*</td><td>IF desired to Manually select a FWLC Level input and Channel to be selected is not reading within +/- 1” of Selected Level on FW Master Controller LIC-C32-1R600, Perform following (normal steady state operations):

Place the FW LEVEL CTL/DEMAND SIGNAL LIC-C32-1R600 Controller in MANUAL.</td><td>Places LIC-C32-1R600 in MANUAL by performing the following:
• Touches RX MASTER LVL CONTROL area or 1R600 MASTER CTLR button.
• Touches MAN button.</td><td>S / U</td><td></td></tr>
<tr><td colspan="5"><u>EVALUATOR NOTE</u>
The same HMI overlay screen can be brought up by touching the FWLC select area. This action would also satisfy this critical step. This action may be repeated later as the candidate switches between HMI screens/overlays.</td></tr>
<tr><td colspan="5"><u>EVALUATOR NOTE</u>
Candidate may switch between HMI screens/overlays as necessary to accomplish operations and monitor parameters.</td></tr>
<tr><td>7*</td><td>Touch applicable button for desired Level input which will be used:
NRLB BIASED</td><td>Depresses NRLB BIASED button on HS-C32-1S01 MANUAL LEVEL INPUT SELECTION overlay.</td><td>S / U</td><td></td></tr>
</table>

8	Touch INC/DEC LVL SETPT buttons on LIC-C32-1R600 controller in order to null Actual Level and Level Setpoint indications on LIC-C32-1R600 controller are within 0.5" of each other.	**Depresses** INC/DEC LVL SETPT buttons as necessary to null Actual Level and Level Setpoint indications on LIC-C32-1R600 overlay.	S / U	
9*	Touch AUTO button on FW LEVEL CTL/DEMAND SIGNAL LIC-C32-1R600 controller.	**Depresses** AUTO button on FW LEVEL CTL/DEMAND SIGNAL LIC-C32-1R600 controller	S / U	
10	Ensure MANUAL FWLC SELECT is indicated on the FW OVERVIEW HMI screen.	**Observes** MANUAL FWLC SELECT is indicated on FW OVERVIEW HMI screen.	S / U	
11	Touch INC/DEC LVL SETPT buttons as necessary in 0.5" increments in order to slowly restore Level Setpoint to 35".	**Depresses** INC/DEC LVL SETPT buttons on LIC-C32-1R600 overlay as necessary to restore level setpoint to 35".	S / U	
EVALUATOR CUE If asked what the desired level setpoint it, direct a level setpoint of 35".				
12	Observe stable RPV Water Level.	**Observes** Reactor water level is stable.	S / U	
EVALUATOR CUE Record JPM stop time: ___________				
EVALUATOR NOTE Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE
45.OP.23984.101

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw 10. Verify the JPM reflects the most current revision of the procedure.

Procedure OP-145-001 Rev 86
Procedure ______ Rev ______
Procedure ______ Rev ______

Mpw 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor: ______________________ Date: ____________

Instructor: ______________________ Date: ____________

REVISION SUMMARY

JOB PERFORMANCE MEASURE
45.OP.23984.101

Revision	Description/Purpose of Revision
0	Created from JPM 45.OP.013.151 R7. Reformatted to the Vision template.

EVALUATOR COPY:

TASK CONDITIONS

- Feedwater level control is in automatic.
- Feedwater level control is selected to Narrow Range level A to support I&C work.
- I&C has requested Feedwater level control be swapped to NRLB BIASED to support continued work.
- All prerequisites have been met

INITIATING CUE

Swap Feedwater level control from Narrow Range level A to NRLB BIASED IAW OP-145-001 section 2.21.

EXAMINEE COPY:

TASK CONDITIONS

- Feedwater level control is in automatic.
- Feedwater level control is selected to Narrow Range level A to support I&C work.
- I&C has requested Feedwater level control be swapped to NRLB BIASED to support continued work.
- All prerequisites have been met

INITIATING CUE

Swap Feedwater level control from Narrow Range level A to NRLB BIASED IAW OP-145-001 section 2.21.

2.21 TRANSFERRING FWLC LEVEL INPUT SELECTION

2.21.1 Prerequisites

☐ a. If switching feedwater level control, the level input channel to be selected is available and indicating within 2 inches of current level indication.

☐ b. At least one Level Instrument is available for selection.

☐ c. RPV Water Level stable.

☐ d. Feed Flow/Steam Flow delta stable.

☐ e. Shift Supervision has authorized the Manual selection of a FWLC level input.

2.21.2 Precautions

a. At any time automatic level control is suspected of not operating correctly, a specific level channel can be manually selected.

b. IF a Level input is **Manually Selected**, the following consequences are possible:

(1) IF selected level instrument fails with a rising trend, either of the following will occur (assuming no Operator Action):

(a) IF indicated level remains < 61.2", Reactor level will lower and a Reactor Scram will occur.

(b) IF indicated level should raise to > 61.2", the Level Instrument will be declared **Unusable** and Selected Level will Default to 35". Actual RPV Level trend will depend upon the Feed Flow/Steam Flow mismatch which was present at the time of the failure.

(2) IF selected level instrument fails downscale, Reactor level will rise, RFPTs and Main Turbine will trip, and a Reactor Scram occurs, if > 26% RTP.

(3) **Prompt** Operator action will be required to Manually control RPV Level **PER** ON-LVL-101, RPV Level Control System Malfunction if either of the previous stated conditions should occur.

(4) IF ICS System detects the selected level signal to be BAD or Unusable, a Default Water Level of 35" will be provided to the FWLC logic. Timely Operator action will then be required to prevent actual water level from becoming too high or too low.

☐

NOTE:	Steps within this procedure section are stand alone and can be performed as needed; however, their sub-steps must be performed step-by-step. N/A steps that are not required.

2.21.3 **Perform** either of following steps as required:

☐ a. Step 2.21.4 IF **restoring** FWLC System to AUTO SELECT

☐ b. Step 2.21.5 IF **Manually** selecting a FWLC Level input.

2.21.4 IF desired to Restore FWLC System to AUTO SELECT:

☐ a. **Touch** FWLC SELECT button on bottom horizontal menu, to open FWLC Selection overlay.

b. **Perform** either of following Steps as applicable:

☐ (1) Step 2.21.4.c IF Level Channel to be selected is reading within +/- 1"of the Selected Level on FW Master Controller LIC-C32-1R600

☐ (2) Step 2.21.4.d IF Level Channel to be selected is **not** reading within +/- 1"of Selected Level on FW Master Controller LIC-C32-1R600.

☐ NOTE (1): Auto FWLC Input Selection will select any of the following Level inputs based upon availability (in the order listed):

- AVG LVL
- NRLB Biased
- NR LVL A
- NR LVL C
- UPSET LVL BIASED

☐ NOTE (2): Auto FWLC Input Selection will **not** select either of the following inputs as they are only available as a Manual Input Level Selection:

- NR LVL B
- UPSET LVL

c. IF desired to align for **Automatic** FWLC Level Input selection and channel to be selected is reading within +/- 1" of Selected Level on FW Master Controller LIC-C32-1R600, **Perform** following (normal steady state operations):

☐ (1) **Touch** AUTO FWLC INPUT SELECTION button on FWLC INPUT SELECT, HS-C32-1S01.

☐ (2) **Observe** ICS System automatically selects an operable Level input, by observing associated button illuminating yellow.

☐ (3) **Observe** that Auto FWLC Input Selection button illuminates yellow.

d. IF desired to align for **Automatic** FWLC Level Input selection and channel to be selected is **not** reading within +/- 1" of Selected Level on FW Master Controller LIC-C32-1R600, **Perform** following (transient operations):

☐ (1) **Place** FW LEVEL CTL/DEMAND SIGNAL LIC-C32-1R600 controller in **MANUAL**.

☐ (2) **Touch** AUTO FWLC INPUT SELECTION button on FWLC INPUT SELECT, HS-C32-1S01.

☐ (3) **Touch** INC/DEC LVL SETPT buttons on the LIC-C32-1R600 controller in order to null the Actual Level and Level Setpoint indications on the LIC-C32-1R600 controller.

☐ (4) **IF** deviation nulls, **Touch** AUTO button on FW LEVEL CTL/DEMAND SIGNAL LIC-C32-1R600 controller.

☐ (a) **Ensure** AUTO FWLC SELECT is indicated on the FW OVERVIEW HMI screen in the FWLC status block.

☐ (b) **Adjust** FW LEVEL CTL/DEMAND SIGNAL controller LIC-C32-1R600 INC/DEC LVL SETPT buttons in increments of 0.5" in order to slowly restore Level Setpoint to 35".

☐ (5) **IF** deviation cannot be nulled, **Align** FWLC system for Manual Level Selection in accordance with this procedure.

2.21.5 **IF** desired to **Manually** select a FWLC Level input:

☐ a. **Ensure** Shift Supervision has authorized Manual Level Input Selection.

☐ b. **Touch** FWLC SELECT button, to open FWLC Selection overlay.

☐ NOTE (1): Manual selection of a Feedwater Level input (with the exception of AVG LEVEL), will remove the system's ability to automatically select the next available level input, upon the failure of the selected input.

☐ NOTE (2): Manually selecting the AVG LVL FWLC Level Input will place the FWLC System in an AUTO FWLC Select alignment.

c. **Perform** either of following Steps as applicable:

☐ (1) Step 2.21.5.d IF Level Channel to be selected is reading within +/- 1"of the Selected Level on FW Master Controller LIC-C32-1R600

☐ (2) Step 2.21.5.e IF Level Channel to be selected is **not** reading within +/- 1"of the Selected Level on FW Master Controller LIC-C32-1R600.

☐ d. **IF** desired to **Manually** select a FWLC Level input and Channel to be selected is reading within +/- 1" of Selected Level on the FW Master Controller LIC-C32-1R600, **Perform** following (normal steady state operations):

(1) **Touch** applicable button for desired Level input which will be used:

☐ (a) AVG LVL (only if NRLA and NRLB Inputs are valid)

☐ (b) NRLB Biased

☐ (c) NR LVL A

☐ (d) NR LVL C

☐ (e) NR LVL B

☐ (f) UPSET LVL BIASED

☐ (g) UPSET LVL

☐ (2) **Observe** selected button illuminates yellow.

☐ (3) **Observe** stable RPV Water Level.

☐ (4) **Ensure** MANUAL FWLC SELECT is indicated on FW OVERVIEW HMI screen.

e. IF desired to **Manually** select a FWLC Level input and Channel to be selected is **not** reading within +/- 1" of Selected Level on FW Master Controller LIC-C32-1R600, **Perform** following (normal steady state operations):

☐ (1) **Place** the FW LEVEL CTL/DEMAND SIGNAL LIC-C32-1R600 Controller in **MANUAL**.

(2) **Touch** applicable button for desired Level input which will be used:

☐ (a) NRLB Biased

☐ (b) NR LVL A

☐ (c) NR LVL C

☐ (d) NR LVL B

☐ (e) UPSET LVL BIASED

☐ (f) UPSET LVL

☐ (3) **Touch** INC/DEC LVL SETPT buttons on LIC-C32-1R600 controller in order to null Actual Level and Level Setpoint indications on LIC-C32-1R600 controller are within 0.5" of each other .

☐ (4) **Touch** AUTO button on FW LEVEL CTL/DEMAND SIGNAL LIC-C32-1R600 controller.

☐ (5) **Ensure** MANUAL FWLC SELECT is indicated on the FW OVERVIEW HMI screen .

☐ (6) **Touch** INC/DEC LVL SETPT buttons as necessary in 0.5" increments in order to slowly restore Level Setpoint to 35"".

☐ (7) **Observe** stable RPV Water Level.

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EXAMINATION MATERIAL
Do not leave unattended without ensuring materials are secured in accordance with training procedures.

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JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Vent the Drywell

JPM#: 73.OP.2287.101 Revision: 5 Date: 02/06/2018

Applicability: ☒ RO ☒ SRO

Setting: Simulator

NUREG–1123 E/APE / Sys 261000 K/A Number A4.04 K/A Importance 3.3/3.4

Alternate Path: ☐ YES ☒ NO Time Critical ☐ YES ☒ NO Validation Time (min): 17

Testing Method: ☐ Simulate ☒ Perform

Author: Paul Isham Date: 2/6/18

Operations Review: Collin Breitman Date: 2/6/18

Validated: Michael Wilcox Date: 2/6/18

Approval: Jeffrey Dills Date: 2/14/18
Nuclear Training Supervisor

Examinee Name: ______________________________ ____________________
Last, First MI Employee Number

Exam Date: ____________________ Exam Duration (Min): ____________________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator: ______________________________ ______________________________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
73.OP.2287.101

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP-173-003, Primary Containment Nitrogen Makeup And Venting
B. OP-070-001, Standby Gas Treatment System

III. TASK CONDITIONS

- Unit 1 is in Mode 1.
- Drywell pressure is 0.5 psig up slow.
- Standby Gas Treatment System is aligned for automatic initiation per OP-070-001 Section 2.1.
- No containment inerting/de-inerting activities are in progress on Unit 2.
- Nitrogen makeup to Unit 1 Drywell is secured.
- All TR/TS requirements are met for venting the Drywell.

IV. INITIATING CUE

Reduce Drywell pressure to 0.2 psig per OP-173-003, Primary Containment Nitrogen Makeup and Venting, Section 2.3. Utilize SGTS Train A.

V. TASK STANDARD

SGTS in operation, Drywell vent initiated with Drywell pressure lowering, then Drywell vent secured.

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
73.OP.2287.101

SIMULATOR SETUP INSTRUCTIONS

Setup the simulator with the following conditions:

1. **Reset** the simulator to any rated-power IC. (IC-393 for LOC 29 NRC Exam)
2. **Open** N2 makeup valves SV-15767 and SV-15789 (sim PID PC5) until DW pressure reaches 0.5 psig, then **close** the valves.

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the initiating cue.
- This JPM must be performed in the simulator. Configure the simulator per the Simulator Setup Instructions.
- Provide marked up copy of OP-173-003, complete through step 2.3.3

BOOTH OPERATOR CUE

When student is ready to begin the JPM and the evaluator indicates, place the simulator in RUN.

EVALUATOR CUE

Record JPM start time: __________

Step	Action	Standard	Eval	Comments
1	**Identifies** governing procedure and obtain controlled copy.	Obtains controlled copy of OP-173-003, reviews Section 2.3.	S / U	
2	**Manually Start** SGTS in accordance with OP-070-001. (Step 2.3.4 of OP-173-003)	Obtains OP-070-001. Selects section 2.2.	S / U	
3	**Evaluates** entry into TS 3.6.4.3 for SBGT. (Step 2.2.3 of OP-070-001)	Notes all TS/TRM requirements for venting Drywell met per Task Conditions.	S / U	

EVALUATOR NOTE

HD07555A remains open for approximately 120 seconds after its respective pushbutton is released. The next two steps must be performed expeditiously to establish a flow path and allow SGTS to start.

Step	Action	Standard	Eval	Comments
*4	**Opens** SGTS Cooling Outside Air Damper HD07555A. (Step 2.2.4/5 of OP-070-001)	Perform the following: • *Depress SGTS Clg 0A Dmp HD07555A OPEN pushbutton • Observe SGTS Clg 0A Dmp HD07555A indicate FULL OPEN	S / U	

*5	**Start** SGTS System A (Step 2.2.6/7 of OP-070-001)	Perform the following: • ***Places** SGTS Fan 0V109A to **START**. • Observe flow increase >3000 cfm on SGTS Air Flow FR07553A.	S / U	
6	**Checks** SGTS A alignment. (Step 2.2.8 of OP-070-001)	Observes the following: • SGTS Makeup 0A Dmp FD07551A2 MODULATED/OPEN approximately 120 seconds after SGTS Fan 0V109A started • SGTS Fan Inlet Dmp HD07552A FULL OPEN • SGTS A Inlet Dmp HD07553A FULL OPEN	S / U	
7	**Vent** desired system to SGTS Inlet Header	Determines 2.2.9.b applies; For inerting, purging or primary containment pressure control for Unit 1, **Perform** actions for desired evolution in accordance with OP-173-003		
<u>EVALUATOR NOTE</u> Examinee should indicate where to observe Drywell to Suppression Chamber differential pressure and note current value.				
<u>EVALUATOR CUE</u> Another operator will update the log.				
3	**Updates** the Unit 1 Log. (Step 2.3.6 of OP-173-003)	Notify other operator to log start time of Drywell vent in Unit 1 log.	S / U	

*4	**Vents** the Drywell to SGTS A. (Step 2.3.7 of OP-173-003)	Open the following dampers: • HD17508A DRWL/WETWELL BURP DMP • HD17508B DRWL/WETWELL BURP DMP • HV-15713 DRWL VENT IB ISO • HV-15711 DRWL VENT BYPS OB ISO	S / U	
5	**Monitors** Drywell pressure. (Step 2.3.8 of OP-173-003)	Observe Drywell pressure lowering on any of the following: • Computer point MAP01 or MAP001Z • PPC screen CONTN • PI-15702 CONTN OR SUPP CHMBR PRESS with selector switch HSS-15702 selected to CONTN	S / U	
<u>EVALUATOR NOTE</u> As soon as the examinee notes a lowering trend in Drywell pressure, provide the cue to secure venting.				
<u>EVALUATOR CUE</u> Drywell pressure is acceptable, secure venting.				
*6	**Secures** Drywell vent. (Step 2.3.9 of OP-173-003)	When Drywell pressure is approximately 0.2 psig, close the following dampers: • HV-15713 DRWL VENT IB ISO • HV-15711 DRWL VENT BYPS OB ISO • HD17508A DRWL/WETWELL BURP DMP • HD17508B DRWL/WETWELL BURP DMP	S / U	
<u>EVALUATOR NOTE / CUE</u> That completes the JPM.				

EVALUATOR CUE Record JPM stop time: __________
EVALUATOR NOTE Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE
73.OP.2287.101

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw ______ 10. Verify the JPM reflects the most current revision of the procedure.

Procedure	OP-173-003	Rev	14
Procedure	OP-070-001	Rev	30
Procedure		Rev	

Mpw ______ 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A ______ 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor: ______________________ Date: ____________

Instructor: ______________________ Date: ____________

REVISION SUMMARY

JOB PERFORMANCE MEASURE
73.OP.2287.101

Revision	Description/Purpose of Revision
5	Minor editorial corrections. Revised from 73.OP.001.001 Rev 4.

EVALUATOR COPY:

TASK CONDITIONS

Unit 1 is in Mode 1.

Drywell pressure is 0.5 psig up slow.

Standby Gas Treatment System is aligned for automatic initiation per OP-070-001 Section 2.1.

No containment inerting/de-inerting activities are in progress on Unit 2.

Nitrogen makeup to Unit 1 Drywell is secured.

All TR/TS requirements are met for venting the Drywell.

INITIATING CUE

Reduce Drywell pressure to 0.2 psig per OP-173-003, Primary Containment Nitrogen Makeup and Venting, Section 2.3. Utilize SGTS Train A.

EXAMINEE COPY:

TASK CONDITIONS

Unit 1 is in Mode 1.

Drywell pressure is 0.5 psig up slow.

Standby Gas Treatment System is aligned for automatic initiation per OP-070-001 Section 2.1.

No containment inerting/de-inerting activities are in progress on Unit 2.

Nitrogen makeup to Unit 1 Drywell is secured.

All TR/TS requirements are met for venting the Drywell.

INITIATING CUE

Reduce Drywell pressure to 0.2 psig per OP-173-003, Primary Containment Nitrogen Makeup and Venting, Section 2.3. Utilize SGTS Train A.

2.3 VENTING DRYWELL

2.3.1 Prerequisites

a. Standby Gas Treatment System available in accordance with OP-070-001.

b. Unit 2 not inerting or de-inerting primary containment, to prevent cross-connecting Unit 1 and Unit 2 containments.

c. Primary Containment Drywell must be determined to be properly aligned for VENTING through SGTS within 4 hours prior to start of VENTING of Drywell (TRS 3.6.1.1).

d. CL-173-0011 complete.

e. CL-173-0012 complete.

f. CL-173-0013 complete.

g. CL-173-0014 complete.

h. CL-173-0016 complete.

i. Nitrogen makeup to Unit 1 Drywell not in progress (this would constitute PURGING as defined in TRM 1.1 and require sampling in accordance with TRM 3.11.2.1).

2.3.2 Precautions

None

2.3.3 **Comply** with following TR/TS requirements:

a. In accordance with TRS 3.6.1.1, the requirements of TR 3.6.1 “Venting and Purging” are met within 4 hours prior to start of and at least once per 12 hours during venting or purging of drywell.

b. In accordance with TR 3.6.1, VENTING or PURGING of the containment drywell shall be performed only with the following conditions established:

(1) Both Standby Gas Treatment System OPERABLE in accordance with LCO 3.6.4.3 "Standby Gas Treatment (SGT) System."

☐ (2) Whenever PURGING during MODE 1, 2, or 3, only one of the SGT System trains may be used. This restriction does not apply during VENTING.

☐ (3) LCO 3.3.6.1 "Primary Containment Isolation Instrumentation" Function 2.e "SGTS Exhaust Radiation - High" shall be operable.

☐ c. During operation of Standby Gas Treatment System, SBGT VERMS OPERABLE in accordance with TR 3.11.2.6 **OR IF** SBGT VERMS INOPERABLE, **THEN**

☐ (1) **Perform** Alternate sampling every 4 hours during SBGT Operation

AND

☐ (2) **Analyze** grab sample within 24 hrs of obtaining the grab sample.

AND

☐ (3) **Restore** monitoring Instrumentation within 30 days.

☐ 2.3.4 **Manually Start** SGTS in accordance with OP-070-001.

☐ 2.3.5 **Ensure** Drywell pressure does not become >0.5 psig below suppression chamber pressure, to prevent opening vacuum breakers.

☐

NOTE:	If pressure decreased to low pressure alarm setpoint (approximately 0.1 psig), pressure will have to be increased to approximately 0.5 psig to reset alarm.

☐ 2.3.6 **Log** vent start time in Unit 1 Log.

2.3.7 **Open** following:

☐ a. HD17508A DRWL/WETWELL BURP DMP

☐ b. HD17508B DRWL/WETWELL BURP DMP

☐ c. HV-15713 DRWL VENT IB ISO

☐ d. HV-15711 DRWL VENT BYPS OB ISO

☐ 2.3.8 **Monitor** Drywell Pressure using any of the following:

- Computer point MAP01 or MAP001Z
- PPC screen CONTN
- PI-15702 CONTN OR SUPP CHMBR PRESS with selector switch HSS-15702 selected to CONTN

2.3.9 **WHEN** Drywell pressure between -1.0 and +1.5 psig, **Secure** venting Drywell as follows:

a. **Close** following:

☐ (1) HV-15713 DRWL VENT IB ISO

☐ (2) HV-15711 DRWL VENT BYPS OB ISO

☐ (3) HD17508A DRWL/WETWELL BURP DMP

☐ (4) HD17508B DRWL/WETWELL BURP DMP

☐ b. **Shut Down** SGTS in accordance with OP-070-001.

☐ 2.3.10 **Log** vent stop time in Unit 1 Log.

2.2 MANUAL START OF STANDBY GAS TREATMENT SYSTEM.

2.2.1 Prerequisites

☐ Standby Gas Treatment System aligned in accordance with section 2.1 of this procedure.

2.2.2 Precautions

a. Maintain flow through operating SGTS Unit at or above 3000 cfm.

b. TS 3.6.4.3 requires that both Standby Gas Treatment Systems are operational when either Unit is in Modes 1, 2, or 3 or when Irradiated Fuel is being handled or work in progress with potential of draining Reactor Vessel or during Core Alterations. Review TR 3.12 for applicability.

☐ 2.2.3 **Evaluate** entry into TS 3.6.4.3 Standby Gas Treatment.

☐ NOTE: HD07555A(B) remains open for approximately 120 seconds after its respective pushbutton is released. Steps 2.2.4 through 2.2.6 must be performed expeditiously to establish a flow path and allow SGTS to start.

☐ 2.2.4 At Panel 0C681, **Depress** SGTS Clg 0A Dmp HD07555A(B) **OPEN** pushbutton.

☐ 2.2.5 **Observe** SGTS Clg 0A Dmp HD07555A(B) **OPENS** to allow suction flow path for start of SGTS Fan A(B).

☐ 2.2.6 At Panel 0C681, **Start** Standby Gas Treatment System A(B) by placing selector switch for SGTS Fan 0V109A(B) to **START**.

☐ 2.2.7 When Fan starts, **Observe** flow increases >3000 cfm on SGTS Air Flow FR07553A(B).

☐ NOTE (1):	SGTS Fans may not obtain 10,100 cfm due to insufficient suction flow path through SGTS Makeup 0A Dmp FD07551A2(B2).
☐ NOTE (2):	Makeup 0A Damper modulates to maintain inlet header DP following a manual SGTS Fan **START**. The time delay **<u>ONLY</u>** occurs after start of **First** SGTS Fan. On **Second** fan start the Makeup 0A Damper may go **Full Open** with little or no time delay.

2.2.8 **Check** following positioned as indicated:

☐ a. SGTS Makeup 0A Dmp FD07551A2(B2) **MODULATED/OPEN** approximately 120 seconds after SGTS Fan 0V109A(B) started.

☐ b. SGTS Fan Inlet Dmp HD07552A(B) **FULL OPEN**.

☐ c. SGTS A(B) Inlet Dmp HD07553A(B) **FULL OPEN**.

2.2.9 **Vent** desired system to SGTS Inlet Header as follows:

☐ a. For processing HPCI Barometric Condenser Vacuum Pump discharge, no further action required.

☐ b. For inerting, purging or primary containment pressure control for Unit 1, **Perform** actions for desired evolution in accordance with OP-173-001 and OP-173-003.

☐ c. For inerting, purging or primary containment pressure control for Unit 2, **Perform** actions for desired evolution in accordance with OP-273-001 and OP-273-003.

☐ NOTE (1):	Following conditions will trip running fan. a. Low flow sensed at common discharge ducting of SGTS Fans. Bypassed by Zone III iso signal. b. Charcoal bed fire indicated by high-high temperature downstream of bed. c. Overload.
☐ NOTE (2):	Charcoal bed fire indicated by a high-high temperature downstream of bed will prevent fan from starting.

☐ 2.2.10 If entry into TS 3.6.4.3 was required, **Evaluate** exiting TS 3.6.4.3.

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Simulator JPM D

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EXAMINATION MATERIAL
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JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Start RCIC for Injection, Component by Component

JPM#: 50.OP.010.103 Revision: 0 Date: 06/01/2017

Applicability: ☒ RO ☒ SRO

Setting: Simulator

NUREG–1123 E/APE / Sys 217000 K/A Number A4.04 K/A Importance 3.6/3.6

Alternate Path: ☒ YES ☐ NO Time Critical ☐ YES ☒ NO Validation Time (min): 15

Testing Method: ☐ Simulate ☒ Perform

Author: Michael Wilcox Date: 06/01/2017

Operations Review: Collin Breitman Date: 12/4/17

Validated: Michael Wilcox Date: 10/21/17

Approval: Jeffrey Dills Date: 12/7/17
Nuclear Training Supervisor

Examinee Name: ______________________________ ____________________
Last, First MI Employee Number

Exam Date: ____________________ Exam Duration (Min): ____________________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator: ____________________ ____________________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
50.OP.010.103

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP-150-001 Reactor Core Isolation Cooling (RCIC) System
B. AR-108-001 Reactor Core Isolation Cooling (RCIC) System 1C601

III. TASK CONDITIONS

- A Reactor scram condition exists and RCIC injection is required for inventory control.
- HPCI is OOS, all RFPs have tripped, and all Condensate pumps are unavailable.
- ESW System is in operation.
- RCIC pump discharge piping has been maintained filled and pressurized.
- MOV Overload Bypass switches will not be required to be positioned to the "TEST" position.
- Manual initiation pushbutton has failed to initiate the RCIC System.
- RCIC is aligned in its normal STANDBY condition for automatic response.

IV. INITIATING CUE

Manually start up RCIC component by component IAW OP-150-001 Attachment B (HC), and establish injection to the vessel at a rate of approximately 600 gpm.

V. TASK STANDARD

Manually start up RCIC component by component IAW OP-150-001, and establish injection to the vessel. Manually secure RCIC when an automatic isolation signal fails to trip RCIC.

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
50.OP.010.103

NOTE:	It is permissible to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

- Reset the simulator to an exam-specific IC _391____.
- Configure an exam-specific IC as follows:
  - Reset to normal full power IC
  - Place ESW in service
  - Override HPCI
  - Insert malfunction: **IMF mfRC150001**
  - Insert malfunction: **IMF rfRC150001**
  - Insert malfunction: **IMF cmfCV02_149F040**
  - Insert Overrides:
    - **diHS15012CA** **NORM**
    - **diHS15012CB** **ARM**
  - Scram the reactor and trip RFPs and COND PPs and let water level drop to -40", snap to IC for use.

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the initiating cue.
- This JPM must be performed in the simulator.
- Configure the Simulator per the Simulator Setup Instructions.

BOOTH OPERATOR CUE

When student is ready to begin the JPM and the evaluator indicates, place the simulator in RUN.

EVALUATOR CUE

Record JPM start time: __________

Step	Action	Standard	Eval	Comments
1	**Obtains** the controlling document.	Controlled copy of OP-150-001 obtained.	S / U	
2*	**(HC.1)** Place RCIC turbine flow control FC-E51-1R600 in Manual and set for minimum speed.	Positions the manual/automatic selector switch on the RCIC Turbine Flow Control FC-E51-1R600 to the "M" (Manual) position. Depresses the CLOSE pushbutton until the controller output meter indicates zero.	S / U	
3*	**(HC.2)** Start the RCIC Barometric Condenser Vacuum Pump.	Momentarily positions the RCIC Baro Cdsr Vacuum PP 1P219 Switch to the START position.	S / U	
4*	**(HC.3)** Open RCIC Lube Oil Cooling Water Valve.	Momentarily positions the RCIC L-O Cooler Wtr HV-150-F046 Switch to OPEN.	S / U	
5*	**(HC.4)** Open STEAM TO RCIC TURBINE HV-150-F045.	Momentarily positions the Steam to RCIC Turbine HV-150-F045 Switch to the OPEN position.	S / U	

EVALUATOR NOTE

When the RCIC Steam Admission Valve is opened:
- Turbine speed will increase to approximately 1,000 rpm.
- RCIC Pump Discharge Lo Flow (AR-108-E02) will alarm when flow <75 gpm and discharge pressure is >190 psig.
- RCIC Low Flow Annunciator (AR-108-E02) will clear when flow >150 gpm.
- Steam Line Drains F025 and F026 will CLOSE.
- RCIC Barometric Condenser Pump Discharge Valve F005 closes.
- RCIC Pump discharge pressure will increase to approximately 110 psig.

6	**(HC.5)** Observe RCIC turbine accelerates.	Observes RCIC turbine accelerates.	S / U	
7	**(HC.6)** When RCIC Pump discharge pressure > 190 psig with flow < 75 gpm, Observe RCIC Minimum Flow to Suppression Pool Valve FV-149-F019 OPENS.	Observes Min Flow to Supp Pool FV-149-F019 OPENS.	S / U	

EVALUATOR NOTE

The min flow valve will open when pump discharge pressure is >190 psig <u>and</u> flow <75 gpm.

8	**(HC.7)** Using RCIC TURBINE FLOW CONTROL FC-E51-1R600, RAISE RCIC Pump discharge pressure within 50 psig of Reactor pressure.	Depresses OPEN pushbutton on RCIC Turbine Flow Control FC-E51-1R600 and increases pump discharge pressure until within 50 psig of reactor pressure.	S / U	

EVALUATOR NOTE

As the open pushbutton is depressed, the following will occur:
- Turbine speed will increase.
- Pump discharge pressure will increase.
- Minimum Flow Valve FV-149-F019 will open at >190 psig and flow <75 gpm.

9*	**(HC)** Open RCIC Injection Valve.	Ensures RCIC Injection Valve HV-149-F013 is in the OPEN position.	S / U	

Alternate Path The alternate path will be initiated during the following step. As the operator is raising RCIC flowrate, a RCIC Turbine Exhaust High Pressure annunciator will alarm. The operator will need to recognize the alarming condition should have caused an automatic RCIC turbine trip and RCIC failed to trip on the isolation signal. The operator will be required to take appropriate action.				
SIMULATOR OPERATOR NOTE Monitor triggers function to cause fault. If fault not triggered, manually initiate fault by depressing **Key[1].**				
10*	**(HC.9)** Using RCIC TURBINE FLOW CONTROL, Establish the desired flowrate (≈600 gpm).	Depresses OPEN or CLOSE pushbutton on RCIC Turbine Flow Control FC-E51-1R600 to raise RCIC flow in an effort to achieve 600 gpm. **Note:** 600 gpm may not be achieved due to the alternate path. Successful completion of this step requires raising flow toward 600 gpm.	S / U	
11	**(HC.10)** Ensure that the RCIC minimum flow to Suppression Pool Valve closes.	Observes RCIC Min Flow to Supp Pool FV-149-F019 CLOSES.	S / U / NA	
12	Recognize alarm and refer to alarm response procedures AR-108-B01	Refer to alarm response procedures.	S / U	
13*	**(ARP 2.1)** Ensure RCIC Turbine Trips	Recognize an automatic RCIC Turbine Trip should have occurred but did not. Manually trips RCIC by depressing RCIC TURB TRIP pushbutton HS-E51-1S17. **Note:** The operator may opt to utilize OP-150-001 to Shutdown RCIC. In this case, the operator would place overload bypass switched to test and manually reduce RCIC Pump flow speed prior to tripping the turbine.	S / U	

EVALUATOR NOTE / CUE That completes the JPM.	
EVALUATOR CUE Record JPM stop time: __________	
EVALUATOR NOTE Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?	

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw

10. Verify the JPM reflects the most current revision of the procedure.

Procedure	OP-150-001	Rev	47
Procedure	AR-108-001	Rev	28
Procedure		Rev	

Mpw 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor:______________________ Date: ____________

Instructor:______________________ Date: ____________

REVISION SUMMARY

JOB PERFORMANCE MEASURE

Revision	Description/Purpose of Revision
0	This JPM was created by modifying 50.OP.010.101.

EVALUATOR COPY:

TASK CONDITIONS

- A Reactor scram condition exists and RCIC injection is required for inventory control.
- HPCI is OOS, all RFPs have tripped, and all Condensate pumps are unavailable.
- ESW System is in operation.
- RCIC pump discharge piping has been maintained filled and pressurized.
- MOV Overload Bypass switches will not be required to be positioned to "TEST"
- Manual initiation pushbutton has failed to initiate the RCIC System.
- RCIC is aligned in its normal STANDBY condition for automatic response.

INITIATING CUE

Manually start up RCIC component by component IAW OP-150-001 Attachment B (HC), and establish injection to the vessel at a rate of approximately 600 gpm.

EXAMINEE COPY:

TASK CONDITIONS

- A Reactor scram condition exists and RCIC injection is required for inventory control.
- HPCI is OOS, all RFPs have tripped, and all Condensate pumps are unavailable.
- ESW System is in operation.
- RCIC pump discharge piping has been maintained filled and pressurized.
- MOV Overload Bypass switches will not be required to be positioned to "TEST"
- Manual initiation pushbutton has failed to initiate the RCIC System.
- RCIC is aligned in its normal STANDBY condition for automatic response.

INITIATING CUE

Manually start up RCIC component by component IAW OP-150-001 Attachment B (HC), and establish injection to the vessel at a rate of approximately 600 gpm.

TALEN ENERGY

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Simulator JPM E

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EXAMINATION MATERIAL

Do not leave unattended without ensuring materials are secured in accordance with training procedures.

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JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Re-establish RB HVAC IAW ES-134-003

JPM#: 34.EO.20802.151 Revision: 7 Date: 06/12/2017

Applicability: ☒ RO ☒ SRO

Setting: Simulator

NUREG–1123 E/APE / Sys 295032 K/A Number EA1.03 K/A Importance 3.7/3.7

Alternate Path: ☒ YES ☐ NO Time Critical ☐ YES ☒ NO Validation Time (min): 15

Testing Method: ☐ Simulate ☒ Perform

Author: Michael Wilcox Date: 9/25/17

Operations Review: Jay Barnes Date: 11/3/17

Validated: Michael Wilcox Date: 10/13/17

Approval: Jeffrey Dills Date: 11/3/17
Nuclear Training Supervisor

Examinee Name: ______________________________ ____________________
Last, First MI Employee Number

Exam Date: ____________________ Exam Duration (Min): ____________________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator: ________________________ ________________________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
34.EO.20802.151

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. ES-134-003, Re-Establishing Reactor Building HVAC

III. TASK CONDITIONS

- The Plant has experienced a loss of normal feed and makeup. The Reactor is shut down, with water level at -65", pressure is 900 psig.
- A primary and secondary containment isolation has occurred due to low reactor water level. The isolations are verified to be completed IAW ON-CONTISOL-101.
- RPV control is IAW EO-100-102. Primary containment parameters are all normal (i.e., pressure, temperature and suppression pool level).
- EO-100-104, Secondary Containment Control, has been entered due to Zone I HVAC not being in service for four hours.
- HPCI is unavailable, RCIC is being restored and expected to be lined up feeding the vessel in approximately 30 minutes. RCIC had been down for repairs, which are now complete.
- Both loops of ESW are in service.
- 'A' Control Structure Chiller is in service.
- All Individual room cooler fans are running.
- Service water is available
- ES-134-003, Attachment A is complete.

IV. INITIATING CUE

Re-establish Reactor Building HVAC in accordance with ES-134-003, step 5.1.3.b

V. TASK STANDARD

Zone 1 ISO SIGNALS LOCKOUT RELAYS re-tripped

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
34.EO.20802.151

NOTE:	It is permissible to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

1. Reset to IC_391__ or setup the IC as follows
2. **Reset** the simulator to any rated-power IC.
3. **Setup** the simulator as follows:
   a. Both loops of ESW in service with at least one pump running in both loops
   b. Take the Mode Switch to SHUTDOWN
   c. Ensure RB HVAC isolation trip on low level and maintain reactor water level <-50" (Trip feed, condensate, HPCI, and maintain with RCIC)
   d. Start all room coolers with a cooling source
4. **Insert** the following malfunctions
   a. **IMF cmfPM01_1V202A** Zone 1 fans do not start
   b. **IMF cmfPM01_1V202B** Zone 1 fans do not start
   c. **IMF cmfPM01_1V205A** Zone 1 fans do not start
   d. **IMF cmfPM01_1V205B** Zone 1 fans do not start
   e. **IMF cmfPM01_1V206A** Zone 1 fans do not start
   f. **IMF cmfPM01_1V206B** Zone 1 fans do not start
5. **Other**

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the initiating cue.
- This JPM must be performed in simulator.
- Configure the Simulator per the Simulator Setup Instructions.

BOOTH OPERATOR CUE

When student is ready to begin the JPM and the evaluator indicates, place the simulator in RUN.

EVALUATOR CUE

Record JPM start time: __________

Step	Action	Standard	Eval	Comments
1	**Identifies** governing procedure and obtain controlled copy.	**Obtains** controlled copy of ES-134-003.	S / U	

EVALUATOR NOTE

It will not be necessary to obtain any of the required equipment in the next step. This JPM deals with the control room actions ONLY.

Step	Action	Standard	Eval	Comments
2	**Reviews**, required equipment, precautions and limitations	**Identifies** Shift manager's office as the location for obtaining the special equipment.	S / U	

EVALUATOR CUE

Inform the student that any required equipment will be SIMULATED.

Step	Action	Standard	Eval	Comments
3	**Ensure** Service Water is available for restoration of Reactor Building chillers prior to bypassing isolations	**Determines** from task conditions that service water is available	S / U	

4	Ensure following conditions exist: • Both loops of ESW in operation in accordance with OP-054-001. • Control Structure Chiller in operation in accordance with OP-030-001. • All individual room cooler fans that have cooling source in operation in accordance with OP-134-002.	**Determines** from task conditions: • Both loops of ESW are in operation • Control structure chiller is in service • All individual room coolers are running	S / U	
EVALUATOR NOTE With Reactor Building HVAC isolation signal present, the following will be performed to bypass High Drywell Pressure/Low RPV Water Level HVAC Interlocks.				
5	**Confirm** automatic actuations per Attachment A	**Determines from task conditions:** Attachment A is complete.	S / U	
*6	On 1C681 Heat & Ventilation Control Panel, **Place** ZONE 1 HVAC LOCA ISO BYPASS HS 17551A keylock switch to BYPASS	**Inserts** key and Places ZONE 1 HVAC LOCA ISO BYPASS HS 17551A keylock switch to BYPASS	S / U	
7	**Observe** Zone 1 HVAC LOCA ISO BYPASSED annunciator AR-127 D09 alarms	Verifies Zone 1 HVAC LOCA ISO BYPASSED annunciator AR-127 D09 alarms	S / U	
*8	On 1C681 Heat & Ventilation Control Panel, **Place** Zone 1 HVAC LOCA ISO BYPASS HS-17551B keylock switch to BYPASS	**Inserts** key and Places ZONE 1 HVAC LOCA ISO BYPASS HS 17551B keylock switch to BYPASS	S / U	
9	**Observe** Zone 1 HVAC LOCA ISO BYPASSED annunciator AR-128 D09 alarms	Verifies Zone 1 HVAC LOCA ISO BYPASSED annunciator AR-128 D09 alarms.	S / U	
EVALUATOR NOTE Several alarms (A-12 and A-13) may come in during this evolution on AR29 and 30. No actions will be required by the ARs.				

<table>
<tr><td>*10</td><td>Reset Zone 1 ISO SIGNALS LOCKOUT RELAY XY07551A</td><td>Turns the lockout relay clockwise UNTIL it remains in the vertical position</td><td>S / U</td><td></td></tr>
<tr><td>*11</td><td>Reset Zone 1 ISO SIGNALS LOCKOUT RELAY XY07551B</td><td>Turns the lockout relay clockwise UNTIL it remains in the vertical position</td><td>S / U</td><td></td></tr>
<tr><td colspan="5"><u>Alternate Path</u>

The zone I fans do not automatically return to normal operation when the lockout relay is reset. The operator will need to manually restore the system.</td></tr>
<tr><td>12</td><td>Ensure Reactor Building Ventilation System Division I and Division II fans for Zone 1 return to normal operation in accordance with OP-134-002</td><td>Verifies RB Zone 1 NO Vent AR-127-C09 is STILL LIT
Contacts the RB NPO to determine the status of the RB Ventilation system</td><td>S / U</td><td></td></tr>
<tr><td colspan="5"><u>EVALUATOR CUE</u>
Acknowledge request and report, “OP-134-002, step 2.1.3.d is complete. The zone 1 supply fan is not running.”</td></tr>
<tr><td colspan="5"><u>EVALUATOR NOTE</u>
The operator should continue to step 5.1.3.b.7 to restore the line-up.</td></tr>
<tr><td>*13</td><td>On 1C681 Heat & Ventilation Control Panel, Place ZONE 1 HVAC LOCA ISO BYPASS HS-17551A keylock switch to NORMAL</td><td>Places ZONE 1 HVAC LOCA ISO BYPASS HS-17551A keylock switch to NORMAL</td><td>S / U</td><td></td></tr>
<tr><td>14</td><td>Observe Zone 1 ISO SIGNALS LOCKOUT RELAY XY07551A trips</td><td>Verifies Zone 1 ISO SIGNALS LOCKOUT RELAY XY07551A - pointing to ~ 10 o’clock position with the RED semaphore visible</td><td>S / U</td><td></td></tr>
<tr><td>15</td><td>Observe Zone 1 HVAC LOCA ISO BYPASSED alarm AR-127 D09 clears</td><td>Verifies Zone 1 HVAC LOCA ISO BYPASSED alarm AR-127 D09 - SLOW FLASHING</td><td>S / U</td><td></td></tr>
<tr><td>*16</td><td>On 1C681 Heat & Ventilation Control Panel, Place Zone 1 HVAC LOCA ISO BYPASS HS-17551B keylock switch to NORMAL</td><td>Places ZONE 1 HVAC LOCA ISO BYPASS HS-17551B keylock switch to NORMAL</td><td>S / U</td><td></td></tr>
</table>

17	**Observe** Zone 1 ISO SIGNALS LOCKOUT RELAY XY07551B trips	Verifies Zone 1 ISO SIGNALS LOCKOUT RELAY XY07551B - pointing to ~ 10 o'clock position with the RED semaphore visible	S / U	
18	**Observe** Zone 1 HVAC LOCA ISO BYPASSED alarm AR 128 D09 clears	Verifies Zone 1 HVAC LOCA ISO BYPASSED alarm AR-128 D09 - SLOW FLASHING	S / U	
*19	**Notify** Technical Support Coordinator attempts to restart RB HVAC have failed and to determine additional actions required to restart HVAC or shed electrical loads to reduce heat load	**Contacts** TSC	S / U	
<u>EVALUATOR CUE</u> Role-play the TSC coordinator, and acknowledge the request.				
20	**Exit** this procedure	**Exits** the procedure	S / U	
<u>EVALUATOR NOTE / CUE</u> That completes the JPM.				
<u>EVALUATOR CUE</u> Record JPM stop time: __________				
<u>EVALUATOR NOTE</u> Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE
34.EO.20802.151

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw — 10. Verify the JPM reflects the most current revision of the procedure.

Procedure	ES-134-003	Rev	24
Procedure	N/A	Rev	N/A
Procedure	N/A	Rev	N/A

Mpw — 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A — 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor: ____________________ Date: __________

Instructor: ____________________ Date: __________

REVISION SUMMARY

JOB PERFORMANCE MEASURE
34.EO.20802.151

Revision	Description/Purpose of Revision
0	New JPM
5	Revised to new JPM format.
6	Incorporated NRC comments from LOC 28 Prep Week.
7	Updated to reflect Vision task number

EVALUATOR COPY:

TASK CONDITIONS

- The Plant has experienced a loss of normal feed and makeup. The Reactor is shut down, with water level at -65", pressure is 900 psig.
- A primary and secondary containment isolation has occurred due to low reactor water level. The isolations are verified to be completed IAW ON-CONTISOL-101.
- RPV control is IAW EO-100-102. Primary containment parameters are all normal (i.e., pressure, temperature and suppression pool level).
- EO-100-104, Secondary Containment Control, has been entered due to Zone I HVAC not being in service for four hours.
- HPCI is unavailable, RCIC is being restored and expected to be lined up feeding the vessel in approximately 30 minutes. RCIC had been down for repairs, which are now complete.
- Both loops of ESW are in service.
- 'A' Control Structure Chiller is in service.
- All Individual room cooler fans are running.
- Service water is available
- ES-134-003, Attachment A is complete

INITIATING CUE

Re-establish Reactor Building HVAC in accordance with ES-134-003, step 5.1.3.b

EXAMINEE COPY:

TASK CONDITIONS

- The Plant has experienced a loss of normal feed and makeup. The Reactor is shut down, with water level at -65", pressure is 900 psig.
- A primary and secondary containment isolation has occurred due to low reactor water level. The isolations are verified to be completed IAW ON-CONTISOL-101.
- RPV control is IAW EO-100-102. Primary containment parameters are all normal (i.e., pressure, temperature and suppression pool level).
- EO-100-104, Secondary Containment Control, has been entered due to Zone I HVAC not being in service for four hours.
- HPCI is unavailable, RCIC is being restored and expected to be lined up feeding the vessel in approximately 30 minutes. RCIC had been down for repairs, which are now complete.
- Both loops of ESW are in service.
- 'A' Control Structure Chiller is in service.
- All Individual room cooler fans are running.
- Service water is available
- ES-134-003, Attachment A is complete

INITIATING CUE

Re-establish Reactor Building HVAC in accordance with ES-134-003, step 5.1.3.b

PROCEDURE COVER SHEET

PPL SUSQUEHANNA, LLC PROCEDURE	
RE-ESTABLISHING REACTOR BUILDING HVAC ADHERENCE LEVEL: INFORMATION USE	ES-134-003 Revision 24 Page 1 of 20 Unit 1

QUALITY CLASSIFICATION:	APPROVAL CLASSIFICATION:
[X] QA Program [ ] Non-QA Program	[X] Plant [ ] Non-Plant [ ] Instruction

EFFECTIVE DATE: ____________________

PERIODIC REVIEW FREQUENCY: 2 years

NEXT PERIODIC REVIEW DUE DATE: ____________________

RECOMMENDED REVIEWS:

Procedure Owner: D Shift

Responsible Supervisor: Shift Manager-D Shift

Responsible FUM: Manager-Nuclear Operations

Responsible Approver: Manager-Nuclear Operations

PROCEDURE REVISION SUMMARY

1. New Periodic Review.

2. Corrected branching error in step 4.1.1

3. Corrected spelling error in step 5.1

4. Corrected label in attachments C and D.

TABLE OF CONTENTS

1.0 PURPOSE AND SCOPE

1.1 Purpose

1.1.1 Provide instructions for bypassing Reactor Building Ventilation System High Drywell Pressure and Low RPV Water Level interlocks during a LOCA event or another event which causes loss of Reactor Building HVAC.

1.2 Scope

1.2.1 This procedure is performed under direction of Shift Supervision and only when directed by an EO or another ES.

2.0 REFERENCES AND COMMITMENTS

2.1 Performance References

2.1.1 AR 128 001, ZONE I HVAC LOCA ISO BYPASS (D09)

2.1.2 OP-030-001, Control Structure Chilled Water System

2.1.3 OP-054-001, Emergency Service Water System

2.1.4 OP-070-001, Standby Gas Treatment System

2.1.5 OP-134-002, Reactor Building HVAC Zones 1 And 3

2.1.6 ES-134-001, Restoring Drywell Cooling With A LOCA Signal Present

2.1.7 OP-134-002, Reactor Building HVAC Zones 1 And 3

2.1.8 ON-159-002, Containment Isolation

2.2 Developmental References

2.2.1 Electrical Schematic E-184 sh 1

2.2.2 Electrical Schematic E-184 sh 3

2.2.3 Electrical Schematic E-201 sh 1

2.2.4 Electrical Schematic E-201 sh 2

2.2.5 Electrical Schematic E-201 sh 3

2.2.6 Electrical Schematic E-201 sh 4

2.3 Commitments

2.3.1 None

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Precautions

3.1.1 None

3.2 Limitations

3.2.1 This procedure shall not be performed while performing ES-070-001.

3.2.2 This procedure shall only be performed under direction of Shift Supervision and only when directed by an EO or another ES.

3.2.3 If for any reason a particular section of this procedure and accompanying restoration are not used, N/A shall be entered in appropriate signoffs and remaining sections completed as necessary.

3.2.4 This procedure does not bypass high radiation isolation logic. If high radiation is cause of reactor building HVAC trip, do not perform this procedure.

3.2.5 This procedure must be performed step by step in sequence written.

4.0 PREREQUISITES AND INITIAL CONDITIONS

4.1 Prerequisites

4.1.1 Required Equipment:

- Section 5.2 - Jumpers (2) (located in the Shift Managers Office ES Tool Box OR OSC ES Tool Box near the FUS Office)
- Section 5.2 - Boots (2) (located in the Shift Managers Office ES Tool Box OR OSC ES Tool Box near the FUS Office)
- Sections 5.2 and 5.3 - Low voltage rubber gloves located in Shift Manager's office equipment cabinet OR OSC ES Tool Box near the FUS Office

4.2 Initial Conditions

4.2.1 None

5.0 INSTRUCTIONS

5.1 RESTORE REACTOR BUILDING HVAC

☑ 5.1.1 **ENSURE** Service Water is available for restoration of Reactor Building chillers <u>**PRIOR**</u> to bypassing isolations.

☑ 5.1.2 **ENSURE** following conditions exist:

☑ a. BOTH loops of ESW in operation **PER** OP-054-001, Emergency Service Water System.

☑ b. Control Structure Chiller in operation **PER** OP-030-001, Control Structure Chilled Water System.

☑ c. All individual room cooler fans that have cooling source in operation **PER** OP-134-002, Reactor Building HVAC Zones 1 And 3.

5.1.3 <u>**IF**</u> Reactor Building HVAC isolation signal present,

☑ <u>**THEN**</u> **PERFORM** following to bypass High Drywell Pressure/Low RPV Water Level HVAC Interlocks:

☑ a. **CONFIRM** automatic actuations per Attachment A.

☐ b. **RESTORE** reactor building zone 1 ventilation:

☐ (1) On 1C681 Heat & Ventilation Control Panel, **PLACE** ZONE 1 HVAC LOCA ISO BYPASS HS-17551A keylock switch to BYPASS.

☐ (2) **OBSERVE** ZONE 1 HVAC LOCA ISO BYPASSED annunciator AR-127-D09 ALARMS.

☐ (3) On 1C681 Heat & Ventilation Control Panel, **PLACE** ZONE 1 HVAC LOCA ISO BYPASS HS-17551B keylock switch to BYPASS.

☐ (4) **OBSERVE** ZONE 1 HVAC LOCA ISO BYPASSED annunciator AR-128-D09 ALARMS.

☐ (5) On 0C681 Heat & Ventilation Panel, **RESET** following lockout relays:

☐ (a) Zone 1 ISO SIGNALS LOCKOUT RELAY XY07551A.

☐ (b) Zone 1 ISO SIGNALS LOCKOUT RELAY XY07551B.

☐ (6) **ENSURE** Reactor Building Ventilation System Division I and Division II fans for Zone 1 return to normal operation **PER** OP-134-002, Reactor Building HVAC Zones 1 And 3.

5.1.3.b (continued)

(7) <u>**IF**</u> Reactor Building HVAC still <u>**NOT**</u> operating,

☐ <u>**THEN**</u> **RESTORE** line up as follows:

☐ (a) On 1C681 Heat & Ventilation Control Panel, **PLACE** ZONE 1 HVAC LOCA ISO BYPASS HS-17551A keylock switch to NORMAL.

☐ (b) **OBSERVE** Zone 1 ISO SIGNALS LOCKOUT RELAY XY07551A TRIPS.

☐ (c) **OBSERVE** ZONE 1 HVAC LOCA ISO BYPASSED alarm AR-127 D09 CLEARS.

☐ (d) On 1C681 Heat & Ventilation Control Panel, **PLACE** ZONE 1 HVAC LOCA ISO BYPASS HS-17551B keylock switch to NORMAL.

☐ (e) **OBSERVE** Zone 1 ISO SIGNALS LOCKOUT RELAY XY07551B TRIPS.

☐ (f) **OBSERVE** ZONE 1 HVAC LOCA ISO BYPASSED alarm AR-128 D09 CLEARS

☐ (g) **NOTIFY** Technical Support Coordinator attempts to restart Reactor Building HVAC have failed and to determine additional actions required to:

- Restart HVAC

<u>**OR**</u>

- Shed electrical loads to reduce heat load.

☐ (h) **EXIT** this Procedure.

5.2 RESTORE REACTOR BUILDING CHILLERS

☐ **NOTE**

Service Water is required for restoration of the Reactor Building Chillers.

5.2.1 IF LOCA trip of reactor building chillers is NOT bypassed by ES-134-001,

☐ THEN **BYPASS** LOCA trip of reactor building chillers:

☐ **NOTE**

Booting of RHR E11A-K10A 7/8 contacts will allow Reactor Building Chiller A to be started with LOCA signal present. No other function will be inhibited by installation of this boot.

☐ a. On 1C617 RHR/HPCI/SBLC RELAY PANEL DIVISION 1 (upper relay room), **REMOVE** front cover from relay E11A-K10A RX LO WTR LVL/DRWL HI PRESS AND RX LOW PRESS.

☐ b. Referring to Attachment C, **INSTALL** boot over 7/8 contact finger of E11A-K10A. (Dwg. Ref. E-216 sh 1).

☐ **NOTE**

Booting of RHR E11A-K10B 7/8 contacts will allow Reactor Building Chiller B to be restarted with LOCA signal present. No other function will be inhibited by installation of this boot.

☐ c. On 1C618 RHR/RCIC RELAY PANEL DIVISION 2 (lower relay room), **REMOVE** front cover from relay E11A-K10B RX LO WTR LVL/DRWL HI PRESS AND RX LOW PRESS.

☐ d. Referring to Attachment D, **INSTALL** boot over 7/8 contact finger of E11A-K10B. (Dwg. Ref. E-216 sh 2)

☐ 5.2.2 **RETURN** Reactor Building Chillers to service **PER** OP-134-001, Reactor Building Chilled Water.

5.2.3 WHEN Zone 1 HVAC restored AND as time and personnel permit,

☐ THEN **RESTORE** reactor building Zone 3 ventilation:

☐ **CAUTION**

Restoration of Zone 3 closes RB Recirc Sys to SGTS Dmp HD07543A&B and Recirc Sys/SGTS Dmp PDD07554A&B which prevents SGTS from maintaining Zone 1 differential pressure.

☐ a. **CONFIRM** automatic actuations per Attachment B, ZONE II & III VENTILATION ISOLATION.

5.2.3 (continued)

☐

NOTE

Installing jumpers per the following steps bypass the K83 and K84 relays and will allow the Zone 3 Isolation Signals Lockout Relays to be reset. Bypassing the K83 and K84 relays also removes the isolation signal from the RHR SW trip enable bypass as well as valves in the following systems:

- Containment Instrument Gas (150 psig header, Tip purge, vacuum breakers)
- Containment radiation Monitoring
- Containment Atmosphere Control (Nitrogen Makeup / Vent and Purge)
- LRW DW Floor Drain and Equipment drain Tank
- Reactor Building Chilled water

Isolation valves will remain closed after the bypass is installed.

☐ b. In 1C622 INBOARD MSIV RELAY & NSSSS DIV 1 PANEL (upper relay room), **INSTALL** jumper EEE7-11 to EEE7-12 for Div. 1 of Zone I and III of Rx Bldg HVAC.

- Terminal strip EEE7 is located on right hand side of 1C622 farthest from door approximately 2 feet up from floor level. (Ref. Dwg. E 184 sh 1)

☐ c. In 1C623 OUTBOARD MSIV RELAY & NSSSS DIV 2 PANEL (lower relay room), **INSTALL** jumper CC-1 to CC-2 for Div. 2 of Zone 1 and 3 of Rx Bldg HVAC.

- Terminal strip CC is located on left hand side bottom of 1C623 farthest from door. (Ref. Dwg. E 184 sh 1)

☐ d. **ALLOW** Zone 1 normal HVAC to stabilize before resetting XY-07553A(B) per next step.

☐ e. On 0C681 Heat & Ventilation Control Panel, **RESET** following lockout relays:

☐ (1) ZONE 3 ISO SIGNALS LOCKOUT RELAY XY07553A.

☐ (2) ZONE 3 ISO SIGNALS LOCKOUT RELAY XY07553B.

☐ f. **ENSURE** reactor building ventilation fans for Zone 3 return to normal operation **PER** OP-134-002, Reactor Building HVAC Zones 1 And 3.

☐ g. **ENSURE** operating CREOASS unit automatically returns to standby in accordance with OP-030-002, Reactor Building HVAC Zones 1 And 3.

☐ h. **REALIGN** SGTS for STANDBY operation **PER** OP-070-001, STANDBY GAS TREATMENT SYSTEM.

5.3 RESTORATION

5.3.1 **WHEN** need for bypass, **OR** LOCA signal has cleared,

☐ **THEN REMOVE** appropriate installed bypasses.

☐ 5.3.2 **ENSURE** NSSSS Isolation logic reset **PER** ON-159-002, Containment Isolation.

☐ 5.3.3 In 1C622 INBOARD MSIV RELAY & NSSSS DIV 1 PANEL (upper relay room), **REMOVE** jumper from EEE7-11 and EEE7-12.

- Terminal strip EEE7 is located on right-hand side of 1C622 farthest from door approximately 2 feet up from floor level.

______________________ / __________
Independent Verification Date

☐ 5.3.4 In 1C623 OUTBOARD MSIV RELAY & NSSSS DIV 2 PANEL (lower relay room) **REMOVE** jumper from CC-1 and CC-2.

- Terminal strip CC is located on left-hand side bottom of 1C623 farthest from door.

______________________ / __________
Independent Verification Date

5.3.5 **IF NOT** performed by ES-134-001,

☐ **THEN RESTORE** drywell cooling isolation logic:

☐ a. At 1C617 RHR/HPCI/SBLC RELAY PANEL DIVISION 1 (upper relay room), **REMOVE** boot from 7/8 contact finger of relay E11A-K10A RX LO WTR LVL/DRWL HI PRESS AND RX LOW PRESS.

______________________ / __________
Independent Verification Date

☐ b. **REPLACE** front cover on relay E11A-K10A.

______________________ / __________
Independent Verification Date

☐ c. At 1C618 RHR/RCIC RELAY PANEL DIVISION 2 (lower relay room), **REMOVE** boot from 7/8 contact finger of relay E11A-K10B RX LO WTR LVL/DRWL HI PRESS AND RX LOW PRESS.

______________________ / __________
Independent Verification Date

☐ d. **REPLACE** front cover on relay E11A-K10B

______________________ / __________
Independent Verification Date

☐ 5.3.6 **WHEN** conditions permit,

☐ **THEN ENSURE** Zones 1, 2 and 3 HVAC are lined up and operating **PER** OP-134-002, Reactor Building HVAC Zones 1 And 3.

☐ 5.3.7 **NOTIFY** Electrical Maintenance to perform maintenance checks on relays that had boots installed as part of this procedure.

☐ 5.3.8 **FORWARD** completed ES-134-003 to following, in sequence, for review and subsequent retention:

a. Shift Manager

_______________________ / __________ / __________
Signature / Time / Date

b. Assistant Operations Manager – Shift Operations

____
Signature

c. Manager – Nuclear Operation

____
Signature

d. Supervisor DCS

END of Instructions

6.0 RECORDS

- Forward completed ES-134-003 to DCS for records retention.

Attachment A, ZONE 1 VENTILATION ISOLATION

	VALVE COMPONENT NAME	PANEL	STATUS	CHECK	TYPE
1.	RECIRC SYS TO ZONE I SUP SYS DMP HD17657A	1C681	OPEN	W	BOP
2.	ZONE I EXH SYS TO RECIRC SYS DMP HD17602A	1C681	OPEN	W	BOP
3.	ZONE I FILT EXH TO RECIRC SYS DMP HD17601A	1C681	OPEN	W	BOP
4.	ZONE I EXH SYS ISOLATION DMP HD17576A	1C681	CLOSED	W	BOP
5.	ZONE I EQUIP COMPT EXH SYS DMP HD17524A	1C681	CLOSED	W	BOP
6.	ZONE I SUP SYS ISOLATION DMP HD17586A	1C681	CLOSED	W	BOP
7.	RECIRC SYS TO ZONE I SUP SYS DMP HD17657B	1C681	OPEN	W	BOP
8.	ZONE I EXH SYS TO RECIRC SYS DMP HD17602B	1C681	OPEN	W	BOP
9.	ZONE I FILT EXH TO RECIRC SYS DMP HD17601B	1C681	OPEN	W	BOP
10.	ZONE I EXH SYS ISOLATION DMP HD17576B	1C681	CLOSED	W	BOP
11.	ZONE I EQUIP COMPT EXH SYS DMP HD17524B	1C681	CLOSED	W	BOP
12.	ZONE I SUP SYS ISOLATION DMP HD17586B	1C681	CLOSED	W	BOP

☑

NOTE

If only one division isolated, place NA in column for division which did not isolate.

Attachment B, ZONE II & III VENTILATION ISOLATION

	VALVE COMPONENT NAME	PANEL	STATUS	CHECK	TYPE
	ZONE III VENTILATION				
1.	ZONE 3 EXH SYS ISOLATION DMP HD17502A	1C681	CLOSED	________	BOP
2.	ZONE 3 FILT EXH SYS DMP HD17514A	1C681	CLOSED	________	BOP
3.	ZONE 3 SUP SYS ISOLATION DMP HD17564A	1C681	CLOSED	________	BOP
4.	ZONE 3 EXH SYS ISOLATION DMP HD17502B	1C681	CLOSED	________	BOP
5.	ZONE 3 FILT EXH SYS DMP HD17514B	1C681	CLOSED	________	BOP
6.	ZONE 3 SUP SYS ISOLATION DMP HD17564B	1C681	CLOSED	________	BOP
7.	ZONE 3 EXH SYS ISOLATION DMP HD27502A	2C681	CLOSED	________	BOP
8.	ZONE 3 FILT EXH SYS DMP HD27514A	2C681	CLOSED	________	BOP
9.	ZONE 3 SUP SYS ISOLATION DMP HD27564A	2C681	CLOSED	________	BOP
10.	ZONE 3 EXH SYS ISOLATION DMP HD27502B	2C681	CLOSED	________	BOP
11.	ZONE 3 FILT EXH SYS DMP HD27514B	2C681	CLOSED	________	BOP
12.	ZONE 3 SUP SYS ISOLATION DMP HD27564B	2C681	CLOSED	________	BOP

☐

NOTE

If only one division isolated, place NA in column for division which did not isolate.

Attachment B, ZONE II & III VENTILATION ISOLATION, Continued

	VALVE COMPONENT NAME	PANEL	STATUS	CHECK	TYPE
	CONTROL STRUCTURE VENTILATION *				
13.	CREOASS A INLET DMP HD07812A	0C681	OPEN	________	BOP
14.	CS NORM OA SUP DMP HD-07802A	0C681	CLOSED	________	BOP
15.	CREOASS A DSCH DMP HD07811A	0C681	OPEN	________	BOP
16.	CREOASS FAN 0V101A(B)**	0C681	RUNNING	________	BOP
17.	CREOASS A INLET DMP HD07814A	0C681	OPEN	________	BOP
18.	CREOASS B INLET DMP HD07812B	0C681	OPEN	________	BOP
19.	CS NORM OA SUP DMP HD07802B	0C681	CLOSED	________	BOP
20.	CREOASS B DSCH DMP HD07811B	0C681	OPEN	________	BOP
21.	CREOASS FAN 0V101B(A)**	0C681	STOPPED	________	BOP
22.	CREOASS B INLET DMP HD07814B	0C681	OPEN	________	BOP
23.	CR TOILET ISO DMP HD07872A	0C681	CLOSED	________	BOP
24.	CR KITCHEN ISO DMP HD07873A	0C681	CLOSED	________	BOP
25.	CR TOILET ISO DMP HD07872B	0C681	CLOSED	________	BOP
26.	CR KITCHEN ISO DMP HD07873B	0C681	CLOSED	________	BOP

☐

NOTE

If only one division isolated, place NA in column for division which did not isolate

* Any Zone I, II or III isolation will cause the CS ventilation to re-align.

** For CREOASS fan division in Stby, it's associated dampers should be marked NA.

Attachment B, ZONE II & III VENTILATION ISOLATION, Continued

	VALVE COMPONENT NAME	PANEL	STATUS	CHECK	TYPE
	STANDBY GAS TREATMENT SYSTEM				
27.	RB RECIRC SYS TO SGTS DMP HD07543A	0C681	OPEN	________	BOP
28.	SGTS FAN OV109A	0C681	RUNNING	________	BOP
29.	SGTS FAN INLET DMP HD07552A	0C681	OPEN	________	BOP
30.	SGTS A INLET DMP HD07553A	0C681	OPEN	________	BOP
31.	RECIRC SYS/SGTS DMP PDD07554A	0C681	OPEN	________	BOP
32.	SGTS MAKEUP OA DMP FD07551A2	0C681	OPEN	________	BOP
33.	RB RECIRC SYS TO SGTS DMP HD07543B	0C681	OPEN	________	BOP
34.	SGTS FAN OV109B	0C681	RUNNING	________	BOP
35.	SGTS FAN INLET DMP HD07552B	0C681	OPEN	________	BOP
36.	SGTS B INLET DMP HD07553B	0C681	OPEN	________	BOP
37.	RECIRC SYS/SGTS DMP PDD07554B	0C681	OPEN	________	BOP
38.	SGTS MAKEUP OA DMP FD07551B2	0C681	OPEN	________	BOP
39.	DRWL/WETWELL BURP DMP HD17508A	1C681	CLOSED	________	BOP
40.	DRWL/WETWELL BURP DMP HD17508B	1C681	CLOSED	________	BOP
41.	DRWL/WETWELL BURP DMP HD27508A	2C681	CLOSED	________	BOP
42.	DRWL & WETWELL PURGE & BURP DMP HD27508B	2C681	CLOSED	________	BOP

☐

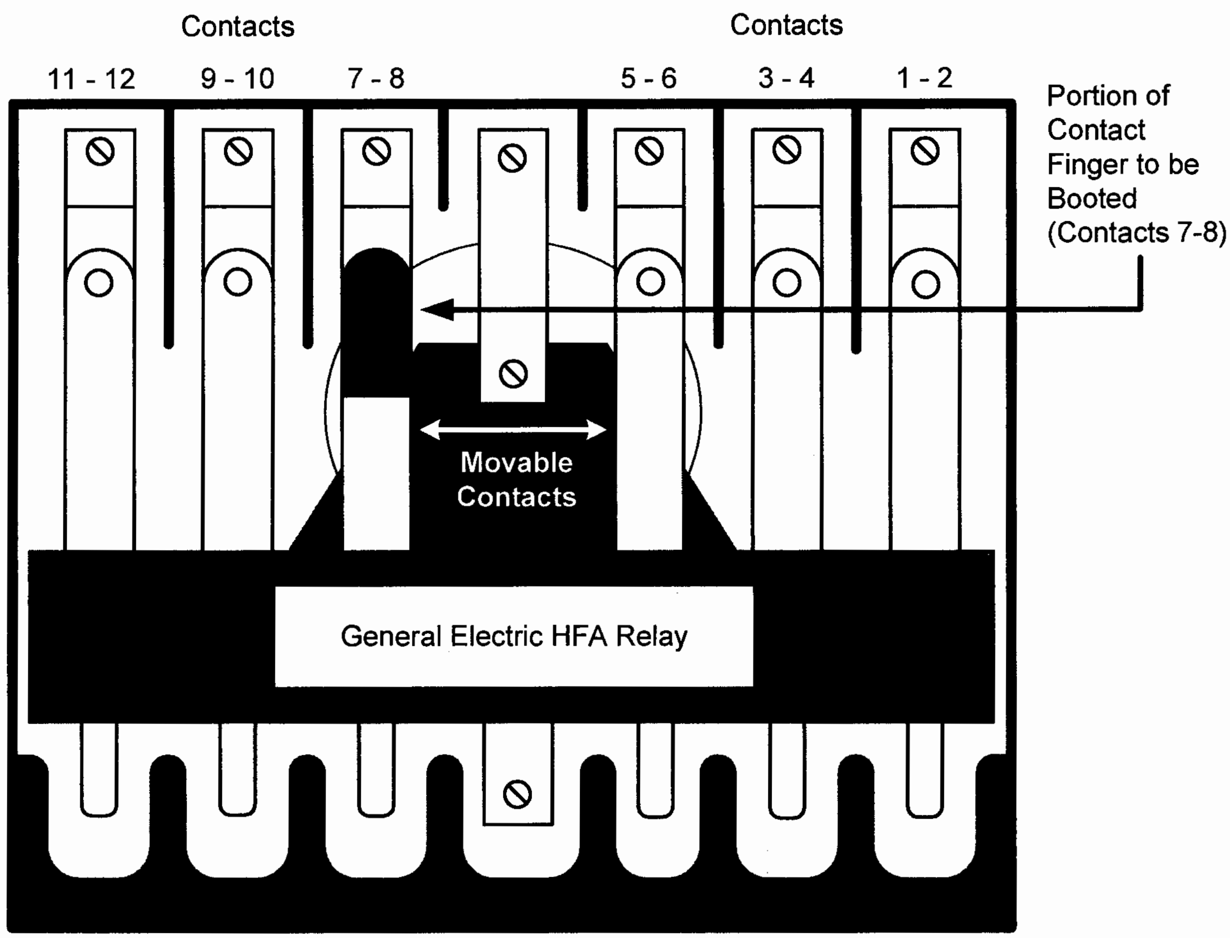
NOTE

If only one division isolated, place NA in column for division that did not isolate.

Attachment C, E11A-K10A

E11A-K10A
RX Lo WTR LVL/DRWL HI
Press
And RX Low Press

(Panel 1C617)

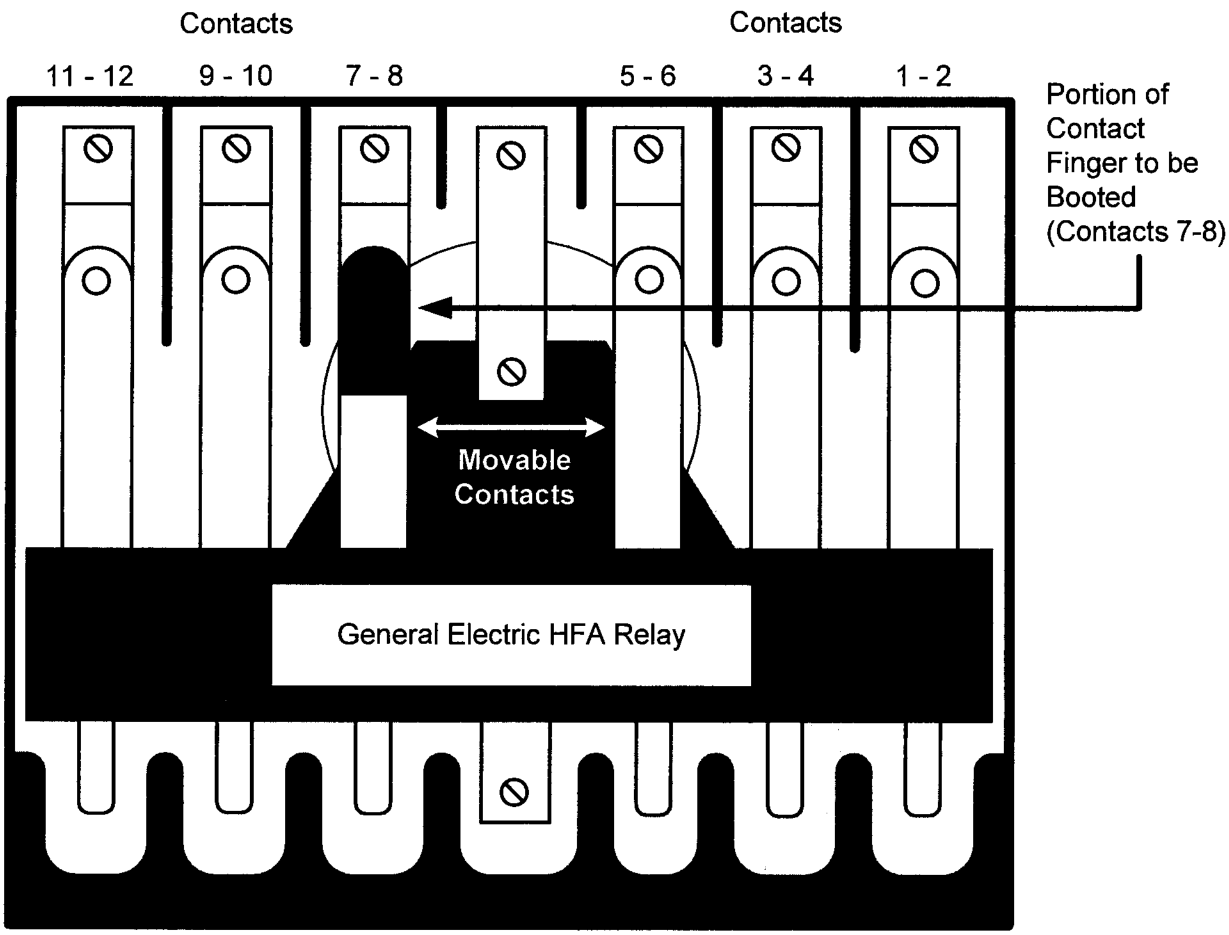


Typical HFA Relay Front View

Attachment D, E11A-K10B

E11A-K10B
RX Lo WTR LVL/DRWL HI
Press
And RX Low Press

(Panel 1C618)



Typical HFA Relay Front View

Attachment E, DISCUSSION

A. Authorized Use of this Procedure

Because of serious consequences incurred while executing this procedure, it should be implemented by Shift Supervision.

B. Use of Jumpers and Boots

The body of this procedure incorporates locations where jumpers and boots are used. Since timely installation is just as important as correct installation, locations of these devices have been color coded. The color green has been designated by Human Factor Engineering for sole purpose of identifying locations outside the control room where action must be taken as directed by Emergency Support (ES) Procedures.

For jumpers, green stripe on red color coded banana jacks have been installed in appropriate panels for ease of jumper installation. For boots, white lettering on green color coded labels have been installed on the appropriate panels for ease of relay identification.

If during execution of this procedure, a designated location is found not to be color coded, extreme care should be exercised to redetermine correct location. If location is verified to be correct but not color coded, jumper or boot should be installed and as time permits, appropriate paperwork filled out to color code point in question.

Jumpers and boots required to implement this procedure are located in the locked Emergency Support tool box located in the Shift Supervisor's office or OSC ES Tool Box near the FUS Office.

C. Basis

This ES procedure is directed from EO-000-104. It prescribes instructions to restore Reactor Building HVAC if high radiation is not indicated in the reactor building. According to EO-000-104, indicators of acceptable radiation levels include: 1) All reactor building area radiation levels below the high alarm setpoints; and 2) SGTS SPING release rates below the hi-hi alarm setpoint.

This procedure restores reactor building HVAC by bypassing the secondary containment HVAC LOCA isolation interlocks. If these interlocks are bypassed and a high radiation condition subsequently occurs in the reactor building, EO-000-104 directs the removal of the bypasses so that the HVAC automatic isolations will occur.

Operation of reactor building HVAC requires the reactor building chillers to be available. Service Water is required for restoration of the reactor building chillers; therefore, if Service Water is not available, the chillers could not be recovered and any time spent performing this procedure would have been in vain. For this reason, the Operator is prompted to reconsider the priority of this ES procedure if service water is not available.

Attachment E, DISCUSSION, Continued

D. Restoration of Zone 3

If procedure is unsuccessful in restoring Zone 1 HVAC, proceeding with the procedure is prohibited to prevent restoration of Zone 3. Zone 3 Lockout Relay XY07553A(B) interlocks with recirc plenum dampers HD-07543A(B) and PDD07554A(B). These dampers close if Zone 3 Lockout Relay XY07553A(B) is reset; therefore, preventing SGTS from maintaining Zone 1 differential pressure.

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JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Synchronize the Main Generator

JPM#: 98.GO.20544.151 Revision: 0 Date: 06/13/2017

Applicability: ☒ RO ☒ SRO

Setting: Simulator

NUREG–1123 E/APE / Sys 262001 K/A Number A4.04 K/A Importance 3.6/3.7

Alternate Path: ☒ YES ☐ NO Time Critical ☐ YES ☒ NO Validation Time (min):20

Testing Method: ☐ Simulate ☒ Perform

Author: Michael Wilcox Date: 06/13/2017

Operations Review: Collin Breitman Date: 12/4/17

Validated: Michael Wilcox Date: 10/21/17

Approval: Jeffrey Dills Date: 12/12/17
Nuclear Training Supervisor

Examinee Name: ______________________ ______________
Last, First MI Employee Number

Exam Date: ______________ Exam Duration (Min):______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator:______________________ ______________________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
98.GO.20544.151

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP-198-001, Main Generator System

B. GO-100-002, Plant Startup, Heatup And Power Operation

III. TASK CONDITIONS

- A plant startup is in progress.
- Reactor power is ~ 13%.
- Main Generator startup is complete.
- Main Generator prestart lineup is complete.
- Service Water is aligned to H2 coolers and the Core Monitor is in service.
- GO-100-002, Plant Startup, Heatup And Power Operation, has been completed up to step 5.75.
- ON-GENGRID-101, Main Generator or Grid Disturbance, has been reviewed as part of the pre-job brief and another PCO is responsible for implementing this ON, should the need arise.
- GCC has given approval to synchronize with the Voltage Regulator in Auto.
- OP-198-001, Main Generator System, has been completed up to step 2.3.

IV. INITIATING CUE

Synchronize the Main Generator to the grid IAW OP-198-001, Main Generator System, section 2.3.

V. TASK STANDARD

Main generator synchronized to grid

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
98.GO.20544.151

NOTE:	It is permissible to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

1. **Reset** the simulator to IC-14 (or equivalent IC prepared for exam – IC-393 for 2018 NRC Exam) Reactor Power ~13%, approximately 3 Turbine Bypass Valves full open, Turbine @ 1800 RPM ready for Generator synchronization.

2. **Other** actions
   a. Set RTIME screen to ON230KV
   b. Place Simulator in RUN
   c. Ensure a stopwatch is available
   d. **Insert IMF cmfBR04_1R101** to keep GEN SYNC BKR 1T from AUTO closing BUT allows MANUAL closing
   e. Insert **MRF EC197002 F:IN_SVC** to place Generator Core Monitor and H_2 Gas Analyzer in service.

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the initiating cue.
- This JPM must be performed in the simulator. Reset to exam-specific IC-393, or configure the simulator per the Simulator Setup Instructions.
- Mark-up a copy of OP-198-001 complete to step 2.3.

EVALUATOR NOTE: For Faulted JPMs

The FAULTED step in the JPM is preceded by a fault statement in **BOLD TYPE WITH ALL CAPITAL LETTERS**.

BOOTH OPERATOR CUE

When student is ready to begin the JPM and the evaluator indicates, place the simulator in RUN.

EVALUATOR CUE

Record JPM start time: __________

Step	Action	Standard	Eval	Comments
1	**Identifies** governing procedure and obtain controlled copy.	Obtains controlled copy of OP-198-001, Main Generator System	S / U	
2	**Reviews** prerequisites and precautions	Determines from initial conditions: • Main Turbine S/U complete. • Generator Prestart Lineup complete. • Service Water is aligned to H2 coolers.	S / U	

EVALUATOR NOTE

Allowing Main Turbine To Remain Unloaded At Rated Speed Causes Overheating Of Exhaust Hoods.

EVALUATOR CUE

Several alarms for feedwater heater levels and Exhaust hood sprays/temp will be received throughout this JPM. Inform the candidate that another PCO will attend to these alarms.

EVALUATOR NOTE
RPV Water Level May Lower As A Result Of Condenser Parameter Changes During Generator Synchronization.

Moisture Separator Drain Tank Levels Will Increase For A Short Duration As A Result Of Steam Flow Changes In The Moisture Separators During Generator Synchronization.

EVALUATOR CUE
Role-play the Unit Supervisor and inform the candidate that Automatic SYNCHRONIZATION will be performed for this startup.

3	Locates appropriate section of procedure for Automatic SYNCHRONIZATION	Refers to section 2.3 of procedure	S / U	
4	**Reviews** prerequisites and precautions	Determines: Main Generator S/U complete.	S / U	
5	**Place** GEN SYNC SEL 1T HS-10002 switch to MAN	**Places:** GEN SYNC SEL 1T HS-10002 keylock switch to MAN **Verifies:** SYNCHROSCOPE meter is rotating and the lights are ON when the meter is NOT at 12 O'clock position	S / U	
6	If in auto voltage control, **Ensure** SYNCHRONIZING DIFF VOLTS, XI-10007, is slightly to the RIGHT of ZERO by Adjusting generator output voltage using AUTO VOLT REG ADJUST HC-10001 potentiometer	**Turns** AUTO VOLT REG ADJUST HC-10001 potentiometer, in direction necessary, to ensure XI-10007, is slightly to the RIGHT of ZERO **Verifies:** SYNCHRONIZING DIFF VOLTS, XI-10007, is slightly to the RIGHT of ZERO	S / U	

EVALUATOR NOTE
If asked, state that the Auto Voltage Regulator will be used.
Candidate may wish to use a stopwatch in performing the next step.

<table>
<tr><td>7*</td><td>Adjust generator frequency using LOAD SELECTOR INCREASE/DECREASE push buttons until SYNCHROSCOPE is rotating in the CLOCKWISE (FAST) direction at approximately 1 revolution per 30 seconds.</td><td>Depresses:
LOAD SELECTOR INCREASE/DECREASE pushbutton until the SYNCHROSCOPE is rotating in the CLOCKWISE (FAST) direction at approximately 1 revolution per 30 seconds.</td><td>S / U</td><td></td></tr>
<tr><td>8*</td><td>Perform next three steps Expeditiously to reduce possibility of a reverse power trip.
To Synchronize Main Generator with the grid, Place GEN SYNC SEL 1T HS-10002 switch to AUTO.</td><td>Places:
GEN SYNC SEL 1T HS-10002 keylock switch to AUTO</td><td>S / U</td><td></td></tr>
<tr><td colspan="5"><u>Alternate Path</u>
IMF cmfBR04_1R101; GEN SYNC BKR 1T will not automatically close when gen sync sel 1t hs-10002 is placed in auto. The operator will be required to complete the task manually.</td></tr>
<tr><td>9</td><td>Ensure GEN SYNC BKR 1T Closes by Observing:
• Red indicating light at GEN SYNC BKR 1T HS-10001 ILLUMINATES.
Megawatts Rise</td><td>Verifies GEN SYNC BKR 1T HS-10001:
• Red light – OFF
• Amber light – ON
• Megawatts NOT rising</td><td>S / U</td><td></td></tr>
<tr><td>10</td><td>Notifies Unit Supervisor that GEN SYNC BKR 1T did not automatically CLOSE</td><td>Notifies Unit Supervisor that GEN SYNC BKR 1T did not automatically CLOSE</td><td>S / U</td><td></td></tr>
<tr><td colspan="5"><u>EVALUATOR CUE</u>
Role-play as Unit Supervisor and inform candidate that electrical maintenance has investigated the problem with the synchronizing circuit, and determined the AUTO SYNCHRONIZE circuit has a bad circuit card. Place the generator on-line via an alternate method.</td></tr>
<tr><td>11</td><td>Locates appropriate section of procedure for Manual SYNCHRONIZATION</td><td>Refers to section 2.4 of procedure</td><td>S / U</td><td></td></tr>
<tr><td>12</td><td>Reviews prerequisites and precautions</td><td>Determines:
Main Generator S/U complete.</td><td>S / U</td><td></td></tr>
</table>

13	**Obtain** Shift Supervision approval to Manually Synchronize main generator.	**Determines:** Shift Supervision approval to Manually Synchronize main generator has been received	S / U	
14*	**Place** GEN SYNC SEL 1T HS-10002 switch to MAN.	**Places:** GEN SYNC SEL 1T HS-10002 keylock switch to MAN **Verifies:** SYNCHROSCOPE meter is rotating and the lights are ON when the meter is NOT at 12 O'clock position	S / U	
EVALUATOR NOTE It may not be necessary to adjust voltage in the next step. This was previously performed back in step 19 of the JPM prior to the Fault. If the candidate determines that no adjustment is necessary at this point, then step 19 becomes the critical step.				
15	If in auto voltage control, **Ensure** SYNCHRONIZING DIFF VOLTS, XI-10007, is slightly to the RIGHT of ZERO by Adjusting generator output voltage using AUTO VOLT REG ADJUST HC-10001 potentiometer	**Verifies:** SYNCHRONIZING DIFF VOLTS, XI 10007, is slightly to the RIGHT of ZERO	S / U	
EVALUATOR NOTE Candidate may wish to use a stopwatch in performing the next step.				
16*	**Adjust** generator frequency using LOAD SELECTOR INCREASE/DECREASE push buttons until SYNCHROSCOPE is rotating in the CLOCKWISE (FAST) direction at approximately 1 revolution per 60 seconds.	**Depresses:** LOAD SELECTOR INCREASE/DECREASE pushbutton until the SYNCHROSCOPE is rotating in the CLOCKWISE (FAST) direction at approximately 1 revolution per 60 seconds.	S / U	

17*	Perform next three steps Expeditiously to reduce possibility of a reverse power trip. • To Synchronize Main Generator with the grid, when synchroscope is at or slightly before "12 O'clock" position **Close** GEN SYNC BKR 1T HS-10001.	When synchroscope is at or slightly before "12 O'clock" position, **Places:** GEN SYNC BKR 1T HS-10001 control switch to CLOSE	S / U	
18	**Ensure** GEN SYNC BKR 1T Closes by Observing: • Red indicating light GEN SYNC BKR 1T HS-10001 is ILLUMINATED. Megawatts Increase.	**Verifies** GEN SYNC BKR 1T HS-10001: • Red light – ON • Amber light – OFF • Megawatts Increase	S / U	
19*	**Depress** Increase push button on LOAD SELECTOR until all BYPASS VALVES are CLOSED.	**Depresses:** LOAD SELECTOR INCREASE pushbutton until: BPVs will close beginning with higher number , and then finally BPV1 POSITION indicates ZERO	S / U	
20	**Place** GEN SYNC SEL 1T HS-10002 Switch to OFF.	**Places:** GEN SYNC SEL 1T HS-10002 keylock switch to OFF	S / U	
EVALUATOR NOTE / CUE That completes the JPM.				
EVALUATOR CUE Record JPM stop time: __________				
EVALUATOR NOTE Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE
98.GO.20544.151

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw 10. Verify the JPM reflects the most current revision of the procedure.

Procedure	OP-198-001	Rev	30
Procedure	GO-100-002	Rev	109
Procedure		Rev	

Mpw 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor:____________________ Date: ____________

Instructor:____________________ Date: ____________

REVISION SUMMARY

JOB PERFORMANCE MEASURE
98.GO.20544.151

Revision	Description/Purpose of Revision
0	Created from JPM 98.GO.2493.151 R3

EVALUATOR COPY:

TASK CONDITIONS

- A plant startup is in progress.
- Reactor power is ~ 13%.
- Main Generator startup is complete.
- Main Generator prestart lineup is complete.
- Service Water is aligned to H2 coolers and the Core Monitor is in service.
- GO-100-002, Plant Startup, Heatup And Power Operation, has been completed up to step 5.75.
- ON-GENGRID-101, Main Generator or Grid Disturbance, has been reviewed as part of the pre-job brief and another PCO is responsible for implementing this ON, should the need arise.
- PJM has given approval to synchronize with the Voltage Regulator in Auto.
- OP-198-001, Main Generator System, has been completed up to step 2.3.

INITIATING CUE

Synchronize the Main Generator to the grid IAW OP-198-001, Main Generator System, section 2.3.

EXAMINEE COPY:

TASK CONDITIONS

- A plant startup is in progress.
- Reactor power is ~ 13%.
- Main Generator startup is complete.
- Main Generator prestart lineup is complete.
- Service Water is aligned to H2 coolers and the Core Monitor is in service.
- GO-100-002, Plant Startup, Heatup And Power Operation, has been completed up to step 5.75.
- ON-GENGRID-101, Main Generator or Grid Disturbance, has been reviewed as part of the pre-job brief and another PCO is responsible for implementing this ON, should the need arise.
- PJM has given approval to synchronize with the Voltage Regulator in Auto.
- OP-198-001, Main Generator System, has been completed up to step 2.3.

INITIATING CUE

Synchronize the Main Generator to the grid IAW OP-198-001, Main Generator System, section 2.3.

CONFIRM

NOTE:	The following step can be performed in parallel with the following: • Main Generator Startup (OP-198-001) • Synchronization and Loading of Main Generator (OP-198-001)

5.74 **WHEN** Main Turbine is at 1800 rpm, **Place** Generator Core Monitor and H2 Gas Analyzer in service **PER** OP-198-001, Main Generator Voltage Regulator System. ______

5.75 **Perform** GENERATOR STARTUP AND LOAD PER OP-198-001. ______

5.76 **Raise** load to approximately 170 MWe by withdrawing control rods. ______

5.76.1 **AT 170 MWe, Verify** the following:

a. UNIT 1 MAIN GENERATOR AC KILOVOLTS XI-10006, phases A-B, B-C, A-C, 23-25 KV. (Computer points GNE02, GNE03, GNE04) ______

b. AC MVARS, XI-10004, Within Limits of Attachment L, Generator Capability Curve. (Computer point GNU02) ______

c. MN GEN K AMPS, XI-10002A,B,C, 4.0-5.0 K Amps. (Computer points GNI02, GNI03, GNI04) ______

☐

NOTE:	The operating values for Generator Field Volts, Generator Field Current and Exciter Field Volts are dependent upon the excitation level of the generator.

d. GEN FLD VOLTAGE, XI-10010, 140-517 VDC. (Computer Point GNE01) ______

e. GEN FLD CURRENT, XI-10011, 2-6 K Amps. (Computer Point GNI01) ______

f. EXC FLD VOLTAGE, XI-10013, 20-56 VDC. (Computer Point GEE01) ______

2.3 AUTO SYNCHRONIZATION AND LOADING OF MAIN GENERATOR

2.3.1 Prerequisites

☐ Main Generator S/U complete

2.3.2 Precautions

None

☐ 2.3.3 **Place** GEN SYNC SEL 1T HS-10002 switch to **MAN**.

☐ 2.3.4 **IF** in auto voltage control, **Ensure** SYNCHRONIZING DIFF VOLTS, XI-10007, is slightly to the **RIGHT** of **ZERO** by adjusting generator output voltage using AUTO VOLT REG ADJUST HC-10001 potentiometer.

☐ 2.3.5 **IF** in manual voltage control, **Ensure** SYNCHRONIZING DIFF VOLTS, XI-10007, is slightly to the **RIGHT** of **ZERO** by adjusting generator output voltage using MAN VOLT REG ADJUST HC-10002 potentiometer.

☐ 2.3.6 **Adjust** generator frequency using LOAD SELECTOR INCREASE/DECREASE push buttons until SYNCHROSCOPE is rotating in the **CLOCKWISE** (**FAST**) direction at approximately 1 revolution per 30 seconds.

2.3.7 **Perform** next three steps **Expeditiously** to reduce possibility of a reverse power trip.

☐ a. To Synchronize Main Generator with the grid, **Place** GEN SYNC SEL 1T HS-10002 switch to **AUTO**.

b. **Ensure** GEN SYNC BKR 1T **CLOSES** by observing:

☐ (1) Red indicating light at GEN SYNC BKR 1T HS-10001 **ILLUMINATES**.

☐ (2) Megawatts **RISE**.

☐ c. **Depress** INCREASE pushbutton on LOAD SELECTOR until all BYPASS VALVES are **CLOSED**.

☐ 2.3.8 **Reset** semaphore for GEN 1 SYNC BKR by momentarily placing GEN SYNC BKR 1T HS-10001 to **CLOSE**.

☐ 2.3.9 **Place** GEN SYNC SEL 1T HS-10002 switch to **OFF**.

☐ 2.3.10 **Maintain** LOAD SET at ≤ 100 MWe **ABOVE** actual load by utilizing LOAD SELECTOR INCREASE/DECREASE pushbuttons.

2.3.11 **Enable** Loss of Bushing Potential alarm at Unit 1 Main Transformer 1X101 and 1X102.

☐ a. **Enable** 1X101HS-6, Loss of Bushing Potential Enable/Disable Alarm Switch.

☐ b. **Enable** 1X102HS-6, Loss of Bushing Potential Enable/Disable Alarm Switch.

☐ 2.3.12 At Panel 1CB1102, **Ensure** Flux Shield Cooling Fan 1V123 Control Switch HS-58701 in **START**.

☐ 2.3.13 **WHEN** Generator Hydrogen Pressure stabilizes, as required, **Establish** Manual or Continuous Hydrogen Makeup IAW OP-195-001.

2.4 TO MANUALLY SYNCHRONIZE MAIN GENERATOR (ALTERNATE METHOD)

2.4.1 Prerequisites

☐ Main Generator **S/U** complete.

2.4.2 Precautions

None

☐ 2.4.3 **Obtain** Shift Supervision approval to Manually Synchronize main generator.

☐ 2.4.4 **Place** GEN SYNC SEL 1T HS-10002 switch to **MAN**.

☐ 2.4.5 <u>IF</u> in auto voltage control, **Ensure** SYNCHRONIZING DIFF VOLTS, XI-10007, is slightly to the **RIGHT** of **ZERO** by adjusting generator output voltage using AUTO VOLT REG ADJUST HC-10001 potentiometer.

☐ 2.4.6 <u>IF</u> in manual voltage control, **Ensure** SYNCHRONIZING DIFF VOLTS, XI-10007, is slightly to the **RIGHT** of **ZERO** by adjusting generator output voltage using MAN VOLT REG ADJUST HC-10002 potentiometer.

☐ 2.4.7 **Adjust** generator frequency using LOAD SELECTOR INCREASE/DECREASE pushbuttons until SYNCHROSCOPE is rotating in the <u>**CLOCKWISE**</u> (<u>**FAST**</u>) direction at approximately 1 revolution per 60 seconds.

2.4.8 **Perform** next three steps **Expeditiously** to reduce possibility of a reverse power trip.

☐ a. To synchronize Main Generator with the grid, when synchroscope is at or slightly before "**12 O'CLOCK**" position, **Close** GEN SYNC BKR 1T HS-10001.

b. **Ensure** GEN SYNC BKR 1T **CLOSES** by observing:

☐ (1) Red indicating light GEN SYNC BKR 1T HS-10001 is **ILLUMINATED**.

☐ (2) Megawatts **RISE**.

☐ c. **Depress** INCREASE pushbutton on LOAD SELECTOR until all BYPASS VALVES are **CLOSED**.

☐ 2.4.9 **Place** GEN SYNC SEL 1T HS-10002 switch to **OFF**.

☐ 2.4.10 **Maintain** LOAD SET at ≤ 100 MWe <u>**ABOVE**</u> actual load by utilizing LOAD SELECTOR INCREASE/DECREASE pushbuttons.

2.4.11 **Enable** Loss of Bushing Potential alarm at Unit 1 Main Transformer 1X101 and 1X102.

☐ a. **Enable** 1X101HS-6, Loss of Bushing Potential Enable/Disable Alarm Switch.

☐ b. **Enable** 1X102HS-6, Loss of Bushing Potential Enable/Disable Alarm Switch.

☐ 2.4.12 At Panel 1CB1102, **Ensure** Flux Shield Cooling Fan 1V123 Control Switch HS-58701 in **START.**

☐ 2.4.13 <u>**WHEN**</u> Generator Hydrogen Pressure stabilizes, as required, **Establish** Manual or Continuous Hydrogen Makeup IAW OP-195-001.

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JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Perform Weekly RPS Surveillance

JPM#: 50.SO. Revision: 0 Date: 06/14/2017

Applicability: ☒ RO ☒ SRO

Setting: Simulator

NUREG–1123 E/APE / Sys 212000 K/A Number A4.02 K/A Importance 3.6/3.7

Alternate Path: ☒ YES ☐ NO Time Critical ☐ YES ☒ NO Validation Time (min): 10

Testing Method: ☐ Simulate ☒ Perform

Author: Michael Wilcox Date: 06/14/2017

Operations Review: Collin Breitman Date: 12/4/17

Validated: Michael Wilcox Date: 10/21/17

Approval: Jeffrey Dills Date: 12/12/17
Nuclear Training Supervisor

Examinee Name: ______________________ ______________
Last, First MI Employee Number

Exam Date: ______________ Exam Duration (Min): ______________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator: ______________________ ______________________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
50.SO.

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. SO-158-001, Weekly Manual Scram Control Switch Functional Check

III. TASK CONDITIONS

- Unit 1 is operating at rated conditions
- Maintenance has just been completed on RPS logic channels.
- Post Maintenance testing is required for RPS channels A and B
- SO-158-001, Weekly Manual Scram Control Switch Functional Check, is being performed for post-maintenance testing and has been completed up to step 5.1

IV. INITIATING CUE

Perform the Weekly Manual Scram Control Switch Functional Check in accordance with SO-158-001, sections 5.1 and 5.3, only.

V. TASK STANDARD

Performs the functional check of RPS channel A1 satisfactorily. Scrams the reactor after three control rods insert while testing RPS channel A1, as directed by ON-CRD-101, Control Rod Malfunction.

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
50.SO.

NOTE:	It is permissible to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

1. **Reset** the simulator to IC-_20__.
2. **Other** actions

Setup the simulator with the following conditions:

- Start in a power operating IC.
- Insert the following Event Triggers:

ET58n18sf7et1

```
diHSC72A1S03AB.CurrValue = #OR.diHSC72A1S03AB.ARM & diHSC72A1S03AA.CurrValue =
#OR.diHSC72A1S03AA.INIT

IMF mfRD1550083039
IMF mfRD1550081843
IMF mfRD1550084631
IRF rfRP158039 d:3 f:BYPASS
IRF rfRP158040 d:3 f:BYPASS
IOR diHSC72A1S03AA f:NORM
IOR diHSC72A1S03CA f:NORM
```

- Perform the following expert commands

```
IOR diHSC72A1S01 f:RUN
```

- Perform the following expert commands to assign keys to manually trigger the appropriate malfunctions if the event triggers do not fire

```
{Key[1]} IMF mfRP158002
{Key[1]} IMF mfRD1550083039
{Key[1]} IMF mfRD1550081843
{Key[1]} IMF mfRD1550084631
{Key[1]} IRF rfRP158039 d:3 f:BYPASS
{Key[1]} IRF rfRP158040 d:3 f:BYPASS
{Key[1]} IOR diHSC72A1S03AA f:NORM
{Key[1]} IOR diHSC72A1S03CA f:NORM
```

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the initiating cue.
- This JPM must be performed in the simulator. Configure the simulator per the Simulator Setup Instructions.
- Mark-up a copy of SO-158-001 complete to Step 5.1.

BOOTH OPERATOR CUE

When student is ready to begin the JPM and the evaluator indicates, place the simulator in RUN.

EVALUATOR CUE

Record JPM start time: __________

Step	Action	Standard	Eval	Comments
1	**Identifies** governing procedure and obtain controlled copy.	Obtains a controlled copy of SO-158-001 from evaluator. Selects step 5.1. Reviews procedure as necessary.	S / U	
2	**Verifies** SO–158–001 prerequisites are satisfied.	Determines prerequisites previously met based on initial conditions.	S / U	

EVALUATOR NOTE

JPM steps 3 – 9 test the reactor scram instrument channel A1.

Step	Action	Standard	Eval	Comments
3*	**5.1.1 - PLACE** RPS MAN SCRAM CHAN A1 HS-C72A-1S03A control switch to ARMED.	Rotates HS–C72A–1S03A, RPS MAN SCRAM CHAN A1, locking collar to the ARMED position. • Observes AR103 A03 in alarm	S / U	
4*	**5.1.3 - DEPRESS** RPS MAN SCRAM CHAN A1 HS-C72A-1S03A control switch.	Trips RPS Channel A1 by depressing HS–C72A–1S03A, RPS MAN SCRAM CHAN A1 pushbutton.	S / U	

ALTERNATE PATH

JPM steps 3 – 4 test the reactor scram instrument channel A1. The alternate path becomes apparent when the manual scram pushbutton is depressed for RPS channel A1. Three control rods will scram, prompting the operator to take the required actions from ON-CRD-101 to place the mode switch in SHUTDOWN if three or more rods have drifted or scrammed from their target positions. Inserting a manual scram for 3 or more control rods scrammed is also an Immediate Operator Action per OP–AD–055 Attachment B. Either procedure is acceptable. Since it is an immediate operator action, the applicant may not reference a procedure prior to taking the required actions.

BOOTH OPERATOR CUE

Ensure Event Trigger n18sf7et1 fires when RPS A1 PB is armed and depressed, to drift the control rods in. If the ET does not fire **depress KEY 1** to insert a RPS A half–scram and control rod drift.

5	**IDENTIFIES** the insertion of three control rods.	• Observes AR104 A01, AR104 F01 in alarm • Observes AR104 H05 in alarm • Depresses the DISPLAY RODS DFTING PB • Observes FULL CORE DISPLAY for control rods 30-39, 18-43, AND 46–31 illuminated RED • Notifies Unit Supervisor of 3 control rod insertions	S / U	
6*	**INSERTS** a manual reactor SCRAM	Places the MODE SWITCH in SHUTDOWN.	S / U	

EVALUATOR NOTE / CUE
That completes the JPM. (The rods will not insert when the Mode Switch is placed in shutdown to facilitate repeating the JPM. The intent of the JPM is met when the applicant places the Mode Switch is placed in shutdown.)

EVALUATOR CUE
Record JPM stop time: __________

EVALUATOR NOTE
Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE

NOTE:	All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw	10. Verify the JPM reflects the most current revision of the procedure.

Procedure	SO-158-001	Rev	16
Procedure	ON-CRD-101	Rev	3
Procedure		Rev	

Mpw	11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A	12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor: ____________________ Date: ____________

Instructor: ____________________ Date: ____________

REVISION SUMMARY

JOB PERFORMANCE MEASURE

Revision	Description/Purpose of Revision
0	New JPM

EVALUATOR COPY:

TASK CONDITIONS

- Unit 1 is operating at rated conditions
- Maintenance has just been completed on RPS logic channels.
- Post Maintenance testing is required for RPS channels A and B
- SO-158-101, Weekly Manual Scram Control Switch Functional Check, is being performed for post-maintenance testing and has been completed up to step 5.1

INITIATING CUE

Perform the Weekly Manual Scram Control Switch Functional Check in accordance with SO-158-001, sections 5.1 and 5.3, only.

EXAMINEE COPY:

TASK CONDITIONS

- Unit 1 is operating at rated conditions
- Maintenance has just been completed on RPS logic channels.
- Post Maintenance testing is required for RPS channels A and B
- SO-158-001, Weekly Manual Scram Control Switch Functional Check, is being performed for post-maintenance testing and has been completed up to step 5.1

INITIATING CUE

Perform the Weekly Manual Scram Control Switch Functional Check in accordance with SO-158-001, sections 5.1 and 5.3, only.

PROCEDURE COVER SHEET

SUSQUEHANNA NUCLEAR, LLC PROCEDURE	
WEEKLY MANUAL SCRAM CONTROL SWITCH FUNCTIONAL CHECK ADHERENCE LEVEL: CONTINUOUS USE	04/18/2017 SO-158-001 Revision 16 Page 1 of 14 Unit 1

QUALITY CLASSIFICATION: (X) QA Program ( ) Non-QA Program	APPROVAL CLASSIFICATION: (X) Plant ( ) Non-Plant ( ) Instruction

EFFECTIVE DATE: ______________

PERIODIC REVIEW FREQUENCY: N/A

PERIODIC REVIEW DUE DATE: N/A

RECOMMENDED REVIEWS:

Procedure Owner: A Shift

Responsible Supervisor: Shift Manager - A Shift

Responsible FUM: Manager - Nuclear Operations

Responsible Approver: Manager - Nuclear Operations

PROCEDURE REVISION SUMMARY

1) Per AR-2017-03938, added 1.2.3 and Note prior to step 5.1, that SI-158-441 and SI-158-442 may be performed in parallel with this SO.

TABLE OF CONTENTS

ATTACHMENTS

1. PURPOSE AND SCOPE

1.1 Purpose

1.1.1 This procedure performs a Channel Functional Test of the Unit 1 Reactor Protection System Manual Scram Instrumentation Channels to meet the weekly surveillance requirements of SR 3.3.1.1.5 when in Modes 1 or 2. This surveillance is also performed weekly in Mode 5 if any control rod is withdrawn from a core cell containing one or more fuel assemblies.

1.2 Scope

1.2.1 This procedure performs testing of the following Manual Scram Instrumentation Channels:

- Channel A1
- Channel A2
- Channel B1
- Channel B2

1.2.2 This procedure may be performed by individual sections as determined by Shift Supervision, but not concurrently. Sections not performed need not be marked NA.

1.2.3 SI-158-441 and SI-158-442 may be performed in parallel with this procedure.

2. REFERENCES AND COMMITMENTS

2.1 Performance References

2.1.1 OP-158-001, RPS System

2.2 Developmental References

2.2.1 LCO 3.3.1.1

2.2.2 FSAR Section 7.2, Reactor Trip System

2.2.3 NDAP-QA-0722, Surveillance Testing Program

2.2.4 J-803, Unit Operating Benchboard 1C651

2.3 Commitments

2.3.1 None

3. PRECAUTIONS AND LIMITATIONS

3.1 Precautions

3.1.1 None

3.2 Limitations

3.2.1 None

4. PREREQUISITES

4.1 **VERIFY** the following conditions:

- ☑ Reactor Protection System is aligned **PER** OP-158-001, RPS System
- ☑ **NO** reactor scram signals are present
- ☑ **NO** other testing or maintenance is currently being performed on any reactor protection instrumentation
- ☑ **NO** testing or maintenance is scheduled to start on any reactor protection instrumentation until this test is complete, except as evaluated by Shift Supervision

☑

NOTE
CRD HCU scram pilot solenoid valve thermography is performed weekly and results are recorded in the Unit Log.

- **IF** CRD HCU Scram Pilot solenoid valve thermography was performed within the previous week,

☐ N/A **THEN VERIFY** thermography results indicate all CRD HCU Scram Pilot solenoid coils are energized.

5. INSTRUCTIONS

☐

NOTE

- All steps are performed at Control Room Benchboard 1C651.
- Sections 5.1 through 5.4 may be performed in any order.
- SI-158-441 and SI-158-442 may be performed in parallel with this procedure.

5.1 Testing Reactor Scram Instrumentation Channel A1

☐ 5.1.1 **PLACE** RPS MAN SCRAM CHAN A1 HS-C72A-1S03A control switch to ARMED.

☐

NOTE

Annunciator AR103 A03 is expected but is not acceptance criteria for this surveillance.

☐ 5.1.2 **VERIFY** annunciator AR103 A03, RPS MAN SCRAM CHANNEL A1/A2 SWITCH ARMED is ILLUMINATED.

☐ 5.1.3 **DEPRESS** RPS MAN SCRAM CHAN A1 HS-C72A-1S03A control switch.

5.1.4 **VERIFY** the following annunciator alarms ILLUMINATED:

☐ • AR103 A01, RPS CHANNEL A1/A2 AUTO SCRAM

☐ • AR103 F01, RPS CHANNEL A1/A2 MAN SCRAM

☐ 5.1.5 **PLACE** RPS MAN SCRAM CHAN A1 HS-C72A-1S03A switch to DISARMED.

5.1.6 **RESET** RPS A half scram as follows:

☐ • Momentarily **PLACE** REACTOR SCRAM RESET HS C72A 1S05 switch to GROUP 1/4 position.

☐ • Momentarily **PLACE** REACTOR SCRAM RESET HS C72A 1S05 switch to GROUP 2/3 position.

5.1.7 **VERIFY** the following annunciators <u>NOT</u> ILLUMINATED:

☐ • AR103 A01, RPS CHANNEL A1/A2 AUTO SCRAM

☐ • AR103 A03, RPS MAN SCRAM CHANNEL A1/A2 SWITCH ARMED

☐ • AR103 F01, RPS CHANNEL A1/A2 MAN SCRAM

☐ 5.1.8 **COMPLETE** Acceptance Criteria Item 1 of Attachment A, Data Form.

5.1.9 IF Acceptance Criteria for Reactor Scram Instrumentation Channel A1 is NOT satisfactory,

THEN **PERFORM** the following:

☐ a. **NOTIFY** Shift Supervision.

☐

CAUTION

A manual scram may occur if half scram is not reset before proceeding. Do not proceed to next channel unless all expected actions occur.

☐ b. **SUSPEND** further testing with this procedure until Reactor Scram Instrumentation Channel A1 is repaired.

5.2 **Testing Reactor Scram Instrumentation Channel A2**

☐ N/A 5.2.1 **PLACE** RPS MAN SCRAM CHAN A2 HS-C72A-1S03C control switch to ARMED.

☐

NOTE

Annunciator AR103 A03 is expected but is not acceptance criteria for this surveillance.

☐ 5.2.2 **VERIFY** annunciator AR103 A03, RPS MAN SCRAM CHANNEL A1/A2 SWITCH ARMED is ILLUMINATED.

☐ 5.2.3 **DEPRESS** RPS MAN SCRAM CHAN A2 HS-C72A-1S03C control switch.

5.2.4 **VERIFY** the following annunciator alarms ILLUMINATED:

☐ • AR103 A01, RPS CHANNEL A1/A2 AUTO SCRAM

☐ • AR103 F01, RPS CHANNEL A1/A2 MAN SCRAM

☐ 5.2.5 **PLACE** RPS MAN SCRAM CHAN A2 HS-C72A-1S03C switch to DISARMED.

5.2.6 **RESET** RPS A half scram as follows:

☐ • Momentarily **PLACE** REACTOR SCRAM RESET HS C72A 1S05 switch to GROUP 1/4 position.

☐ • Momentarily **PLACE** REACTOR SCRAM RESET HS C72A 1S05 switch to GROUP 2/3 position.

☐ 5.2.7 **VERIFY** the following annunciators **NOT** ILLUMINATED:

☐ N/A
- AR103 A01, RPS CHANNEL A1/A2 AUTO SCRAM

☐
- AR103 A03, RPS MAN SCRAM CHANNEL A1/A2 SWITCH ARMED

☐
- AR103 F01, RPS CHANNEL A1/A2 MAN SCRAM

☐ 5.2.8 **COMPLETE** Acceptance Criteria Item 2 of Attachment A, Data Form.

5.2.9 **IF** Acceptance Criteria for Reactor Scram Instrumentation Channel A2 is **NOT** satisfactory,

THEN PERFORM the following:

☐ a. **NOTIFY** Shift Supervision.

☐

> **CAUTION**
>
> A manual scram may occur if half scram is not reset before proceeding. Do not proceed to next channel unless all expected actions occur.

☐ b. **SUSPEND** further testing with this procedure until Reactor Scram Instrumentation Channel A2 is repaired.

5.3 Testing Reactor Scram Instrumentation Channel B1

☐ 5.3.1 **PLACE** RPS MAN SCRAM CHAN B1 HS-C72A-1S03B control switch to ARMED.

☐

> **NOTE**
>
> Annunciator AR104 A03 is expected but is not acceptance criteria for this surveillance.

☐ 5.3.2 **VERIFY** annunciator AR104 A03, RPS MAN SCRAM CHANNEL B1/B2 SWITCH ARMED is ILLUMINATED.

☐ 5.3.3 **DEPRESS** RPS MAN SCRAM CHAN B1 HS-C72A-1S03B control switch.

5.3.4 **VERIFY** the following annunciator alarms ILLUMINATED:

☐
- AR104 A01, RPS CHANNEL B1/B2 AUTO SCRAM

☐
- AR104 F01, RPS CHANNEL B1/B2 MAN SCRAM

☐ 5.3.5 **PLACE** RPS MAN SCRAM CHAN B1 HS-C72A-1S03B switch to DISARMED.

5.3.6 **RESET** RPS B half scram as follows:

☐ • Momentarily **PLACE** REACTOR SCRAM RESET HS C72A 1S05 switch to GROUP 1/4 position.

☐ • Momentarily **PLACE** REACTOR SCRAM RESET HS C72A 1S05 switch to GROUP 2/3 position.

5.3.7 **VERIFY** the following annunciators **NOT** ILLUMINATED:

☐ • AR104 A01, RPS CHANNEL B1/B2 AUTO SCRAM

☐ • AR104 A03, RPS MAN SCRAM CHANNEL B1/B2 SWITCH ARMED

☐ • AR104 F01, RPS CHANNEL B1/B2 MAN SCRAM

☐ 5.3.8 **COMPLETE** Acceptance Criteria Item 3 of Attachment A, Data Form.

5.3.9 IF Acceptance Criteria for Reactor Scram Instrumentation Channel B1 is **NOT** satisfactory,

THEN PERFORM the following:

☐ a. **NOTIFY** Shift Supervision.

☐

> **CAUTION**
>
> A manual scram may occur if half scram is not reset before proceeding. Do not proceed to next channel unless all expected actions occur.

☐ b. **SUSPEND** further testing with this procedure until Reactor Scram Instrumentation Channel B1 is repaired.

5.4 **Testing Reactor Scram Instrumentation Channel B2**

☐ N/A 5.4.1 **PLACE** RPS MAN SCRAM CHAN B2 HS-C72A-1S03D control switch to ARMED.

☐

> **NOTE**
>
> Annunciator AR104 A03 is expected but is not acceptance criteria for this surveillance.

☐ 5.4.2 **VERIFY** annunciator AR104 A03, RPS MAN SCRAM CHANNEL B1/B2 SWITCH ARMED is ILLUMINATED.

☐ N/A 5.4.3 **DEPRESS** RPS MAN SCRAM CHAN B2 HS-C72A-1S03D control switch.

5.4.4 **VERIFY** the following annunciator alarms ILLUMINATED:

☐ • AR104 A01, RPS CHANNEL B1/B2 AUTO SCRAM

☐ • AR104 F01, RPS CHANNEL B1/B2 MAN SCRAM

☐ 5.4.5 **PLACE** RPS MAN SCRAM CHAN B2 HS-C72A-1S03D switch to DISARMED.

5.4.6 **RESET** RPS B half scram as follows:

☐ • Momentarily **PLACE** REACTOR SCRAM RESET HS C72A 1S05 switch to GROUP 1/4 position.

☐ • Momentarily **PLACE** REACTOR SCRAM RESET HS C72A 1S05 switch to GROUP 2/3 position.

5.4.7 **VERIFY** the following annunciators <u>NOT</u> ILLUMINATED:

☐ • AR104 A01, RPS CHANNEL B1/B2 AUTO SCRAM

☐ • AR104 A03, RPS MAN SCRAM CHANNEL B1/B2 SWITCH ARMED

☐ • AR104 F01, RPS CHANNEL B1/B2 MAN SCRAM

☐ 5.4.8 **COMPLETE** Acceptance Criteria Item 4 of Attachment A, Data Form.

5.4.9 <u>IF</u> Acceptance Criteria for Reactor Scram Instrumentation Channel B2 is <u>NOT</u> satisfactory,

<u>THEN</u> **PERFORM** the following:

☐ a. **NOTIFY** Shift Supervision.

☐

CAUTION

A manual scram may occur if half scram is not reset before proceeding. Do not proceed to next channel unless all expected actions occur.

☐ b. **SUSPEND** further testing with this procedure until Reactor Scram Instrumentation Channel B2 is repaired.

5.5 **Test Completion**

☐ 5.5.1 **DIRECT** an operator to perform independent verification per Attachment B, Independent Verification.

☐ 5.5.2 **NOTIFY** Shift Supervision test is complete.

☐ 5.5.3 **FORWARD** surveillance to Shift Supervision for review.

6. ACCEPTANCE CRITERIA

☐ 6.1 **REVIEW** Acceptance Criteria in Attachment A, Data Form.

6.2 IF Acceptance Criteria not met,

☐ **THEN COMPLETE** Required Actions section of Attachment A, Data Form.

7. RECORDS

- Attachment A, Data Form
- Attachment B, Independent Verification

DATA FORM
WEEKLY MANUAL SCRAM CONTROL SWITCH FUNCTIONAL CHECK

ACCEPTANCE CRITERIA	ACCEPTABLE	INITIALS
SR 3.3.1.1.5 and SR 3.3.1.1.15 function 11 (partial) 1. Reactor Manual Scram Instrumentation Channel A1 control switch functionally checked satisfactory per Steps 5.1.1 thru 5.1.7. (Step 5.1.8)	YES/NO [1]	______
SR 3.3.1.1.5 and SR 3.3.1.1.15 function 11 (partial) 2. Reactor Manual Scram Instrumentation Channel A2 control switch functionally checked satisfactory per Steps 5.2.1 thru 5.2.7. (Step 5.2.7)	YES/NO [1]	______
SR 3.3.1.1.5 and SR 3.3.1.1.15 function 11 (partial) 3. Reactor Manual Scram Instrumentation Channel B1 control switch functionally checked satisfactory per Steps 5.3.1 thru 5.3.7. (Step 5.3.8)	YES/NO [2]	______
SR 3.3.1.1.5 and SR 3.3.1.1.15 function 11 (partial) 4. Reactor Manual Scram Instrumentation Channel B2 control switch functionally checked satisfactory per Steps 5.4.1 thru 5.4.7. (Step 5.4.8)	YES/NO [2]	______

5. Reviewed by Shift Supervision:

______________________	______________________	______________
Print	Signature	Date

Notes:

[1] Annunciator AR103 A03 is expected to alarm and clear but is not acceptance criteria for this surveillance.

[2] Annunciator AR104 A03 is expected to alarm and clear but is not acceptance criteria for this surveillance.

REQUIRED ACTIONS

1. **IF** Acceptance Criteria not met,

   THEN PERFORM the following Required Actions as applicable:

LCO	APPLICABLE	INITIALS
LCO 3.3.1.1 Actions	YES/NO	_______

INDEPENDENT VERIFICATION

	COMPONENT	POSITION	INDEPENDENT VERIFICATION
1.	RPS MAN SCRAM CHAN A1 HS-C72A-1S03A	DISARM	
2.	RPS MAN SCRAM CHAN A2 HS-C72A-1S03C	DISARM	
3.	RPS MAN SCRAM CHAN B1 HS-C72A-1S03B	DISARM	
4.	RPS MAN SCRAM CHAN B2 HS-C72A-1S03D	DISARM	

Reviewed by Shift Supervision:

Print	Signature	Date

TALEN ENERGY

LOC29
NRC INITIAL LICENSE EXAM

Simulator JPM H

TEAM SUSQUEHANNA
Generating Excellence

SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Perform RBCCW System Flush

JPM#: 14.ON.20370.151 Revision: 0 Date: 06/13/2017

Applicability: ☒ RO ☒ SRO

Setting: Simulator

NUREG–1123 E/APE / Sys 400000 K/A Number A2.01 K/A Importance 3.3/3.4

Alternate Path: ☒ YES ☐ NO Time Critical ☐ YES ☒ NO Validation Time (min): 11

Testing Method: ☐ Simulate ☒ Perform

Author: Michael Wilcox Date: 10/3/17

Operations Review: Jay Barnes Date: 11/7/17

Validated: Michael Wilcox Date: 10/6/17

Approval: Jeffrey Dills Date: 11/7/17
Nuclear Training Supervisor

Examinee Name: ______________________________ ______________________
Last, First MI Employee Number

Exam Date: ____________________ Exam Duration (Min): ____________________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator: ________________________ ________________________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
14.ON.20370.151

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. GO-100-014, Unit 1 Hot Weather Operation (Rev 13)

B. ON-RBCCW-101, Loss of RBCCW (Rev 1)

C. OP-114-001, Reactor Building Closed Cooling Water System (Rev 25)

D. OP-AD-001, Ops Standards for System and Equipment Operation (Rev 59)

III. TASK CONDITIONS

- Systems cooled by Unit 1 RBCCW are experiencing degraded performance due to hot weather operation.
- Engineering has recommended a flush of the in-service RBCCW Heat Exchanger A to see if performance improves.
- The RBCCW TCV bypass valve is unavailable to be operated.
- No throttled isolation valves are to be operated during the flush.

IV. INITIATING CUE

Perform a flush of RBCCW HX A per GO-100-014 Section 5.3.2.

V. TASK STANDARD

The operator will recognize the loss of the 'A' RBCCW pump. 'B' RBCCW pump will be running and vented in accordance with ON-RBCCW-101.

SIMULATOR SETUP INSTRUCTIONS
JOB PERFORMANCE MEASURE
14.ON.20370.151

NOTE:	It is permissible to use a similar IC to the IC listed below, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

1. **Reset** the simulator to any IC with RBCCW in operation.
2. **Run** scenario file JPM14ON20370151.SCN
   aet ETJPM14ON20370151
   IMF cmfPM04_1P210B
   IRF rfRW114002 f:20
   {Key[1]} IRF rfRW114002 f:100 r:10
   ETJPM14ON20370151.ET/SCN
   ;METER:RBCCW HX TEMP CONTROL (HORZ METER)
   aoTIC11028B.CurrValue > 90
   IMF cmfPM03_1P210A d:30

EVALUATOR INSTRUCTIONS

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the Initiating Cue.
- This JPM must be performed in the simulator. Reset to exam-specific IC, or configure the simulator per the Simulator Setup Instructions.
- Mark-up a copy of GO-100-014 complete up to initiating flush of RBCCW with TCV. N/A steps associated with the TCV bypass and throttled isolation valves.

EVALUATOR CUE

Record JPM start time: __________

BOOTH OPERATOR CUE

When the evaluator indicates the examinee is ready to begin the JPM, **place** the simulator in RUN.

Step	Action	Standard	Eval	Comments
1	**Identifies** governing procedure and obtain controlled copy.	Obtains controlled copy of GO-100-014. Determines Att. E is the correct section.	S / U	

Alternate Path

RBCCW PUMP 1A trips 30 seconds after controller output exceeds 90 percent. The operator will need to restore RBCCW flow with Pump B.

Step	Action	Standard	Eval	Comments
*2	**Initiates** flush of system heat exchangers cooled by RBCCW.	Performs the following on controller TIC-11028, RBCCW COOLER TEMP: • Places M/A toggle switch to M • Depresses OPEN PB until controller output indicates 100 percent	S / U	
3	**Observes** RBCCW Pump 1A tripped.	Observes the following: • RBCCW Pump 1A indication lost • RBCCW system pressure low on PI-11308, RBCCW HX DSCH PRESS • AR-123-E03, RBCCW PUMPS DISCHARGE HEADER LO PRESS, and AR-123-E04, RBCCW HEAT EXCHANGER HEADER LO PRESS, in alarm • RBCCW Pump 1B fails to automatically start • Informs Unit Supervisor	S / U	

EVALUATOR CUE (As Unit Supervisor) Respond in accordance with plant procedures.				
*4	**Starts** RBCCW Pump 1B.	Depresses RBCCW PUMP 1P210B START PB.	S / U	
EVALUATOR NOTE Normal RBCCW system pressure on PI-11308 is approximately 75 psig.				
5	**Observes** RBCCW Pump 1B fails to develop flow.	Observes the following: • RBCCW Pump 1B indicates running • RBCCW system pressure low on PI-11308, RBCCW HX DSCH PRESS • AR-123-E03, RBCCW PUMPS DISCHARGE HEADER LO PRESS, and AR-123-E04, RBCCW HEAT EXCHANGER HEADER LO PRESS, in alarm Informs Unit Supervisor	S / U	
EVALUATOR NOTE The above condition drives entry into ON-RBCCW-101. The applicant may execute AR-123-001 to eventually get into ON-RBCCW-101. If the applicant executes the AR, provide appropriate cues for steps 2.3 and 2.4. Report RBCCW head tank level as 56".				
EVALUATOR CUE (As Unit Supervisor) If the applicant requests direction, provide the appropriate cue to make a recommendation and carry out the recommendation.				
6	**Records** Recirc Pump bearing and seal cavity temperatures.	Recirc Pumps A&B Motor Temperature TRSH B31 1R601 Panel 1C614, records Reactor Recirc Pump A(B) Motor Bearing and Seal Cavity temperatures. (1-4, 8, 9, 13-16, 20, 21)	S / U	
EVALUATOR CUE (When first set of data collected) Another operator will monitor Recirc Pump temperatures. I will determine when action is required before the temperature limits. Continue in ON-RBCCW-101.				
7	**Determines** loss of flow has occurred.	Selects Condition A to perform.	S / U	

8	**Ensures** RBCCW Pump 1B running.	Observes RBCCW Pump 1B indicates running, but pump discharge header pressure low annunciator remains in alarm.	S / U	
9	**Checks** RBCCW Pump breakers.	Directs NPO to check the following breakers: • RBCCW Pump 1A: 1B216-103 • RBCCW Pump 1B: 1B237-093	S / U	
<u>EVALUATOR CUE</u> 1B216-103 is tripped. 1B237-093 is closed.				
10	**Identifies** performance of ON-CIG-101 for loss of CIG compressors is required.	Informs Unit Supervisor to enter ON-CIG-101.	S / U	
<u>EVALUATOR CUE</u> Another operator will perform ON-CIG-101.				
11	**Determines** if RBCCW Pump 1B is developing flow.	Directs the NPO to report the status of RBCCW Pump 1B.	S / U	
<u>EVALUATOR CUE</u> (As NPO) RBCCW Pump 1B is running, but sounds air-bound.				
*12	**Vents** RBCCW Pump 1B.	Directs NPO to vent RBCCW Pump 1B.	S / U	
<u>BOOTH OPERATOR CUE</u> When directed to vent RBCCW Pump 1B, **depress KEY 1** to simulate venting the pump. Note: If this step is directed form the AR, wait until the applicant gets to the ON guidance prior to inserting Key 1.				
<u>EVALUATOR CUE</u> I got a lot of air when I initially opened the pump casing vents, then a solid stream of water. RBCCW Pump 1B sounds to be running normally now.				

13	**Verifies** RBCCW flow is restored.	Observes the following: • Observes RBCCW system pressure approximately 75 psig on PI-11308, RBCCW HX DSCH PRESS • Observes AR-123-E03, RBCCW PUMPS DISCHARGE HEADER LO PRESS, and AR-123-E04, RBCCW HEAT EXCHANGER HEADER LO PRESS, clear	S / U	
14	**Ensures** RBCCW Head Tank in normal band.	Observes annunciator AR-132-E06, RBCCW HEAD TANK HI LO LEVEL, is clear.	S / U	

EVALUATOR NOTE / CUE
That completes the JPM.

EVALUATOR CUE
Record JPM stop time: ___________

EVALUATOR NOTE
Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE
14.ON.20370.151

NOTE:	All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw

10. Verify the JPM reflects the most current revision of the procedure.

Procedure	OP-114-001	Rev	25
Procedure	ON-RBCCW-101	Rev	2
Procedure	GO-100-014	Rev	14

Mpw 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor: ______________________ Date: ____________

Instructor: ______________________ Date: ____________

REVISION SUMMARY

JOB PERFORMANCE MEASURE
14.ON.20370.151

Revision	Description/Purpose of Revision
0	Crated from JPM 14.ON.1335.151. Reformatted to the Vision template.

EVALUATOR COPY:

TASK CONDITIONS

- Systems cooled by Unit 1 RBCCW are experiencing degraded performance due to hot weather operation.
- Engineering has recommended a flush of the in-service RBCCW Heat Exchanger A to see if performance improves.
- The RBCCW TCV bypass valve is unavailable to be operated.
- No throttled isolation valves are to be operated during the flush.

INITIATING CUE

Perform a flush of RBCCW HX A per GO-100-014 Section 5.3.2.

EXAMINEE COPY:

TASK CONDITIONS

- Systems cooled by Unit 1 RBCCW are experiencing degraded performance due to hot weather operation.
- Engineering has recommended a flush of the in-service RBCCW Heat Exchanger A to see if performance improves.
- The RBCCW TCV bypass valve is unavailable to be operated.
- No throttled isolation valves are to be operated during the flush.

INITIATING CUE

Perform a flush of RBCCW HX A per GO-100-014 Section 5.3.2.

PROCEDURE COVER SHEET

PPL SUSQUEHANNA, LLC PROCEDURE	
UNIT 1 HOT WEATHER OPERATION ADHERENCE LEVEL: CONTINUOUS USE	GO-100-014 Revision 14 Page 1 of 56 Unit 1

QUALITY CLASSIFICATION:	APPROVAL CLASSIFICATION:
[X] QA Program [ ] Non-QA Program	[X] Plant [ ] Non-Plant [ ] Instruction

EFFECTIVE DATE: ____________________

PERIODIC REVIEW FREQUENCY: NONE

NEXT PERIODIC REVIEW DUE DATE: NONE

RECOMMENDED REVIEWS:

Procedure Owner: A Shift

Responsible Supervisor: Shift Manager- A Shift

Responsible FUM: Manager - Nuclear Operations

Responsible Approver: Manager - Nuclear Operations

PROCEDURE REVISION SUMMARY

1) Changed section 5.11 to match the revised actions already listed in OP-193-001 Attachment G. (Ref AR-2016-17191)

TABLE OF CONTENTS

SECTION PAGE

1.0 PURPOSE AND SCOPE

1.1 Purpose

1.1.1 Intent of this procedure is to provide guidance on how to identify and preclude or minimize impact on the operation of plant systems and the Unit during hot weather conditions. These conditions may reach or exceed design basis of plant necessitating power reductions.

1.2 Scope

1.2.1 The Service Water system is a flow balance system which is designed to transfer heat from heat exchangers located in the Reactor, Turbine and Radwaste Buildings to the circulating water system.

1.2.2 During hot weather conditions, plant systems operate at elevated temperatures causing Service Water TCV to full open. Heat transfer rates lower due to corrosion or crud build up in plant system heat exchangers. Service Water may reach maximum design capability preventing efficient heat removal from associated loads.

1.2.3 Reconfiguring the Service Water System by eliminating unnecessary loads or rising of total flow will provide additional cooling ability to the troubled system although it may have adverse effects by starving remaining supplied loads. Operation of three Service Water Pumps will provide a minimal increase in total system flow and extended operating in this configuration should be minimized.

1.2.4 If actions to prevent heat up of associated loads or steps to improve efficiency of service water system are not effective, power reductions will be required.

1.2.5 Isolated Phase Bus Duct Air or bus temperature will rise with hot weather operation. Exhaust dampers have been provided at the Isophase Cooler Return Duct A & C to allow removal of hot return air and introduce cooler turbine building air through the air intake filters.

1.2.6 CRD (Purge) Water Temperature above 130°F add additional heat to the RWCU Motor Cooling Loop that must be removed by the RWCU Motor Coolers.

a. High CRD Temperatures especially in conjunction with elevated RBCCW Temperatures can lead to the condition where the Purge Water causes the RWCU Motor Temperature to exceed the 130°F Alarm Point or the 135°F Pump Trip Point.

b. Historically, the RWCU Motor Temperatures can be maintained below 130°F with CRD/Purge Water Temperatures of up to 140°F and RBCCW up to 95°F. Above these temperatures, purge flow should be reduced in order to limit the amount of heat added by the purge water. Short Term RWCU Pump operation with low or no purge flow is acceptable, however, RWCU Pump operation without purge flow can lead to additional contamination of the pump internals. This is an ALARA issue and does not affect pump operability.

1.2.7 If power reductions are required to cope with high system temperatures, GO-100-012, Power Maneuvers will provide guidance.

2.0 REFERENCES AND COMMITMENTS

2.1 Performance References

2.1.1 AR-106-001, Main Turbine Generator, Computer HVAC, Instrument AC, 24V DC, 125V DC, 250V DC Panel 1C651.

2.1.2 ON-100-102, Unit 1 Hot Weather

2.1.3 GO-100-012, Power Maneuvers

2.1.4 OP-111-001, Service Water System

2.1.5 OP-161-001, Unit 1 Reactor Water Cleanup System.

2.1.6 OP-161-002, Unit 1 RWCU Filter Demineralizers

2.1.7 OP-187-001, Isophase Bus Duct Cooling System.

2.1.8 OP-197-001, Stator Cooling System

2.1.9 Mach Gas Temp High Alarm (A03) LA-1125-001

2.2 Developmental References

2.2.1 AR-957471, Develop new GO procedure for Hot Weather operations

2.3 Commitments

2.3.1 None

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Precautions

3.1.1 None

3.2 Limitations

3.2.1 None

4.0 PREREQUISITES AND INITIAL CONDITIONS

4.1 Prerequisites

4.1.1 Any of the following conditions:

a. Any temperature control valve for Service Water cooled heat exchangers is full open.

b. Elevated Circ Water temperature and anticipated temperature rise.

c. Elevated Service Water temperature and anticipated temperature rise.

d. Elevated Isophase Bus Duct Air or Bus Temperatures **OR** as directed by AR- 106-001, Main Turbine Generator, Computer HVAC, Instrument AC, 24V DC, 125V DC, 250V DC Panel 1C651.

e. High RWCU Motor Temperatures due to elevated CRD/Purge and/or RBCCW temperatures.

4.2 Initial Conditions

4.2.1 Plant operation in accordance with GO-100-012, Power Maneuvers.

5.0 INSTRUCTIONS

NOTE

Steps within this procedure are generally performed in the order written, however it is acceptable to perform steps concurrently with Shift Supervision permission.

5.1 Initiate Unit 1 Hot Weather Operations:

5.1.1 Shift Supervision **AUTHORIZE** entry into GO-100-014, Hot Weather Operations:

TIME Now

DATE T/D/Y

Shift Supervision

5.2 Evaluate Service Water loads

5.2.1 **MONITOR** available system parameters to determine potential alarm status.

5.2.2 **COMPARE** data to normal operating values given on Attachment A, UNIT 1 SERVICE WATER LOADS

5.2.3 **DETERMINE** potentially troubled systems.

5.2.4 Prior to exceeding maximum operating temperature for any system listed on Attachment A, **REDUCE** Reactor power **PER** the following:

a. Reactor Engineering Instructions in CRC Book

AND

b. GO-100-012, Power Maneuvers.

5.3 Mitigate rising temperatures on troubled systems:

5.3.1 **IDENTIFY** Attachments from the list below associated with troubled systems determined in step 5.2.3 above.

- Attachment E, UNIT 1 RBCCW HEAT EXCHANGER
- Attachment F, UNIT 1 TBCCW HEAT EXCHANGER
- Attachment G, UNIT 1 GRRCCW HEAT EXCHANGER
- Attachment H, UNIT 1 REACTOR FEED TURB A LUBE OIL HEAT EXCHANGER
- Attachment I, UNIT 1 REACTOR FEED PUMP TURB B LUBE OIL HEAT EXCHANGER

5.3.1 (continued)

- Attachment J, UNIT 1 REACTOR FEED PUMP TURB C LUBE OIL HEAT EXCHANGER
- Attachment K, UNIT 1 MG SET A HYD FLUID HEAT EXCHANGER
- Attachment L, UNIT 1 MG SET B HYD FLUID HEAT EXCHANGER
- Attachment M, UNIT 1 ISO PHASE BUS HEAT EXCHANGER
- Attachment N, UNIT 1 GEN STATOR HEAT EXCHANGER
- Attachment O, UNIT 1 GEN H2 HEAT EXCHANGER
- Attachment P, UNIT 1 TURB LUBE OIL HEAT EXCHANGER
- Attachment Q, UNIT 1 ALTERREX AIR HEAT EXCHANGER

5.3.2 **PERFORM** flush of identified troubled system Heat exchanges as follows:

a. IF Additional attachments are needed due to sections being repeated,

☐ THEN **ATTACH** needed attachments to this procedure package

☐ b. **PLACE** heat exchanger TCV controller in MANUAL.

☐ c. **FULLY OPEN** heat exchanger TCV controller.

☐ d. **OPEN** TCV bypass valve.

☐ (1) **RECORD** TCV bypass valve OPEN on associated Attachment

☐ e. **OPEN** throttled isolation valve(s).

☐ (1) **RECORD** on associated Attachment.

☐ f. **CONTINUE** heat exchanger flush for a minimum of 30 minutes

☐ g. **RETURN** throttled isolation valve(s) to AS FOUND POS as specified in Checklist on associated Attachment.

☐ (1) **RECORD** on associated Attachment.

h. IF any flow balance valves were manipulated,

☐ THEN **NOTIFY** System Engineer of manipulated flow balance valves.

☐ i. **CLOSE** TCV bypass valve.

5.3.2 (continued)

j. **PLACE** TCV controller in auto as follows:

☐ (1) **NULL** TCV controller.

☐ (2) **PLACE** TCV controller in AUTO.

☐ (3) **SLOWLY ADJUST** Tape Set to normal value.

5.3.3 IF a Service Water System Heat Exchanger is suspected to be air bound,

☐ THEN **VENT** System Heat Exchanger **PER** OP-111-001, Service Water System.

☐ 5.3.4 **ENSURE** system heat exchanger inlet and outlet valves are in AS FOUND POS.

☐ a. **RECORD** on associated Attachment.

5.3.5 IF TCV is full open,

☐ THEN **OPEN** TCV bypass valve.

☐ a. **RECORD** on associated Attachment.

5.3.6 IF directed by Shift Supervision,

☐ THEN **TRANSFER** system heat exchangers **PER** associated system operating procedure.

☐

NOTE

1. Gen Stator Clr A(B) Sw Outlet Iso Vlvs 109040 and 109042 are susceptible to stem/disk separation.
2. A rise in flow and a drop in system pressure could indicate Gen Stator Clr A(B) Sw Outlet Iso Vlvs 109040 and 109042 have stem/disk separation and the valve has failed open.

5.3.7 IF Gen Stator Clr A(B) Sw Outlet Iso Vlvs 109040 and 109042 stem/disk separation is suspected,

☐ THEN **TRANSFER** Stator Water Cooling heat exchangers **PER** OP-197-001, Stator Cooling System.

5.4 Improve Service Water System cooling ability

5.4.1 **ELIMINATE** unnecessary loads as follows:

☐ a. **NOTIFY** System Engineer to perform calculations to determine if Fuel Pool Cooling Heat Exchanger(s) can be removed from service.

5.4.1 (continued)

b. IF Additional attachments are needed due to sections being repeated,

☐ THEN **ATTACH** needed attachments to this procedure package.

c. IF Fuel Pool calculation determines removal is acceptable,

THAN **REMOVE** Fuel Pool Cooling Heat Exchanger(s) A(B)(C) as follows:

☐ (1) **NOTIFY** Health Physics of intent to isolate Fuel Pool Heat Exchanger.

☐ (2) **CLOSE** Unit 1 Fuel Pool Hx A(B)(C) Sw Sup Iso 110094(110092) (110090)

☐ (a) **RECORD** on Attachment B, Unit 1 Fuel Pool Heat Exchanger Valve Status

d. **PERFORM** one or more of the following to reduce RWCU Heat Load on RBCCW:

☐

NOTE

RWCU recirculation pumps trip on pump discharge low flow of 150 gpm. There is a 20 sec time delay on pump start only.

☐ (1) **REDUCE** Unit 1 RWCU Filter Demin flow.

☐ (2) **REMOVE** Unit 1 RWCU Filter Demin with highest conductivity **PER** OP-161-002, Unit 1 RWCU Filter Demineralizers.

☐

NOTE

The following step is to reduce heat load on the RWCU Non-Regenerative heat exchanger and is two actions being performed simultaneously. This is done to maintain system flow as constant as possible.

(3) WHEN **THROTTLING OPEN** RWCU REGENHX BPV HV-144F104,

☐ THEN **THROTTLE CLOSE** RWCU Filt Demin BPV HV-144F044 to maintain system flow constant.

☐ (a) **RECORD** on Attachment C, Unit 1 RWCU Heat Load Reduction.

e. IF cooling margin is available,

☐ **THEN SHIFT** Service Water common loads to Unit 2 **PER** OP-111-001, Service Water System.

5.4.1 (continued)

f. <u>IF</u> Unit 1(0) GRRCCW heat exchanger in standby,

☐ <u>**THEN**</u> at Off Gas Recombiner Panel 0C673, **RAISE** Temp Ctl TIC-10938 (TIC-00938) to 95°F.

5.4.2 Raise Service Water Flow as follows:

☐

NOTE
Raising flow to no more than two troubled system heat exchangers is to avoid depriving other system heat exchanges of adequate Service Water flow.

a. **RAISE** flow to no more than two troubled system heat exchange as follows:

☐ (1) Slowly **THROTTLE OPEN** selected heat exchanger Inlet and / or Outlet Valves.

☐ (a) **RECORD** on associated Attachment.

☐ (2) **MONITOR** other Service Water loads for any adverse effects.

☐

NOTE
Operation of three Service Water Pumps at same time should be minimized

☐ (3) **PLACE** third Unit 1 Service Water Pump **PER** OP-111-001, Service Water System.

5.5 High Temperature Hydrogen Gas Response

5.5.1 <u>IF</u> Mach Gas Temp High Alarm (A03) LA-1125-001 is received,

☐ <u>**THEN**</u> **MONITOR** PPC Point GNT03 Generator Field Temperature

5.5.2 <u>IF</u> PPC Point GNT03 Generator Field Temperature is greater than 70°C,

☐ <u>**THEN**</u> **REDUCE** reactor power approximately 5% per GO-100-012, Power Maneuvers.

5.6 Improve Isophase Bus Duct Cooling System ability

☐ 5.6.1 **NOTIFY** Safety to monitor for hydrogen in area of duct.

☐ 5.6.2 **NOTIFY** System Engineer to perform temperature trending and evaluation

☐ 5.6.3 **REMOVE** exhaust damper flanged cover located on east side of Isophase cooler on return duct phase A and C.

5.6 (continued)

☐ 5.6.4 **Monitor** Bus Duct Conductor temperatures on PPC (Plant Process Computer) screen Main Generator Synchronization (GENB).

☐ 5.6.5 **NOTIFY** Maintenance to Remove one of the Condensate Pump Floor Plugs in Area 08 to elevation 729 and erect handrail.

5.6.6 **IF** directed by Shift Supervision.

☐ **THEN** Manually **RAISE** isophase fan speeds **PER** OP-187-001, Isophase Bus Duct Cooling System.

5.6.7 **IF** Isophase Bus Conductor temperatures reach 216°F,

THEN PERFORM the following:

☐

> **NOTE**
>
> The following step will realign air flow return normally leading back to the AHU coolers to Exhaust to the Turbine Building.

a. **IF** Isophase Bus Cooler Fan in service,

☐ **THEN SHUT** Isophase Bus Duct Plenum Exhaust Dampers Phase A **AND** C Return, HD19301 AND HD19302.

b. **IF** directed by Shift Supervision.

☐ **THEN** Manually **RAISE** isophase fan speeds **PER** OP-187-001, Isophase Bus Duct Cooling System.

☐ c. **NOTIFY** System Engineering for additional direction.

5.6.8 **IF** Isophase Bus Conductor temperatures reach 221°F,

THEN PERFORM the following:

☐ a. **REDUCE** reactor power by 2% **PER**: .

☐ (1) Reactor Engineering Instructions in CRC Book

AND

☐ (2) GO-100-012, Power Maneuvers.

☐ b. After 30 minutes, **OBSERVE** Isophase Bus Conductor temperatures.

c. **IF** temperatures remain above 221°F,

☐ **THEN** Repeat Steps 5.6.8 until temperatures stabilize at less than 221°F.

5.6.8 (continued)

☐ d. **NOTIFY** system Engineering for additional direction.

5.7 Reduce the Heat Addition from Purge Water to the RWCU Pumps

5.7.1 IF Additional attachments are needed due to sections being repeated,

☐ **THEN ATTACH** needed attachments to this procedure package.

☐ 5.7.2 **MONITOR** RWCU Motor Temperatures for adverse rise. .

☐ 5.7.3 **POSITION** RWCU Pump A(B) Low Flow Inhibit Switch HS14481A2(B2) to YES.

☐ 5.7.4 **REDUCE** Purge Flow to the affected pump by Throttling 144059(144060)

☐ a. **RECORD** in Attachment D, UNIT 1 Purge Water To RWCU Pumps Checklist.

5.7.5 IF directed by Shift Supervision,

☐ **THEN PERFORM** Purge Water Restoration section of OP-161-001, Unit 1 Reactor Water Cleanup System.

5.8 Restore Service Water systems to normal alignment

☐ 5.8.1 **RESTORE** Service Water System to two pump operation **PER** OP-111-001, Service Water System.

☐ 5.8.2 **RESTORE** system throttled valves to original flow balance position as listed in the associated Attachment.

☐ a. **RECORD** restoration in the associated Attachment.

5.8.3 IF Fuel Pool Cooling Heat Exchanger(s) were removed from service,

☐ **THEN RESTORE** Fuel Pool Cooling Heat Exchanger(s) to service as follows:

☐ a. **NOTIFY** Health Physics of intent to place Fuel Pool Heat Exchanger in service.

☐ b. **OPEN** Unit 1 Fuel Pool Hx A(B)(C) Sw Sup Iso 110094(110092)(110090).

☐ (1) **RECORD** on Attachment B, Unit 1 Fuel Pool Heat Exchanger Valve Status.

5.8.3 (continued)

☐ c. **RESTORE** RWCU to normal **PER** OP-161-001, Unit 1 Reactor Water Cleanup System.

☐ (1) **RECORD** on Attachment C, Unit 1 RWCU Heat Load Reduction

AND

☐ (2) **RECORD** on Attachment D, Purge Water To RWCU Pumps Checklist.

☐ d. **RESTORE** service water common loads to Unit 1 **PER** OP-111-001, Service Water System.

☐ e. **ENSURE** GRRCCW standby heat exchanger Temp Ctl TIC-10938(TIC-00938) restored to 70°F.

5.9 Restore Isophase Bus Duct Cooling to Normal Alignment.

5.9.1 **WHEN** directed by Shift Supervision,

☐ **THEN NOTIFY** System Engineer to restore Isophase Bus Duct Cooling to normal alignment.

5.10 SERVICE WATER SYSTEM FINAL CONDITIONS

☐ 5.10.1 Service Water system restored to normal configuration.

5.11 ELEVATED CONDENSATE TEMPERATURE

☐

NOTE

1. The following actions are directed per OP-193-001, Main Turbine Operation, Attachment G, SSES Turbine Exhaust Pressure Alarm and Trip Level.

☐ 5.11.1 **ENSURE** Main Turbine Operating within Limits specified in OP-193-001 Attachment G.

5.11.2 **IF** Condensate Temperature reaches 137°F on PPC CPT02 CFS Filter Dsch Temp,

☐ **THEN NOTIFY** Chemistry.

END of Instructions

6.0 RECORDS

6.1.1 Forward completed GO-100-014 with Power/Flow Map attached, to following, in sequence, for review and subsequent retention:

a. Shift Manager

______________________ / __________
Signature Date

b. AOM - Shift

______________________ / __________
Signature Date

c. Manager-Nuclear Operations

______________________ / __________
Signature Date

d. DCS Supervisor

______________________ / __________
Signature Date

Attachment A, UNIT 1 SERVICE WATER LOADS

SW SYSTEM	INSTRUMENT/LOCATION	NORM	ALARM	MAX	NOTE
TBCCW	TI-11408/1C668	95°F	105°F	NONE	Monitor serviced system for impact when alarm is received.
RBCCW	TI-11305/1C668	95°F	105°F	NONE	Monitor serviced system for impact when alarm is received.
GRRCCW	TI-13123/0C673	55°F-110°F	110°F	NONE	
RADWASTE EVAPORATORS	NA	NA	NA	NA	Equipment in layup
CONTROL STRUCTURE CHILLERS	TI-08621A(B)/0K112A(B)	47°F	50°F	NONE	
TURBINE LUBE OIL COOLERS (Oil from Cooler)	XR-19201/1C668	114°F-118°F	125°F	130°F	Last resort, monitor brg metal temp, ≤200°F if MAX exceeded.
GENERATOR HYDROGEN COOLERS	TISH-10185/1C125	(111°F) 44°C	(132°F) 56°C	NONE	Generator Gas Temperature alarm take action PER Step 5.5
ALTERREX AIR COOLERS	TISH-10184/1C125	(104°F) 40°C	(115°F) 46°C	(120°F) 49°C	Air from Alterrex Cooler
GENERATOR STATOR COOLERS	TISH-10183A/1C125	(122°F-140°F) 50°C-60°C	(167°F) 75°C	(176°F) 80°C	Stator Cooling Water From Generator
ISO-PHASE BUS COOLERS	BUS DUCT TEMP SW	140°F	180°F	190°F	
RADWASTE BUILDING CHILLERS	TI-08923A(B)/0K325A(B)	50°F	NONE	NONE	
REACTOR FEED PUMP TURBINE LUBE OIL COOLERS	TR-11918/1C668	120°F	135°F	170°F	Lube Oil from Cooler
REACTOR BUILDING PIPE TUNNEL COOLERS	TI-17641/1C276	<115°F	130°F	NONE	START monitoring Main Steam Tunnel Leak Detection.
REACTOR BUILDING CHILLERS	TI-18723A(B)/1K206A(B)	50°F	NONE	NONE	Standby chiller auto starts at ≥80°F
RECIRC MG SET OIL COOLER	TI-14020A/1C668 TI-14020B/1C668	140°F	190°F	210°F	Lube Oil from Cooler
TURBINE BUILDING CHILLERS	TI-18823A(B)/1K102A(B)	50°F	NONE	NONE	Standby chiller auto starts at ≥80°F
FUEL POOL HEAT EXCHANGERS	TI-15333/0C211	110°F	125°F	125°F	Fuel Pool Water Temperature

Attachment E, UNIT 1 RBCCW HEAT EXCHANGER

	VALVE	NAME	LOCATION	AS FOUND POSITION		STEP 5.3.2.d.(1) & 5.3.2.e.(1) FLUSH POSITION		STEP 5.3.2.g.(1) & 5.3.4.a RESTORED POSITION		STEP 5.3.5.a & 5.4.2.a.(1)(a) REALIGNED POSITION		STEP 5.8.2.a RESTORED POSITION	
				Date	Verified	Date	Verified	Date	Verified	Date	Verified	Date	Verified
1.	110046	RBCCW HX A SW SUP ISO	27-683'										
	110046	RBCCW HX A SW SUP ISO	27-683'										
	110046	RBCCW HX A SW SUP ISO	27-683'										
	110046	RBCCW HX A SW SUP ISO	27-683'										
2.	110047	RBCCW HX A SW DSCH ISO	27-683'	#185									
	110047	RBCCW HX A SW DSCH ISO	27-683'	#185									
	110047	RBCCW HX A SW DSCH ISO	27-683'	#185									
	110047	RBCCW HX A SW DSCH ISO	27-683'	#185									

#185 Flow balance valve. Points of valve position indicator arrow and plastic flow balance arrow are aligned.

Attachment E, UNIT 1 RBCCW HEAT EXCHANGER, Continued

	VALVE	NAME	LOCATION	AS FOUND POSITION		STEP 5.3.2.d.(1) & 5.3.2.e.(1) FLUSH POSITION		STEP 5.3.2.g.(1) & 5.3.4.a RESTORED POSITION		STEP 5.3.5.a & 5.4.2.a.(1)(a) REALIGNED POSITION		STEP 5.8.2.a RESTORED POSITION	
				Date	Verified	Date	Verified	Date	Verified	Date	Verified	Date	Verified
3.	110048	RBCCW HX B SW SUP ISO	27-683'										
	110048	RBCCW HX B SW SUP ISO	27-683'										
	110048	RBCCW HX B SW SUP ISO	27-683'										
	110048	RBCCW HX B SW SUP ISO	27-683'										
4.	110049	RBCCW HX B SW DSCH ISO	27-683'	#185									
	110049	RBCCW HX B SW DSCH ISO	27-683'	#185									
	110049	RBCCW HX B SW DSCH ISO	27-683'	#185									
	110049	RBCCW HX B SW DSCH ISO	27-683'	#185									

#185 Flow balance valve. Points of valve position indicator arrow and plastic flow balance arrow are aligned.

Attachment E, UNIT 1 RBCCW HEAT EXCHANGER, Continued

	VALVE	NAME	LOCATION	AS FOUND POSITION		STEP 5.3.2.d.(1) & 5.3.2.e.(1) FLUSH POSITION		STEP 5.3.2.g.(1) & 5.3.4.a RESTORED POSITION		STEP 5.3.5.a & 5.4.2.a.(1)(a) REALIGNED POSITION		STEP 5.8.2.a RESTORED POSITION	
				Date	Verified	Date	Verified	Date	Verified	Date	Verified	Date	Verified
5.	110062	RBCCW HX SW DSCH TEMP CV BPV	27-683'										
	110062	RBCCW HX SW DSCH TEMP CV BPV	27-683'										
	110062	RBCCW HX SW DSCH TEMP CV BPV	27-683'										
	110062	RBCCW HX SW DSCH TEMP CV BPV	27-683'										

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LOC29
NRC INITIAL LICENSE EXAM

Plant JPM I

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JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Shift the CRD Flow Control Stations from A to B per OP-155-001

JPM#: 55.OP.20251.101 Revision: 0 Date: 06/15/2017

Applicability: ☒ RO ☒ SRO

Setting: Plant

NUREG–1123 E/APE / Sys 201001 K/A Number A2.07 K/A Importance 3.2/3.1

Alternate Path: ☐ YES ☒ NO Time Critical ☐ YES ☒ NO Validation Time (min):20

Testing Method: ☒ Simulate ☐ Perform

Author: Michael Wilcox Date: 06/15/2017

Operations Review: Collin Breitman Date: 12/4/17

Validated: Bruce Althouse Date: 11/16/17

Approval: Jeffrey Dills Date: 12/12/17
Nuclear Training Supervisor

Examinee Name: ______________________________ ______________________
Last, First MI Employee Number

Exam Date: ____________________ Exam Duration (Min):____________________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator:_________________________ _________________________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
55.OP.20251.101

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP-155-001, Control Rod Drive Hydraulics System

III. TASK CONDITIONS

Unit 1 is at 80 percent reactor power.

CRD System is aligned for normal operation per OP-155-001

IV. INITIATING CUE

Change CRD flow control stations from FV-1F002A to FV-1F002B per OP-155-001 Section 2.4

V. TASK STANDARD

Formerly out of service FCV in service and former in-service out of service. CRD System operating normally

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the initiating cue.
- This JPM must be performed in the plant. Obtain Shift Manager authorization to proceed. This JPM requires access to Unit 1 CRD FCV in the Reactor Building.

EVALUATOR CUE

Record JPM start time: __________

Step	Action	Standard	Eval	Comments
1	**Verifies** OP–155–001 Section 2.4 is governing procedure and obtains controlled copy.	Controlled copy of OP-155-001 obtained, selects Section 2.4.	S / U	

EVALUATOR NOTE

With the A flow control station in service the following conditions exist:

- M/A-1D009A is in AUTO
- CLOSED and OPEN position indicator lights for FCV A are illuminated
- M/A-1D009B is in MAN
- FCV B CLOSED light is ILLUMINATED and the OPEN light is EXTINGUISHED

EVALUATOR NOTE

M/A-1D009A(B) RED pen is controller output, BLACK pen is Control Room controller demand

Step	Action	Standard	Eval	Comments
2	**Verifies** CRD in operation per OP-155-001. (Prerequisites)	Observe from Task Conditions CRD aligned for normal operation per procedure.	S / U	
3	**Ensures** FC-C12-1R600, CRD Flow Controller, in AUTO. (Step 2.4.3)	Notifies Control Room to ensure FC-C12-1R600, CRD Flow Controller, in AUTO.	S / U	

EVALUATOR CUE

The CRD flow controller is in AUTO.

4	**Ensures** M/A-1D009B, Man/Auto Station Flow Control Valve B, in **MAN** at minimum output. (step 2.4.4)	Observe the following on controller M/A-1D009B, MAN/AUTO STATION FLOW CONTROL VALVE B: • Man/Auto control switch in the MAN position • Red pen indicates 0	S / U	
<u>EVALUATOR CUE</u> M/A-1D009B is in manual with red pen indicating 0.				
5	**Ensures** FV146F002B. CRD Flow Control Vlv B, CLOSED by position indication. (step 2.4.5)	Observe amber light ILLUMINATED, red light EXTINGUISHED	S / U	
<u>EVALUATOR CUE</u> Amber light ILLUMINATED, red light EXTINGUISHED				
6	**Ensures** 146F046B, CRD Flow Control Valve B Inlet Iso Vlv, OPEN. (step 2.4.6)	Perform the following: • Rotate handwheel for 146F046B, CRD FLOW CONTROL VALVE B INLET ISO VLV, in the clockwise direction • Rotate handwheel for 146F046B, CRD FLOW CONTROL VALVE B INLET ISO VLV, in the counter-clockwise direction until resistance felt	S / U	
<u>EVALUATOR CUE</u> You feel no resistance in the clockwise direction You feel resistance in the counter-clockwise direction				
<u>EVALUATOR NOTE</u> The F047B must be opened very slowly or large (20 to 25 gpm) CRD system flow changes may result.				
7	**Slowly cracks open** 146F047B, CRD Flow Control Valve B Outlet Iso Vlv, slowly, to a partially OPEN position. (step 2.4.7)	Rotate handwheel for 146F047B, CRD FLOW CONTROL VALVE B OUTLET ISO VLV in the counter-clockwise direction a few turns.	S / U	

EVALUATOR CUE You feel no resistance in the counter-clockwise direction. There was an audible flow noise, which has subsided				
8	**Verifies** CRD system flow stabilizes. (step 2.4.8.a)	Observe the following: • M/A-1D009A, MAN/AUTO STATION FLOW CONTROL VALVE A, black pen (Control Room demand) STABLE • FI-1R019, FLOW CONTROL STATION TOTAL WATER FLOW, indicates approximately 63 gpm	S / U	
EVALUATOR CUE M/A-1D009A black pen is STABLE. FI-1R019 indicates approximately 63 gpm				
9*	**Opens** 146F047B, CRD Flow Control Valve B Outlet Iso Vlv full OPEN. (step 2.4.8.b – 2.4.9)	Rotate handwheel for 146F047B, CRD FLOW CONTROL VALVE B OUTLET ISO VLV in the counter-clockwise direction until resistance felt.	S / U	
EVALUATOR CUE You feel resistance in the counter-clockwise direction.				
10*	**Raises** output of M/A-1D009B, Man/Auto Station Flow Control Valve B, to match Control Room controller demand. (step 2.4.10)	On controller M/A-1D009B, MAN/AUTO STATION FLOW CONTROL VALVE B, adjust manual adjust knob as necessary until BLACK and RED pens are closely matched.	S / U	
EVALUATOR CUE Black and red pens are matched				

11	**Verifies** CRD system flow stabilizes. (step 2.4.11.a-c)	Observe the following: • Audible flow noise stops • M/A-1D009A, MAN/AUTO STATION FLOW CONTROL VALVE A, black pen lowers and stabilizes • FI-1R019, FLOW CONTROL STATION TOTAL WATER FLOW, indicates approximately 63 gpm	S / U	
EVALUATOR CUE There was an audible flow noise, which has subsided. M/A-1D009A black pen is STABLE at a lower value. FI-1R019 indicates approximately 63 gpm.				
12	**Nulls** M/A-1D009A, Man/Auto Station Flow Control Valve A. (step 2.4.12)	On controller M/A-1D009A, MAN/AUTO STATION FLOW CONTROL VALVE A, adjust manual adjust knob as necessary until BLACK and RED pens are closely matched.	S / U	
EVALUATOR CUE Black and red pens are matched				
13	**Ensures** CRD system flow stable. (step 2.4.13)	Observe FI-1R019, FLOW CONTROL STATION TOTAL WATER FLOW, indicates approximately 63 gpm, steady	S / U	
EVALUATOR CUE FI-1R019 indicates approximately 63 gpm				
14	**Places** M/A-1D009A, Man/Auto Station Flow Control Valve A, in MANUAL (step 2.4.14)	On controller M/A-1D009A, MAN/AUTO STATION FLOW CONTROL VALVE A, place the Man/Auto control switch in the MAN position	S / U	
EVALUATOR CUE The controller is in manual				

15*	**Places** M/A-1D009B, Man/Auto Station Flow Control Valve B, in AUTO (step 2.4.15)	On controller M/A-1D009B, MAN/AUTO STATION FLOW CONTROL VALVE B, place the Man/Auto control switch in the AUTO position	S / U	
EVALUATOR CUE The controller is in AUTO				
16	**Reduces** output of M/A-1D009A, Man/Auto Station Flow Control Valve A, to minimum. (step 2.4.16)	Perform the following: • On controller M/A-1D009A, MAN/AUTO STATION FLOW CONTROL VALVE A, adjust manual adjust knob until RED pen indicates 0 • Observe Position Indicator Flow Control Valve A amber light ILLUMINATED and red light EXTINGUISHED	S / U	
EVALUATOR CUE The red pen is at 0. (If requested) Amber light ILLUMINATED and red light EXTINGUISHED				
17	**Ensures** CRD system flow stable. (step 2.4.17)	Observe FI-1R019, FLOW CONTROL STATION TOTAL WATER FLOW, indicates approximately 63 gpm, steady	S / U	
EVALUATOR CUE FI-1R019 indicates approximately 63 gpm				
18*	**Closes** 146F047A, CRD Flow Control Valve A Outlet Iso Vlv, slowly (step 2.4.18)	Rotate handwheel for 146F047A, CRD FLOW CONTROL VALVE A OUTLET ISO VLV, in the clockwise direction until resistance felt.	S / U	
EVALUATOR CUE You feel resistance in the clockwise direction				

19	**Verifies** indication for CRD Flow Control Valve, FV146F002B. (step 2.4.19)	Perform the following: • Observe Position Indicator Flow Control Valve B amber light ILLUMINATED and red light ILLUMINATED • Mark Step 2.4.19a-d as N/A	S / U	

EVALUATOR CUE
FV146F002B indicates dual

20	**Verifies** CRD system parameters normal. (step 2.4.20)	Observe the following: • FI-1R019, FLOW CONTROL STATION TOTAL WATER FLOW, indicates approximately 63 gpm • PDI-1R005, DOWNSTREAM P-C/REA DIFFERENTIAL PRESSURE, indicates < 50 psid. • PDI-1R009, UPSTREAM P-C/REA DIFFERENTIAL PRESSURE, indicates approximately 250 psid.	S / U	

EVALUATOR CUE
FI-1R019 indicates 63 gpm
PDI-1R005 indicates 13 psid
PDI-1R009 indicates 247 psid

EVALUATOR NOTE / CUE
That completes the JPM.

EVALUATOR CUE
Record JPM stop time: ___________

EVALUATOR NOTE
Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE
55.OP.20251.101

NOTE:	All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
BA	1. Task description and number, JPM description and number are identified.
BA	2. Knowledge and Abilities (K/A) references are included.
BA	3. Performance location specified. (in-plant, control room, or simulator)
BA	4. Initial setup conditions are identified.
BA	5. Initiating and terminating cues are properly identified.
BA	6. Task standards identified and verified by SME review.
BA	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
BA	8. Verify cues both verbal and visual are free of conflict.
BA	9. Ensure performance time is accurate.

BA

10. Verify the JPM reflects the most current revision of the procedure.

Procedure	OP-155-001	Rev	74
Procedure		Rev	
Procedure		Rev	

BA 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor: N/A Date: N/A

Instructor: N/A Date: N/A

REVISION SUMMARY

JOB PERFORMANCE MEASURE
55.OP.20251.101

Revision	Description/Purpose of Revision
0	Created from JPM 55.OP.2011.101 R5. Reformatted to Vision template.

EVALUATOR COPY:

TASK CONDITIONS

- Unit 1 is at 80 percent reactor power.
- CRD System is aligned for normal operation per OP-155-001

INITIATING CUE

Change CRD flow control stations from FV-1F002A to FV-1F002B per OP-155-001 Section 2.4

EXAMINEE COPY:

TASK CONDITIONS

- Unit 1 is at 80 percent reactor power.
- CRD System is aligned for normal operation per OP-155-001

INITIATING CUE

Change CRD flow control stations from FV-1F002A to FV-1F002B per OP-155-001 Section 2.4

2.4 SWAPPING FLOW CONTROL STATIONS (A to B)

2.4.1 Prerequisites

☐ CRD Hydraulic System in operation in accordance with section "Startup Of Control Rod Drive Hydraulic System" section of this procedure.

2.4.2 Precautions

(1) FCV oscillations are possible under lower RPV pressure conditions.[8]

☐ NOTE:	Following steps describe changing from Flow Control Valve FV146F002A to FV146F002B.

☐ 2.4.3 **Ensure** FC-C12-1R600, CRD Flow Controller, in **AUTO**.

☐ 2.4.4 **Ensure** M/A-1D009B, Man/Auto Station Flow Control Valve B, in **MAN** with red pen indicating **0** (red pen displays manual demand on the local controller).

☐ 2.4.5 **Ensure** FV146F002B **CLOSED**, as indicated by Position Indicator Flow Control Valve B amber light **ILLUMINATED** **AND** red light **EXTINGUISHED**.

☐ 2.4.6 **Ensure** 146F046B, CRD Flow Control Valve B Inlet Iso Vlv, **OPEN**.

☐ NOTE:	To prevent large (20 to 25 gpm) flow changes, following step should be performed very slowly.

☐ 2.4.7 **SLOWLY Crack Open** 146F047B, CRD Flow Control Valve B Outlet Iso Vlv.

2.4.8 **Observe** following, indicating flow stabilized:

☐ a. Audible sound change **STOPPED**.

☐ b. M/A-1D009A, Man/Auto Station Flow Control Valve A, black pen **STABLE** (black pen displays control room demand).

☐ c. FI-1R019, Flow Control Station Total Water Flow, ~ **63 gpm**.

☐ 2.4.9 WHEN stable flow indicated, THEN **Fully Open** 146F047B, CRD Flow Control Valve B Outlet Iso Vlv.

☐ 2.4.10 SLOWLY **Rotate** manual adjust knob on M/A-1D009B, Man/Auto Station Flow Control Valve, UNTIL black and red pens **CLOSELY MATCHED** as possible.

2.4.11 **Observe** following, indicating flow stabilized:

☐ a. Audible sound change **STOPPED**.

☐ b. M/A-1D009A, Man/Auto Station Flow Control Valve A, black pen **LOWERS** and **STABILIZES**.

☐ c. FI-1R019, Flow Control Station Total Water Flow, ~ **63 gpm**.

☐ 2.4.12 SLOWLY **Rotate** manual adjust knob on M/A-1D009A, Man/Auto Station Flow Control Valve, UNTIL black and red pens **CLOSELY MATCHED** as possible.

☐ 2.4.13 **Ensure** FI-1R019, Flow Control Station Total Water Flow, ~ **63 gpm** and **STABLE**.

☐ 2.4.14 **Place** M/A-1D009A, Man/Auto Station Flow Control Valve A, control switch to **MAN**.

☐ 2.4.15 **Place** M/A-1D009B, Man/Auto Station Flow Control Valve B, control switch to **AUTO**.

☐ 2.4.16 SLOWLY **Rotate** manual adjust knob on M/A-1D009A, Man/Auto Station Flow Control Valve A, UNTIL red pen indicates **0**.

☐ 2.4.17 **Ensure** FI-1R019, Flow Control Station Total Water Flow, ~ **63 gpm** and **STABLE**.

☐ | NOTE: | To prevent large (20 to 25 gpm) flow changes, following step should be performed very slowly. |
|---|---|

☐ 2.4.18 SLOWLY **Close** 146F047A, CRD Flow Control Valve A Outlet Iso Vlv.

☐

NOTE:	The next step is only performed when Reactor is at rated pressure with Shift Supervision direction.

2.4.19 **WITH** the Reactor at rated pressure, **IF** the in-service CRD Flow Control Valve, FV146F002B is at a mid-position and dual indication is not indicated, **THEN** **Perform** the following at Panel 1C601:

☐ a. **Place** FC-C12-1R600, CRD Flow Controller in **MANUAL**.

☐ b. **Momentarily Raise** CRD system flow to ~70 gpm to obtain dual indication on the in-service CRD Flow Control Valve, FV146F002B.

☐ c. **Return** CRD System Flow to ~63 gpm.

☐ d. **Place** FC-C12-1R600, CRD Flow Controller in **AUTO**.

2.4.20 **Check** following for normal CRD System parameters:

☐ a. FI-1R019, Flow Control Station Total Water Flow, **~ 63 gpm**.

☐ b. PDI-1R005, Downstream P-C/Rea Differential Pressure, **< 50 psid**.

☐ c. PDI-1R009, Upstream P-C/Rea Differential Pressure, **~ 250 psid**.

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JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Place RHR In Suppression Pool Cooling At Unit 2 Remote Shutdown Panel

JPM#: 49.OP.20301.101 Revision: 3 Date: 7/25/17

Applicability: ☒ RO ☒ SRO

Setting: Plant

NUREG–1123 E/APE / Sys 219000 K/A Number A2.13 K/A Importance 3.5/3.7

Faulted: ☐ YES ☒ NO Time Critical ☐ YES ☒ NO Validation Time (min): 20

Testing Method: ☒ Simulate ☐ Perform

Author: Michael Wilcox Date: 7/25/17

Operations Review: Collin Breitman Date: 12/4/17

Validated: Michael Wilcox Date: 10/22/17

Approval: Jeffrey Dills Date: 12/12/17
Nuclear Training Supervisor

Examinee Name: ______________________________ ____________________
Last, First MI Employee Number

Exam Date: ____________________ Exam Duration (Min): ____________________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator: ______________________________ ______________________________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
49.OP.20301.201

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Susquehanna Nuclear, LLC safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP-249-005, RHR Suppression Pool Cooling

III. TASK CONDITIONS

- Unit 2 was operating at rated power when the Control Room was evacuated due to a hazardous atmosphere.
- Operators completed all actions in ON-CREVAC-201, Control Room Evacuation, before evacuating the Control Room.
- Unit 2 RSDP transfer switches have been aligned per ON-CREVAC-201.
- RPV level control is with RCIC, stable at –40". RPV pressure is being maintained with SRVs 800–1050 psig.
- RHR was in the normal standby alignment when the Control Room was evacuated.
- ESW is in operation.
- RHRSW is in operation, supplying the 2A RHR heat exchanger.
- Condensate Transfer is in operation.

IV. INITIATING CUE

Place RHR A in Suppression Pool cooling from the Unit 2 RSDP IAW OP-249-005 section 2.4.

V. TASK STANDARD

RHR A operating in Suppression Pool Cooling per OP–249–005 at ≤10,000 gpm flow, with all flow through the RHR heat exchanger.

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the candidate acknowledges the initiating cue.
- This JPM must be performed in the plant. If in the plant, obtain permission from Shift Manager to perform this JPM. This JPM requires access to Unit 2 RSDP.
- Have a copy of OP-249-005 section 2.4 and ON-CREVAC-201.

EVALUATOR CUE

Record JPM start time: __________

Step	Action	Standard	Eval	Comments
1	**Identifies** governing procedure and obtain controlled copy.	Obtains controlled copy of OP-249-005 section 2.4.	S / U	
2	**Reviews** note.	Reviews note.	S / U	
3	**Reviews** prerequisites.	Reviews prerequisites.	S / U	
4	**Reviews** precautions.	Reviews precautions.	S / U	
5	**Reviews** note.	Reviews note.	S / U	
6 (step 2.4.3)	**Ensure** ESW in operation IAW OP-054-001, Emergency Service Water System.	Observes ESW in operation is specified in Task Conditions.	S / U	
7 (step 2.4.4)	**Place** RHRSW in operation IAW OP-216-001, RHR Service Water System.	Observes RHRSW in operation is specified in Task Conditions.	S / U	
EVALUATOR NOTE/CUE: The following step may be completed a variety of ways. If the trainee attempts to Start the 2A RHR Pump, ensure this attempt is **Simulated.** Cue will be "Indications are as seen". If the trainee attempts to determine RHR Pump 1A via communications with other operators, Role Play as necessary to provide the information that the 1A RHR Pump is not running.				
8 (step 2.4.5)	**If** RHR Pump 1A is running, as determined locally or RHR Pump 2A will not start, **Stop** RHR Pump 1A locally at RHR Pump 1P202A breaker 1A20102.	Determines step is Not Applicable.	S / U	

9 (step 2.4.6)	**Ensure** HV-251-F048 HX A SHELL SIDE BYPS **OPEN.**	Observes HV-251-F048 is open.	S / U	
*10 (step 2.4.7)	**Open** HV-251-F028A SUPP CHMBR SPRY TEST SHUTOFF.	**Simulates** placing HV-251-F028A to OPEN.	S / U	
<u>EVALUATOR CUE:</u> HV-251-F028A Red light illuminated, amber light off.				
11 (step 2.4.8)	**Ensure** HV-251-F007A RHR PP A/C MIN FLOW **OPEN.**	Observes HV-251-F007A is open.	S / U	
12 (step 2.4.9)	**If** RHR discharge loop is potentially voided in accordance with ON-037-001, **Fill** and **Pressurize** RHR Loop A as follows:	Determines RHR discharge loop is not voided and step is Not Applicable. Condensate Transfer is in operation as specified in the Task Conditions.	S / U	
13 (step 2.4.10)	**Ensure** RHR System filled and vented.	Notifies NPO to perform step 2.4.10 of OP-249-005.	S / U	
<u>EVALUATOR CUE:</u> Step 2.4.10 of OP-249-005 is complete.				
*14 (step 2.4.11)	**Start** 2P202A RHR PP.	**Simulates** placing RHR PP 2A control switch to START.	S / U	
<u>EVALUATOR CUE:</u> RHR Pump 2A Red Light Illuminated, Amber Light Off.				
15	**If** RHR Pump A 2P202A is not available, substeps A and B are to be performed.	Determines this step is Not Applicable.	S / U	
*16 (step 2.4.13)	**Throttle Open** HV-251-F024A TEST LINE CTL	**Simulates** placing HV-251-F024A to OPEN	S / U	
<u>EVALUATOR CUE:</u> As HV-251-F024A is simulated in the OPEN position, indicate that the associated Red Light is Illuminated, Amber Light is Illuminated, and RHR System flow on FI-25105 is rising. The examinee should release HV-251-F024A when RHR Flow is > 3,000 gpm. This will stop the rise in RHR Flow.				
17 (step 2.4.14)	**After** 3,000 gpm flow reached, **Close** HV-251-F007A RHR PUMP A/C MIN FLOW.	**Simulates** placing HV-251-F007 in CLOSE.	S / U	

EVALUATOR CUE: HV-251-F007 Red Light is Off, Amber Light is Illuminated.				
*18 (step 2.4.15)	**Adjust** flow to ≤ 10,000 gpm using HV-251-F024A TEST LINE CTL.	**Simulates** placing HV-251-F024 to OPEN to establish ≤ 10,000 gpm RHR Flow on FI-25105. Minimum acceptable value is > 3,000 gpm established in step 16.	S / U	
EVALUATOR CUE: Manipulate RHR Flow Indication, FI-25105, to respond to examinee manipulations. Closing HV-251-F024 will lower RHR Flow; Opening HV-251-F024 will raise RHR Flow.				
*19 (step 2.4.16)	**Close** HV-251-F048A HX B SHELL SIDE BYPS.	**Simulates** placing HV-251-F048A to close.	S / U	
EVALUATOR CUE: HV-251-F048A Red Light is Off, Amber Light is Illuminated.				
EVALUATOR NOTE / CUE That completes the JPM.				
EVALUATOR CUE Record JPM stop time: __________				
EVALUATOR NOTE Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE
49.OP.20301.201

> **NOTE:** All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
Mpw	1. Task description and number, JPM description and number are identified.
Mpw	2. Knowledge and Abilities (K/A) references are included.
Mpw	3. Performance location specified. (in-plant, control room, or simulator)
Mpw	4. Initial setup conditions are identified.
Mpw	5. Initiating and terminating cues are properly identified.
Mpw	6. Task standards identified and verified by SME review.
Mpw	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
Mpw	8. Verify cues both verbal and visual are free of conflict.
Mpw	9. Ensure performance time is accurate.

Mpw 10. Verify the JPM reflects the most current revision of the procedure.

Procedure	OP-249-005	Rev	32
Procedure		Rev	
Procedure		Rev	

Mpw 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor:______________________ Date: ____________

Instructor:______________________ Date: ____________

REVISION SUMMARY

JOB PERFORMANCE MEASURE
49.OP.20301.201

Revision	Description/Purpose of Revision
0	New JPM
1	Changed to new TQ format. Updated to latest procedure revisions
2	Updated to latest procedure revisions.
3	Updated to latest TQ revisions.

EVALUATOR COPY:

TASK CONDITIONS

- Unit 2 was operating at rated power when the Control Room was evacuated due to a hazardous atmosphere.
- Operators completed all actions in ON-CREVAC-201, Control Room Evacuation, before evacuating the Control Room.
- Unit 2 RSDP transfer switches have been aligned per ON-CREVAC-201.
- RPV level control is with RCIC, stable at –40". RPV pressure is being maintained with SRVs 800–1050 psig.
- RHR was in the normal standby alignment when the Control Room was evacuated.
- ESW is in operation.
- RHRSW is in operation, supplying the 2A RHR heat exchanger.
- Condensate Transfer is in operation.

INITIATING CUE

Place RHR A in Suppression Pool cooling from the Unit 2 RSDP IAW OP-249-005 section 2.4.

EXAMINEE COPY:

TASK CONDITIONS

- Unit 2 was operating at rated power when the Control Room was evacuated due to a hazardous atmosphere.
- Operators completed all actions in ON-CREVAC-201, Control Room Evacuation, before evacuating the Control Room.
- Unit 2 RSDP transfer switches have been aligned per ON-CREVAC-201.
- RPV level control is with RCIC, stable at –40". RPV pressure is being maintained with SRVs 800–1050 psig.
- RHR was in the normal standby alignment when the Control Room was evacuated.
- ESW is in operation.
- RHRSW is in operation, supplying the 2A RHR heat exchanger.
- Condensate Transfer is in operation.

INITIATING CUE

Place RHR A in Suppression Pool cooling from the Unit 2 RSDP IAW OP-249-005 section 2.4.

2.4 RHR SUPP POOL COOLING OPERATIONS FROM REMOTE SHUTDOWN PANEL

☐ NOTE: During implementation of Emergency Operating Procedures RHR can be used in multiple modes of operation at the same time. It is preferable that RHR be aligned either to inject (LPCI Mode) or to address containment (Suppression Chamber Spray, Drywell Spray, and/or Suppression Pool Cooling Modes). If RHR is aligned to address containment and a LPCI initiation signal is received, RHR should be realigned to either inject or to address containment as soon as time permits.

2.4.1 Prerequisites

☐ a. Control Room Evacuated.

☐ b. Plant being controlled from Remote Shutdown Panel.

☐ c. RHR Service Water System available for use in accordance with OP-216-001 RHR Service Water.

☐ d. ESW System available in accordance with OP-054-001, Emergency Service Water System.

2.4.2 Precautions

a. RHR min flow HV-251-F007A will not auto open or close when controlled from Remote Shutdown Panel.

b. RHR Pump A will not auto start on LPCI injection signal when controlled from Remote Shutdown Panel.

c. RHR loop A will not auto align for LPCI injection when controlled from Remote Shutdown Panel.

d. Unit 1 is most likely operating at the Remote Shutdown Panel also; therefore, coordination may be required between units.

☐ NOTE: If RHR loop A unavailable for suppression pool cooling, Section 2.6 provides the necessary instructions for placing the B Loop in service. Placing the B Loop in service will require manual valve and breaker operation and utilization of local flow indicator FI-25105B (34-683').

☐ 2.4.3 **Ensure** ESW in operation in accordance with OP-054-001, Emergency Service Water System.

☐ 2.4.4 **Place** RHRSW in operation in accordance with OP-216-001, RHR Service Water System.

2.4.5 IF RHR Pump 1A is running, as determined locally or RHR Pump 2A will not start, **Stop** RHR Pump 1A locally at RHR Pump 1P202A breaker 1A20102: (2)

☐ a. **Pull Out** Lateral Control Switch.

☐ b. **Place** Lateral Control Switch to **TRIP**.

☐ 2.4.6 **Ensure** HV-251-F048A HX A SHELL SIDE BYPS **OPEN**.

☐ 2.4.7 **Open** HV-251-F028A SUPP CHMBR SPRY TEST SHUTOFF.

☐ 2.4.8 **Ensure** HV-251-F007A RHR PP A/C MIN FLOW **OPEN**.

2.4.9 IF RHR discharge loop is potentially voided in accordance with ON-037-001, **Fill** and **Pressurize** RHR Loop A as follows:(7)

☐ a. **Fully Open** HV-251-F024A TEST LINE CTL.

☐ b. **Close** HV-251-F047A RHR HX A SHELL SIDE INLET.

☐ c. **Close** HV-251-F048A RHR HX A SHELL SIDE BYPS (Throttle Valve).

d. IF PUMP A(B)(C)(D) BKR POWER LOSS STATUS LIGHT **ILLUMINATED**, **Close** the Control and Trip DC Power Knife Switch for the RHR Pump that will be started:

☐ (1) For RHR PUMP 2A, **Close** Bkr 2A20102 DC Knife.

☐ (2) For RHR PUMP 2B, **Close** Bkr 2A20202 DC Knife.

☐ (3) For RHR PUMP 2C, **Close** Bkr 2A20302 DC Knife.

☐ (4) For RHR PUMP 2D, **Close** Bkr 2A20402 DC Knife.

☐ e. **Start** 2P202A RHR PP

☐ f. **Throttle Open** HV-251-F048A HX A SHELL SIDE BYPS to establish a system flow between 3,000 gpm and 3,500 gpm as indicated on RHR SYSTEM FLOW INDICATOR FI-25105.

☐ NOTE (1):	The next step will completely fill the RHR LPCI INJECTION LINE and RHR HEAD SPRAY LINE (A Loop only) as flow rises from 3,500 gpm to 6,000 gpm.
☐ NOTE (2):	Slowly throttling in one to two second bumps corresponds to approximately 500 gpm.

☐ g. **Open** HV-251-F048A HX A SHELL SIDE BYPS in 500 gpm increments followed by a 20 second pause to establish a system flow rate of 6,000 gpm as indicated on RHR SYSTEM FLOW INDICATOR FI-25105.

☐ h. **Throttle Open** HV-251-F048A HX A SHELL SIDE BYPS to establish RHR loop flow between 11,000 gpm and 12,000 gpm as indicated on RHR SYSTEM FLOW INDICATOR FI-25105.

☐ NOTE:	The next step will completely fill the DRYWELL SPRAY LINE. This will occur at a TEST LINE CTL HV-251-F024A position of 30-40% open.

☐ i. **Throttle Closed** HV-251-F024A TEST LINE CTL to maintain ≤ 10,000 gpm as indicated on RHR SYSTEM FLOW INDICATOR FI-25105.

☐ j. **Full Open** HV-251-F048A HX A SHELL SIDE BYPS.

☐ k. **Open** HV-251-F047A RHR HX A SHELL SIDE INLET .

☐ l. **Go To** step 2.4.13

2.4.10 **Ensure** RHR System filled and vented as follows:

☐ a. **Open** 251821 RHR Div 1 Drywell Spray Vent Valve.

☐ b. **WHEN** venting complete, **Close** 251821 RHR Div 1 Drywell Spray Vent Valve.

☐ 2.4.11 **Start** RHR PUMP A 2P202A.

2.4.12 **IF** RHR PUMP A 2P202A not available:

☐ a. **Verify** Div 2 ESW operating or request Unit 1 place ESW Loop B in operation in accordance with OP-054-001, Emergency Service Water System.

b. **Start** 2P202C RHR PUMP C locally at RHR Pump 2P202C breaker 2A20302.

☐ (1) **Pull Out** Lateral Control Switch.

☐ (2) **Place** Lateral Control Switch to **CLOSE**.

☐ 2.4.13 **Throttle Open** HV-251-F024A TEST LINE CTL.

☐ 2.4.14 **AFTER** 3000 gpm flow reached, **Close** HV-251-F007A RHR PUMP A/C MIN FLOW.

☐ 2.4.15 **Adjust** flow to ≤ 10,000 gpm using HV-251-F024A TEST LINE CTL.

☐ 2.4.16 **Close** HV-251-F048A HX B SHELL SIDE BYPS.

☐

NOTE:	RHR Room Cooler 2V202A normally auto starts when RHR Pump 2A starts. The Room Cooler will auto start at 128°F and auto stops at 70°F during a Control Room fire which damages HVAC Panel 2C681.

☐ 2.4.17 As time and personnel become available, **Ensure** RHR Room Cooler 2V202A **STARTED**.

2.4.18 **IF** containment sprays not in service, **Shut Down** RHR Suppression Pool Cooling as follows:

☐ a. **BEFORE** flow is decreased to < 3000 gpm, **Open** HV-251-F007A RHR PP A/C MIN FLOW.

☐ b. **Close** HV-251-F024A TEST LINE CTL.

☐ c. **Stop** 2P202A RHR PUMP.

d. **IF** RHR PUMP 2P202C running, **Stop** RHR PUMP C 2P202C locally at RHR Pump 2P202C breaker 2A20302.

☐ (1) **Place** Lateral Control Switch to **TRIP**.

☐ (2) **Place** the lateral control switch to the **HANDLE IN** position.

☐ e. **Close** HV-251-F028A SUPP CHMBR SPRY TEST SHUTOFF.

☐ f. **Open** HV-251-F048A HX A SHELL SIDE BYPS (Throttle Valve).

2.4.19 With Containment Sprays in service, **Shutdown** RHR Suppression Pool Cooling as follows:

☐ a. **BEFORE** flow is decreased to < 3000 gpm, **Open** HV-251-F007A RHR PP A/C MIN FLOW.

☐ b. **Close** HV-251-2024A TEST LINE CTL.

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Plant JPM K

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JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

Task Title: Transfer of DG ‘E’ for DG ‘C’

JPM#: 24.OP.20661.001 Revision: 0 Date: 06/15/2017

Applicability: ☒ RO ☒ SRO

Setting: Plant

NUREG–1123 E/APE / Sys 264000 K/A Number A2.09 K/A Importance 3.7/4.1

Alternate Path: ☐ YES ☒ NO Time Critical ☐ YES ☒ NO Validation Time (min):20

Testing Method: ☒ Simulate ☐ Perform

Author: Michael Wilcox Date: 06/15/2017

Operations Review: Collin Breitman Date: 12/4/17

Validated: Bruce Althouse Date: 11/16/17

Approval: Jeffrey Dills Date: 12/12/17
Nuclear Training Supervisor

Examinee Name: ______________________________ ____________________
Last, First MI Employee Number

Exam Date: ____________________ Exam Duration (Min):____________________

Evaluation Result: ☐ Satisfactory ☐ Unsatisfactory

Evaluator:____________________ ____________________
Name Signature

Comments:

REQUIRED TASK INFORMATION
JOB PERFORMANCE MEASURE
24.OP.20661.001

I. SAFETY CONSIDERATIONS

A. All Operations personnel are responsible for maintaining their radiation exposure As Low As Reasonably Achievable in accordance with OP-AD-002, Standards for Shift Operations.

B. All applicable safety precautions shall be taken in accordance with established Talen Energy safety policies and the Safety Rule Book, for example:

1. Whenever any electrical panel is opened for inspection during JPM performance.

2. Whenever entering any plant area where specific safety equipment such as hearing or eye protection, safety shoes, hardhats, etc., is required and/or posted as being necessary.

C. If, in the judgment of the Evaluator any safety issue occurs during the performance of a JPM, the JPM will be terminated until the issue is resolved.

D. Peer checking is the expectation for all evolutions; however, since a JPM is an individual effort, no peer check will be provided and Self Checking is required.

II. REFERENCES

A. OP–024–004, TRANSFER AND TEST MODE OPERATIONS OF DIESEL GENERATOR E

III. TASK CONDITIONS

- A Station Blackout occurred due to a loss of offsite power. The control room crew is performing Unit 1(2) Response to Station Blackout, EO–100(200)–030.
- Diesel Generators A and B were started LOCALLY.
- The Control Room is preparing to energize ESS Buses 1C and 2C using Diesel Generator E.
- Another operator is at DG E and has already performed steps 1-3 of OP–024–004, Attachment C.
- The C Diesel Bldg Basement has been evaluated and conditions are adequate for habitability, another operator is on station to support.

IV. INITIATING CUE

Swap E EDG for C EDG using OP-024-004, Attachment C starting at step 4.

V. TASK STANDARD

DG C removed from service, and DG E ready to supply power to ESS Buses 1C and 2C in accordance with OP–024–004 Attachment C steps 4–12.

INFORMATION FOR EVALUATOR

- Marking a step as UNSAT requires written comments on respective step.
- Critical steps are marked with a *. If elements of the Standard are non-critical, the critical elements of the Standard are marked with a *.
- The time clock starts when the applicant acknowledges the initiating cue.
- This JPM must be performed in the plant. Obtain Shift Manager Authorization to proceed. This JPM requires access to DG C.
- Have a copy of OP-024-004 att. C

EVALUATOR CUE
Record JPM start time: ___________

Step	Action	Standard	Eval	Comments
1	**Verifies** OP–024–004 Attachment C is governing procedure and obtains controlled copy.	Controlled copy of OP–024–004 obtained, selects Attachment C.	S / U	
2	At 0C521C Diesel Generator C Engine Control Panel, **place** DG C Control Mode Select Switch 43CM to LOCAL. (step 4)	**Rotates** 43CM DG C CONTROL MODE SELECT SWITCH to LOCAL	S / U	

EVALUATOR CUE
43CM control mode select switch is in LOCAL

Step	Action	Standard	Eval	Comments
3	**Observe** the following: • Control switches not proper for Remote Auto Oper. ALARM • Remote white light Extinguishes • Local white light Illuminates DG C available for Emergency white light Extinguishes (step 5)	**Observes** the following: • Alarm E–08, CONTROL SWITCHES NOT PROPER FOR REMOTE AUTO OPER, in alarm • REMOTE white light EXTINGUISHED • LOCAL white light ILLUMINATED • DG C AVAILABLE FOR EMERGENCY white light EXTINGUISHED	S / U	

EVALUATOR CUE
Alarm E–08, CONTROL SWITCHES NOT PROPER FOR REMOTE AUTO OPER, is in alarm
REMOTE White light is out
LOCAL white light is lit
DG C AVAILABLE FOR EMERGENCY white light is out

Step	Action	Standard	Eval	Comments
4	**Verifies** Control Room alarm (step 6)	**Contacts** Control Room PCO and requests status of DG panel alarm	S / U	

<table>
<tr><td colspan="5"><u>EVALUATOR CUE</u>
DG panel alarm was received.</td></tr>
<tr><td colspan="5"><u>EVALUATOR NOTE</u>
The applicant may attempt to enter the basement area to perform the next two steps. It is desired to minimize industrial safety risk and utilize the additional operator on station to perform the next two steps. For credit on JPM steps 5 and 6, the applicant must recognize the need to enter the basement to access the valves. Do not allow the applicant to enter the basement area.</td></tr>
<tr><td>5*</td><td>Manually Closes HV–01112C/ HV-0112C, DG C ESW A supply/return isolation valve</td><td>• Directs field operator in basement to perform step 7 of Attachment C, OP-024-004.</td><td>S / U</td><td></td></tr>
<tr><td colspan="5"><u>EVALUATOR CUE</u>
Step 7 of OP-024-004 Attachment C is complete.</td></tr>
<tr><td>6*</td><td>Manually Closes HV–01110C/ HV-0110C, DG C ESW B supply/return isolation valve</td><td>• Directs field operator in basement to perform step 8 of Attachment C, OP-024-004.</td><td>S / U</td><td></td></tr>
<tr><td colspan="5"><u>EVALUATOR CUE</u>
Step 8 of OP-024-004 Attachment C is complete.</td></tr>
<tr><td>7</td><td>At 0C512C, Place DG C building ventilation supply fan 0V512C to Stop.</td><td>At 0C512C, DG E FOR DG C TRANSFER PANEL, places HS DG C BLDG VENTIL SUPPLY FAN 0V512C to STOP</td><td>S / U</td><td></td></tr>
<tr><td colspan="5"><u>EVALUATOR CUE</u>
DG C BLDG VENTIL SUPPLY FAN 0V512C is in STOP</td></tr>
<tr><td>8*</td><td>At 0C512C:
• Place HS-00057C, DG C Auto Start Control to Disable.
• Observe DG C Aligned white light Extinguished</td><td>Performs the following:
• Places HS–00057C, DG C AUTO START CONTROL, to DISABLE
• Observes DG C ALIGNED white light EXTINGUISHED</td><td>S / U</td><td></td></tr>
<tr><td colspan="5"><u>EVALUATOR CUE</u>
HS–00057C is in DISABLE
DG C ALIGNED white light is out</td></tr>
<tr><td colspan="5"><u>EVALUATOR CUE</u>
As each of the following steps (11-19) are performed, cue the examinee that the identified switch is in the desired position.</td></tr>
</table>

9*	**Place** HS–00058C, GENERATOR METERING & COMPUTER MONITORING, to the DG E position	**Places** HS–00058C, GENERATOR METERING & COMPUTER MONITORING, to the DG E position	S / U	
10*	**Place** HS–00059C, GENERATOR FIELD CURRENT COMPUTER MONITORING, to the DG E position	**Places** HS–00059C, GENERATOR FIELD CURRENT COMPUTER MONITORING, to the DG E position	S / U	
11*	**Place** HS–00060C, DIESEL ALARMS TO CONTROL ROOM ANNUNCIATOR, to the DG E position	**Places** HS–00060C, DIESEL ALARMS TO CONTROL ROOM ANNUNCIATOR, to the DG E position	S / U	
12*	**Place** HS–00061C, ESW TEMP MONITORING & HVAC ALARMS, to the DG E position	**Cycles** and **Places** HS–00061C, ESW TEMP MONITORING & HVAC ALARMS, to the DG E position	S / U	
13*	**Place** HS–00062C, ESW LOOP A SUPPLY VALVE CONTROL & INDICATION, to the DG E position	**Places** HS–00062C, ESW LOOP A SUPPLY VALVE CONTROL & INDICATION, to the DG E position	S / U	
14*	**Place** HS–00063C, ESW LOOP A RETURN VALVE CONTROL & INDICATION, to the DG E position	**Places** HS–00063C, ESW LOOP A RETURN VALVE CONTROL & INDICATION, to the DG E position	S / U	
15*	**Place** HS–00064C, ESW LOOP B SUPPLY VALVE CONTROL & INDICATION, to the DG E position	**Places** HS–00064C, ESW LOOP B SUPPLY VALVE CONTROL & INDICATION, to the DG E position	S / U	
16*	**Place** HS–00065C, DG BYPASS INDICATION UNIT 1, to the DG E position	**Places** HS–00065C, DG BYPASS INDICATION UNIT 1, to the DG E position	S / U	
17*	**Place** HS–00066C, DG BYPASS INDICATION UNIT 2, to the DG E position	**Places** HS–00066C, DG BYPASS INDICATION UNIT 2, to the DG E position	S / U	
18*	**Place** HS–00067C, ALIGNMENT ALARM & INDICATION ONLY, to the DG E position	**Places** HS–00067C, ALIGNMENT ALARM & INDICATION ONLY, to the DG E position	S / U	
19*	**Place** HS–00068C, ESW LOOP B RETURN VALVE CONTROL & INDICATION, to the DG E position	**Places** HS–00068C, ESW LOOP B RETURN VALVE CONTROL & INDICATION, to the DG E position	S / U	

20*	**Place** HS–00069C, ESW BYPASS INDICATION AND AUTO LOOP TRANSFER, to the DG E position	**Places** HS–00069C, ESW BYPASS INDICATION AND AUTO LOOP TRANSFER, to the DG E position	S / U	
21*	**Place** HS–00070C, VENTILATION SUPPLY FANS CONTROL, to the DG E position	**Places** HS–00070C, VENTILATION SUPPLY FANS CONTROL, to the DG E position	S / U	
22*	**Place** HS–00071C, DG CTL, INDICATION, METERING & BREAKER TRIP INTERLOCK, to the DG E position	**Places** HS–00071C, DG CTL, INDICATION, METERING & BREAKER TRIP INTERLOCK, to the DG E position	S / U	
23*	**Place** HS–00072C, GENERATOR RELAYING & BREAKER TRIP INTERLOCK, to the DG E position	**Places** HS–00072C, GENERATOR RELAYING & BREAKER TRIP INTERLOCK, to the DG E position	S / U	
24*	**Place** HS–00073C, GENERATOR METERING & BREAKER TRIP INTERLOCK, to the DG E position	**Places** HS–00073C, GENERATOR METERING & BREAKER TRIP INTERLOCK, to the DG E position	S / U	
25*	**Place** HS–00074C, ENGINE CONTROL & INDICATION, to the DG E position	**Places** HS–00074C, ENGINE CONTROL & INDICATION, to the DG E position	S / U	
26*	**Place** HS–00075C, ENGINE, GENERATOR & ESW PUMP CONTROL, to the DG E position	**Places** HS–00075C, ENGINE, GENERATOR & ESW PUMP CONTROL, to the DG E position	S / U	
27*	**Place** HS–00076C, Generator Breaker Control, to the DG E position	**Places** HS–00076C, Generator Breaker Control, to the DG E position	S / U	
EVALUATOR NOTE / CUE That completes the JPM.				
EVALUATOR CUE Record JPM stop time: __________				
EVALUATOR NOTE Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

VALIDATION CHECKLIST
JOB PERFORMANCE MEASURE
24.OP.20661.001

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 10-13 below.

Instructor Initials	
BA	1. Task description and number, JPM description and number are identified.
BA	2. Knowledge and Abilities (K/A) references are included.
BA	3. Performance location specified. (in-plant, control room, or simulator)
BA	4. Initial setup conditions are identified.
BA	5. Initiating and terminating cues are properly identified.
BA	6. Task standards identified and verified by SME review.
BA	7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).
BA	8. Verify cues both verbal and visual are free of conflict.
BA	9. Ensure performance time is accurate.

BA

10. Verify the JPM reflects the most current revision of the procedure.

Procedure OP-024-004 Rev 36

Procedure ______ Rev ______

Procedure ______ Rev ______

BA 11. Pilot the JPM.

For Sim JPMs, ensure simulator response is unchanged. Run concurrent JPMs simultaneously to ensure proper simulator response and there is no interaction between JPMs.

For plant JPMs, ensure the JPM is consistent with conditions in the plant (labeling, radiological, etc.).

N/A 12. If the JPM cannot be performed as written, then revise as necessary and revalidate.

13. When JPM is validated, sign and date JPM cover page. When JPM is Re-validated sign below:

Instructor: ______________________ Date: ____________

Instructor: ______________________ Date: ____________

REVISION SUMMARY

JOB PERFORMANCE MEASURE
24.OP.20661.001

Revision	Description/Purpose of Revision
0	Created from JPM 24.OP.1464.001 R4. Reformatted to the Vision template.

EVALUATOR COPY:

TASK CONDITIONS

- A Station Blackout occurred due to a loss of offsite power. The control room crew is performing Unit 1(2) Response to Station Blackout, EO–100(200)–030.
- Diesel Generators A and B were started LOCALLY.
- The Control Room is preparing to energize ESS Buses 1C and 2C using Diesel Generator E.
- Another operator is at DG E and has already performed steps 1-3 of OP–024–004, Attachment C.
- The C Diesel Bldg Basement has been evaluated and conditions are adequate for habitability, another operator is on station to support.

INITIATING CUE

Swap E EDG for C EDG using OP-024-004, Attachment C starting at step 4.

EXAMINEE COPY:

TASK CONDITIONS

- A Station Blackout occurred due to a loss of offsite power. The control room crew is performing Unit 1(2) Response to Station Blackout, EO–100(200)–030.
- Diesel Generators A and B were started LOCALLY.
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INITIATING CUE

Swap E EDG for C EDG using OP-024-004, Attachment C starting at step 4.

TRANSFER OF DG E FOR DG C

DATE: TO / DD / YY

		CONFIRM	VERIFY
1.	**IF** transfer of fuel oil necessary to meet Technical Specification 3.8.3 for the inoperable Diesel Generator C, **Perform** the fuel oil transfer per OP-023-001 prior to the Diesel Generator Transfer.	N/A	
2.	**Check** DG E available for substitution determined by following at 0C521E Diesel Generator E Engine Control Panel:		
2.1	Master Trip Ckt Reset light **ILLUMINATED**.	W	______
2.2	DC Power Avail Circuit #1 & #2 lights **ILLUMINATED**.	W	______
2.3	All annunciators clear or evaluated as not affecting DG E operability.	W	______
3.	**Log** transfer start time in PCO log.	W	

☐ NOTE: Next step produces Control Room & Local Alarm.

		CONFIRM	VERIFY
4.	At 0C521C Diesel Generator C Engine Control Panel, **Place** DG C Control Mode Select Switch 43CM to **LOCAL**.	______	
5.	**Observe** following:		
5.1	Control Switches Not Proper for Remote Auto Oper. **ALARM**.	______	______
5.2	Remote white light **EXTINGUISHES**.	______	______
5.3	Local white light **ILLUMINATED**.	______	______
5.4	DG C Available for Emergency white light **EXTINGUISHES**.	______	______
6.	**Ensure** Control Room received DG Panel **ALARM**.	______	

		CONFIRM	VERIFY
☐	NOTE: IF transfer of 'E' D/G for 'C' D/G is due to loss of off-site power **OR** Station Blackout, valves in steps 7 and 8 must be manually **CLOSED**.		
7.	At 0C521C **Close** ESW Loop A Valves for DG C by momentarily placing switch to **CLOSE** for ESW Supply/Return HV-01112C/HV-01122C.	______	______
	OR		
	IF D/G transfer is due to Loss of Off-site Power HV-01112C/ HV-01122C must be **Manually Closed**.	______	______
8.	At 0C521C **Close** ESW Loop B Valves for DG C by momentarily placing switch to **CLOSE** for ESW Supply/Return HV-01110C/HV-01120C.	______	______
	OR		
	IF D/G transfer is due to Loss of Off-site Power HV-01110C/ HV-01120C must be **Manually Closed**.	______	______
☐	NOTE: Switching protective equipment required at switchgear.		
9.	At 0C512C DG E for DG C Transfer Panel **Place** DG C Bldg Ventil Supply Fan 0V512C to **STOP**.	______	______
10.	At 0C512C **Place** HS-00057C, DG C Auto Start Control, to **DISABLE** to prevent inadvertent start while transferring logic.	______	______
11.	At 0C512C **Observe** DG C Aligned white light **EXTINGUISHED**.	______	______
12.	At 0C512C **Sequentially Place** following switches to D/G E position:		
	12.1 HS-00058C Generator Metering & Computer Monitoring	______	______
	12.2 HS-00059C Generator Field Current Computer Monitoring	______	______
	12.3 HS-00060C Diesel Alarms to Control Room Annunciator	______	______
☐	NOTE: Cycle the following HS several times to clean the contacts.		
	12.4 HS-00061C ESW Temp Monitoring & HVAC Alarms	______	______

TRANSFER OF DG E FOR DG C

		CONFIRM	VERIFY
12.5	HS-00062C ESW Loop A Supply Valve Control & Indication	________	________
12.6	HS-00063C ESW Loop A Return Valve Control & Indication	________	________
12.7	HS-00064C ESW Loop B Supply Valve Control & Indication	________	________
12.8	HS-00065C DG Bypass Indication Unit 1	________	________
12.9	HS-00066C DG Bypass Indication Unit 2	________	________
12.10	HS-00067C Alignment Alarm & Indication Only	________	________
12.11	HS-00068C ESW Loop B Return Valve Control & Indication	________	________
12.12	HS-00069C ESW Bypass Indication and Auto Loop Transfer	________	________
12.13	HS-00070C Ventilation Supply Fans Control	________	________
12.14	HS-00071C DG Ctl, Indication, Metering & Breaker Trip Interlock	________	________
12.15	HS-00072C Generator Relaying & Breaker Trip Interlock	________	________
12.16	HS-00073C Generator Metering & Breaker Trip Interlock	________	________
12.17	HS-00074C Engine Control & Indication	________	________
12.18	HS-00075C Engine, Generator & ESW Pump Control	________	________
12.19	HS-00076C Generator Breaker Control	________	________
13.	At DG C-C 4.16KV Swgr, **TRIP Open** Diesel Gen. Bkr 0A510C01 using CSW0A510C01.	________	________
14.	**Open** Transfer Breaker 0A510C01 Control & Trip DC Power Knife Switch.	________	________
15.	**Rack Out** 0A510C01.	________	________
16.	**Remove** transfer breaker from 0A510C01 and **Place** in 0A510C02 DG E - DG C, 4.16KV Swgr, Diesel Gen. Bkr Alternate Pos.	________	________

TRANSFER OF DG E FOR DG C

		CONFIRM	VERIFY
17.	**Rack In** 0A510C02.	________	________
18.	**Close** DG E for DG C Transfer Breaker, 0A510C02 Control & Trip DC Power Knife Switch.	________	________
19.	**Close** 0A510C02 using CSW0A510C02.	________	________
20.	At 0C512C **Place** DG C Bldg Ventil Supply Fan 0V512C to **AUTO**.	________	________
21.	At 0C512C **Observe** DG E Aligned white light **ILLUMINATED**.	________	________

☐ NOTE: Breaker will not close in following step.

22. At 0A510, Diesel Generator E 4.16KV Switchgear:

		CONFIRM	VERIFY
22.1	**Place** Feeder Breaker to MCC 0B565 0A51005 control switch to **CLOSE** position and **Release** to reset breaker logic for automatic closure on undervoltage at 0B565.	________	________
22.2	**Confirm** Bkr OA51005 Aligned for Auto white light **ILLUMINATED**.	________	________

☐ NOTE: The following step is to **Verify** position of HS-00057E-C, no action should be required.

		CONFIRM	VERIFY
23.	At 0C512E-C DG E for DG C Transfer Panel **Verify** DG C Auto Start Control HS-00057E-C in **DISABLE**.		________

24. At 0C512E-C **Sequentially Place** following switches to D/G E position:

		CONFIRM	VERIFY
24.1	HS-00076E-C Generator Breaker Control	________	________
24.2	HS-00075E-C Engine, Generator & ESW Pump Control	________	________
24.3	HS-00074E-C Engine, Control & Indication	________	________
24.4	HS-00073E-C Generator Metering & Breaker Trip Interlock	________	________
24.5	HS-00072E-C Generator Relaying & Breaker Trip Interlock	________	________

TRANSFER OF DG E FOR DG C

		CONFIRM	VERIFY
24.6	HS-00071E-C DG Ctl, Indication, Metering & Breaker Trip Interlock	________	________
24.7	HS-00070E-C Ventilation Supply Fans Control	________	________
24.8	HS-00069E-C ESW Bypass Indication & Auto Loop Transfer	________	________
24.9	HS-00068E-C ESW Loop B Return Valve Control & Indication	________	________
24.10	HS-00067E-C Alignment Alarm & Indication Only	________	________
24.11	HS-00066E-C DG Bypass Indication Unit 2	________	________
24.12	HS-00065E-C DG Bypass Indication Unit 1	________	________
24.13	HS-00064E-C ESW Loop B Supply Valve Control & Indication	________	________
24.14	HS-00063E-C ESW Loop A Return Valve Control & Indication	________	________
24.15	HS-00062E-C ESW Loop A Supply Valve Control & Indication	________	________

☐ NOTE: Cycle the following HS several times to clean the contacts.

		CONFIRM	VERIFY
24.16	HS-00061E-C ESW Temp Monitoring & HVAC Alarms	________	________
24.17	HS-00060E-C Diesel Alarms to Control Room Annunciator	________	________
24.18	HS-00059E-C Generator Field Current Computer Monitoring	________	________
24.19	HS-00058E-C Generator Metering & Computer Monitoring	________	________

☐ NOTE: Following steps refer to one transfer breaker used in five different locations. Normally it is located at 0A510, DG E 4.16KV Switchgear, Feeder Breaker to Test Facility Xfmr 0A51006. There is an associated label "Transfer Breaker Location" that is moved with the transfer breaker to each of the five locations.

25. At 0A510, **Perform** following:

TRANSFER OF DG E FOR DG C

(3)

		CONFIRM	VERIFY
25.1	**Remove** transfer breaker 0A51006, and	________	________
25.2	**Place** in DG E for DG C Breaker 0A51003 in accordance with OP-000-001, Racking Breakers, and	________	________
25.3	**Place** "Transfer Breaker Location" label on the DG E for DG C Breaker cubicle door.	________	________
26.	**Rack In** 0A51003 in accordance with OP-000-001.	________	________
27.	**Close** Transfer Breaker 0A51003 Control & Trip DC Power Knife Switch.	________	________
28.	**Close** 0A51003.	________	________
29.	At 0C512E-C **Place** DG C Auto Start Control HS-00057E-C to **ENABLE** position.	________	________
30.	At 0C512E-C **Observe** DG E Aligned white light **ILLUMINATED**.	________	________
31.	At 0C577E DG E Bldg Auxiliary Systems Control Panel, **Open** ESW Loop A Valves for DG E by placing handswitch to **OPEN** for ESW Loop A Supply/Return HV-01112E/HV-01122E.	________	________
32.	At 0C577E **Open** ESW Loop B Valves for DG E by placing handswitch to **OPEN** for ESW Loop B Supply/Return HV-01110E/HV-01120E.	________	________
33.	**IF** in a Station Blackout IAW EO-100-030, **Ensure** ESW Logic is reset IAW EO-100-030 Attachment C at A, else NA.	________	

CONFIRM VERIFY

☐

CAUTION

If this attachment is being performed during a Station Blackout per EO-1(2)00-030 OR a LOOP per ON-1(2)04-001, the next step will start the E D/G. Coordination with the control room will be required prior to taking the diesel generator to REMOTE. If the ESW Logic is not reset prior to going to REMOTE the associated ESW Pump will not start.

34. At 0C521E **Place** Control Mode Select Switch to **REMOTE**. ________ ________

☐

NOTE: IF transfer was being directed by EO-1(2)00-030, Station Blackout OR ON-1(2)04-001, Loss of Offsite Power, steps 35 through 41 are **NA**.

35. **Ensure** Control Room DG Panel Alarm **EXTINGUISHED**. ________

36. At 0C521E **observe**:

    36.1 Control Switches Not Proper for Remote Auto Oper. Alarm **EXTINGUISHED**. ________ ________

    36.2 DG Bypassed or Inoperable alarm **EXTINGUISHED**. ________ ________

    36.3 Local white light **EXTINGUISHED**. ________ ________

    36.4 Remote white light **ILLUMINATED**. ________ ________

    36.5 DG Available for Emerg white light **ILLUMINATED**. ________ ________

37. **Align** Diesel Generator E for Standby Automatic operation in accordance with OP-024-001. ________

38. **Notify** Control Room DG E has been substituted for DG C. ________

39. **Affix** E DG placards on C Diesel Controls on Panel 0C653. ________

40. **Log** time of transfer completion in PCO Log. ________

41. **Perform** SO-024-001 to maintain DG E operability. System Test Verification is performed in lieu of Independent Verification. ________

SUSQUEHANNA NUCLEAR, LLC
OPERATIONS TRAINING PROGRAM

SCENARIO EXAMINATION GUIDE

2018
LOC 29 NRC SCENARIO 2

SCN# LOC29-NRC-02
Revision 0

06/22/2017

TEAM SUSQUEHANNA
Generating Excellence

Lesson Information

Title	Swap TBCCW / Fuel Failure / Steam Leak into TB				
Vision ID		Accredited		■YES	□ NO
Training ID	LOC29-NRC-02	Revision	0	Date	06/22/17
Prerequisites					
Teaching Time	65 Minutes				

Approval

CBT Approval[1]	N/A	Date	N/A
Preparer	Michael Wilcox	Date	06/22/17
Review (Instructor/SME)	Charles Rigsbee	Date	12/5/17
Nuclear Engineering[1]	N/A	Date	N/A
Training Supervision	Jeffrey Dills	Date	12/12/17
Line Management	Collin Breitman	Date	12/6/17

[1]If required, otherwise N/A

This simulator scenario has been reviewed and satisfies management expectations for inclusion of OE, Department Fundamentals and HuP, error-reduction techniques and safety standards. Specific applications and/or opportunities for reinforcement of management expectations are noted in the scenario guide or Attachment(s) where applicable.

Revision History

Revision	Date	Comments
0	06/22/2017	New exam

Table of Contents

Scenario Overview

The crew assumes the shift with the plant operating at approximately 100% power. IAC B and SLC pump B are out of service for maintenance.

The crew will begin by starting TBCCW pump B and securing TBCCW pump A per OP-115-001. During this evolution, an APRM fails upscale and causes a control rod block. The crew will bypass the APRM to clear the rod block. The SRO will review the Technical Specification impact of the failed APRM.

Next, a failure of the Turbine First Stage Pressure instrumentation will occur. The SRO will determine the Technical Specification impact.

Next, extraction steam to Feedwater Heater 4A will isolate. The loss of Feedwater heating will cause Reactor power to rise. The crew will respond per ON-FWHTG-101, Feedwater Heating Off Normal Operation, and multiple other off-normal procedures. The crew will be required to reduce Reactor power to ≤71%. They will initiate a Recirculation runback to limiter #2. The crew will then isolate Feedwater Heater string A. The SRO will determine the Technical Specification impact.

The reactivity excursion will cause fuel damage. Off-gas and Main Steam Line radiation levels will rise. The crew will execute ON-MSLRAD-101, Rising Offgas MSL Rad Levels. The crew will lower Reactor power in an attempt to reduce radiation levels. The crew will eventually scram the Reactor and attempt to isolate the MSIVs. The MSIVs will stick in mid-position.

After the scram, a Main Steam Line break will develop in the Turbine Building. With the MSIVs stuck mid-position, this is an un-isolable primary system discharging outside of the primary containment. Turbine Building exhaust fan A will trip. Turbine Building exhaust fan B will trip approximately 1 minute after being started. The loss of Turbine Building HVAC will lead to an un-monitored release from the Turbine Building. The crew will execute EO-000-105, Radioactivity Release Control. When dose rates approach the General Emergency level, the crew will execute EO-000-112, Emergency Depressurization, and open all ADS valves. The crew will control Reactor injection to restore / maintain Reactor water level during and after the emergency depressurization.

The scenario will be terminated when 6 SRVs are open and Reactor water level is being restored to or controlled in the assigned band above -161".

The expected E Plan classification is a Site Area Emergency, RS1.1, based on a loss of two barriers or RS1.2, based on offsite radiation levels. Also meet FS1.1. Depending on when the scenario is terminated, RG1.2, General Emergency criteria may be met.

Objectives

Mastery of the training content shall be demonstrated by individual and/or crew performance evaluation as specified in this training material and the applicable training program description, in accordance with training procedures.

A. Terminal Objective

Perform all system operations required to maintain the plant operating safely, or place the plant in a safe condition if a plant shutdown is required

During the specified mode of plant / system operation

Without error and in accordance with site procedures and management expectations

B. Generic Performance Objectives

1. For all activities, exhibit use of the Human Performance Tools, demonstrating the ability to:

   Use HU tools to effectively control the plant during normal, abnormal, and emergency conditions

   Use of HU tools will be observable per the standards in HU-AD-003

   (SRO) Take every opportunity to coach the team when HU standards are not being met and provide feedback to the team when the HU standards are being met

2. For all activities, exhibit proper use of procedures by:

   Applying the correct procedure to operate equipment and respond to abnormalities

   Ensuring procedures are detailed enough to allow precise control of plant evolutions.

   Demonstrating the ability to:

   Apply the correct procedure to the situation

   Use place keeping for accurate implementation

   Identify any and all areas for procedure improvement

   Take ownership of and complete the improvement, whenever an area for procedure improvement is identified

3. Base actions and decisions with a bias toward conservative, safe operation of the plant, demonstrating the ability to:

   Assure all plant evolutions and work are assessed for Radiological Safety, Industrial Safety, Nuclear Safety, Environmental Safety, or Corporate Safety

   Once a risk is determined, take appropriate actions to mitigate or minimize risk

   Request assistance for any activity which requires additional planning, special precautions, and management oversight to adequately manage the risks

   (SRO) Champion activities that are biased conservatively

4. Demonstrate complete understanding of plant design and system interrelationships, demonstrating the ability to:

   Work effectively as a team to interpret plant indications and determine an effective response

   Understand the bases for, and the plant response to, actions being taken

5. Maintain continuous awareness of critical parameters, demonstrating the ability to:

   Validate parameters by observing multiple independent indications

   Relay parameter values with value, units, and trend; and include action being taken for an abnormal value or trend

   Notify supervision of any change to critical parameters

   (SRO) Assure critical parameters for operational conditions are understood by the team

6. Operate plant systems and equipment within design and operational limits, maintaining relevant parameters within assigned operating bands, demonstrating the ability to:

   Anticipate the impact of component operation prior to its operation, and then verify that the expected effects occur during and following the operation

   Take manual actions (in accordance with procedure direction) when automatic actions do not occur

   Take prompt action to adjust system operating controls before assigned operating bands are exceeded

   Make reactivity and mode changes as directed by detailed operating procedures and approved reactivity plans

C. Simulator Performance Objectives

1. Operational Actions and Annunciator Response

   Correctly identify plant annunciators and indications and perform appropriate remedial actions

2. System Operation, Controls and Instrumentation

   Accurately identify plant instrumentation and correctly interpret instrument readings to respond to normal, abnormal, and emergency conditions

3. Facility Design and Operating Characteristics

   Demonstrate the following:

   - An understanding of facility operating characteristics
   - The ability to safely control the operating characteristics of the facility within prescribed operating boundaries

4. System Loss and Component Level Malfunctions

   Perform system control manipulations to obtain desired operating results and demonstrate the ability to correctly respond to malfunction/loss of components and the impact of the malfunction/loss on interfacing plant systems

5. Heat Removal Component Operation

   Safely operate the plant's heat removal components and demonstrate knowledge of the relationship between the heat removal systems and the operation of facility to prevent exceeding System, Structure, or Component (SSC) design limits which include:

   - Primary coolant systems
   - Emergency coolant systems
   - Decay heat removal systems

6. Auxiliary and Emergency Component Operations

   Safely operate the plant's auxiliary and emergency components / systems to include the controls associated with plant equipment that could affect reactivity or the release of radioactive materials to the environment to control release of radioactivity within regulatory limits

7. Reactivity Management

   Demonstrate knowledge of how reactivity is affected by plant operation and ability to respond to the change in reactivity to protect the safety and integrity of the reactor core

8. Technical Specifications

   During plant operation with the plant or system in a condition requiring Technical Specification action

   Identify the deviation and any required actions / notifications

9. Emergency Plan (if required)

   During plant operation in an emergency condition

   Recognize conditions covered by the Emergency Plan

   (SRO) Demonstrate the ability to:

   - Identify and Implement the appropriate Emergency Action Level
   - Use the applicable bases to support an Event Classification on the specified Emergency Action Level

10. Control Room Duties

    Demonstrate the knowledge and ability to assume the appropriate responsibilities (for the assigned position) associated with the safe operation of the facility

11. Control Room Team Work

    Demonstrate the ability to function within the Control Room team to comply with station procedures and limits of facility license and respond to plant events using appropriate human performance tools to support safe operation of the facility

D. Task List

Task Title	ID
Licensed Operator	
Apply Technical Specification (TS) And Technical Requirements Manual (TRM) Requirements	S-COO-00-1185
Implement Reactivity Manipulations Standards and Communication Requirements	S-COO-00-2784
Implement Appropriate Portions Of Operations Standards For System and Equipment Operation	S-COO-00-1081
Implement Operations Standards For Error And Event Prevention	S-ADM-00-1091
Implement Standards for Shift Operations	S-COO-00-2780
Implement Appropriate Portions of Conduct of Operations	S-COO-00-1015
Implement Appropriate Portions of Secondary Containment Integrity Control	S-COO-00-1020
Implement EOP Cautions	S-COO-00-2566
Implement Operations Directives	S-COO-00-3130
Ensure Plant Operates IAW the Operating License, Technical Specifications (TS), and Technical Requirements Manual (TRM)	S-COO-00-1183
Implement HUMAN PERFORMANCE (HuP) – Standards for Error and Event Prevention	S-EPP-00-3068

Scenario Attributes

A. Critical Tasks

1. Given a fuel failure causing Main Steam Line radiation levels to rise, manually scram the Reactor when Main Steam Line Hi Hi Rad setpoint is approached or exceeded.	
Safety Significance	Manually scramming the Reactor when Main Steam Line radiation levels approach or exceed predetermined values is important to limit the production and release of fission products outside of the Reactor coolant system and Primary Containment.
Consequences for Failure to Perform Task	Continued Reactor operation with fuel damage causing high Main Steam Line radiation levels will result in increased production and release of fission products. Plant release rates will rise, resulting in an elevated dose to the public.
Indications/Cues for Event Requiring Critical Task	Offgas and Main Steam Line high radiation indicators and annunciators.
Performance Criteria	Manually scram the Reactor when Main Steam Line Hi Hi Rad setpoint is approached or exceeded.
Performance Feedback	Control rods inserted and Reactor power lowering.

2. Given a radiological release where dose rates cannot be maintained below GE Declaration Levels, perform a Emergency Depressurization.	
Safety Significance	In order to minimize radiation exposure to the public, Emergency Depressurization of RPV is required if a primary system is discharging and the radioactivity release rate cannot be controlled below release rate that requires a General Emergency.
Consequences for Failure to Perform Task	Failure to take the EOP actions will result in increased dose and/or dose rates at the EPB. An offsite radioactivity release rate above the General Emergency action level represents a substantial increase in the severity of the offsite radioactivity release, relative to the entry condition, and accordingly presents a more immediate threat to the continued health and safety of the public. Emergency depressurization is directed before the release rate reaches the General Emergency level to reduce the radioactivity release rate.
Indications/Cues for Event Requiring Critical Task	The results of Offsite radiation exposures and radiation release rate projections are transmitted to the Control Room Crew after obtained. The Crew must determine that the calculated results exceed the limits for General Emergency level releases (1R or 1R/hour TEDE or 5R or 5R/hour Thyroid CDE at the EPB) as noted on EO-000-105 Table 13.
Performance Criteria	Perform an Emergency Depressurization per EO-000-112 when EPB dose or dose rates are projected to exceed EO-000-105 Table 13 values. Initiate ADS / Manually open all 6 ADS valves
Performance Feedback	Initiating an emergency depressurization causes Reactor pressure to lower which lowers the driving force of any primary system breach. Verify ADS valves are open using red light indication, acoustic monitoring and lowering Reactor pressure and rising reactor water level.

B. Scenario Malfunctions

Event	Malfunction	Operator Action in Response
1	N/A	Swap TBCCW Pumps
2	APRM Fails Upscale	Bypass APRM, Reset half scram
3	Turbine First Stage Pressure Instrument Failure	SRO determines Technical Specification impact
4	Loss of Extraction Steam to Feedwater Heating	Lower Reactor power, isolate Feedwater Heater string
5	Fuel Failure – MSIVs fail to isolate	Lower Reactor power, scram the Reactor, attempt MSIV closure
6	Main Steam Leak into Turbine Building	Attempt MSIV closure, perform Emergency Reactor Depressurization
7	Turbine Building HVAC Trips	Re-start Turbine Building HVAC, perform Emergency Reactor Depressurization

C. Abnormal Events and Major Transients

Malfunction	Description
AE1, TS	APRM Fails Upscale AR-103-A06(B06), Technical Specifications
TS	Turbine First Stage Pressure Instrument Failure AR- Technical Specifications
TS	Turbine First Stage Pressure Instrument Failure AR- Technical Specifications
AE2, R, TS	Loss of Extraction Steam to Feedwater Heating ON-FWHTG-101, Technical Specifications
AE3	Fuel Failure – MSIVs fail open ON-MSLRAD-101, ON-SCRAM-101, EO-000-102
MT1	Main Steam Leak into Turbine Building EO-000-102, EO-000-105
MAE1	Turbine Building HVAC Trips EO-000-105, EO-000-112

D. EOP and EOP Contingencies Used

EOPs	EOP Contingencies
☒ EO-000-102, RPV Control	☐ EO-000-102, Alternate Level Control
☐ EO-000-103, Primary Containment Control	☐ EO-000-102, Steam Cooling
☒ EO-000-104, Secondary Containment Control	☒ EO-000-112, Emergency Depressurization
☒ EO-000-105, Radioactivity Release Control	☐ EO-000-113, Power/Level Control
	☐ EO-000-114, RPV Flooding

E. Technical Specifications

1. TS 3.2.2, Minimum Critical Power Ratio (MCPR)
2. TS 3.3.1.1, Reactor Protection System (RPS) Instrumentation

References

1.	OP-115-001	TURBINE BUILDING CLOSED COOLING WATER SYSTEM
2.	ON-FWHTG-101	FEEDWATER HEATING OFF NORMAL OPERATION
3.	ON-RBCCW-101	LOSS OF RBCCW
4.	OP-164-001	REACTOR RECIRCULATION SYSTEM
5.	ON-MSLRAD-101	RISING OFFGAS/MSL RAD LEVELS
6.	ON-SCRAM-101	REACTOR SCRAM
7.	EO-000-102	RPV CONTROL
8.	ON-TURBINE-101	MAIN TURBINE OFF NORMAL
9.	OP-145-001	RFP AND RFP LUBE OIL SYSTEM
10.	ON-CONTISOL-101	CONTAINMENT ISOLATION
11.	EO-000-104	SECONDARY CONTAINMENT CONTROL
12.	EO-000-105	RADIOACTIVITY RELEASE
13.	EP-RM-004	EAL Classification Bases
14.	EO-000-112	EMERGENCY DEPRESSURIZATION

Setup Instructions

A. Required Materials

1. US Turnover Sheet
   a. Unit 1
      1) 100% power
      2) SLC Pump B is out of service for maintenance.
      3) Instrument Air Compressor B is out of service for maintenance.
      4) Shift activity is to start TBCCW pump B and secure TBCCW pump A per OP-115-001 section 2.2.
   b. Common and Unit 2
      1) Unit 2 at rated power.
2. Supporting Documents
   a. OP-115-001 (for the Normal Event)

B. Simulator Initialization

1. **Reset** to exam specific IC-382. If not available, setup IAW the following instructions.
2. **Run** SCN file **exam\n18scn2.scn**
3. **Place** the simulator in RUN prior to operators entering simulator.
4. **Perform** simulator activities
   a. **Place** a tag on the Instrument Air Compressor B control switch and the SLC pump keylock switch.
   b. **Markup** OP-115-001, as appropriate to start at step 2.2
5. **Reset** ODAs and all Overhead, PPC, HMI and RWM alarms
6. **Ensure** horns and annunciators are on
7. **Ensure** Overhead Lights Override is off

C. Simulator Preparation

1. **Ensure** the EOL CRC Book is at the PCO Console

D. Document Training and Performance Feedback

1. **Record** crew position assignments per TQ-104 (ILO)
2. **Complete** simulator exam checklist

E. Scenario Execution

1. **Provide** turnover to the crew using the US Turnover sheet

2. **Direct** the crew to walk down the Control Room panels

3. **Inform** the Shift Manager that the crew has the shift

F. Simulator Files

N18scn2.scn

```
; Scenario File
; Monitored parameters
SCN Exam\n18_mp
; IAC B OOS
IRF crfPM09_1K107B f:OUT

; SLC pump B OOS
IRF rfDB106723 f:OPEN
IMF cmfPM01_1P208B

; Crew starts TBCCW pump B and secures TBCCW pump A

; NPO closes TBCCW pump A discharge valve
{Key[10]} IRF rfTW115001 r:30 f:0

; APRM 1 Fails Upscale
{Key[1]} IMF mfNM178007A f:125

; Loss of extraction steam to Feedwater heater 4A and rad monitors
{Key[3]} IMF cmfMV05_HV10241A

{Key[8]} IMF mfRR179003 f:1
{Key[8]} IMF mfRM179004A r:5:00 f:7000
{Key[8]} IMF mfRM179004B r:5:00 f:5800
{Key[8]} IMF mfRM179004C r:5:00 f:3900
{Key[8]} IMF mfRM179004D r:5:00 f:5000

; NPO closes RFP seal water bleed off to FWH 5A
{Key[31]} IMF cmfAV02_HV10244A

; NPO re-starts CIG compressor by resetting logic at 1C239:
{Key[11]} scn n18scn2_2

; Turbine first stage bowl pressure instrument failure
{Key[2]} IMF cmfRL02_C721K9A

; Fuel failure
; Inserted as part of event

; Fuel failure gets worse

{Key[23]} MMF mfRR179003 f:50
{Key[23]} MMF mfRM179004A r:6:00 f:20000
{Key[23]} MMF mfRM179004B r:6:00 f:20000
{Key[23]} MMF mfRM179004C r:6:00 f:20000
{Key[23]} MMF mfRM179004D r:6:00 f:20000
{Key[23]} IMF mfRM179002A r:30:00 f:40
{Key[23]} IMF mfRM179002B r:30:00 f:40

; Local Evac Alarm
{Key[24]} scn exam\local_evac_alarm

; Main steam leak into Turbine Building
aet Exam_ET\n18scn2et5

; D MSIVs fail mid-position
IMF cmfAV06_HV141F022D f:90
IMF cmfAV06_HV141F028D f:90
```

```
; Turbine building exhaust fan A trips and B fails to auto-start
{Key[4]} IMF cmfPM03_1V104A
IMF cmfPM04_1V104B

; NPO starts Turbine building exhaust fan B and fan
; trips after one minute
{Key[5]} IRF crfPM09_1V104B f:CLS
{Key[5]} IMF cmfPM03_1V104B d:60


; Open ADS valves from relay room
{Key[6]} scn n18scn2_3
```

n18scn2_3.scn

```
; Opens ADS valves from relay room

IOR diHS14113G2 f:OPEN
IOR diHS14113J2 d:6 f:OPEN
IOR diHS14113K2 d:12 f:OPEN
IOR diHS14113L2 d:18 f:OPEN
IOR diHS14113M2 d:24 f:OPEN
IOR diHS14113N2 d:30 f:OPEN
```

n18scn2et5.et

```
;SWITCH:MODE SWITCH
diHSC72A1S01.CurrValue = #OR.diHSC72A1S01.SHUTDN
```

n18scn2et5.scn

```
IMF mfMS183008 f:1 d:3:00 r:6:00
IMF mfrm179005D r: 20:00 f: 115000
DMF mfRM179004A
DMF mfRM179004B
DMF mfRM179004C
DMF mfRM179004D
```

Sound Local Evac Alarm

```
;
+1 IOR di20A02A02S001B f:OUT
+1 IOR di20A02A02S002 f:WARBLE
;
+1 IOR di20A02A02S001A f:6
+1 IOR di20A02A02S001B f:IN
+5 IOR di20A02A02S001B f:OUT
+1 IOR di20A02A02S001A f:4
+1 IOR di20A02A02S002 f:SIREN
+1 IOR di20A02A02S001B f:IN
;
DOR di20A02A02S001A
DOR di20A02A02S001B
DOR di20A02A02S002
```

Event 1 – Swap TBCCW Pumps

Instructor Activities	Operator Activities	Notes
Booth Operator Role play any other directed actions as required		
Role Play When dispatched as **NPO** to close TBCCW pump A discharge valve, immediately **depress KEY 10**, wait 30 seconds, then **report**: **"TBCCW pump A discharge valve is closed."** **{Key[10]} IRF rfTW115001 r:30 f:0** **Role Play** If dispatched as **NPO** to check on start of TBCCW pump B, immediately **report**, **"We have a good start on TBCCW pump B."** **Role Play** When dispatched as **NPO** to open TBCCW pump A discharge valve, immediately **modify the remote inserted on KEY 10** to 100% over 30 seconds, wait 30 seconds, then **report**: **"TBCCW pump A discharge valve is open."**	**US** ☐ Directs BOP to start TBCCW pump B and secure TBCCW pump A per OP-115-001 section 2.2. **PCOM** ☐ Monitors plant parameters **US** Starts TBCCW pump B and secures TBCCW pump A per OP-115-001 section 2.2: ☐ On Panel 1C668, Start TBCCW PP 1P103B by Depressing RUN pushbutton. ☐ Dispatch NPO to slowly Close TBCCW Pump A Dsch 114011. ☐ Direct NPO to observe TBCCW Pump 1P103B discharge pressure 86-100 psig as indicated on PI-11405B. ☐ Stop TBCCW PP 1P103A by Depressing STOP pushbutton. ☐ Check TBCCW Heat Exchanger A outlet temperature 92-98°F on TI-11407A. ☐ Check TBCCW System pressure stabilizes at ~ 64-66 psig with 'A' Hx I/S, 70-74 psig for 'B' Hx I/S as indicated on PI-11409 or Computer Pt. ATP01 (values expected for normal operating conditions). ☐ Direct NPO to open TBCCW Pump A Dsch 114011. ☐ Reference Attachment A as necessary to verify proper flowrates / temperatures.	

Instructor Note
If the student asks, all prerequistes are completed so that the evolution may proceed.
The crew may decide to also swap heat exchangers. If the crew makes this decision, move on to the next event.

Event 2 – APRM Fails Upscale

Instructor Activities	Operator Activities	Notes
Booth Operator When directed to perform TBCCW field action, **depress KEY 1** to initiate event. **{Key[1]} IMF mfNM178007A f:125** **Role Play:** As **WWM** (or equivalent) contacted for assistance, acknowledge request.		
	CREW **1) Recognize / report:** ☐ Annunciator AR-103-A06, APRM UPSCALE OR INOP TRIP ☐ Annunciator AR-103-B06, APRM UPSCALE ☐ Annunciator AR-104-H03, ROD OUT BLOCK ☐ APRM 1 indicates upscale. ☐ Other Reactor power indications indicate normal values. **PCOM** ☐ Execute ARs. ☐ Determine APRM 1 has failed upscale. ☐ Bypass APRM 1 by moving APRM BYPASS joystick up to CH 1 position. **PCOP** ☐ Monitor Plant Parameters **US** ☐ Ensure execution of ARs. ☐ Determine Technical Specification 3.3.1.1 only requires 3 APRMs, which allows bypassing of APRM 1. ☐ Direct bypass of APRM 1.	

Event 3 – Turbine First Stage Pressure Instrument Failure

Instructor Activities	Operator Activities	Notes
Booth Operator After TBCCW pumps are swapped and APRM 1 is bypassed, **depress KEY 2** to initiate event. **{Key[2]} IMF cmfRL02_C721K9A** **Role Play:** As **WWM** (or equivalent) contacted for assistance, acknowledge request.		
Role Play As **NPO** dispatched to investigate in relay room, wait 2 minutes, then **report, "K9A and K9C are energized. K9B and K9D are de-energized."**	**Crew** ☐ Recognizes / reports AR-103-001 (E03), TURB CV FAST CLS & STOP VLV TRIP BYPASS **US** ☐ Determines Technical Specification Table 3.3.1.1 Functions 8 and 9 are not met. ☐ Determines Technical Specification 3.3.1.1 Condition C must be entered and requires RPS trip capability restored within 1 hour. **PCOM** ☐ Executes AR-103-001 (E03). **PCOP** ☐ Monitors plant parameters.	

Event 4 – Loss of Extraction Steam to Feedwater Heating

<table>
<tr><th>Instructor Activities</th><th>Operator Activities</th><th>Notes</th></tr>
<tr><td colspan="3">Booth Operator
When directed by lead examiner, depress KEY 3 to initiate event.

{Key[3]} IMF cmfMV05_HV10241A

A smaller fuel failure is initiated on Key 8 from the loss of FW heating. The fuel failure worsens when directed by the lead examiner for event 5.

{Key[8]} IMF mfRR179003 f:1
{Key[8]} IMF mfRM179004A r:5:00 f:7000
{Key[8]} IMF mfRM179004B r:5:00 f:5800
{Key[8]} IMF mfRM179004C r:5:00 f:3900
{Key[8]} IMF mfRM179004D r:5:00 f:5000

Role Play:
As WWM (or equivalent) contacted for assistance, acknowledge request.</td></tr>
<tr><td></td><td>Crew
Recognizes / reports:
☐ Annunciator AR-120-001 (H04), FW LOOP A PANEL 1C101 TROUBLE
☐ HTR 4A HP EXTR ISO HV-10241A indicates closed.
☐ Reactor power rises above 100%.

US
☐ Enters ON-FWHTG-101, Feedwater Heating Off Normal Operation.
☐ Enters ON-PWR-101, Reactor Power.
☐ Directs power reduction to ≤71% RTP.
☐ Provides oversight for reactivity manipulation.
☐ Enters ON-RECIRC-101, Reactor Recirculation Malfunction.
☐ Directs isolation of Feedwater Heater string A.
☐ Prior to isolation of Feedwater Heater string A, determines MCPR must be declared not within limits and Technical Specification 3.2.2 requires MCPR to be restored to within limits within 2 hours.
Once Feedwater Heater string A is isolated, determines MCPR is back within limits and Technical Specification 3.2.2 is satisfied.</td><td>OP-144-001, section 2.8 specifies the requirement to enter TS 3.2.2 when power >23% and only 2 FW heater strings in service.</td></tr>
</table>

Event 4 – Loss of Extraction Steam to Feedwater Heating

Instructor Activities	Operator Activities	Notes
	PCOM ☐ Coordinates with BOP to immediately Reduce Reactor Power IAW RE Instructions in CRC Book to ≤71% RTP by Performing the following: • IF required, Insert Control Rods as necessary to obtain a Rod Line which is less than the value stated in the CRC Book. • Initiate the required flow/power reduction by performing either of the following: o Initiate a Manual Rx Recirc Limiter #2 Runback in accordance with OP-164-001. OR o Adjust the double chevron DEC buttons on the REACTOR RECIRC PUMP A(B) SPEED controllers SY-B31-1R621A & B as required to establish the final Core Flow value stated in the CRC Book. o Inserts control rods, if necessary	The first four rods that would be inserted are 30-15, 30-47, 46-31, and 14-31.

Event 4 – Loss of Extraction Steam to Feedwater Heating

Instructor Activities	Operator Activities	Notes
	PCOM Executes ON-RECIRC-101, Reactor Recirculation Malfunction: ☐ Performs section D, Dual Reactor Recirculation Pump Runback. ☐ Plot position on Power/Flow Map. ☐ Ensure a Non Peripheral Control Rod selected. AND ☐ Monitor LPRM's for Limit Cycle Oscillations. ☐ Perform appropriate actions specified in ON-PWR-101, Reactor Power. ☐ Ensure the applicable Rx Recirc Pump(s) runs back to value associated with controlling limiter (~48% Generator Speed). ☐ Ensure the associated SY-B31-1R621A(B) controller(s) have transferred to Manual as appropriate. ☐ Continue Monitoring position on Power/Flow map. ☐ On 1C600, Monitor the following: • Main Steam Line Radiation Monitor, RR-D12-1R603. • Offgas Pretreatment Log Radiation Monitor, RR-D12-1R601. ☐ Observe following plant parameters WITHIN LIMITS corresponding to new power level: • Power to flow limits • Condenser vacuum • Feedwater flow/steam flow • RPV water level Perform the applicable sections of GO-100-012, Power Maneuvers.	

Event 4 – Loss of Extraction Steam to Feedwater Heating

Instructor Activities	Operator Activities	Notes
	PCOP Executes ON-FWHTG-101, Feedwater Heating Off Normal Operation, Condition B: ☐ Coordinates with PCOM to immediately Reduce Reactor Power IAW ON-RPR-101 to ≤71% RTP. ☐ Concurrently perform ON-RECIRC-101. ☐ Monitor for core instabilities. ☐ WHEN power reduction complete: • Monitor position and Comply with Stability Region Requirements on Power/Flow map. • On 1C600, Monitor the following: o Main Steam Line Radiation Monitor RR-D12-1R603. o Offgas Pretreatment Log Radiation Monitor RR-D12-1R601. • (B.1.) IF operating with 3 feedwater heater strings in service at greater than 23% power, all extraction steam to those heaters must be inservice or MCPR LCO 3.2.2 Action Statement is applicable. • (B.2.) IF operating with only 2 feedwater heater strings in service at greater than 23% power, all extraction steam to those heaters must be in service or MCPR LCO 3.2.2 Action Statement is applicable and power must be reduced to < 23%. ☐ Contact Reactor Engineering.	
Role Play If directed as **NPO** to perform field actions for the loss of extraction steam, acknowledge directions.	☐ (Step B.11) IF extraction steam lost to Feedwater Heater 4A: • Ensure HTR 4A HP EXTR ISO HV-10241A CLOSED. • Close HTR 5A(B)(C) HP EXTR ISO HV-10242A. • Close MSEP A DRN TO HTR 4A HV-10213A. • Close MSEP B DRN TO HTR 4A HV-10216A. (B.3.) IF any feedwater heating lost and cannot be restored within 2 hours, Isolate affected feedwater string in accordance with OP-144-001 Condensate and Feedwater System. Maximum power level with 2 feedwater strings is 71%.	Recommend inserting **Key 8** after HV-10216A is closed, or as directed by the lead examiner.

Event 4 – Loss of Extraction Steam to Feedwater Heating

Instructor Activities	Operator Activities	Notes
	PCOP May isolate Feedwater Heater string A per OP-144-001, Condensate and Feedwater System: ☐ IF extraction steam is isolated to any feedwater heater with Reactor Power ≥ 23% RTP AND the associated feedwater string is not isolated, Enter T.S. 3.2.2 for MCPR limit. ☐ Open Feedwater HTR STRING A INLET BYPS HV-10659A by depressing OPEN pushbutton. ☐ Close Feedwater HTR STRING A INLET HV-10639A by depressing CLOSE pushbutton. ☐ IF possible, Maintain this heater string cooldown flow path until shell pressure in heater is approximately atmospheric pressure. ☐ Close Feedwater HTR STRING A DSCH ISO HV-10620A by depressing CLOSE pushbutton. ☐ IF no feedwater heater tube leak indicated and it is desired to maintain feedwater heater string pressurized, Maintain Feedwater HTR STRING A INLET BYPS HV-10659A OPEN. ☐ To isolate feedwater heater string, Close Feedwater HTR STRING A INLET BYPS HV-10659A by depressing CLOSE push button. IF level of Feedwater Heater String A continues to increase, Close FW Heater Train A(B)(C) Inlet Iso 106245A.	

Evaluator Note: Depending on how and when the operators evaluate MSL rad levels rising, the crew may opt to scram the reactor prior to event 5. This satisfies the critical task to scram the reactor on MLS radiation. If the crew scrams the reactor prior to event 5, initiate event 5.

Event 5 – Fuel Failure with MSIVs Failing Open

Instructor Activities	Operator Activities	Notes

Booth Operator

When directed by lead examiner, depress **Key 23** to make the fuel failure worse and drive the crew to scram: If the crew elects to place the Mode Switch in Shutdown prior to entering **Key 23**, ensure **Key 23** is depressed prior to placing the Mode Switch in Shutdown.

{Key[23]} MMF mfRR179003 f:50 (Fuel Failure)
{Key[23]} MMF mfRM179004A r:6:00 f:20000 (MSL Rad Monitors)
{Key[23]} MMF mfRM179004B r:6:00 f:20000
{Key[23]} MMF mfRM179004C r:6:00 f:20000
{Key[23]} MMF mfRM179004D r:6:00 f:20000
{Key[23]} MMF mfRM179002A r:30:00 f:40 (Containment Rad Monitors)
{Key[23]} MMF mfRM179002B r:30:00 f:40

When the mode switch is taken out of run, verify automatic event trigger n18scn2et5 inserts the following to allow MSL rad levels to lower:

DMF mfRM179004A
DMF mfRM179004B
DMF mfRM179004C
DMF mfRM179004D

If directed to evacuate any portion of the power block, use **KEY 24** to sound the local evacuation alarm. **Perform** OP-009-004 attachment A for the announcement and order for the alarm.

{Key[24]} SCN exam\LOCAL_EVAC_ALARM

<u>**Role Plays:**</u>
As **Reactor Engineering**, acknowledge any reports / requests.
As **WWM** (or equivalent) contacted for assistance, acknowledge request.

★	**Critical Task** **Given a fuel failure causing Main Steam Line radiation levels to rise, manually scram the Reactor when Main Steam Line Hi Hi Rad setpoint is approached or exceeded.**

Event 5 – Fuel Failure with MSIVs Failing Open

Instructor Activities	Operator Activities	Notes
	Crew Recognizes / reports: ☐ Annunciator AR-101-001 (C05), TURB BLDG AREA PANEL 1C605 HI RADIATION ☐ Off-gas radiation levels rising. ☐ Main Steam Line radiation levels rising. ☐ Annunciator AR-106-001 (G03), OFF GAS HI RADIATION ☐ Annunciator AR-106-001 (F03), OFF GAS HI-HI RADIATION Annunciator AR-111-001 (C03), MN STM LINE RAD MONITOR HI RADIATION	
	US ☐ Enters ON-MSLRAD-101, Rising Offgas MSL Rad Levels. ☐ Enters ON-SCRAM-101, Reactor Scram. ☐ Directs Reactor power reduction. ☐ Provides oversight for reactivity manipulation. ☐ **Directs manual Reactor scram.** ☐ Enters EO-000-102, RPV Control, on low Reactor water level. ☐ Directs closure of MSIVs and MSL drains. ☐ Acknowledges failure of D line MSIVs to close. ☐ Directs Reactor water level controlled +13" to +54" using Condensate / Feedwater, HPCI, RCIC, and/or CRD. ☐ Directs Reactor pressure controlled 800-1050 psig using Turbine Bypass Valves, SRVs, HPCI, and/or RCIC. ☐ May direct cooldown <100°F/hr. ☐ May enter EO-000-104, Secondary Containment Control, on high Reactor Building radiation levels.	The initial Reactor water level control band is likely to be +20 to +45".

Event 5 – Fuel Failure with MSIVs Failing Open

<table>
<tr><th>Instructor Activities</th><th>Operator Activities</th><th>Notes</th></tr>
<tr><td></td><td>PCOM
☐ Coordinates with BOP to reduce Reactor power in accordance with CRC Book to stabilize rad increase below setpoint by performing the following:
• IF required, Insert Control Rods, as necessary, to obtain a Rod Line which is less than the value stated in the CRC Book.
• Initiate the required flow/power reduction by performing either of the following:
o Initiate a Manual Rx Recirc Limiter #2 Runback in accordance with OP-164-001.
OR
o Adjust the double chevron DEC buttons on the REACTOR RECIRC PUMP A(B) SPEED controllers SY-B31-1R621A & B, as required, to establish the final Core Flow value stated in the CRC Book.

☐ Executes ON-SCRAM-101, Reactor Scram.
☐ Places the Mode Switch in SHUTDOWN.
☐ Recognizes/reports all control rods inserted.
☐ Inserts SRMs/IRMs.
☐ Stops Condensate Pumps 1P102A(B)(C)(D) as necessary to leave 2 pumps in operation.
☐ Observes Scram Discharge Volume Vent and Drain valves CLOSED.

☐ WHEN main generator load < 150 MWe, at 1C651, Depresses Trip Pushbutton for Main Turbine.</td><td>If the crew is aggressive with the Reactor power reduction, it is possible that Main Steam Line radiation monitors will not approach levels requiring a Reactor scram. If this occurs, initiate the next event (Main Steam Line break) to proceed with the scenario. In this case, Critical Task #1 will be N/A. The new Critical Task #1 will be, “Manually scram the Reactor when an un-isolable primary system is discharging and causing off-site rad release rate above the Alert level.”</td></tr>
</table>

Event 5 – Fuel Failure with MSIVs Failing Open

Instructor Activities	Operator Activities	Notes
	PCOM cont… Performs ON-TURBINE-101, Main Turbine Off Normal, to ensure main turbine trip and main generator lockout. Ensures: ☐ Main Generator Output Breaker TRIPS. ☐ IF Main Generator is unable to disconnect from grid after a turbine trip, Perform ON-GENGRID-101. ☐ Main Generator Exciter Field Breaker TRIPS. ☐ Auxiliary Bus "11A" 1A101 TRANSFERS to Startup Bus 0A103. ☐ Auxiliary Bus "11B" 1A102 TRANSFERS to Startup Bus 0A103. ☐ Motor Suction Pump 1P108 STARTS. ☐ Turning Gear Oil Pump 1P111 STARTS. ☐ Turbine Lift Pumps 1P109A,B,C,D,E,F,G, H & J START. ☐ Reactor Recirc Pumps 1P401A and B TRIP caused by EOC RPT if thermal power > 26%. Ensures Feedwater is aligned for Start Up Level Control per OP-145-001: ☐ IF Setpoint Setdown Signal AND lead SULC RFP is in AUTO Valve Control is present, Ensure following: • One RFP automatically transfers to DISCHARGE PRESSURE MODE. • Remaining in service RFP(s) automatically transfer to IDLE MODE. ☐ Ensure Condensate System Flow > 2,200 gpm per in service pump using CONDENSATE RECIRC FLOW FIC-10508 controller AND/OR RX FEED PUMP A(B)(C) RECIRC FLOW FIC-10604A(B)(C). ☐ Trip a RFP 1P101A(B)(C) as necessary to leave one RFP feeding and one RFP in Idle Mode. ☐ Ensure Open Startup ISO VLV HV-10651A(B)(C) for feeding RFP 1P101A(B)(C). ☐ Ensure Closed RFP STARTUP ISO VLV HV-10651A(B)(C) for any non feeding RFP. ☐ Ensure Closed all RFP DSCH ISO VLV HV-10603A(B)(C). ☐ IF applicable, AFTER feeding RFP has completed the transfer to DPM AND RPV level is ≥ 15" and stable, Touch HS-C32-1S08 RESET SETPT SETDOWN button on FW_OVERVIEW HMI screen. ☐ Ensure FW LO LOAD DEMAND SIGNAL TO LV-10641 LIC-C32-1R602 is in AUTO AND Slowly Raise Level Setpoint to 35".	

Event 5 – Fuel Failure with MSIVs Failing Open

Instructor Activities	Operator Activities	Notes
	PCOM Resets Main Generator Lockouts in accordance with ON-TURBINE-101: ☐ At Generator and Transformers Protection Relays Vertical Board 1C654, Circle as found position AND Reset the following Primary and Backup Lockout Relays if tripped: • 86GA TRIPPED/RESET • 86GCTRIPPED/RESET • 86GE TRIPPED/RESET • Reset/Ensure Reset Breaker Failure Lockout Relay 86BF–190B1 at Panel 0C190B. • 86GB TRIPPED/RESET • 86GDTRIPPED/RESET ☐ May control Reactor water level +13" to +54" using Condensate/Feedwater. ☐ May control Reactor pressure 800-1050 psig using Turbine Bypass Valves	

Event 5 – Fuel Failure with MSIVs Failing Open

<table>
<tr><th>Instructor Activities</th><th>Operator Activities</th><th>Notes</th></tr>
<tr>
<td>Role Play
If directed as NPO to check HWC, wait 2 minutes, then report, "Everything is normal at the HWC control panel."</td>
<td>PCOP
Executes ON-MSLRAD-101, Rising Offgas MSL Rad Levels:
☐ IF MSIV Hi Hi Rad setpoint is exceeded, Perform the following:
• Coordinates with PCOM to immediately SCRAM Reactor IAW ON-SCRAM-101 REACTOR SCRAM
• Close MSIVs and MSL drains, if open.
• Recognizes / reports failure of D line MSIVs to close.
☐ At any time during performance of this Off Normal, IF Main Steam Line Rad levels approach the MSIV Hi Hi Rad Alarm setpoint (10,000 or approx. 1E4), Perform the following:
• Coordinates with PCOM to reduce Reactor power.
• IF Power decrease did NOT stop Rad increase OR MSIV Hi Hi Rad setpoint is exceeded:
o SCRAM reactor IAW ON-SCRAM-101
o Close MSIVs and MSL drains:
• Remove SJAE from service IAW OP-172-001 (SJAE AND OFFGAS SYSTEM)
☐ IF MSIV Hi Hi Rad Alarms are received, Confirm automatic action in accordance with ON-CONTISOL-101, Containment Isolation.
☐ Ensure Hydrogen Water Chemistry not the cause as follows:
• Confirm Hydrogen Water Chemistry hydrogen and oxygen flows set IAW OP-145-002 and Chemistry Report. PPC screens are "hydrogen" and "oxygen".
• IF required, Dispatch operator to HWC panel 1C198.
☐ Evaluate changes in offgas flow.
☐ IF >Lim1,
• Contact Chemistry to obtain offgas pretreatment sample.
Evaluate required actions of TS 3.7.5.</td>
<td>The following are normal and alarm values for Off-gas and Main Steam Line radiation monitors:
• Normal Off-gas – ~42 mr/hr
• Off-gas hi alarm – ~9,500 mr/hr
• Off-gas hi-hi alarm - ~21,000 mr/hr
• Normal Main Steam Line - ~6,475 mr/hr
• Main Steam Line hi alarm - ~7,800 mr/hr
Main Steam Line hi-hi alarm - ~10,000 mr/hr</td>
</tr>
</table>

Event 5 – Fuel Failure with MSIVs Failing Open

Instructor Activities	Operator Activities	Notes
	PCOP cont... ☐ (Step B.5) If increase of radioactive material released from fuel confirmed, Perform the following steps concurrently: • Monitor Offgas/Main Steam Line Radiation levels for an increasing trend using PPC display PROCMON. • Monitor area radiation levels using PPC (RADRX, RADTB, EO104). • As required, Evacuate locally impacted areas of the plant IAW OP-099-004. • Informs SRO to evaluate entry in EO-100-104, SC Control. • Informs SRO to evaluate entry into the E plan (MU 7 and Fuel Clad Degradation). • Notify Health Physics of condition. ☐ Executes ON-SCRAM-101, Reactor Scram. ☐ May control Reactor pressure 800-1050 psig using Turbine Bypass Valves, SRVs, HPCI, and/or RCIC. ☐ May control Reactor water level +13" to +54" using Condensate, Feedwater, RCIC, HPCI, and/or CRD. ☐ May perform a Reactor cooldown <100°F/hr using Turbine Bypass Valves, HPCI, RCIC, and/or SRVs.	

Evaluator Note
The steam line break will automatically insert when the mode switch is taken to shutdown.

Event 6, 7 – Main Steam Line Break in TB, TB HVAC Trips

Instructor Activities	Operator Activities	Notes

Booth Operator

If directed by lead examiner, initiate the Main Steam Line break by **forcing event trigger n18scen2et5**, which causes:

IMF mfMS183008 f:1 d:3:00 r:6:00 (if desired, lower the delay time if manually triggered; this will be automatically inserted if the mode switch is taken to shutdown)

When the crew enters the Rad Release EOP, **depress Key 4** to trip Turbine Building exhaust fan:
{Key[4]} IMF cmfPM03_1V104A

If dispatched as **NPO/Security** to check Turbine Building blowout panels, wait 2 minutes, then report: **"Steam is coming out of the side of the Turbine Building from the blowout panels."** If NPO/Security was not dispatched, make the report as Security seven minutes after the steam line break was initiated (10 minutes after Mode Switch to Shutdown).

EVALUATOR NOTES

1. If the crew scrams on MSL high radiation, the MSL break will occur 3 minutes later. The MSL break should be manually triggered if the crew does not scram on MSL high radiation.
2. The D line MSIVs will close only ~10%. This is enough to give dual indication on the valves, but not enough to cause an RPS scram signal on MSIV position.
3. The Turbine Building exhaust fans are sequentially tripped. This is designed to both exercise EO-000-105 step RR-1 and to provide an unmonitored release from the Turbine Building.

★ **Critical Task**
Given a radiological release where dose rates cannot be maintained below GE Declaration Levels, perform an Emergency Depressurization.

Instructor Activities	Operator Activities	Notes
	Crew Recognizes / reports: ☐ Annunciators AR-111(112)-001 (B02), STEAM TUNNEL LOGIC A/C(B/D) HI TEMP ☐ Annunciators AR-111(112)-001 (B03), MN STM LINE LEAK DETECTION HI TEMP ☐ Annunciators AR-111-001 (D01(E01)), MSIV LOGIC A/C(B/D) ISO INITIATED ☐ Rising Main Steam Tunnel temperatures. ☐ Rising Turbine Building radiation levels. ☐ MSIVs fail to fully close.	

Event 6, 7 – Main Steam Line Break in TB, TB HVAC Trips

Instructor Activities	Operator Activities	Notes
Role Play If dispatched as **HP, Chemistry, or equivalent** to assess dose, acknowledge request and use dose assessment role plays below. Five minutes after tripping Turbine Building exhaust fan A, call the control room **as RP** and deliver MIDAS report indicating, **the current off-site dose rate at the EPB is 300 mRem/hr TEDE.** Three minutes later, call the control room **as RP** and deliver MIDAS report indicating, **the current off-site dose rate at the EPB is 500 mRem/hr TEDE.** Three minutes later, call the control room **as RP** and deliver MIDAS report indicating, **the current off-site dose rate at the EPB is 750 mRem/hr TEDE.** Three minutes later, call the control room **as RP** and deliver MIDAS report indicating, **the current off-site dose rate at the EPB is 900 mRem/hr TEDE.** Three minutes later, call the control room **as RP** and deliver MIDAS report indicating, **the current off-site dose rate at the EPB is 1150 mRem/hr TEDE.**	**US** ☐ Directs attempt to manually close MSIVs. (if not performed earlier) ☐ Acknowledges MSIVs cannot be manually closed. ☐ Determines an un-isolable primary system is discharging into the Turbine Building. ☐ May direct Reactor cooldown <100°F/hr. ☐ When Noble Gas exceeds Alert Level, Enters EO-000-105, Radioactivity Release Control, on off-site release rate / unmonitored release from primary system. ☐ May enter EO-000-104, Secondary Containment Control, due to shine causing high rad levels on HPCI rad monitors. • Directs start of ESW and Unit Coolers. ☐ Contacts HP, Chemistry, or equivalent to ensure off-site dose calculations are performed. ☐ Re-enters EO-000-102, RPV Control, from EO-000-105. ☐ Acknowledges Turbine Building exhaust fan A tripped. ☐ Directs restarting Turbine Building HVAC. ☐ Acknowledges Turbine Building exhaust fan B tripped. ☐ Determines off-site release rates are approaching the General Emergency value. ☐ Enters EO-000-112, Rapid Depressurization: • Exits EO-000-102 pressure leg • Directs preventing uncontrolled Condensate injection. • **Directs opening all ADS valves.** ☐ Directs Reactor water level controlled +13" to +54" using Condensate/Feedwater, CRD, LPCI, and/or Core Spray.	

Event 6, 7 – Main Steam Line Break in TB, TB HVAC Trips

Instructor Activities	Operator Activities	Notes
Role Play If dispatched to start Turbine Building exhaust fan B, wait 2 minutes, then **depress Key 5**: **{Key[5]} IRF crfPM09_1V104B f:CLS / {Key[5]} IMF cmfPM03_1V104B d:60** **Role Play** If dispatched to open ADS valves from relay room, wait 2 minutes, then **depress Key 6:** **{Key[6]} scn n18scen2_3**	**PCOM / PCOP** ☐ Ensure isolations, initiations, and EDG starts per the hard card. ☐ Attempts to close MSIVs. (If not performed earlier) ☐ Recognizes / reports MSIVs fail to manually close. ☐ Recognizes / reports Turbine Building exhaust fan trip and/or high Turbine Building pressure. ☐ Dispatches NPO to re-start Turbine Building HVAC. ☐ Recognizes / reports Turbine Building exhaust fan trip and/or high Turbine Building pressure. ☐ May perform Reactor cooldown <100°F/hr. ☐ May place RHR in suppression pool cooling. ☐ Prevents uncontrolled Condensate injection, as necessary. ☐ **Opens all ADS valves (6).** ☐ Restores / maintain Reactor water level +13" to +54" using Condensate/Feedwater, CRD, LPCI, and/or Core Spray.	

Instructor Activity - Termination
Recommended termination criteria:

a. 6 SRVs open.
b. Reactor water level being restored to or controlled in assigned band above -161".

UNIT SUPERVISOR TURNOVER SHEET

UNIT 1 to/dd/yy
Date

SHIFT 1900 (Start) to 0700 (End)	SHIFT 0700 (Start) to 1900 (End)
MODE 1	MODE
POWER LEVEL 100 %	POWER LEVEL %
GENERATOR OUTPUT 1344 MWe	GENERATOR OUTPUT MWe
CASK STORAGE GATE INSTALLED: YES/NO	CASK STORAGE GATE INSTALLED: YES/NO

REMARKS:

1) Standby Liquid Pump 'B' is out of service for maintenance.
2) Instrument Air Compressor 'B' is out of service for maintenance.
3) Shift activity is to start TBCCW pump 1B and secure TBCCW pump 1A per OP-115-001 section 2.2.
4)
5)
6)
7)
8)
9)
10)
11)
12)
13)
14)
15)

COMMON:

1)
2)
3)
4)
5)
6)
7)
8)
9)

OFFGOING UNIT SUPERVISOR CHECKLIST:

NRC CODE PRIOR TO 0800	DELTA	TANGO	XRAY	ECHO
NRC CODE AFTER 0800	ECHO	XRAY	XRAY	ECHO

1900-0700	0700-1900		
us		1.	Evolutions in progress and items to be completed during next shift, as noted in remarks, have been discussed with oncoming Unit Supervisor (including special evolutions, i.e. SICT/E, OPDRVs, etc.).
us		2.	Problems encountered during past shift and abnormal plant conditions, as noted in remarks, have been discussed with oncoming Unit Supervisor.
us		3.	Information in SOMS Log is complete and discussed with oncoming Unit Supervisor.
us		4.	As applicable, turnover plastic Security Badge cover and CRS Monitor function to oncoming Unit Supervisor.
us		5.	Risk profile for the next 24 hours has been reviewed with the oncoming US.
us		6.	Review TMX qualifications (required to take shift) with oncoming personnel.

1900 - 0700 Unit Supervisor

0700 - 1900 ______________________

Offgoing Unit Supervisor

ONCOMING UNIT SUPERVISOR CHECKLIST:

0700 -	1900 -		
		1.	LCO/TRO Log reviewed.
		2.	SOMS Log reviewed for entries made in past 24 hours.
		3.	Report any changes to license or medical status PER NDAP-QA-0723.

([14])

0700 - 1900 ______________________

1900 - 0700 ______________________

Oncoming Qualified Unit Supervisor

POST RELIEF

0700 -	1900 -		
		1.	Walk down Control Room panels with Unit Responsible PCO.
		2.	CRC Book reviewed and Reactivity Brief performed with PCO.
		3.	Completed System Status Operable audit for open PMT this shift.
		4.	From the OPS Web page, Review OPS Aggregate Index for Challenges, Work Arounds, and Deficiencies Reports for impact on scheduled work activities and compensatory actions. [20]

0700 - 1900 ______________________

1900 - 0700 ______________________

SUSQUEHANNA NUCLEAR, LLC
OPERATIONS TRAINING PROGRAM

SCENARIO EXAMINATION GUIDE

2018
LOC 29 NRC SCENARIO 3

SCN# LOC29-NRC-03
Revision 0

06/22/2017

TEAM SUSQUEHANNA
Generating Excellence

Lesson Information

Title	CRD Failures / Turbine Vibrations / Hydraulic ATWS				
Vision ID		Accredited		■YES	□ NO
Training ID	LOC29-NRC-03	Revision	0	Date	06/22/17
Prerequisites					
Teaching Time	65 Minutes				

Approval

CBT Approval[1]	N/A	Date	N/A
Preparer	Michael Wilcox	Date	06/22/17
Review (Instructor/SME)	Charles Rigsbee	Date	12/5/17
Nuclear Engineering[1]	N/A	Date	N/A
Training Supervision	Jeffrey Dills	Date	12/12/17
Line Management	Collin Breitman	Date	12/6/17

[1]If required, otherwise N/A

This simulator scenario has been reviewed and satisfies management expectations for inclusion of OE, Department Fundamentals and HuP, error-reduction techniques and safety standards. Specific applications and/or opportunities for reinforcement of management expectations are noted in the scenario guide or Attachment(s) where applicable.

Facility: **SSES Units 1 and 2** Scenario No.: **NRC-3** Op-Test No.: **LOC29**

Examiners: ____________________ Operators: ____________________

____________________ ____________________

____________________ ____________________

Initial Conditions: The plant is operating at approximately 45-46% power. IAC B is out of service for maintenance.

Turnover: Insert control rods to lower the rod line below 60% per the Reactivity Manipulation Package, OP-156-001, and GO-100-012. Then, remove Recirculation pump B from service per OP-164-001 section 2.6.

Critical Tasks: **See Page 2**

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R – ATC, SRO	Lower Reactor Power with Control Rod Insertion OP-156-001, GO-100-012
2	N/A	N – ATC, SRO TS - SRO	Remove Recirculation Pump B from Service OP-164-001, Technical Specifications
3	cmfPM03_1 P132A mfRD15501 93431	C – BOP, SRO TS - SRO	CRD Pump A Trip with One Inoperable CRD Accumulator ON-CRD-101, Technical Specifications
4	Override aiHS10001	C – ATC, SRO	Main Generator Auto Voltage Regulator Failure ON-GENGRID-101
5	cmfCN02_T IC10955	C – BOP, SRO	Main Turbine Lube Oil Controller Fails to Minimum Cooling in Auto AR-123-H05
6	mfTU19300 7D mfTU19300 8D	C – All	Main Turbine Bearing #4 High Vibration AR-105-C05, AR-105-E05, ON-SCRAM-101
7	mfRD15501 7	M – All	Hydraulic ATWS EO-000-102, EO-000-113
8	cmfPM02_1 P208A cmfPM01_1 P208B	C – BOP	SLC Pumps Trip EO-000-113

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

Facility: **SSES Units 1 and 2** Scenario No.: **NRC-3**		Op-Test No.: **LOC29**
1. Malfunctions after EOP entry (1-2) **Event 8**	1	
2. Abnormal events (2-4) **Events 3, 4, 5, 6**	4	
3. Major transients (1-2) **Event 7**	1	
4. EOPs entered/requiring substantive actions (1-2) **EO-000-102, EO-000-103**	2	
5. EOP contingencies requiring substantive actions (0-2) **EO-000-113**	1	
6. Preidentfied Critical tasks ($\geq$ 2)	2	

CRITICAL TASK DESCRIPTIONS:	**CRITICAL TASK JUSTIFICATION:**
CT-1.0: Given a failure of the reactor to scram with power >5%, Stop and Prevent all injection to the RPV except RCIC, CRD, and SBLC to reduce power IAW EO-000-113, Level/Power Control.	High Reactor power after a scram is attempted indicates a challenge to nuclear fuel and to plant heat sinks. In the event of a loss of the normal heat sink, this may result in adding heat to the Suppression Pool and challenging the Primary Containment. Lowering Reactor power reduces these challenges.
CT-2.0: Given a failure of the reactor to scram, reduce reactor power by inserting control rods or injecting Boron IAW EO-100-113	Inserting control rods lowers Reactor power, which reduces challenges to the plant during a failure to scram. Additionally, inserting control rods ultimately provides a long-term, stable core shutdown. Boron injection will lower power rapidly, however, alone may not provide a stable shutdown condition.

Revision History

Revision	Date	Comments
0	06/22/2017	New exam

Table of Contents

Scenario Overview

The crew assumes the shift with the plant operating at approximately 45-46% power. IAC B is out of service for maintenance.

The crew will begin by lowering Reactor power with control rod insertion. The crew will insert control rods to lower rod line below 60% for securing Recirculation pump B. Then, the crew will secure Recirculation pump B per OP-164-001. The crew will establish single loop operation and the SRO will determine the Technical Specification requirements.

Next, CRD pump A will trip. The crew will respond per ON-CRD-101 by placing the CRD flow control valve in manual and fully closing it. Then the crew will start CRD pump B, open the CRD flow control valve, and place the valve back in automatic. One CRD accumulator will alarm with low nitrogen pressure. The low nitrogen pressure condition will continue even after other CRD parameters are restored. The SRO will determine the Technical Specification impact of the inoperable accumulator.

The Main Generator voltage regulator will fail to maximum demand while in automatic. The crew will respond per ON-GENGRID-101. The crew may attempt to fix the automatic voltage regulator demand signal, but will eventually place the manual voltage regulator in service and lower reactive load.

The Main Turbine Lube Oil temperature controller will fail to minimum cooling while in automatic. The crew will respond by placing the temperature controller in manual and lowering oil temperature. Main Turbine bearing #4 vibration will rise even after cooling is restored, indicating bearing damage from the initial temperature transient. Damage to Main Turbine seals will result in rising Main Condenser air in-leakage. Bearing vibrations will eventually require the crew to insert a manual Reactor scram.

A hydraulic failure to scram will occur. The crew will execute EO-000-113, Level/Power Control, to control Reactor power, level, and pressure. The crew will attempt to inject SLC, but SLC pump A and SLC pump B will both trip shortly after being started. The crew will lower Reactor water level. The crew will be able to insert control rods using RMCS and by repeated manual scrams. If all control rods are inserted during the scenario, the crew will restore and maintain Reactor water level to the normal level control band.

The scenario will be terminated when control rod insertion is in progress or when all control rods are inserted and Reactor water level is being restored to or controlled in the assigned band above -161".

The expected EAL is an Alert, SA6.1 due to the failure to scram.

Objectives

Mastery of the training content shall be demonstrated by individual and/or crew performance evaluation as specified in this training material and the applicable training program description, in accordance with training procedures.

A. Terminal Objective

Perform all system operations required to maintain the plant operating safely, or place the plant in a safe condition if a plant shutdown is required

During the specified mode of plant / system operation

Without error and in accordance with site procedures and management expectations

B. Generic Performance Objectives

1. For all activities, exhibit use of the Human Performance Tools, demonstrating the ability to:

   Use HU tools to effectively control the plant during normal, abnormal, and emergency conditions

   Use of HU tools will be observable per the standards in HU-AD-003

   (SRO) Take every opportunity to coach the team when HU standards are not being met and provide feedback to the team when the HU standards are being met

2. For all activities, exhibit proper use of procedures by:

   Applying the correct procedure to operate equipment and respond to abnormalities

   Ensuring procedures are detailed enough to allow precise control of plant evolutions.

   Demonstrating the ability to:

   Apply the correct procedure to the situation

   Use place keeping for accurate implementation

   Identify any and all areas for procedure improvement

   Take ownership of and complete the improvement, whenever an area for procedure improvement is identified

3. Base actions and decisions with a bias toward conservative, safe operation of the plant, demonstrating the ability to:

   Assure all plant evolutions and work are assessed for Radiological Safety, Industrial Safety, Nuclear Safety, Environmental Safety, or Corporate Safety

   Once a risk is determined, take appropriate actions to mitigate or minimize risk

   Request assistance for any activity which requires additional planning, special precautions, and management oversight to adequately manage the risks

   (SRO) Champion activities that are biased conservatively

4. Demonstrate complete understanding of plant design and system interrelationships, demonstrating the ability to:

   Work effectively as a team to interpret plant indications and determine an effective response

   Understand the bases for, and the plant response to, actions being taken

5. Maintain continuous awareness of critical parameters, demonstrating the ability to:

   Validate parameters by observing multiple independent indications

   Relay parameter values with value, units, and trend; and include action being taken for an abnormal value or trend

   Notify supervision of any change to critical parameters

   (SRO) Assure critical parameters for operational conditions are understood by the team

6. Operate plant systems and equipment within design and operational limits, maintaining relevant parameters within assigned operating bands, demonstrating the ability to:

   Anticipate the impact of component operation prior to its operation, and then verify that the expected effects occur during and following the operation

   Take manual actions (in accordance with procedure direction) when automatic actions do not occur

   Take prompt action to adjust system operating controls before assigned operating bands are exceeded

   Make reactivity and mode changes as directed by detailed operating procedures and approved reactivity plans

C. Simulator Performance Objectives

1. Operational Actions and Annunciator Response

   Correctly identify plant annunciators and indications and perform appropriate remedial actions

2. System Operation, Controls and Instrumentation

   Accurately identify plant instrumentation and correctly interpret instrument readings to respond to normal, abnormal, and emergency conditions

3. Facility Design and Operating Characteristics

   Demonstrate the following:

   - An understanding of facility operating characteristics
   - The ability to safely control the operating characteristics of the facility within prescribed operating boundaries

4. System Loss and Component Level Malfunctions

   Perform system control manipulations to obtain desired operating results and demonstrate the ability to correctly respond to malfunction/loss of components and the impact of the malfunction/loss on interfacing plant systems

5. Heat Removal Component Operation

   Safely operate the plant's heat removal components and demonstrate knowledge of the relationship between the heat removal systems and the operation of facility to prevent exceeding System, Structure, or Component (SSC) design limits which include:

   - Primary coolant systems
   - Emergency coolant systems
   - Decay heat removal systems

6. Auxiliary and Emergency Component Operations

   Safely operate the plant's auxiliary and emergency components / systems to include the controls associated with plant equipment that could affect reactivity or the release of radioactive materials to the environment to control release of radioactivity within regulatory limits

7. Reactivity Management

   Demonstrate knowledge of how reactivity is affected by plant operation and ability to respond to the change in reactivity to protect the safety and integrity of the reactor core

8. Technical Specifications

   During plant operation with the plant or system in a condition requiring Technical Specification action

   Identify the deviation and any required actions / notifications

9. Emergency Plan (if required)

   During plant operation in an emergency condition

   Recognize conditions covered by the Emergency Plan

   (SRO) Demonstrate the ability to:

   - Identify and Implement the appropriate Emergency Action Level
   - Use the applicable bases to support an Event Classification on the specified Emergency Action Level

10. Control Room Duties

    Demonstrate the knowledge and ability to assume the appropriate responsibilities (for the assigned position) associated with the safe operation of the facility

11. Control Room Team Work

    Demonstrate the ability to function within the Control Room team to comply with station procedures and limits of facility license and respond to plant events using appropriate human performance tools to support safe operation of the facility

D. Task List

Task Title	ID
Licensed Operator	
Apply Technical Specification (TS) And Technical Requirements Manual (TRM) Requirements	S-COO-00-1185
Implement Reactivity Manipulations Standards and Communication Requirements	S-COO-00-2784
Implement Appropriate Portions Of Operations Standards For System and Equipment Operation	S-COO-00-1081
Implement Operations Standards For Error And Event Prevention	S-ADM-00-1091
Implement Standards for Shift Operations	S-COO-00-2780
Implement Appropriate Portions of Conduct of Operations	S-COO-00-1015
Implement Appropriate Portions of Secondary Containment Integrity Control	S-COO-00-1020
Implement EOP Cautions	S-COO-00-2566
Implement Operations Directives	S-COO-00-3130
Ensure Plant Operates IAW the Operating License, Technical Specifications (TS), and Technical Requirements Manual (TRM)	S-COO-00-1183
Implement HUMAN PERFORMANCE (HuP) – Standards for Error and Event Prevention	S-EPP-00-3068

Scenario Attributes

A. Critical Tasks

1. Given a failure of the reactor to scram with power >5%, Stop and Prevent all injection to the RPV except RCIC, CRD, and SBLC to reduce power IAW EO-000-113, Level/Power Control.	
Safety Significance	High Reactor power after a scram is attempted indicates a challenge to nuclear fuel and to plant heat sinks. In the event of a loss of the normal heat sink, this may result in adding heat to the Suppression Pool and challenging the Primary Containment. Lowering Reactor power reduces these challenges.
Consequences for Failure to Perform Task	A General Electric Company study (NEDO-32047) indicates that the major threat to fuel integrity from ATWS is caused by large-amplitude power/flow instabilities. The power oscillations can become large enough to cause melting of fuel in high-power bundles. EOP Basis LQ/L-13 - This step identifies the widest, acceptable water level control band. Although level fluctuations within this band are safe, it is very desirable to maintain level within the more restrictive target area of -110" to -60". The target area and expanded band are shown in Figure 8, Water Level Operation Guidance. The intent of this step is to remain within the target band at all times unless prohibited by system perturbations, and remain within the expanded band at all times.
Indications/Cues for Event Requiring Critical Task	ATWS with initial reactor power level greater than 5% APRM power.
Performance Criteria	Lower reactor water level by manually controlling injection rate from Feedwater, HPCI and/or RCIC.
Performance Feedback	Lowering water level to –60 to –110 inches will result in power level lowering as indicated on the Average Power Range Monitors.
2. Given a failure of the reactor to scram, reduce reactor power by inserting control rods or injecting Boron IAW EO-100-113	
Safety Significance	Inserting control rods lowers Reactor power, which reduces challenges to the plant during a failure to scram. Additionally, inserting control rods ultimately provides a long-term, stable core shutdown. Boron injection will lower power rapidly, however, alone may not provide a stable shutdown condition.
Consequences for Failure to Perform Task	Failure to insert control rods or inject Boron allows power to remain elevated with resultant power oscillations and potential core damage.
Indications/Cues for Event Requiring Critical Task	Exceeding a RPS scram setting with NO reactor scram signal, or RPS/ARI fail to fully insert all control rods.
Performance Criteria	Manipulation of RPS, CRD, liquid poison, and RMCS controls will provide observable actions for the evaluation team.
Performance Feedback	Control rod position and Reactor power will provide performance feedback regarding success of crew actions to insert control rods or inject poison .

B. Scenario Malfunctions

Event	Malfunction	Operator Action in Response
1	N/A	Lower Reactor Power Using Control Rods
2	N/A	Remove Recirculation Pump B From Service
3	CRD Pump A Trip with One Inoperable CRD Accumulator	Take manual control of CRD FCV, start alternate pump, place CRD FCV back in automatic, determine Technical Specification impact
4	Main Generator Auto Voltage Regulator Failure	Swap to manual voltage regulation, lower MVARs
5	Main Turbine Lube Oil Controller Fails to Minimum Cooling in Auto	Take manual control of controller and lower oil temperature
6	Main Turbine Bearing #4 High Temperature and Vibration	Scram the Reactor
7	Hydraulic ATWS	Trip Recirc pump, lower Reactor water level, maximize CRD, attempt to inject SLC, insert control rods
8	SLC Pump Trip	Direct alternate boron injection, utilize other methods to lower Reactor power

C. Abnormal Events and Major Transients

Malfunction	Description
R	Lower Reactor Power Using Control Rods
N TS	Remove Recirculation Pump B from Service OP-164-001, Technical Specifications
AE1 TS	CRD Pump A Trip with One Inoperable CRD Accumulator ON-CRD-101, Technical Specifications
AE2	Main Generator Auto Voltage Regulator Failure ON-GENGRID-101
AE3	Main Turbine Lube Oil Controller Fails to Minimum Cooling in Auto AR-123-H05
AE4	Main Turbine Bearing #4 High Temperature and Vibration AR-105-C05, AR-105-E05, ON-SCRAM-101
MT	Hydraulic ATWS EO-000-102, EO-000-113
MAE1	SLC Pump Trip EO-000-113

D. EOP and EOP Contingencies Used

EOPs	EOP Contingencies
☒ EO-000-102, RPV Control	☐ EO-000-102, Alternate Level Control
☐ EO-000-103, Primary Containment Control	☐ EO-000-102, Steam Cooling
☐ EO-000-104, Secondary Containment Control	☐ EO-000-112, Emergency Depressurization
☐ EO-000-105, Radioactivity Release Control	☒ EO-000-113, Power/Level Control
	☐ EO-000-114, RPV Flooding

E. Technical Specifications

1. TS 3.4.1, Recirculation Loops Operating
2. TS 3.1.5, Control Rod Scram Accumulators

References

1.	OP-164-001	REACTOR RECIRCULATION SYSTEM
2.	OP-156-001	REACTOR MANUAL CONTROL SYSTEM (RMCS)
3.	AR-112-001 (G02)	REFUEL FLOOR HI EXH MON DNSCALE
4.	ON-CRD-101	Control Rod Malfunction
5.	AR-106-001 (C09)	GEN VOLT REG AUTO TO MAN SET POINT UNBALANCE
6.	OP-198-001	MAIN GENERATOR SYSTEM
7.	EO-000-102	RPV CONTROL
8.	GO-100-009	SINGLE RECIRCULATION LOOP OPERATION
9.	EO-000-113	LEVEL/POWER CONTROL
10.	OP-153-001	STANDBY LIQUID CONTROL SYSTEM
11.	OP-149-001	RHR SYSTEM
12.	OP-116-001	RHR SERVICE WATER
13.	GO-100-012	Power Maneuvers
14.	ON-SCRAM-101	Reactor Scram
15.	OP-155-001	CONTROL ROD DRIVE HYDRAULIC SYSTEM
16.	OP-150-001	RCIC SYSTEM
17.	EP-RM-004	EAL Classification Bases

Setup Instructions

A. Required Materials

1. US Turnover Sheet
   a. Unit 1
      1) 45-46% power
      2) Instrument Air Compressor B is out of service for maintenance.
      3) Insert control rods to lower the rod line below 60% per the Reactivity Manipulation Package, OP-156-001, and GO-100-012. Starting at step 168 of A2 Shutdown Sequence.
      4) Shift activity is to remove Recirculation pump B from service per OP-164-001 section 2.6 for short duration maintenance on MG Set tachometer.
      5) Work on 1B RRP to last ~ 9 hours.
      6) Another operator will perform SO-164-004, Unit 1 Single Loop Flow Recording.
      7) HWC is already shutdown in preparation for lowering power.
   b. Common and Unit 2
      1) Unit 2 at rated power.
2. Supporting Documents
   a. RMR (2 copies)
   b. OP-156-001
   c. GO-100-012
   d. OP-164-001 (for the Normal Event)
   e. GO-100-009 marked up through step 5.4

B. Simulator Initialization

1. **Reset** to exam specific IC-383. If not available, setup IAW the following instructions
2. **Run** SCN file **exam\n18scn3.scn**
3. **Place** the simulator in RUN prior to operators entering simulator.
4. **Perform** simulator activities
   a. **Place** a tag on the Instrument Air Compressor B control switch.
   b. **Markup** OP-164-001 to step 2.6.6.b
   c. **Markup** the shutdown control sequence to the current place for rod insertions
5. **Reset** ODAs and all Overhead, PPC, HMI and RWM alarms

6. **Ensure** horns and annunciators are on

7. **Ensure** Overhead Lights Override is off

C. Simulator Preparation

1. **Ensure** the EOL CRC Book is at the PCO Console

D. Document Training and Performance Feedback

1. **Record** crew position assignments per TQ-104 (ILO)

2. **Complete** simulator exam checklist

E. Scenario Execution

1. **Provide** turnover to the crew using the US Turnover sheet

2. **Direct** the crew to walk down the Control Room panels

3. **Inform** the Shift Manager that the crew has the shift

F. Simulator Files

```
n18scn3.scn
; Scenario File
; Monitored parameters
; Shutdown HWC
; Disable RFP inputs to LIM 2 per step 2.6.6.a
SCN rat_mp

; IAC B OOS
IRF crfPM09_1K107B f:OUT


; Crew inserts control rods to lower rod line
; Crew secures RRP B

; Crew performs control rod pattern adjustment

; CRD pump A trips with one accumulator inoperable
{Key[3]} IMF cmfPM03_1P132A
{Key[3]} IMF mfRD1550193431 d:10

; Main Generator auto voltage regulator fails high
{Key[4]} IOR aiHS10001 r:8:00 f:1

; Main turbine lube oil controller fails to min cooling in auto
{Key[5]} IMF cmfCN02_TIC10955 f:0

; Main turbine bearing #4 high temperature and vibration
{Key[5]} IMF mfTU193007D d:1:00 r:8:00 f:160
{Key[5]} IMF mfTU193008D d:2:00 r:10:00 i:2 f:10

; Loss of main condenser vacuum
{Key[5]} IMF mfMC143001 d:2:00 r:2:00 f:100

; Hydraulic ATWS with some additional stuck rods
IMF mfRD155017
IMF mfRD1550063443 f:40
IMF mfRD1550063839 f:40
IMF mfRD1550063431 f:40
IMF mfRD1550063423 f:40
IMF mfRD1550063419 f:40
IMF mfRD1550063415 f:40
```

```
IMF mfRD1550064223 f:40
IMF mfRD1550063831 f:40
IMF mfRD1550063027 f:40
IMF mfRD1550063035 f:40
IMF mfRD1550064243 f:40
IMF mfRD1550064635 f:40
IMF mfRD1550063851 f:40

; CRD FCV isolation valve throttles flow to prevent
; maximizing CRD from drifting in control rods
aet Exam_ET\n18scn3et2


; Disable ARI per ES-158-002
{Key[10]} IRF rfDC102129 f:OPEN
{Key[10]} IRF rfDC102103 f:OPEN

; Bypass RPS per ES-158-002
{Key[20]} IRF rfRP158039 f:BYPASS
{Key[20]} IRF rfRP158040 f:BYPASS
{Key[20]} IRF rfRP158041 f:BYPASS
{Key[20]} IRF rfRP158042 f:BYPASS

; Close charging water header isolation valve
{Key[30]} IRF rfRD155017 f:0

; SLC pump A trip
aet Exam_ET\n18scn3etA

; SLC pump B trip
aet Exam_ET\n18scn3etB
```

n18scn3et2.et

```
;SWITCH:MODE SWITCH
diHSC72A1S01.CurrValue = #OR.diHSC72A1S01.SHUTDN
```

n18scn3et2.scn

```
IRF rfRD155020 f:5
```

n18scn3etA.et

```
;SWITCH:SBLC MANUAL INITIATION 'A'
diHSS14804.CurrValue = #OR.diHSS14804.START_A
```

n18scn3etA.scn

```
IMF cmfPM02_1P208A d:5
```

n18scn3etB.et

```
;SWITCH:SBLC MANUAL INITIATION 'B'
diHSS14804.CurrValue = #OR.diHSS14804.START_B
```

n18scn3etB.scn

```
IMF cmfPM01_1P208B d:5
```

n18scn3mp.scn

Event 1 & 2 – Lower Reactor Power with Control Rod Insertion, Remove Recirculation Pump B from Service

Instructor Activities	Operator Activities	Notes
Booth Operator Role play any other directed actions as required No additional actions required		
	US ☐ Directs PCOM to lower Reactor power by inserting control rods per the Reactivity Manipulation Package, OP-156-001, and GO-100-012. ☐ Directs PCOM to remove Recirculation pump B from service per OP-164-001 section 2.6. ☐ Provides oversight for reactivity manipulations. ☐ Determines Technical Specification 3.4.1 requires adjustment to APLHGR, MPCR, LHGR, and APRM Flow Biased scram limits for single-loop operation within 12 hours. ☐ Comply with TR 3.8.2.1 Motor Operated Valves (MOV) Thermal Overload Protection – Continuous. **PCOP** ☐ Monitors plant parameters	

Event 1 & 2 – Lower Reactor Power with Control Rod Insertion, Remove Recirculation Pump B from Service

Instructor Activities	Operator Activities	Notes
Role Play The FW Loop A, B, and/or C alarms may alarm throughout the scenario (AR120 H4, H7, H10). If contacted as plant operator to investigate, **report** the FW alarms are hovering around their alarm setpoints. I'm going to leave the alarms flashing.	**PCOM** Inserts control rods to achieve < 60% rod line (expect 06-23, 54-23, 54-39, and 06-39 from 48 to 00): ☐ Manipulator select control rod to be inserted continuously by Depressing corresponding CONTROL ROD pushbuttons. ☐ Verifier confirms correct control rod is selected. ☐ Manipulator states intended move and correct control rod number. ☐ Verifier confirms the Manipulator is positioned adjacent to the correct directional control button. ☐ Verifier state intended move and correct control rod number. ☐ Verifier states PROCEED. ☐ Manipulator depress appropriate button and observe directional control lights on reactor benchboard prior to looking at control rod position indication. AND ☐ Verifier observe control rod position indication on Standby Information Panel.	Operator may only insert 3 rods to achieve <43% power.

Event 1 & 2 – Lower Reactor Power with Control Rod Insertion, Remove Recirculation Pump B from Service

Instructor Activities	Operator Activities	Notes
Role Play When dispatched as **NPO** to check RRP B lube oil pressure, immediately report, **"I am on-station and ready for swapping RRP B lube oil pumps."** When the running pump is secured, wait a few seconds, then **report, "The standby AC Lube Oil Pump started approximately one second after lube oil pressure lowered to 10 psig."**	**PCOM cont…** Removes Recirculation pump B from service per OP-164-001 section 2.6: ☐ Ensure Reactor Power below 60% rod line by following direction provided in Emergency Power Reduction/Shutdown Instructions located in Core Reactivity Control book OR Reactor Engineering direction. ☐ Refer to Attachment A for Recirc Pump Speeds and Core Flow/Jet Pump Loop Flow Limitations. ☐ Reduce Rx Recirc Pump B speed to 30% rated speed in Manual Mode as indicated on HMI screen GEN 1B SPEED indicator SI-14032B in accordance with OP-164-002. ☐ Swap Recirculation Pump MG Set B Lube Oil Pumps in accordance with this procedure: • Dispatch an operator locally to observe lube oil pressure at MG Set Fld Drive Lube Oil In PI-14018B. • Establish constant communication with operator at PI-14018B. (Local operator must promptly notify PCO if standby pump does not auto start approximately one second after lube oil pressure lowers to 10 psig.) • Depress AND Hold AC LUBE OIL PP 1P154A STOP pushbutton. • Observe Standby AC Lube Oil Pump 1P154B auto starts approximately one second after lube oil pressure lowers to 10 psig. • Release AC LUBE OIL PP 1P154A STOP pushbutton. ☐ Depress MG SET B DRV MTR BKR HS-14001B STOP pushbutton. ☐ Observe the following: • Amber stop indication light ILLUMINATES on MG SET B DRIVE MTR BKR HS-140001B. • GEN 1B SPEED indicator on SI-14032B lowers to 0% on the RRP_B or RRP DUAL SCRN (Manual Mode) HMI screens. • After short time delay, GEN 1B Field Breaker OPENS. • After the Gen 1B Field Breaker opens, the Gen 1B Speed Demand (XI-14032B) and Scoop Tube Position indications ramps to the Startup Limiter values of 20.0% (20.0%). ☐ WHEN one Recirculation Loop in operation: • Comply with TRO 3.4.6. AND • Perform SO-164-004.	Pump speed is labeled Generator Speed on Rtime

Event 1 & 2 – Lower Reactor Power with Control Rod Insertion, Remove Recirculation Pump B from Service

Instructor Activities	Operator Activities	Notes
	PCOM cont… ☐ Perform SO-100-007, Daily Surveillance Operating Log, Item #1. ☐ IF Core Thermal Power ≥ 23%, Perform SO-178-002, Verification of APRM Scram and Rod Block Settings. ☐ Comply with TR 3.8.2.1 Motor Operated Valves (MOV) Thermal Overload Protection – Continuous. ☐ For the stopped Recirculation Pump, Place RECIRC B MOV OL BYPS HV-143-F031B/F032B switch to TEST position. ☐ Close RECIRC PUMP B DSCH HV-143-F031B. ☐ Ensure RECIRC PUMP B DSCH BYPS HV-143-F032B OPEN. ☐ Within 5 minutes, Re Open RECIRC PUMP B DSCH HV-143- F031B. ☐ AFTER 2 minutes, Place RECIRC B MOV OL BYPS HV-143-F031B/F032B switch to NORM position. ☐ IF desired, Clear TR 3.8.2.1.Motor Operated Valves (MOV) Thermal Overload Protection Continuous ☐ Perform GO-100-009 Single Recirculation Loop Operation.	

Evaluator Note
The next event may be initiated any time after RRP B is stopped.

Event 3 – CRD Pump A Trip with One Inoperable CRD Accumulator

Instructor Activities	Operator Activities	Notes
Booth Operator When directed by lead examiner, **depress KEY 3** to initiate event. **{Key[3]} IMF cmfPM03_1P132A** **{Key[3]} IMF mfRD1550193431 d:10** **Role Plays:** As **Reactor Engineer** (or equivalent) contacted for assistance with determining accumulator 34-31 scram time data, acknowledge request (no data will be given during time frame of scenario). As **WWM** (or equivalent) contacted for assistance with CRD pump A and/or CRD accumulator 34-31, acknowledge request.		
	Crew Recognizes / reports: ☐ Annunciator AR-107-001 (A01), CRD CHARGING WATER LO PRESS ☐ Annunciator AR-107-001 (D01), CRD PUMP A TRIP ☐ Annunciator AR-103-001 (H06), CRD ACCUMULATOR TROUBLE ☐ CRD pump A tripped. ☐ Annunciator AR-102-001 (G03), RECIRC PUMP MOTOR HI TEMP (due to loss of seal purge) **US** ☐ Enters ON-CRD-101, Control Rod Malfunction. ☐ May enter ON-PWR-101 for Unplanned Loss of Heat Balance ☐ Declares CRD accumulator 34-31 inoperable due to low pressure (≤940 psig). ☐ Determines Technical Specification 3.1.5 Condition A.1 requires declaring control rod “slow” within 8 hours if scram time was within limits during last surveillance. ☐ Determines Technical Specification 3.1.5 Condition A.2 requires declaring control rod inoperable within 8 hours if scram time was NOT within limits during last surveillance.	SRO may declare on condition A.1 -OR- condition A.2.

Event 3 – CRD Pump A Trip with One Inoperable CRD Accumulator

Instructor Activities	Operator Activities	Notes
Role Play As **NPO** dispatched to investigate CRD accumulator 34-31, wait 2 minutes and **report**, **"CRD accumulator 34-31 pressure is 900 psig and stable."**	**PCOM** May respond to AR-102-001 (G03): ☐ Monitors Recirc pump seal cavity temperatures. ☐ If seal cavity temperatures approach limits, may lower Recirculation flow.	
Role Play As **NPO** dispatched to investigate CRD pump A, wait 2 minutes and **report**, **"There are no abnormal indications at CRD pump 1A."**	**PCOP** <u>Executes ON-CRD-101, Control Rod Malfunction, Condition A:</u> ☐ Determines accumulator trouble alarm has been received for control rod 34-31: • Determines control rod 34-31 is withdrawn. • Dispatches NPO to check HCU.	
Role Play As **NPO** dispatched to check the breaker for 1A CRD Pump, wait two minutes and **report**, **"1A201-07 for 1A CRD Pump is tripped and there is an acrid odor in the area."**	• Acknowledges HCU pressure is 900 psig. • Informs SRO to evaluate Technical Specification 3.1.5. • Determines Reactor pressure is > 900 psig and a Reactor scram is NOT required. • Directs NPO to charge accumulator.	Accumulator 34-31 must be declared inoperable per TS 3.1.5
Role Play As **NPO** dispatched to check CRD pump B start, wait 2 minutes and **report**, **"CRD pump B post-start checks are SAT."**	<u>Determines CRD pump A tripped and trip not caused by low suction pressure and performs Condition B.</u> ☐ (Step B.3.)Close CRD Flow Control Valve FV-146-F002A(B) as follows: • Place CRD Flow Controller FC-C12-1R600 in MANUAL.	
Role Play If dispatched to reset RWCU Pump Trouble annunciator, acknowledge direction and perform booth operation.	• Set CRD Flow Controller FC-C12-1R600 to 0% DEMAND SIGNAL. • Verify CRD Flow Control Valve FV-146-F002A(B) CLOSED. ☐ Start standby CRD Pump 1P132B by placing control switch to RUN position. ☐ With CRD Pump 1P132B in operation, Establish system flow ~ 63 gpm using CRD Flow Controller FC-C12-1R600. ☐ Place CRD Flow Controller FC-C12-1R600 in AUTO.	

Event 4 – Main Generator Auto Voltage Regulator Failure

Instructor Activities	Operator Activities	Notes
Booth Operator When directed by lead examiner, **depress KEY 4** to initiate event. **{Key[4]} IOR aiHS10001 r:8:00 f:1** **Role Plays:** Provide the following role plays either when called or 4 minutes after event initiation (call as TCC): **"We have noticed a slight rise in grid voltage, but other than that, the grid appears stable."** **"We need SSES Unit 1 to supply approximately 150 MVAR to the grid."** As **WWM** (or equivalent) contacted for assistance, acknowledge request. Evaluator Note: The procedural path taken in this event may vary depending on how the crew diagnoses failure of the auto voltage regulator. Multiple procedure sections are described, however the crew may not perform all sections.		
	Crew Recognizes / reports: ☐ Annunciator AR-106-001 (C09), GEN VOLT REG AUTO TO MAN SETPOINT UNBALANCED ☐ Annunciator AR-106-001 (A06), GEN FLD OVERVOLTAGE ☐ Main Generator reactive load high. **US** ☐ Ensures execution of AR-106-C09. ☐ Enters ON-GENGRID-101, Main Generator or Grid Disturbance ☐ Directs placing Main Generator voltage regulator in MANUAL. ☐ Directs lowering Main Generator reactive load. ☐ May enter ON-VACUUM-101. **PCOP** ☐ Monitors plant parameters. ☐ As time permits, Contact GCC (TENASCA) and TCC and advise MVAR output greater than desired on Generator Capability Curve.	

Event 4 – Main Generator Auto Voltage Regulator Failure

Instructor Activities	Operator Activities	Notes
	PCOM Executes AR-106-001 (C09): ☐ Determines Generator field overvoltage alarm is NOT in. (If it's not yet in) ☐ Determines grid is stable. ☐ Ensures AC MVARS, XI-10004, within limits of OP-198-001 Attachment A, Main Generator Reactive Capability curve. ☐ Determines Main Generator is in Auto Voltage Regulator control. ☐ Monitors Main Generator parameters (MVars, MWe, Stator Cooling Temps Gen H2 Press. and Temp). ☐ May attempt to null Manual and Automatic regulators using MAN VOLT REG ADJUST HC-10002 potentiometer. Executes AR-106-001 (C09): ☐ Ensure transfer to manual voltage regulator. May execute ON-GENGRID-101, Main Generator or Grid Disturbance: ☐ Bring Up Group Display ON198 or PPC PID menu (GENB) and Record parameters. ☐ If MVAR is approaching or exceeding Generator Capability Curve OR Generator Field Current exceeding 6000 Amps as viewed on Unit 1 Computer Point GNI01, Perform Condition D: • May attempt to slowly Lower generator output voltage by using AUTO VOLT REG ADJUST HC-10001 potentiometer in order to control the Generator MVAR output	

Event 4 – Main Generator Auto Voltage Regulator Failure

Instructor Activities	Operator Activities	Notes

	PCOM cont…
	If a problem is suspected of the Voltage Regulator, Perform either of the following as required:
	☐ To wipe the auto and manual voltage regulator potentiometers, Perform Condition F of ON-GENGRID-101:
	• WIPE manual and auto voltage regulators.
	AND / OR
	• Operate voltage regulator as follows:
	    • Transfer voltage regulator from AUTO to MANUAL
	    • If necessary, transfer voltage regulator back to AUTO	

Event 4 – Main Generator Auto Voltage Regulator Failure

Instructor Activities	Operator Activities	Notes
	PCOM cont… <u>May use OP-198-001 section 2.8 to WIPE the manual and auto voltage regulators.</u> • Obtain US permission to wipe regulators • Contact TCC to request permission to transfer to the manual regulator for a period of time to ride out MVAR oscillations. • IF generator voltage becomes unstable at any time during or after transfers between regulators, Promptly Transfer to the regulator that provides stable operation. • Ensure both Rx Recirc Pump controllers are operating in the Manual Mode in accordance with OP-164-002. • Ensure HS-10006, VOLT REG XFER SELECT, switch is in the AUTO position. • Rapidly rotate HC-10002, MAN VOLT REG ADJUST from end to end a few times and null volts at XI-10012, VR XFER. • Transfer HS-10006, VOLT REG XFER SELECT, switch to MAN position. • Adjust HC-10001, AUTO VOLT REG ADJUST, to null volts at XI-10012, VR XFER if required. • Transfer HS-10006, VOLT REG XFER SELECT, switch back to AUTO position. • Observe operation of the auto voltage regulator voltage adjust controls to verify proper operation and response. • Select the desired modes of operation for the Rx Recirc Pump controllers in accordance with OP-164-002	

Event 4 – Main Generator Auto Voltage Regulator Failure

Instructor Activities	Operator Activities	Notes
	PCOM cont… May use OP-198-001 section 2.7 to transfer to manual voltage regulator: ☐ Obtain Unit Supervisor Permission to Transfer. ☐ Contact GCC (TENASCA) and TCC to Request permission to transfer to the MANUAL regulator. ☐ IF generator voltage becomes UNSTABLE at any time during OR after transfers between regulators, Promptly Transfer to the regulator that provides STABLE operation. ☐ Ensure HS-10006, VOLT REG XFER SELECT, switch is in the AUTO position. ☐ Adjust HC-10002, MAN VOLT REG ADJUST, to Null volts at XI-10012, VR XFER IF Required. ☐ Transfer HS-10006, VOLT REG XFER SELECT, switch to MAN position. ☐ Check operation of the Manual voltage regulator voltage adjust controls AND Observe proper Response. ☐ Adjusts HC-10002, MAN VOLT REG ADJUST, as necessary to obtain desired Main Generator reactive load.	

Event 5 – Main Turbine Lube Oil Controller Fails to Minimum Cooling in Auto

Instructor Activities	Operator Activities	Notes
Booth Operator When directed by lead examiner, **depress KEY 5** to initiate event. **{Key[5]} IMF cmfCN02_TIC10955 f:0** **{Key[5]} IMF mfTU193007D d:1:00 r:8:00 f:160** **{Key[5]} IMF mfTU193008D d:2:00 r:10:00 i:2 f:10** **{Key[5]} IMF mfMC143001 d:2:00 r:2:00 f:100** **Role Plays:** As **WWM** (or equivalent) contacted for assistance with Main Turbine Lube Oil, acknowledge request. Evaluator Note: The next event (Turbine bearing vibrations, high temperature, and slight condenser vacuum degradation) is inserted along with this event.		
	Crew Recognizes / reports: ☐ Annunciator AR-123-001 (H05), MAIN TURB L-O COOLER DSCH HI TEMP ☐ Main Turbine Lube Oil temperature controller in auto with a zero demand signal. **US** ☐ Ensures execution of AR-123-001(H05). ☐ Directs manual control of Main Turbine Lube Oil temperature controller. **PCOM** ☐ Monitors plant parameters.	

Event 5 – Main Turbine Lube Oil Controller Fails to Minimum Cooling in Auto

Instructor Activities	Operator Activities	Notes
Role Play As **NPO** dispatched to investigate Main Turbine Lube Oil cooler / temperature controller, wait 2 minutes, then **report**, **"The Main Turbine Lube Oil TCV appears to be closed (or open, based on actual position)."** **Role Play** If asked as **NPO** for field indication of Main Turbine Lube Oil temperature, wait 1 minute, then **report temperature based on simulator value.**	**PCOP** <ins>Executes AR-123-001 (H05):</ins> ☐ Check L O CLR TEMPS XR-19201 temperature indication. ☐ Check TURB L O CLRS TEMP TIC-10955 for proper operation maintaining temperature between 110°F to 120°F. ☐ Check local TI-11932 indication. ☐ Check service water available to cooler in accordance with OP-111-001 Service Water System. ☐ Places Main Turbine Lube Oil controller in MAN and depresses OPEN pushbutton as necessary to lower oil temperature.	

Event 6 – Main Turbine Bearing #4 High Vibration

Instructor Activities	Operator Activities	Notes
Booth Operator The malfunctions for this event were inserted on delay times with event 5. **Role Plays**: As **WWM** (or equivalent) contacted for assistance, acknowledge request.		
	Crew Recognizes / reports: ☐ Annunciator AR-105-001 (C05), TURB GEN BRG HI TEMP ☐ Annunciator AR-105-001 (E05), TURB GEN BRD HI VIBRATION ☐ Rising Main Turbine bearing #4 vibration. **US** ☐ Ensures execution of AR-105-001 (C05/E05). ☐ Determines bearing vibration exceeds scram threshold (6.5 mils), and a scram is required. ☐ Enters ON-SCRAM-101, Reactor Scram. ☐ Directs manual Reactor scram. **PCOM** ☐ Monitors plant parameters. ☐ Places the Mode Switch in SHUTDOWN. ☐ Arms and depresses manual scram pushbuttons.	Bearing vibration will reach a maximum ~10 mils with no operator action.

Event 6 – Main Turbine Bearing #4 High Vibration

Instructor Activities	Operator Activities	Notes
Role Play If dispatched as NPO to check local lube oil flow from bearing #4, wait 2 minutes, then report, **"Local lube oil flow from bearing #4 is normal."** **Role Play** If dispatched as **NPO** to investigate Turbine vibration, wait 2 minutes, then **report**, "There is a noticeable rise in noise and vibration near the Turbine."	**PCOP** May Execute AR-105-001 (C05): ☐ Check TURB/GEN BRG TEMP TR-11980 to see which bearing(s) is causing the alarm and Compare that reading with computer point. (TBVIB) (The computer uses a separate RTD element for each bearing). ☐ Check Lube Oil temperature leaving the Main Turbine Lube Oil Cooler between 110 and 120°F. ☐ Verify locally adequate Lube Oil flow from each of the bearings. ☐ IF bearing metal temperature exceeds 225°F, Notify Mechanical Maintenance. ☐ IF bearing metal temperature exceeds 230°F, Commence Plant Shutdown to Minimum Power IAW GO-100-004. ☐ IF bearing metal temperature reaches 250°F: • IF ≥ 26% Power, Manually Scram Reactor IAW ON-SCRAM-101, Reactor Scram. • IF < 26% Power, Trip Main Turbine AND Perform ON-193-002, Main Turbine Trip. ☐ Manually initiates ARI by arming and depressing pushbuttons. May Execute AR-105-001 (E05): ☐ If any of the rotor or casing vibration limits are exceeded, Trip the main turbine and perform ON-TURBINE-101, Main Turbine Off Normal, and perform action per OP-193-001.	

Instructor Note
The next event is initiated when the mode switch is taken to shutdown.

Event 7 & 8 – Hydraulic ATWS, SLC Pumps Trip

Instructor Activities	Operator Activities	Notes

Booth Operator

When the mode switch is taken to shutdown, verify automatic event trigger n18scn3et2 throttles CRD flow to prevent drifting in control rods:

IRF rfRD155020 f:5

When SLC pump A is started, verify automatic event trigger n18scn3etA trips the pump:

IMF cmfPM02_1P208A d:5

When SLC pump B is started, verify automatic event trigger n18scn3etB trips the pump:

IMF cmfPM01_1P208B d:5

When the scram is reset, delete the ATWS malfunction to allow rods to insert if another manual scram is attempted.

Role Play:
As **WWM** (or equivalent) contacted for assistance, acknowledge request.

★	**Critical Task** **Given a failure of the reactor to scram with power >5%, Stop and Prevent all injection to the RPV except RCIC, CRD, and SBLC to reduce power IAW EO-000-113, Level/Power Control.**

★	**Critical Task** **Given a failure of the reactor to scram, reduce reactor power by inserting control rods or injecting Boron IAW EO-100-113**

	Crew ☐ Recognizes / reports failure to scram.	

Event 7 & 8 – Hydraulic ATWS, SLC Pumps Trip

Instructor Activities	Operator Activities	Notes

	US
	Enters EO-000-102, RPV Control, on high Reactor power.
	
	Exits EO-000-102 and enters EO-000-113, Level/Power Control:
	☐ Directs ARI initiated.
	☐ Records initial ATWS power level.
	☐ Executes Power Leg:
	• Answers, "Is initial ATWS pwr >5% or cannot be determined?" Yes
	• Directs SLC injection.
	• Directs ADS inhibited.
	• When informed of SLC failure, may direct boron injection with RCIC per ES-150-002.
	• Ensures RWCU isolated.
	• Ensures SRMs and IRMs inserted.
	• Ensures Recirc run back to minimum.
	• Directs Recirc pump tripped.
	• Direct CRD maximized.
	• Enters EO-000-113 sheet 2 for control rod insertion:
	  o Answers, "Is more than 1 control rod >00?" Yes.
	  o **Directs control rod insertion by repeated manual scrams and/or with RMCS.**
	☐ Executes Level Leg:
	• Directs verification of isolations and initiations.
	• Answers, "Is initial ATWS pwr >5% or cannot be determined?" Yes
	• **Directs injection throttled and prevented until level between -60" and -110".**
	• Directs bypassing of MSIV and CIG interlocks.
	• **Directs Reactor water level controlled -60" to -161" using Table 15 systems (SLC, FW, Cond, CRD, HPCI, RCIC).**
	☐ Executes Pressure Leg:
	☐ Directs Reactor pressure controlled 800-1050 psig using Main Turbine, Turbine Bypass Valves, SRVs, RCIC, and/or HPCI.	

Event 7 & 8 – Hydraulic ATWS, SLC Pumps Trip

Instructor Activities	Operator Activities	Notes
	US cont… ☐ May direct tripping Main Turbine due to vibrations/temperatures. ☐ Acknowledges all control rods are inserted. ☐ Directs stopping boron injection. ☐ Exits EO-000-113 and enters EO-000-102, RPV Control. ☐ Directs Reactor water level restored and maintained +13" to +54". ☐ May direct placing loop of RHR in Suppression Pool Cooling, as time allows ☐ After being notified of SLC Pump A tripping, may direct Boron injection with RCIC IAW ES-150-002	

Event 7 & 8 – Hydraulic ATWS, SLC Pumps Trip

<table>
<tr><th>Instructor Activities</th><th>Operator Activities</th><th>Notes</th></tr>
<tr><td>________________</td><td>
PCOM
☐ Inserts SRMs/IRMs.
☐ Runs Recirc to minimum From any RRP HMI screen by:
• Selects MANUAL FLOW REDUCTION INITIATION.
• Selects RRP SPEED TO MINIMUM.
• Selects INITIATE RRP FLOW REDUCTION.
☐ Trips Recirculation pump A.
☐ Throttles and prevents RPV injection from FW and Cond until level is between -60” and -110” per OP-145-001 hard card:
☐ IF RFP A(B)(C) is in DPM, or transfer to DPM is in progress:
o Control level in MANUAL via LV-10641 FW Startup Control Vlv controller LIC-C32-1R602.
o As required, Adjust INC/DEC button on feeding RFP A(B)(C) SPD CTL/DEMAND SIGNAL controller SIC C32 1R601A(B)(C) in MANUAL to establish and maintain assigned level band. (2.19.9b)
☐ IF RFP A(B)(C) is operating in FCM: (2.19.10)
o Place FW LO LOAD DEMAND SIGNAL TO LV-10641, controller LIC-C32-1R602 in MANUAL with a controller output of 0%.
o Place FW LEVEL CTL/DEMAND SIGNAL controller LIC-C32-1R600 in MANUAL.
o Perform following for RFP A(B)(C) which will continue feeding:
▪ Touch A(B)(C) RFPT MAN VLV CTL button.
▪ Place feeding RFP A(B)(C) SPD CTL/DEMAND SIGNAL controller SIC-C32-1R601A(B)(C) in MANUAL.
• Lower FW LEVEL CTL/DEMAND SIGNAL controller LIC C32 1R600 output by ~ 20%.
</td><td></td></tr>
</table>

Event 7 & 8 – Hydraulic ATWS, SLC Pumps Trip

<table>
<tr><th>Instructor Activities</th><th>Operator Activities</th><th>Notes</th></tr>
<tr><td></td><td>PCOM
o Place remaining in service RFP B(C)(A) in IDLE MODE. (Fast Rate)
o Adjust INC/DEC buttons on feeding RFP A(B)(C) SPD CTL/DEMAND SIGNAL controller SIC-C32-1R601A(B)(C) in MANUAL to establish and maintain assigned level band (initially all the way to no flow).</td><td></td></tr>
<tr><td>Role Play
If directed as NPO to disable ARI, wait one minute, depress KEY 10, then report, "ARI is disabled."

{Key[10]} IRF rfDC102129 f:OPEN / {Key[10]} IRF rfDC102103 f:OPEN</td><td>☐ Stop Condensate pumps as necessary to leave 2 pumps in operation.</td><td></td></tr>
<tr><td>Role Play
If directed as NPO to bypass RPS scram logic, wait one minute, depress KEY 20, then report, "RPS scram logic is bypassed for DIV 1."

{Key[20]} IRF rfRP158039 f:BYPASS / {Key[20]} IRF rfRP158040 f:BYPASS

Wait an additional one minute, depress KEY 22, then report, "RPS scram logic is bypassed for DIV 2."

{Key[22]} IRF rfRP158041 f:BYPASS / {Key[20]} IRF rfRP158042 f:BYPASS</td><td>☐ Maintains Reactor water level between -60" and -161" using Table 15 systems (FW, Cond, CRD, RCIC, HPCI, LPCI).
☐ May insert control rods using RMCS per EO-000-113 Sheet 2 hard card:
Bypass RWM.
Establish approximately (if obtainable) (closing Charging Water Iso 146F034 as necessary):
o 63 gpm cooling water flow.
o 350 psid drive water pressure.
Select rod.
Depress continuous insert pushbutton.
☐ May insert control rods by repeated manual scrams:
Dispatches NPO to disable ARI and bypass RPS logic trips per ES-158-002.</td><td></td></tr>
<tr><td>Role Play
If directed as NPO to close CRD charging water header isolation valve, wait 2 minutes, depress KEY 30 as described above, then report, "The CRD charging water header isolation valve is closed."

{Key[30]} IRF rfRD155017 f:0</td><td>Resets scram.
Ensures Charging Water Iso 146F034 is open.
When SDV partially drains, inserts manual scram.
☐ Recognizes / reports control rod insertion in progress.
☐ If all control rods are inserted, restores and maintains Reactor water level +13" to +54".</td><td></td></tr>
</table>

Event 7 & 8 – Hydraulic ATWS, SLC Pumps Trip

Instructor Activities	Operator Activities	Notes
Role Play If directed as **NPO** to inject boron with RCIC, acknowledge direction. No booth action will be taken.	**PCOP** Attempts to inject SLC per OP-153-001: ☐ Place HS-14804 SBLC MANUAL INITIATION keylock control switch to A START. ☐ Observe SBLC PUMPS 1P208A STARTS ☐ Once initiated, Observe the following: • HV-144-F004 RWCU INLET OB ISO CLOSES. • SBLC SQUIB READY A B white indicating lights EXTINGUISHED. • SBLC SQUIB VALVES LOSS OF CKT CONTINUITY annunciator ALARMS. • Pump 1P208A Red indicating light ILLUMINATED. • SBLC PUMP discharge header pressure > 200 psig greater than reactor pressure. • SBLC FLOW Indicates ~ 40 GPM. • SBLC Storage Tank level decreasing. ☐ Recognize / report SLC pump A trips after ~5 seconds. ☐ Initiate SLC using SLC pump B ☐ Recognize / report SLC pump B trips after ~5 seconds. ☐ If directed, dispatches NPO to begin lining up for Boron injection with RCIC. ☐ Bypasses ADS. Maximizes CRD per OP-155-001: ☐ Place control switch CRD Pump 1P132B(A) to RUN, to start 1P132B(A), Ctl Rod Drive Water Pump B(A). ☐ Using FC-C12-1R600, CRD Flow Controller, in MANUAL, Fully Open FV-146-F002A(B), CRD Flo Ctl. ☐ Fully Open THTLG PV-146-F003, DRIVE WTR PRESS THTLG valve. Overrides RCIC per OP-150-001: ☐ To prevent Auto Injection if RCIC NOT initiated, Close RCIC TURBINE TRIP AND THROTTLING HV-15012. ☐ To stop injection, Place RCIC pump on minimum flow as follows: • Place RCIC TURBINE FLOW CONTROL FC-E51-1R600 in MANUAL. • Adjust RCIC TURBINE FLOW CONTROL FC-E51-1R600 to reduce RCIC discharge pressure less than reactor pressure while maintaining turbine above 2200 RPM. • WHEN RCIC pump discharge pressure > 190 psig with flow < 75 gpm, Ensure RCIC MIN FLOW TO SUPP POOL FV-149-F019 OPENS. • IF above steps do not stop RCIC injection, Close RCIC TURBINE TRIP AND THROTTLING HV-15012.	

Event 7 & 8 – Hydraulic ATWS, SLC Pumps Trip

Instructor Activities	Operator Activities	Notes
	PCOP Overrides HPCI per OP-152-001: ☐ To prevent auto injection if HPCI not initiated, Place HPCI TURBINE FLOW CONTROL FC-E41-1R600 in MANUAL AND Reduce demand to zero (0). ☐ To stop injection place HPCI pump on minimum flow as follows: • Place or CHECK PLACED HPCI AUXILIARY OIL PUMP 1P213 switch to START. • Place HPCI TURBINE FLOW CONTROL FC E41 1R600 in MANUAL. • Adjust HPCI TURBINE FLOW CONTROL FC E41 1R600 to reduce HPCI discharge pressure less than Reactor pressure. • Ensure HPCI MIN FLOW TO SUPP POOL HV 155 F012 opens when HPCI flow < 500 gpm and discharge pressure > 125 psig. ☐ Maintain Reactor pressure 800-1050 psig (or similar) using Main Turbine, TBVs, SRVs, HPCI, and/or RCIC. ☐ May place loop of RHR in Suppression Pool Cooling mode, as time allows. ☐ If dispatched earlier, informs NPO to stop lining up boron injection with RCIC once all rods are inserted.	

Instructor Activity - Termination

Recommended termination criteria:

a. Control rod insertion in progress or all control rods inserted
b. Reactor water level being restored to or controlled in assigned band above -161".

UNIT SUPERVISOR TURNOVER SHEET

UNIT 1 — to/dd/yy (Date)

SHIFT 1900 (Start) to 0700 (End)	SHIFT 0700 (Start) to 1900 (End)
MODE 1	MODE
POWER LEVEL 45 %	POWER LEVEL %
GENERATOR OUTPUT 618 MWe	GENERATOR OUTPUT MWe
CASK STORAGE GATE INSTALLED: YES/NO	CASK STORAGE GATE INSTALLED: YES/NO

REMARKS:

1) Instrument Air Compressor 'B' is out of service for maintenance.
2) Shift activity is to remove the 1B Reactor Recirc pump from service per OP-164-001 and GO-100-009 to support work on the MG Set tachometer.
3) HWC is shutdown in preparation for lowering power.
4) Shutdown per CRC book OP-AD-338 Attachment E. Starting at step 168. Maintain 2 RFPs in FCM and 3 Condensate pumps in service for short duration RRP 1B work.
5) Work on 1B RRP to last ~ 9 hours.
6) Another operator will perform SO-164-004, Unit 1 Single Loop Flow Recording.
7)
8)
9)
10)
11)
12)
13)
14)
15)

COMMON:

1)
2)
3)
4)
5)
6)
7)
8)
9)

OFFGOING UNIT SUPERVISOR CHECKLIST:

NRC CODE PRIOR TO 0800	DELTA	TANGO	XRAY	ECHO
NRC CODE AFTER 0800	ECHO	XRAY	XRAY	ECHO

1900-0700	0700-1900		
us		1.	Evolutions in progress and items to be completed during next shift, as noted in remarks, have been discussed with oncoming Unit Supervisor (including special evolutions, i.e. SICT/E, OPDRVs, etc.).
us		2.	Problems encountered during past shift and abnormal plant conditions, as noted in remarks, have been discussed with oncoming Unit Supervisor.
us		3.	Information in SOMS Log is complete and discussed with oncoming Unit Supervisor.
us		4.	As applicable, turnover plastic Security Badge cover and CRS Monitor function to oncoming Unit Supervisor.
us		5.	Risk profile for the next 24 hours has been reviewed with the oncoming US.
us		6.	Review TMX qualifications (required to take shift) with oncoming personnel.

1900 - 0700 Unit Supervisor

0700 - 1900 ____________________

Offgoing Unit Supervisor

ONCOMING UNIT SUPERVISOR CHECKLIST:

0700 -	1900 -		
		1.	LCO/TRO Log reviewed.
		2.	SOMS Log reviewed for entries made in past 24 hours. [14]
		3.	Report any changes to license or medical status PER NDAP-QA-0723.

0700 - 1900 ____________________

1900 - 0700 ____________________

Oncoming Qualified
Unit Supervisor

POST RELIEF

0700 -	1900 -		
		1.	Walk down Control Room panels with Unit Responsible PCO.
		2.	CRC Book reviewed and Reactivity Brief performed with PCO.
		3.	Completed System Status Operable audit for open PMT this shift.
		4.	From the OPS Web page, Review OPS Aggregate Index for Challenges, Work Arounds, and Deficiencies Reports for impact on scheduled work activities and compensatory actions. [20]

0700 - 1900 ____________________

1900 - 0700 ____________________

UNIT 1 SHUTDOWN CYCLE EXPOSURE
CYCLE 18 CONTROL ROD 15200 MWD/MT
SEQUENCE A2 06-17-12

STEP	RWM GROUP	ROD (RSCS) GROUP	FROM -> TO NOTCHES	ROD ID	PCO CHECKOFF	2ND VERIFIER CHECKOFF	ROD SEQ NOTES
180	022	94	48 -> 00	30-15			*RWM BEGINS*
179				30-47			
178				46-31			
177				14-31			
RESELECT & CONFIRM POSITION OF PREVIOUS MOVES:							
176	021	93	48 -> 00	14-15			
175				46-15			
174				46-47			
173				14-47			
RESELECT & CONFIRM POSITION OF PREVIOUS MOVES:							
172	020	92	48 -> 00	22-07			
171				38-07			
170				38-55			
169				22-55			
RESELECT & CONFIRM POSITION OF PREVIOUS MOVES:							
168	019	91	48 -> 00	06-23			
167				54-23			
166				54-39			
165				06-39			
RESELECT & CONFIRM POSITION OF PREVIOUS MOVES:							
164	018	14	48 -> 00	30-23			
163				30-39			
162				38-31			
161				22-31			
RESELECT & CONFIRM POSITION OF PREVIOUS MOVES:							

PCO SIGNATURE:__________ DATE:________ APRM POWER LEVEL:________

SUSQUEHANNA NUCLEAR, LLC
OPERATIONS TRAINING PROGRAM

SCENARIO EXAMINATION GUIDE

2018
LOC 29 NRC SCENARIO 4

SCN# LOC29-NRC-04
Revision 0

06/12/2017

Lesson Information

Title	RCIC Testing / Electrical Faults / Steam Leak with degraded injection				
Vision ID		Accredited		■YES	□ NO
Training ID	LOC29-NRC-04	Revision	0	Date	06/12/17
Prerequisites					
Teaching Time	65 Minutes				

Approval

CBT Approval[1]	N/A	Date	N/A
Preparer	Michael Wilcox	Date	06/12/17
Review (Instructor/SME)	Ed Brice	Date	12/6/17
Nuclear Engineering[1]	N/A	Date	N/A
Training Supervision	Jeffrey Dills	Date	12/12/17
Line Management	Collin Breitman	Date	12/6/17

[1]If required, otherwise N/A

This simulator scenario has been reviewed and satisfies management expectations for inclusion of OE, Department Fundamentals and HuP, error-reduction techniques and safety standards. Specific applications and/or opportunities for reinforcement of management expectations are noted in the scenario guide or Attachment(s) where applicable.

Revision History

Revision	Date	Comments
0	06/12/2017	New exam

Table of Contents

Facility: **SSES Units 1 and 2** Scenario No.: **NRC 4** Op-Test No.: **LOC29**

Examiners: ______________________ Operators: ______________________

______________________ ______________________

______________________ ______________________

Initial Conditions: The plant is operating at approximately 100% power. IAC B and SLC pump B are out of service for maintenance.

Turnover: Reduce reactor power to 95% using Recirc Flow. Then perform RCIC valve exercising per SO-150-004. The procedure is in progress up to step 5.1.8.

Critical Tasks: **See Page 2**

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R – ATC, SRO	Lower Reactor Power Using Recirc Flow
2	N/A	N – BOP, SRO	Perform Quarterly RCIC Valve Exercising SO-150-004
3	diHS14959 A	C – SRO TS-SRO	RCIC Turbine Exhaust to Suppression Pool Valve Fails to Re-Open SO-150-004, Technical Specifications
4	rfDC102114	C – BOP, SRO	Loss of Power to Instrument Bus 1Y125 ON-YPNL-101
5	cmfEB01_1 A201	C – All TS-SRO	Electrical Fault on ESS Bus 1A (1A201) ON-4KV-101, Technical Specifications
6	mfMS18300 7 mfHP15201 5	M – All	Steam Leak in Drywell With a Failure of HPCI ON-DWLEAK-101, ON-SCRAM-101, EO-000-102, EO-000-103
7	cmfPM03_1 P202B(D)	C – All	RHR Pumps B or D Trip EO-000-103, OP-116-001
8	cmfAV04_P SV15704B1 (2)	M – All	Failed Open Suppression Chamber to Drywell Vacuum Breaker EO-000-103, EO-000-112

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

Facility: **SSES Units 1 and 2** Scenario No.: **NRC-4**		Op-Test No.: **LOC29**
1. Malfunctions after EOP entry (1-2) **Events 7, 8**	2	
2. Abnormal events (2-4) **Events 3, 4, 5**	3	
3. Major transients (1-2) **Event 6, 8**	2	
4. EOPs entered/requiring substantive actions (1-2) **EO-000-102, EO-000-103**	2	
5. EOP contingencies requiring substantive actions (0-2) **EO-000-112**	1	
6. Preidentfied Critical tasks ($\geq$ 2)	2	
CRITICAL TASK DESCRIPTIONS:		**CRITICAL TASK JUSTIFICATION:**
CT-1.0: Given a steam leak into primary containment, spray the Drywell with RHR when Suppression Chamber pressure exceeds 13 psig.		Initiating Containment Sprays reduces Primary Containment pressure. This reduces stresses on the Drywell and Suppression Chamber, assists in avoiding "chugging" that may cause fatigue failure of the LOCA downcomers, and avoids the need for a blowdown. These benefits reduce challenges to the fuel cladding, the RPV, and the Primary Containment.
CT-2.0: Perform Emergency Depressurization when Suppression Chamber Pressure cannot be maintained below the Pressure Suppression Limit.		A Blowdown is required to limit further release of energy into the Primary Containment and to ensure that the RPV is depressurized while pressure suppression capability is still available. This protects the integrity of the Primary Containment.

Scenario Overview

The crew assumes the shift with the plant operating at approximately 100% power. IAC B and SLC pump B are out of service for maintenance.

The crew will begin by lowering reactor power using recirc flow, then performing quarterly RCIC valve exercising per SO-150-004. The second valve to be exercised will be the Turbine Exhaust to Suppression Pool Isolation Valve. This valve will close, but fail to re-open. The surveillance will be placed on hold and the SRO will determine the Technical Specification impact.

Next, power will be lost to Instrument Bus 1Y125. This bus supplies power to multiple Reactor and ECCS indicators. The SRO will determine the Technical Specification impact. The crew will respond per ON-YPNL-101, Loss of Instrument Bus, and restore power to the various instruments from the alternate supply.

Then, an electrical fault will cause ESS Bus 1A to de-energize. This results in the loss of Core Spray pump A, RHR pump A, and RHR loop A Containment Spray ability. The crew will respond per ON-4KV-101, Loss of 4KV Bus, and multiple other off-normal procedures. The crew will cross-tie Instrument Air to Containment Instrument Gas, place RPS Bus A on the alternate supply, reset a half scram and half isolation, and start the 1B CRD pump. The SRO will determine the Technical Specification impact.

A steam leak will develop inside the Primary Containment. The crew will execute ON-SCRAM-101, Reactor Scram, EO-000-102, RPV Control, and EO-000-103, Primary Containment Control. The crew will scram the Reactor, initiate Suppression Chamber spray, and attempt to initiate Drywell spray. HPCI will trip upon start, requiring use of other systems for Reactor water level control.

When Drywell spray is initiated, the first RHR pump started, B or D, will trip. RHR loop A is unavailable for Drywell spray due to earlier electrical losses. The crew will then place Containment Spray in service using the remaining available RHR pump. Spray will be hindered by the spray valve failing to fully open. Partial spray will be achieved and will be sufficient to improve containment parameters temporarily.

After containment spray is in service, a Suppression Chamber to Drywell vacuum breaker will stick open and the steam leak will worsen. Containment pressure will rise and the Pressure Suppression Limit will be violated. The crew will execute EO-000-112, Emergency Depressurization, and open 6 ADS valves.

The scenario will be terminated when 6 SRVs are open, RHR is spraying the Drywell, and Reactor water level is being restored to or controlled in the assigned band above -161".

The expected EAL call is an Alert, FA1.1 due to loss of RCS barrier.

Objectives

Mastery of the training content shall be demonstrated by individual and/or crew performance evaluation as specified in this training material and the applicable training program description, in accordance with training procedures.

A. Terminal Objective

Perform all system operations required to maintain the plant operating safely, or place the plant in a safe condition if a plant shutdown is required

During the specified mode of plant / system operation

Without error and in accordance with site procedures and management expectations

B. Generic Performance Objectives

1. For all activities, exhibit use of the Human Performance Tools, demonstrating the ability to:

   Use HU tools to effectively control the plant during normal, abnormal, and emergency conditions

   Use of HU tools will be observable per the standards in HU-AD-003

   (SRO) Take every opportunity to coach the team when HU standards are not being met and provide feedback to the team when the HU standards are being met

2. For all activities, exhibit proper use of procedures by:

   Applying the correct procedure to operate equipment and respond to abnormalities

   Ensuring procedures are detailed enough to allow precise control of plant evolutions.

   Demonstrating the ability to:

   Apply the correct procedure to the situation

   Use place keeping for accurate implementation

   Identify any and all areas for procedure improvement

   Take ownership of and complete the improvement, whenever an area for procedure improvement is identified

3. Base actions and decisions with a bias toward conservative, safe operation of the plant, demonstrating the ability to:

   Assure all plant evolutions and work are assessed for Radiological Safety, Industrial Safety, Nuclear Safety, Environmental Safety, or Corporate Safety

   Once a risk is determined, take appropriate actions to mitigate or minimize risk

   Request assistance for any activity which requires additional planning, special precautions, and management oversight to adequately manage the risks

   (SRO) Champion activities that are biased conservatively

4. Demonstrate complete understanding of plant design and system interrelationships, demonstrating the ability to:

   Work effectively as a team to interpret plant indications and determine an effective response

   Understand the bases for, and the plant response to, actions being taken

5. Maintain continuous awareness of critical parameters, demonstrating the ability to:

   Validate parameters by observing multiple independent indications

   Relay parameter values with value, units, and trend; and include action being taken for an abnormal value or trend

   Notify supervision of any change to critical parameters

   (SRO) Assure critical parameters for operational conditions are understood by the team

6. Operate plant systems and equipment within design and operational limits, maintaining relevant parameters within assigned operating bands, demonstrating the ability to:

   Anticipate the impact of component operation prior to its operation, and then verify that the expected effects occur during and following the operation

   Take manual actions (in accordance with procedure direction) when automatic actions do not occur

   Take prompt action to adjust system operating controls before assigned operating bands are exceeded

   Make reactivity and mode changes as directed by detailed operating procedures and approved reactivity plans

C. Simulator Performance Objectives

1. Operational Actions and Annunciator Response

   Correctly identify plant annunciators and indications and perform appropriate remedial actions

2. System Operation, Controls and Instrumentation

   Accurately identify plant instrumentation and correctly interpret instrument readings to respond to normal, abnormal, and emergency conditions

3. Facility Design and Operating Characteristics

   Demonstrate the following:

   - An understanding of facility operating characteristics
   - The ability to safely control the operating characteristics of the facility within prescribed operating boundaries

4. System Loss and Component Level Malfunctions

   Perform system control manipulations to obtain desired operating results and demonstrate the ability to correctly respond to malfunction/loss of components and the impact of the malfunction/loss on interfacing plant systems

5. Heat Removal Component Operation

   Safely operate the plant's heat removal components and demonstrate knowledge of the relationship between the heat removal systems and the operation of facility to prevent exceeding System, Structure, or Component (SSC) design limits which include:

   - Primary coolant systems
   - Emergency coolant systems
   - Decay heat removal systems

6. Auxiliary and Emergency Component Operations

   Safely operate the plant's auxiliary and emergency components / systems to include the controls associated with plant equipment that could affect reactivity or the release of radioactive materials to the environment to control release of radioactivity within regulatory limits

7. Reactivity Management

   Demonstrate knowledge of how reactivity is affected by plant operation and ability to respond to the change in reactivity to protect the safety and integrity of the reactor core

8. Technical Specifications

   During plant operation with the plant or system in a condition requiring Technical Specification action

   Identify the deviation and any required actions / notifications

9. Emergency Plan (if required)

   During plant operation in an emergency condition

   Recognize conditions covered by the Emergency Plan

   (SRO) Demonstrate the ability to:

   - Identify and Implement the appropriate Emergency Action Level
   - Use the applicable bases to support an Event Classification on the specified Emergency Action Level

10. Control Room Duties

    Demonstrate the knowledge and ability to assume the appropriate responsibilities (for the assigned position) associated with the safe operation of the facility

11. Control Room Team Work

    Demonstrate the ability to function within the Control Room team to comply with station procedures and limits of facility license and respond to plant events using appropriate human performance tools to support safe operation of the facility

D. Task List

Task Title	ID
Licensed Operator	
Apply Technical Specification (TS) And Technical Requirements Manual (TRM) Requirements	S-COO-00-1185
Implement Reactivity Manipulations Standards and Communication Requirements	S-COO-00-2784
Implement Appropriate Portions Of Operations Standards For System and Equipment Operation	S-COO-00-1081
Implement Operations Standards For Error And Event Prevention	S-ADM-00-1091
Implement Standards for Shift Operations	S-COO-00-2780
Implement Appropriate Portions of Conduct of Operations	S-COO-00-1015
Implement Appropriate Portions of Secondary Containment Integrity Control	S-COO-00-1020
Implement EOP Cautions	S-COO-00-2566
Implement Operations Directives	S-COO-00-3130
Ensure Plant Operates IAW the Operating License, Technical Specifications (TS), and Technical Requirements Manual (TRM)	S-COO-00-1183
Implement HUMAN PERFORMANCE (HuP) – Standards for Error and Event Prevention	S-EPP-00-3068

Scenario Attributes

A. Critical Tasks

1. **Given a steam leak into primary containment, spray the Drywell with RHR when Suppression Chamber pressure exceeds 13 psig.**	
Safety Significance	Initiating Containment Sprays reduces Primary Containment pressure. This reduces stresses on the Drywell and Torus, assists in avoiding "chugging" that may cause fatigue failure of the LOCA downcomers, and avoids the need for a blowdown. These benefits reduce challenges to the fuel cladding, the RPV, and the Primary Containment.
Consequences for Failure to Perform Task	Potential failure of primary containment. SSES EOP Basis for: PC/P-5 **WHEN** SUPP CHMBR PRESS **> 13 PSIG** CONTINUE [Directions to initiate drywell sprays]
Indications/Cues for Event Requiring Critical Task	Multiple control board and control room indications of suppression chamber and drywell pressures. Multiple indications of unavailability of normal Drywell spray from RHR.
Performance Criteria	Start RHR and align it to the Drywell spray flow path.
Performance Feedback	RHR pump, valve and system flow indications are available. Multiple indications of Drywell pressure dropping
2. **Perform Emergency Depressurization when Suppression Chamber Pressure cannot be maintained below the Pressure Suppression Limit.**	
Safety Significance	Maintenance of primary containment integrity.
Consequences for Failure to Perform Task	Potential subsequent violation of Primary Containment Pressure Limit (PCPL) and damage to primary containment.
Indications/Cues for Event Requiring Critical Task	Containment parameters exceeding the limits of the Pressure Suppression Limit curve.
Performance Criteria	When the determination is made that efforts to maintain Suppression Pool level and Suppression Chamber pressure within the PSL limit are unsuccessful, perform EO–000–112, Emergency Depressurization.
Performance Feedback	Verify ADS valves are open using light red light indication, acoustic monitoring and lowering Reactor pressure and rising reactor water level.

B. Scenario Malfunctions

Event	Malfunction	Operator Action in Response
1	N/A	Lower Reactor Power Using Recirc Flow
2	N/A	Perform Quarterly RCIC Valve Exercising SO-150-004
3	RCIC Turbine Exhaust to Suppression Pool Valve Fails to Re-Open	Stop surveillance test, SRO determines Technical Specification impact
4	Loss of Power to Instrument Bus 1Y125	Align alternate instrument power, determine Technical Specification impact
5	Electrical Fault on ESS Bus 1A (1A201)	Cross-tie IA to CIG, start CRD pump, re-energize RPS A, reset half scram and isolation, determine Technical Specification impact
6	Steam Leak in Drywell With Failure of HPCI	Scram the Reactor, spray the Containment, Use alternate systems for Reactor water level control
7	RHR Pumps B or D Trip	Align alternate Containment spray
8	Failed Open Suppression Chamber to Drywell Vacuum Breaker	Perform emergency depressurization

C. Abnormal Events and Major Transients

Malfunction	Description
R	Lower Reactor Power Using Recirc Flow
N	Perform Quarterly RCIC Valve Exercising SO-150-004
TS	RCIC Turbine Exhaust to Suppression Pool Valve Fails to Re-Open SO-150-004, Technical Specifications
AE1 TS	Loss of Power to Instrument Bus 1Y125 ON-YPNL-101, Technical Specifications
AE2 TS	Electrical Fault on ESS Bus 1A (1A201) ON-4KV-101, Technical Specifications
MT1	Steam Leak in Drywell With Failure of HPCI ON-DWLEAK-101, ON-SCRAM-101, EO-000-102, EO-000-103
MAE1	RHR Pumps B or D Trip EO-000-103, OP-116-001
MT2	Failed Open Suppression Chamber to Drywell Vacuum Breaker EO-000-103, EO-000-112

D. EOP and EOP Contingencies Used

EOPs	EOP Contingencies
☒ EO-000-102, RPV Control	☐ EO-000-102, Alternate Level Control
☒ EO-000-103, Primary Containment Control	☐ EO-000-102, Steam Cooling
☐ EO-000-104, Secondary Containment Control	☒ EO-000-112, Emergency Depressurization
☐ EO-000-105, Radioactivity Release Control	☐ EO-000-113, Power/Level Control
	☐ EO-000-114, RPV Flooding

E. Technical Specifications

1. TS 3.5.3, RCIC System
2. TS 3.3.3.1, Post Accident Monitoring (PAM) Instrumentation
3. TS 3.8.7, Distribution Systems – Operating

References

1.	SO-150-004	QUARTERLY RCIC VALVE EXERCISING
2.	OP-164-001	REACTOR RECIRCULATION SYSTEM
3.	OP-144-001	CONDENSATE AND FEEDWATER SYSTEM
4.	ON-YPNL-101	LOSS OF INSTRUMENT BUS
5.	ON-4KV-101	LOSS OF 4KV ESS BUS 1A (1A201)
6.	ON-SCRAM-101	REACTOR SCRAM
7.	EO-000-102	RPV CONTROL
8.	EO-000-103	PRIMARY CONTAINMENT CONTROL
9.	OP-149-004	RHR CONTAINMENT COOLING
10.	OP-160-001	DRYWELL VENTILATION SYSTEM
11.	OP-149-001	RHR SYSTEM
12.	OP-151-001	CORE SPRAY SYSTEM
13.	GO-100-012	Power Maneuvers
14.	EO-000-112	EMERGENCY DEPRESSURIZATION
15.	EP-PS-100	Emergency Director Control Room Emergency Plan Position Specific Instruction
16.	EP-RM-004	EAL Classification Bases

Setup Instructions

A. Required Materials

1. US Turnover Sheet
   a. Unit 1
      1) 100% power
      2) SLC Pump B is out of service for maintenance.
      3) Instrument Air Compressor B is out of service for maintenance.
      4) Lower reactor power to 95% with Recirculation Flow
      5) Shift activity is to perform quarterly RCIC valve exercising per SO-150-004. The procedure is in progress up to step 5.1.8. The applicable Technical Specifications have been entered.
   b. Common and Unit 2
      1) Unit 2 at rated power.
2. Supporting Documents
   a. RMR (2 copies)
   b. SO-150-004 (for the Normal Event)

B. Simulator Initialization

1. **Reset** to exam specific IC. If not available, setup IAW the following instructions
2. **Run** SCN file **exam\N18scen4.scn**
3. **Place** the simulator in RUN prior to operators entering simulator.
4. **Perform** simulator activities
   a. **Place** a tag on the Instrument Air Compressor B control switch and the SLC pump keylock switch.
   b. **Markup** SO-150-004 to step 5.1.8
   c. **Place** flags on expected annunciators for the RCIC surveillance.
      1) AR-108-001 (B04, B05, C01, D01, D05, E02, F01, G01, H01)
      2) AR-106-001 (G15)
5. **Reset** ODAs and all Overhead, PPC, HMI and RWM alarms
6. **Ensure** horns and annunciators are on
7. **Ensure** Overhead Lights Override is off

C. Simulator Preparation

1. **Ensure** the EOL CRC Book is at the PCO Console

D. Document Training and Performance Feedback

1. **Record** crew position assignments per TQ-104 (ILO)
2. **Complete** simulator exam checklist

E. Scenario Execution

1. **Provide** turnover to the crew using the US Turnover sheet
2. **Direct** the crew to walk down the Control Room panels
3. **Inform** the Shift Manager that the crew has the shift

F. Simulator Files

```
N18scen4.scn
; Monitored parameters
SCN rat_mp

; IAC B OOS
IRF crfPM09_1K107B f:OUT

; SLC pump B OOS
IRF rfDB106723 f:OPEN
IMF cmfPM01_1P208B

; Crew performs RCIC valve stroke surveillance

; RCIC Turbine Exhaust to Suppression Pool valve fails to re-open
aet Exam_ET\N18scn4et1

; Loss of power to Instrument Bus 1Y125
{Key[2]} IRF rfDC102114 f:OPEN

; NPO swaps instrument power HSE-112505 to alternate
{Key[12]} IRF rfDB157002 f:ALTERNATE

; Electrical fault on  ESS Bus 1A (1A201)
{Key[3]} IMF cmfEB01_1A201

; NPO crossties IA to CIG
{Key[13]} IRF rfPC125001 f:OPEN

; Steam leak in Drywell
{Key[4]} IMF mfMS183007 r:2:00 f:0.06

; Steam leak gets worse when mode switch is in shutdown
aet Exam_ET\N18scn4et2

; HPCI trips upon initiation
aet Exam_ET\N18scn4et5

; RHR pump B or D trip shortly after Drywell spray is initiated
aet Exam_ET\N18scn4etB
aet Exam_ET\N18scn4etD

;If crew sprays with RHRSW, manually Key containment degradation
{Key[25]} +30 IMF cmfAV04_PSV15704B2 r:15 f:100
{Key[25]} IMF cmfAV04_PSV15704B1 d:15  r:15 f:100
{Key[25]} +30 MMF mfMS183007 d:15 r:1:30 f:3.5

; Failed open Supp Chamber to Drywell vacuum breaker and
; steam leak worsens shortly after RHR is spraying DW
aet Exam_ET\N18scn4et4
```

N18scn4et1.et
```
;when 59 valve is closed, will not re-open
rcvsphv149f059 = 0
```

N18scn4et1.scn
```
ior dihs14959a f:close
```

N18scn4et2.et
```
;SWITCH:MODE SWITCH
diHSC72A1S01.CurrValue = #OR.diHSC72A1S01.SHUTDN
```

N18scn4et2.scn
```
MMF mfMS183007 r:2:00 f:1.5
```

N18scn4et3.et
```
;METER:CONTAINMENT SPRAY - DIV 2
aoFI15120BA.CurrValue > 2000
```

N18scn4et4.et
```
; RHRSW B to RHR crossties open and RHR B DW spray valves open
doHS15121B_2.CurrValue = #OR.doHS15121B_2.ON & doHS15116B_2.CurrValue = #OR.doHS15116B_2.ON &
doHS11275B_2.CurrValue = #OR.doHS11275B_2.ON & doHS11273B_2.CurrValue = #OR.doHS11273B_2.ON
```

N18scn4et3.scn
```
imf cmfMV01_HV151F016B
+30 IMF cmfAV04_PSV15704B2 r:15 f:100
IMF cmfAV04_PSV15704B1 d:15  r:15 f:100
+30 MMF mfMS183007 d:15 r:1:30 f:3.5
```

N18scn4et5.et
```
;LIGHT:HPCI TURBINE STEAM SUPPLY
doHS15501_2.CurrValue = #OR.doHS15501_2.ON
```

N18scn4et5.scn
```
IMF mfHP152015
```

N18scn4et6.et
```
;LIGHT:TURBINE EXHAUST TO SUPP POOL (HS-E51A-S21)
doHS14959A_2.CurrValue = #OR.doHS14959A_2.OFF
```

N18scn4et6.scn
```
IOR diHS14959A f:CLOSE
```

N18scn4etB.et
```
;if B RHR started first
doHS15102B1_3.CurrValue = #OR.doHS15102B1_3.ON
```

N18scn4etB.scn
```
+1 imf cmfpm03_1P202B
```

N18scn4etD.et
```
;if D RHR started first
doHS15102D1_3.CurrValue = #OR.doHS15102D1_3.ON
```

N18scn4etD.scn
```
+1 imf cmfpm03_1P202D
```

Event 1 – Lower Reactor Power Using Recirculation Flow

Instructor Activities	Operator Activities	Notes
Booth Operator **Role Play:** The crew may contact PJM (Tenaska) requesting if the power reduction was sufficient. With lead examiner concurrence, confirm sufficient power reduction. No actions required for this event		
	PCOM ☐ Lowers Reactor Power by depressing either the single or double chevron DEC PB and maintaining loop flows matched ☐ Monitors indications of reactor power per OP-AD-001 Att G **PCOP** ☐ Performs peer checks as requested ☐ IAW AR-106-C09, nulls Manual and Automatic regulators using MAN VOLT REG ADJUST HC-10002 potentiometer ☐ Maintains Load Set ~100MWe above actual Generator Load IAW GO-100-012 using LOAD SELECTOR DECREASE/INCREASE PBs **US** ☐ Directs lowering reactor power with recirculation flow	

Event 2 & 3 – Perform Quarterly RCIC Valve Exercising, RCIC Turbine Exhaust to Suppression Pool Valve Fails to Re-Open

Instructor Activities	Operator Activities	Notes
Booth Operator		
Role Play If dispatched to investigate HV-149-F059 failing to reopen, and/or the associated breaker, acknowledge direction and delay action. The next event will be initiated prior to any investigation actions.	**US** ☐ Directs PCOP to perform quarterly RCIC valve exercising per SO-150-004, starting at step 5.1.8. ☐ Acknowledges that HV-149-F059 TURB EXH TO SUPP POOL is closed and will not re-open. ☐ Places surveillance testing on hold. ☐ Determines Technical Specification 3.5.3 requires immediately verifying by administrative means that HPCI is operable. ☐ Determines Technical Specification 3.5.3 requires RCIC to be restored to operable status within 14 days. **PCOM** ☐ Monitors Plant Parameters	SRO may conservatively declare the PCIV inop per 3.6.1.3 condition A, due to not knowing whether the failure affects the function to shut the valve. The action statement would already be met since the valve failed in the closed position. If the SRO knew the failure would not affect the valve's ability to close, entry into that action statement would not be required. However, the SRO does not have that data,and therefore may declare the valve inoperable per TS 3.6.1.3.

Event 2 & 3 – Perform Quarterly RCIC Valve Exercising, RCIC Turbine Exhaust to Suppression Pool Valve Fails to Re-Open

Instructor Activities	Operator Activities	Notes
	PCOP ☐ Performs quarterly RCIC valve exercising per SO-150-004, starting at step 5.1.8: • Test HV-149-F060 VAC PP DSCH TO SUPP POOL as follows: o Confirm HV-149-F060 OPEN. o Simultaneously Close HV-149-F060 AND Commence stroke timing. o Stop timing HV-149-F060 when FULL CLOSE indication observed. o Record HV-149-F060 closure stroke time on Attachment A. o Open HV-149-F060. • Test HV-149-F059 TURB EXH TO SUPP POOL as follows: o Confirm HV-149-F059 OPEN. o Simultaneously Close HV-149-F059 AND Commence stroke timing. o Stop timing HV-149-F059 when FULL CLOSE indication observed. o Record HV-149-F059 closure stroke time on Attachment A. o Open HV-149-F059. ☐ Recognizes / reports HV-149-F059 TURB EXH TO SUPP POOL is closed and will not re-open.	HV-149-F060 stroke time should be 24 +/- 1 seconds HV-149-F059 stroke time should be 43 +/- 1 seconds

Event 4 – Loss of Power to Instrument Bus 1Y125

Instructor Activities	Operator Activities	Notes
Booth Operator At the Lead Examiner's direction, **Insert Key 2** to initiate event. **{Key[2]} IRF rfDC102114 f:OPEN**		
	Crew ☐ Recognizes / reports: • Annunciator AR-107-001 (C06), BYPASS INDICATION SYS DIV 2 INOP ECCS/ESF SYS • Annunciator AR-112-001 (F04), SUPP POOL DIV 2 AVERAGE TEMP HI • Multiple control room indicators fail	
	US ☐ Enters ON-YPNL-101, Loss of Instrument Bus. ☐ Determines certain channels of post-accident monitoring instrumentation are inoperable. ☐ Determines Technical Specification 3.3.3.1 Condition A requires restoring channels to operable status within 30 days. ☐ Determines TRM 3.3.4 Condition A and C to restore to operable within 30 days. ☐ Determines TRM 3.6.3 Condition A to restore to operable within 24 hours. **PCOM** ☐ Monitors plant parameters.	The intent of this event is not to evaluate the Tech Spec call. Proceed to the next event prior to the Tech Spec evaluation being complete.

Event 4 – Loss of Power to Instrument Bus 1Y125

Instructor Activities	Operator Activities	Notes
	PCOP ☐ May execute AR-112-001 (F04), which alarmed due to the power loss: • (Step 2.6) Ensure the following closed: o SPOTMOS Div 2 Normal Supply 1Y12502 o Post accident mon/SPOTMOS 1C690B o SPOTMOS Div 2 Normal Supply 1Y12501	
Role Play As **NPO** dispatched to ensure component positions per AR-112 (F04), wait 2 minutes and report completion.		
Role Play As **NPO** dispatched to investigate 1D62430, wait 2 minutes, then **report**, **"1D62430 is tripped open."**	☐ Executes ON-YPNL-101, Loss of Instrument Bus, Condition H: • Refer to Attachment Y for functions/instrumentation lost and recommended actions. • Dispatch Operator to ensure 1D62430 CLOSED.	
Role Play As **NPO** dispatched to investigate 1D125 lights, wait 1 minute, then **report**, **"1D125 Master Unit Indicating Light and 1D125 Slave Unit Indicating Light are extinguished."**	• Dispatch Operator to 1D125.	
Role Play When directed as **NPO** to place HSE-112505 in ALTERNATE position, wait 2 minutes, then depress KEY 12, then **report**, **"HSE-112505 is in the ALTERNATE position."** **{Key[12]} IRF rfDB157002 f:ALTERNATE**	• IF 1D125 Indicating Lights EXTINGUISHED: o Dispatches operator to PLACE HSE-112505 in ALTERNATE position. o At 1C690B, PLACE HSE-112502 in ALTERNATE position. o At 1C601-22B, PLACE HSE-112501 in ALTERNATE position.	Due to arc flash concerns, electrical safety is required to operate switches in the panel. Long sleeve natural fiber shirt and eye protection are required.

Event 5 – Electrical Fault on ESS Bus 1A (1A201)

Instructor Activities	Operator Activities	Notes
Booth Operator When directed by lead examiner, **depress KEY 3** to initiate event. **{Key[3]} IMF cmfEB01_1A201**		
	Crew ☐ Recognizes / reports: • Annunciator AR-015-001 (A08), 4KV BUS 1A (1A201) LO VOLT/PROT CKT TROUBLE • Annunciator AR-015-001 (D08), 4.8KV BUS 1A BUS LOCKOUT RELAY TRIP • Annunciator AR-015-001 (D10), DB A SUPPLY BKR TO BUS 1A/2A TRIP • Annunciators AR-109-001 (B02(B09)), CORE SPRAY (RHR) LOOP A OUT OF SERVICE • Half scram. • Loss of ESS Bus 1A	

Event 5 – Electrical Fault on ESS Bus 1A (1A201)

Instructor Activities	Operator Activities	Notes
Role Play As **WWM** (or equivalent) contacted for assistance with ESS Bus 1A, acknowledge request.	**US** ☐ Enters ON-4KV-101, Loss of 4KV Bus. ☐ Enters ON-CIG-101, Loss of Containment Instrument Gas. ☐ Enters ON-CRD-101, Control Rod Drive Malfunction. ☐ Enters ON-RPS-101, Loss of RPS. ☐ May enter ON-PWR-101 for an Unplanned Loss of Heat Balance. ☐ Determines Technical Specification 3.8.7 Condition A Required Action 1 is applicable for loss of ESS Bus 1A. **PCOM** ☐ Monitors plant parameters. ☐ Once RPS A is placed on alternate supply, resets half scram by momentarily positioning REACTOR SCRAM RESET HS-C72A-1S05 to GROUP 1/4 position AND THEN to GROUP 2/3 position.	

Event 5 – Electrical Fault on ESS Bus 1A (1A201)

Instructor Activities	Operator Activities	Notes

Role Play
When dispatched as **NPO** to crosstie Instrument Air to CIG, wait 2 minutes, then **depress KEY 13,** then **report,**
"Instrument Air has been cross-tied to CIG."
{Key[13]} IRF rfPC125001 f:OPEN
 	
Role Play
If dispatched as **NPO** to investigate ESS Bus 1A, wait 2 minutes, then **report**,
"The normal supply breaker to ESS Bus 1A tripped on overcurrent."
 	
Role Play
If dispatched as **NPO** to perform EDG post-start checks, wait 2 minutes, then **report**,
"Post-start checks for the A EDG are completed sat."
	PCOP
	☐ Executes ON-4KV-101, Loss of 4KV Bus, Condition B:
	• Ensure ESW in service to provide cooling to diesel generator in accordance with OP-054-001, ESW System:
	  o Starts at least one ESW pump.
	• **ENSURE** B CRD pump in service
	  o Close CRD Flow Control Valve FV 146 F002A(B) as follows:
	  o Place CRD Flow Controller FC-C12-1R600 in MANUAL.
	  o Set CRD Flow Controller FC-C12-1R600 to 0% DEMAND SIGNAL.
	  o Verify CRD Flow Control Valve FV-146-F002A(B) CLOSED.
	  o Start standby CRD Pump 1P132B by placing control switch to RUN position.
	  o With CRD Pump 1P132B in operation, Establish system flow ~ 63 gpm using CRD Flow Controller FC-C12-1R600.
	  o Place CRD Flow Controller FC-C12-1R600 in AUTO.
	• Crosstie Instrument Air to CIG 90# header:
	  o Dispatches NPO to perform OP-125-001, Containment Instrument Gas System, section 2.8.
	• **ENSURE** ESS Transformers 101, 201, 111, and 211 cooling systems in service. (OP-004-001)	

Event 5 – Electrical Fault on ESS Bus 1A (1A201)

Instructor Activities	Operator Activities	Notes
Role Play Multiple field actions will be directed from ON-4KV-101, which do not require booth action. Acknowledge the direction, as appropriate.	**PCOP Cont...** ENSURE Unit 1 RPS Bus A is ENERGIZED and Containment Isolations RESET ☐ Transfer RPS bus A to alternate supply and Restore containment isolation in accordance with ON-RPS-101, Loss of RPS: • Ensure ALTERNATE A FEED White indicating light ILLUMINATED. • Ensure RPS M G SET TRANSFER SWITCH HS-C72B-S1 in NORM position. • Place RPS M G SET TRANSFER SWITCH HS-C72B-S1 in ALT A position. • Reset the Main Steam Line Rad Monitors at Panel 1C606. (Field action) • Coordinates with PCOM to reset A RPS half scram by momentarily positioning REACTOR SCRAM RESET HS-C72A-1S05 to GROUP 1/4 position AND THEN to GROUP 2/3 position. • Depress MN STM LINE DIV 1 ISO RESET HS-B21-1S32. (1C601) • Depress MN STM LINE DIV 2 ISO RESET HS-B21-1S33. (1C601) • Recover from RBCW isolation: o Ensure RRP A CLG WTR OB ISO VALVES HV-18791A1&A2 CLOSED. o Ensure RRP B CLG WTR IB ISO VALVES HV-18792A1&A2 CLOSED. o Depress HV-18791A1&A2 ISOLATION RESET. o Depress HV-18792A1&A2 ISOLATION RESET. o Ensure RRP A CLG WTR OB ISO VALVES HV-18791A1&A2 OPEN. o Ensure RRP B CLG WTR IB ISO VALVES HV-18792A1&A2 OPEN.	

Evaluator Note

- Recommend moving to the next event once RPS is on the alternate supply, the half scram is reset, RBCW is restored, CRD is restored, and the Technical Specification call is made.

Events 6, 7, & 8 – Steam Leak in Drywell, HPCI Trips, RHR Pumps B and D Trip, Failed Open Suppression Chamber to Drywell Vacuum Breaker

Instructor Activities	Operator Activities	Notes

Booth Operator

When directed by lead evaluator, depress **KEY 4**:
{Key[4]} IMF mfMS183007 r:2:00 f:0.06

When the mode switch is placed in shutdown, verify automatic event trigger n18scen4et2 modifies the steam leak severity: **MMF mfMS183007 r:2:00 f:1.5**

When HPCI steam supply valve opens, verify automatic event trigger n18scen4et5 trips HPCI:
IMF mfHP152015

When the crew sprays containment with RHR, verify automatic event trigger n18scen4et4 initiated to cause further containment degradation. If crew sprays with RHRSW, manually Key containment degradation.
{Key[25]} +30 IMF cmfAV04_PSV15704B2 r:15 f:100
{Key[25]} IMF cmfAV04_PSV15704B1 d:15 r:15 f:100
{Key[25]} +30 MMF mfMS183007 d:15 r:1:30 f:3.5

EVALUATOR NOTES

1. The initial Reactor water level control band will likely be +20 to +45".
2. When the Main Generator lockouts trip with Drywell pressure > 1.72 psig, Condensate pumps will lose power due to load shedding. HPCI will trip on start, leaving the crew with RCIC, CRD and SLC for level control.
3. Due to loss of ESS Bus 1A, RHR A will be unavailable for Containment Sprays.
4. Once Drywell spray is placed in service on RHR loop B or D, RHR pump B or D will trip. This will drive the crew to place the other RHR pump in service.
5. After RHR is spraying the Drywell and conditions are improving, a Suppression Chamber to Drywell vacuum breaker will stick open and the steam leak will get worse. This will lead to violation of the Pressure Suppression Limit (~26 psig).

★ **Critical Task**
Given a steam leak into primary containment, spray the Drywell with RHR when Suppression Chamber pressure exceeds 13 psig.

★ **Critical Task**
Perform Emergency Depressurization when Suppression Chamber Pressure cannot be maintained below the Pressure Suppression Limit.

	Crew ☐ Recognizes / reports rising: • Drywell leakage • Drywell temperature • Drywell pressure	

Events 6, 7, & 8 – Steam Leak in Drywell, HPCI Trips, RHR Pumps B and D Trip, Failed Open Suppression Chamber to Drywell Vacuum Breaker

Instructor Activities	Operator Activities	Notes
	US ☐ Enters ON-SCRAM-101, Reactor Scram. ☐ Directs Scram Imminent actions. ☐ May direct Limiter #2 IAW ON-RPR-101 ☐ Directs manual Reactor scram. ☐ Enters EO-100-102, RPV Control, due to low Reactor water level and high Drywell pressure. ☐ Enters EO-100-103, Primary Containment Control, due to high Drywell temperature and pressure. ☐ Directs initiation of Suppression Chamber spray. ☐ Directs Reactor water level controlled between +13" and +54" using Condensate, RCIC, CRD, and/or SLC. ☐ Directs Reactor pressure controlled 800-1050 psig with Turbine Bypass Valves. ☐ May direct Reactor cooldown. When Suppression Chamber pressure exceeds 13 psig or Drywell temperature approaches 340°F: • Ensures shutdown of Drywell coolers and fans. • Ensures shutdown of Recirculation pumps.	

Role Play As **WWM** contacted for assistance, acknowledge and take no action	**US Cont...** ☐ Acknowledges trip of RHR pumps B (D). ☐ **Directs spraying containment using RHR D(B) or alternate Drywell sprays using RHRSW cross-tied to RHR per OP-116-001.** ☐ Determines Containment parameters are NOT within the Pressure Suppression Limit. ☐ Enters EO-000-112, Emergency Depressurization. ☐ Directs preventing uncontrolled Condensate injection ☐ Directs preventing injection from LPCI and Core Spray pumps. ☐ **Directs opening all ADS valves.**	
Role Play If directed as **NPO** to investigate HPIC trip, **acknowledge direction and delay action**.	**PCOM** ☐ May insert Limiter #2 IAW ON-RPR-101 ☐ **Places the Mode Switch in SHUTDOWN.** ☐ Executes scram actions of ON-SCRAM-101, Reactor Scram: • Observe all Control Rods indicate fully inserted (using two indications, OD 7 completed as soon as possible). • Insert IRMs and SRMs. • Observe Scram Discharge Volume Vent and Drain valves CLOSED. • Check Reactor water level between 13" and 54". • Check Reactor pressure <1087 psig. • WHEN main generator load < 150 MWe, at 1C651, Depress Trip Pushbutton for Main Turbine. • Check Turbine speed is lowering. • Check status of MSIVs.	

	PCOP
	☐ Executes ON-SCRAM-101, Reactor Scram:
	• Verifies isolations and initiations:
	  o 13" Reactor water level isolations
	  • 1.72 psig Drywell pressure isolations	

Booth Operator When Drywell spray is initiated, verify automatic event trigger n18scen4etB/D trips RHR pumps B or D, whichever was started. And **abort**, the event trigger to trip the remaining RHR pump: **n18scn4etB/D** **Role Play** If directed as **NPO** to check RHR pumps B or D, wait 2 minutes, then **report**, **"RHR pump B(D) breaker tripped on overcurrent."** **Booth Operator** When RHR is spraying the Drywell, verify automatic event trigger n18scen4et3 fails open a SC to Drywell vacuum breaker and modifies the steam leak severity: **+30 IMF cmfAV04_PSV15704B2 d:15 r:15 f:100 / IMF cmfAV04_PSV15704B1 d:15 r:15 f:100** **+30 MMF mfMS183007 r:1:30 f:3.5** **Role Play** If dispatched to manually open RHR Div 1 valves, wait 4 minutes, then **report**, **"The manual handwheel will not operate to open the valve."**	**PCOM / PCOP** ☐ Initiates Suppression Chamber spray per OP-149-004: • IF available, Place Emergency Service Water System in operation supplying RHR Room Cooler and RHR Pump to be placed in service. • IF LOCA signal present, Place HS-E11-1S17B LOCA ISOLATION MANUAL OVERRIDE Switch to OVERRIDE. • Observe White Indicating Light ILLUMINATED above HS-E11-1S17B LOCA ISOLATION MANUAL OVERRIDE. • Observe LOCA ISO SWITCH LOOP B MANUAL OVERRIDE (AR-113-C5) Annunciator alarms. • Open HV-151-F028B SUPP CHMBR SPR TEST SHUTOFF. • Close HV-151-F017B RHR INJ FLOW CTL. • IF a RHR Pump not in service, Start 1P202B(D)RHR PUMP. • Throttle Open HV-151-F027B SUPP POOL SPRAY CTL, as necessary, to maintain ≤ 500 GPM as indicated on FI-15120B CONTN SPRAY DIV 2 AND maintain total loop flowrate ≤ 10,000 gpm. After RHR pump trips • Recognize RHR pump trip • Line up to spray with remaining RHR pump. • Start remaining RHR pump and open spray valve. • Recognize valve only partially opened, but sprays are in service. • Monitor Suppression Chamber pressure. • IF Suppression Chamber pressure drops to 0 psig, THEN Stop Suppression Chamber Sprays	The crew may need to perform a slow fill prior to initiating spray, if the RHR loop was voided. This takes several minutes.

	PCOM / PCOP ☐ Recognizes/reports Drywell pressure rising. ☐ Recognizes/reports Containment parameters exceed Pressure Suppression Limit. ☐ Prevents LPCI and Core Spray injection. <u>Actions to prevent LPCI injection per OP-149-001:</u> • IF RHR initiated and RPV pressure >420 psig, Prevent injection per following: o Place pump control switches to STOP and then Release. o Observe white pump override lights ILLUMINATED, and NO RHR Pumps running. • IF RHR not initiated, Prevent injection per following: o Arm AND Depress initiation button HS-E11-1S20A. o Place pump control switches to STOP, then Release. o Observe white pump override lights ILLUMINATED, and NO RHR Pumps running. <u>Actions to prevent Core Spray injection per OP-151-001:</u> • IF Core Spray NOT initiated, Arm AND Depress initiation button HS-E21-1S16A(B). • Shutdown pumps: o Place pump control switches to STOP AND Release. o Observe white pump override lights ILLUMINATED. Observe no Core Spray pump running. ☐ **Opens 6 ADS valves.** ☐ Controls Reactor water level +13" to +54" using CRD, SLC, Core Spray, and/or LPCI.	The electrical malfunctions earlier will cause only three ADS valve indicating lights. The crew may check tailpipe temperatures to verify 6 ADS valves open.

Termination
Recommended termination criteria:
a. 6 SRVs open.
b. RHR spraying the Drywell.
c. Reactor water level being restored to or controlled in assigned band above -161".

UNIT SUPERVISOR TURNOVER SHEET

UNIT 1 — to/dd/yy (Date)

SHIFT 1900 (Start) to 0700 (End)	SHIFT 0700 (Start) to 1900 (End)
MODE 1	MODE
POWER LEVEL 100 %	POWER LEVEL %
GENERATOR OUTPUT 1344 MWe	GENERATOR OUTPUT MWe
CASK STORAGE GATE INSTALLED: YES/NO	CASK STORAGE GATE INSTALLED: YES/NO

REMARKS:

1) Standby Liquid Pump 'B' is out of service for maintenance.
2) Instrument Air Compressor 'B' is out of service for maintenance.
3) Lower reactor power to 95% with Recirculation Flow. PJM minimum generation alert has been declared and RE has approved the downpower to 95%.
4) Shift activity is to perform Quarterly RCIC Valve Exercising, SO-150-004. The surveillance is in progress up to step 5.1.8. The applicable Technical Specifications have been entered.
5)
6)
7)
8)
9)
10)
11)
12)
13)
14)
15)

COMMON:

1)
2)
3)
4)
5)
6)
7)
8)
9)

OFFGOING UNIT SUPERVISOR CHECKLIST:

NRC CODE PRIOR TO 0800	DELTA	TANGO	XRAY	ECHO
NRC CODE AFTER 0800	ECHO	XRAY	XRAY	ECHO

1900-0700	0700-1900		
us		1.	Evolutions in progress and items to be completed during next shift, as noted in remarks, have been discussed with oncoming Unit Supervisor (including special evolutions, i.e. SICT/E, OPDRVs, etc.).
us		2.	Problems encountered during past shift and abnormal plant conditions, as noted in remarks, have been discussed with oncoming Unit Supervisor.
us		3.	Information in SOMS Log is complete and discussed with oncoming Unit Supervisor.
us		4.	As applicable, turnover plastic Security Badge cover and CRS Monitor function to oncoming Unit Supervisor.
us		5.	Risk profile for the next 24 hours has been reviewed with the oncoming US.
us		6.	Review TMX qualifications (required to take shift) with oncoming personnel.

1900 - 0700 Unit Supervisor

0700 - 1900 ______________________

Offgoing Unit Supervisor

ONCOMING UNIT SUPERVISOR CHECKLIST:

0700 -	1900 -		
		1.	LCO/TRO Log reviewed.
		2.	SOMS Log reviewed for entries made in past 24 hours.
		3.	Report any changes to license or medical status PER NDAP-QA-0723.

([14])

0700 - 1900 ______________________

1900 - 0700 ______________________

Oncoming Qualified
Unit Supervisor

POST RELIEF

0700 -	1900 -		
		1.	Walk down Control Room panels with Unit Responsible PCO.
		2.	CRC Book reviewed and Reactivity Brief performed with PCO.
		3.	Completed System Status Operable audit for open PMT this shift.
		4.	From the OPS Web page, Review OPS Aggregate Index for Challenges, Work Arounds, and Deficiencies Reports for impact on scheduled work activities and compensatory actions. [20]

0700 - 1900 ______________________

1900 - 0700 ______________________