

**Susquehanna Learning Center**  
769 Salem Boulevard  
Berwick, PA 18603-0467  
570-542-3353



*Received and OKed  
1/4/11*

December 30, 2010

Mr. John Caruso  
US NRC Chief Examiner  
US NRC Region 1  
475 Allendale Road  
King of Prussia, PA 19406-1415

Susquehanna Learning Center  
**Examination Materials**  
PLA 006684     File A14-13D

Dear Mr. Caruso:

Enclosed for your review and approval are Proposed Examination Materials for the PPL Susquehanna, LLC Initial Licensed Operator Examination scheduled to begin January 18, 2011. These materials are submitted in accordance with NUREG 1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9. The following materials are enclosed:

- Form ES-201-3, Examination Security Agreement (Up-to-Date Copy)
- Form ES-301-1, Administrative Topics Outline RO
- Form ES-301-1, Administrative Topics Outline SRO
- Form ES-301-2, Control Room/In-Plant Systems Outline RO
- Form ES-301-2, Control Room/In-Plant Systems Outline SRO-I
- Form ES-301-2, Control Room/In-Plant Systems Outline SRO-U
- Form ES-301-3, Operating Test Quality Checklist
- Form ES-301-4, Simulator Scenario Quality Checklist
- Form ES-301-5, Transient and Event Checklist
- Form ES-301-6, Competencies Checklist
- Form ES-D-1, Scenario Outline
- 7 Administrative Topics JPMs
- 11 Control Room/In-Plant Systems JPMs
- 3 Simulator Scenarios

All proposed Examination Materials have been validated by Licensed Operator personnel in accordance with the guidance provided within NUREG 1021, Operator Licensing Examination Standards for Power Reactors, Revision 9.

We request that these materials be withheld from public disclosure until after the completion of the examination. If you have any questions, please feel free to contact me at 570-542-3677 or Paul Moran at 570-542-1891.

The above materials have been reviewed for "Safeguards Material" content. None of these materials are deemed to be "Safeguards Material."

Sincerely,



Richard E. Klinefelter  
Assistant Operations Manager – Shift OPS

Response: No

Enclosures: Listed

cc: J. M. Diltz  
M. H. Crowthers  
Ops Letter File  
Nuc Records – Site

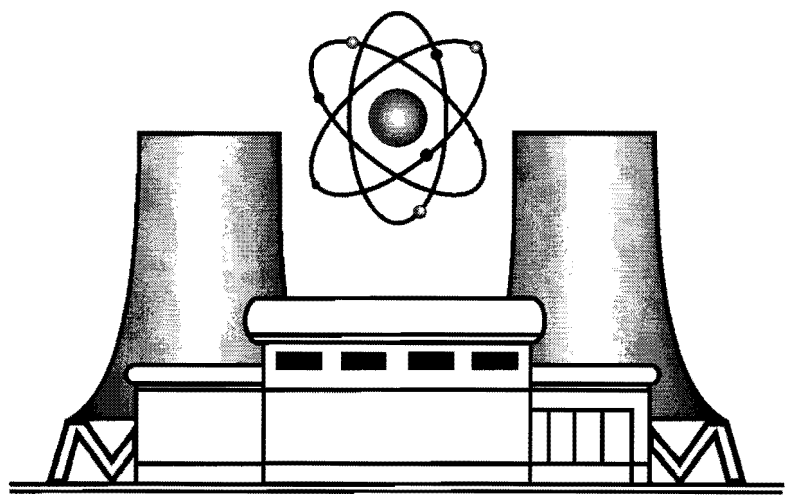
PM/REK/lgo

*Final Exam  
1/4/11*



SUSQUEHANNA

# NRC RO & SRO Administrative Job Performance Measures ~~and References~~



**LOC-23**  
January 2011

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

SRO SRO 00.AD.3658.101 0 12/22/10 Generic 2.1.7 4.7  
Appl. JPM Number Rev. Date NUREG K/A No. K/A Imp.  
To No. No. No. 1123 Sys. No.

Task Title: Perform RE-1TP-026 Validation of Heat Balance at 90% power

Completed By: M. Jacopetti 12/22/10 Paul Moran 12/22/10  
Writer Date Instructor/Writer Date

Approval:

M. Jacopetti 01/03/11  
Nuclear Trng. Supv. Date

25

Date of Performance: Validation Time (Min.): Time Taken (Min.):

JPM Performed By:

Student Name:

Last First M.I. Employee # / S.S. #

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name:

Signature Typed or Printed

Comments:

REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
SRO 00.AD.3658.101

**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 PPL 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. RE-1TP-026, "Validation of Core Thermal Power Heat Balance", Rev. 10

**III. OPERATIONAL ACTIVITIES**

None

**IV. TASK CONDITIONS**

A plant startup is in progress on Unit 1, and:

- APRMs indicate as follows: #1 89.9%, #2 90.1%, #3 92.2%, and #4 90.3%
- % Core Thermal Power (OD-3) is 90%
- LPRM arithmetic average from PI is 46.5
- HPTE pressure at entrance of the A Moisture Separator (TEP02) is 187 psig
- HPTE pressure at entrance of the B Moisture Separator (TEP03) is 188 psig
- Computer Point NBA14 is 93.026 %PWR
- Computer Point NBA15 is 93.329 %PWR
- Computer Point NBA16 is 94.7 %PWR
- Computer Point NBA17 is 93.16
- Computer Point NFA50 is 15.5011 MLBS/H

**V. INITIATING CUE**

Perform RE-1TP-026 Validation of Heat Balance. Determine what action, if any, is required. Document conclusions, as necessary, on this cue sheet.

**VI. TASK STANDARD**

Completes RE-1TP-026, determines the Heat Balance cannot be validated, and contacts STA and Reactor Engineering to perform RE-1TP-026 Attachment C.

**VII. TASK SAFETY SIGNIFICANCE**

Identification of incorrect core thermal power indication is important because scram protective features can be inaccurate and non-conservative.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: SRO 00.AD.3658.101

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>EVALUATOR NOTE:</u></b></p> <p>Ensure the following material is available to support performance of this JPM:</p> <ul style="list-style-type: none"> <li>• A copy of RE-1TP-026</li> <li>• calculator</li> </ul> <p><b><u>EVALUATOR CUE:</u></b></p> <p>To begin this JPM, provide the candidate with the Task Conditions and Initiating Cue Sheet.</p> |  |      |          |
| 1.   | <p>Obtain a controlled copy of RE-1TP-026.</p> <p><b><u>EVALUATOR CUE</u></b></p> <p>When the candidate indicates RE-1TP-026, must be completed, give him/her the blank form. If asked, provide AR-103-001 (C04)</p>   | Controlled copy obtained.  |      |          |
| 2.   | Complete RE-1TP-026, section 4.2.  | Determines section 4.1 only applies when the Mode Switch is in Startup and proceeds to section 4.2.<br>(Mode Switch is in Run) |      |          |

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| 3.   | <p>Record the % CTP as determined by Heat Balance (i.e., OD-3) on Att A.</p> <p><b><u>EVALUATOR NOTE:</u></b><br/>           Procedure incorrectly states Attachment A, it should be 'B'. AR to revise procedure will be generated after NRC exam is completed.</p>  | <p>Refers to cue sheet, then per Step 4.2.1, enters <b>90</b> for % CTP on Attachment B.</p>   |      |          |
| *4.  | <p>Validate % CTP based on HPTE pressure to the A Moisture Separator:</p> <ul style="list-style-type: none"> <li>• Record the HPTE pressure at entrance of the A moisture separator (Computer Point TEP02). Record on Attachment B.</li> <li>• Plot Computer Point TEP02 and % CTP (Step 4.2.1) on Attachment G "High Pressure Turbine Exhaust vs Heat Balance % Power."</li> <li>• Record Computer Point NBA14 (Alternate % CTP) on Attachment B.</li> <li>• Confirm that the plotted point is within the valid region <u>OR</u> % CTP is within <math>\pm 2\%</math> of the Computer Point NBA14. Record on Attachment B.</li> </ul> | <p>Refers to Step 4.2.2 and cue sheet, then:</p> <ul style="list-style-type: none"> <li>• Records <b>187</b> for TEP02 value on Att. B.</li> <li>• Plots point on Att. G with coordinates of <b>187</b> (TEP02) and <b>90</b> (% CTP).</li> <li>• Enters <b>93.026</b> for NBA14 on Att B</li> <li>• Determines point plotted on Att. G (Step 4.2.2 b.) is Not within the valid region and % CTP is Not within <math>\pm 2\%</math> of NBA14, and notes it on Att. B.</li> </ul> |      |          |



| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| *5.  | <p>Validate % CTP based on HPTE pressure to the B Moisture Separator:</p> <ul style="list-style-type: none"> <li>Record the HPTE pressure at entrance of the B moisture separator (Computer Point TEP03). Record on Attachment B.</li> <li>Plot Computer Point TEP03 and % CTP (Step 4.2.1) on Attachment G "High Pressure Turbine Exhaust vs Heat Balance % Power."</li> <li>Record Computer Point NBA15 (Alternate % CTP) on Attachment B.</li> <li>Confirm that the plotted point is within the valid region <u>OR</u> % CTP is within <math>\pm 2\%</math> of the Computer Point NBA15. Record on Attachment B.</li> </ul> | <p>Refers to Step 4.2.3 and cue sheet, then:</p> <ul style="list-style-type: none"> <li>Records <b>188</b> for TEP03 value on Att. B.</li> <li>Plots point on Att. G with coordinates of <b>188</b> (TEP03) and <b>90</b> (% CTP).</li> <li>Enters <b>93.329</b> for NBA15 on Att B</li> <li>Determines point plotted on Att. G (Step 4.2.3 b.) is Not within the valid region and % CTP is Not within <math>\pm 2\%</math> of NBA15, and notes it on Att. B.</li> </ul> |      |          |
| *7.  | <p>Validate % CTP based on LPRM average:</p> <ul style="list-style-type: none"> <li>Obtain a printout of the current LPRM readings (OD-8, Function Key F3).</li> <li>Identify non-valid LPRMs</li> </ul> <p><b>EVALUATOR NOTE:</b><br/>If the candidate indicates the need to obtain printout of LPRM readings and calculate the arithmetic average of the valid LPRMs, tell her / him to use the value obtained from the PI program.</p>  | <p>Refers Step 4.2.4 and cue sheet, then:</p> <ul style="list-style-type: none"> <li>Indicates need to obtain LPRM current readings, identify non-valid LPRMs, and calculate arithmetic average of the valid LPRMs.</li> </ul>   |      |          |

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
|      | <ul style="list-style-type: none"> <li>• Record arithmetic average of the valid LPRM values (PI program may be used to obtain the LPRM average) on Attachment B.</li> <li>• Plot the LPRM arithmetic average and % CTP (Step 4.2.1) on Attachment F "LPRM Average vs % Power (Heat Balance)."</li> <li>• Record Computer Point NBA17 (Alternate % CTP) on Attachment B</li> <li>• Confirm that the plotted point is within the valid region <u>OR</u> % CTP is within <math>\pm 2\%</math> of the Computer Point NBA17. Record on Att. B.</li> </ul> | <ul style="list-style-type: none"> <li>• Enters <b>46.5</b> from PI program valve for LPRM average on Att. B.</li> <li>• Plots point on Att. F with coordinates of <b>46.5</b> (LPRM Average) and <b>90</b> (% CTP).</li> <li>• Enters <b>93.16</b> for NBA17 Att. B</li> <li>• Determines point plotted on Att. F (Step 4.2.4 b.) is Not within the valid region and % CTP is Not within <math>\pm 2\%</math> of NBA17, and notes it on Att. B.</li> </ul> |      |          |
| *8.  | <p>Validate % CTP based on Feedwater Flows.:</p> <ul style="list-style-type: none"> <li>• Record Feedwater Flow (Computer Point NFA50) on Attachment B.</li> <li>• Plot Computer Point NFA50 and % CTP (Step 4.2.1) on Attachment H "Feedwater Flow vs % Power (Heat Balance)."</li> <li>• Record Computer Point NBA16 (Alternate % CTP) on Attachment B</li> <li>• Confirm that the plotted point is within the valid region <u>OR</u> % CTP is within <math>\pm 2\%</math> of the Computer Point NBA16.</li> </ul>                                 | <p>Refers Step 4.2.5 and cue sheet, then:</p> <ul style="list-style-type: none"> <li>• Enters <b>15.5011</b> for NFA50 on Att. B</li> <li>• Plots point on Att. H with coordinates of <b>15.5</b> (Feed Flow) and <b>90</b> (% CTP).</li> <li>• Enters <b>94.7</b> for NBA16 on Att. B</li> </ul> <p>Determines point plotted on Att. H (Step 4.2.5 b.) is Not within the valid region and % CTP is Not</p>   |      |          |

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
|      | Record on Attachment B <ul style="list-style-type: none"> <li>Confirm that the plotted point is within the valid region <u>OR</u> % CTP is within <math>\pm 2\%</math> of the Computer Point NBA16. Record on Att B.</li> </ul>  | within $\pm 2\%$ of NBA17, and notes it on Att. B.  |      |          |
| *9.  | Confirm that the Heat Balance is within the valid regions of any one of the previous four methods ( $\pm 2\%$ CTP from OD-3). Record on Attachment B.<br><br><b>EVALUATOR CUE:</b><br>When candidate indicates the need to Contact RE <u>and</u> STA to perform Att C due to not being able to validate the Heat Balance, inform her / him This completes the JPM. | Determines Heat Balance is not within the valid regions of any of the four methods.<br><br>Contacts Reactor Engineering and the STA to perform Attachment C |      |          |
|      | <b>EVALUATOR:</b><br>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?   |   |      |          |

\*Critical Step

#Critical Sequence

**TASK CONDITIONS**

A plant startup is in progress on Unit 1, and:

- APRMs indicate as follows: #1 89.9%, #2 90.1%, #3 92.2%, and #4 90.3%
- % Core Thermal Power (OD-3) is 90%
- LPRM arithmetic average from PI is 46.5
- HPTE pressure at entrance of the A Moisture Seperator (TEP02) is 187 psig
- HPTE pressure at entrance of the B Moisture Seperator (TEP03) is 188 psig
- Computer Point NBA14 is 93.026 %PWR
- Computer Point NBA15 is 93.329 %PWR
- Computer Point NBA16 is 94.7 %PWR
- Computer Point NBA17 is 93.16
- Computer Point NFA50 is 15.5011 MLBS/H

**INITIATING CUE**

Perform RE-1TP-026 Validation of Heat Balance. Determine what action, if any, is required.

**Document conclusions, as necessary, on this cue sheet:**

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VALIDATION/REVALIDATION OF HEAT BALANCE

4.2.1 % CTP by Heat Balance: 90 % Today's Current  
 Date Time

|         |   |                            |
|---------|---|----------------------------|
| 4.2.2.a | HPTE pressure to the A Moisture Separator (Computer Point TEP02): <u>187</u> psig   |                            |
| 4.2.2.c | Computer Point NBA14: <u>93.026</u> Alt. % CTP  |                            |
| 4.2.2.d | <b>Confirm</b> Power vs HPTE to the A Moisture Separator is within valid region <b>OR</b> % CTP is within $\pm 2\%$ of NBA14. | <u>See Note</u><br>Initial |
| 4.2.3.a | HPTE pressure to the B Moisture Separator (Computer Point TEP03): <u>188</u> psig   |                            |
| 4.2.3.c | Computer Point NBA15: <u>93.329</u> Alt. % CTP  |                            |
| 4.2.3.d | <b>Confirm</b> Power vs HPTE to the B Moisture Separator is within valid region <b>OR</b> % CTP is within $\pm 2\%$ of NBA15. | <u>See Note</u><br>Initial |
| 4.2.4.c | Arithmetic Average of LPRMs: <u>46.5</u>  |                            |
| 4.2.4.e | Computer Point NBA17: <u>93.16</u> Alt. % CTP   |                            |
| 4.2.4.f | <b>Confirm</b> Power vs LPRM Average is within valid region <b>OR</b> % CTP is within $\pm 2\%$ of NBA17.                     | <u>See Note</u><br>Initial |
| 4.2.5.a | FW Flow (Computer Point NFA50): <u>15.5011</u> MLBm/hr  |                            |
| 4.2.5.c | Computer Point NBA16: <u>94.7</u> Alt. % CTP  |                            |
| 4.2.5.d | <b>Confirm</b> Power vs FW Flow is within valid region <b>OR</b> % CTP is within $\pm 2\%$ of NBA16.                          | <u>See Note</u><br>Initial |

4.2.6 **Confirm** that the Heat Balance is within the valid regions ( $\pm 2\%$  CTP) of any one of the above four methods.

See Note  
Initial

4.2.6.a **Confirm** notification of Reactor Engineering **IF** unable to validate the Heat Balance.

Initials Here  
Initial

4.2.7 As Found APRM Channel Readings

APRM 1 89.9 APRM 3 92.2

APRM 2 90.1 APRM 4 90.3

Adds Note to indicate that the Heat Balance didn't meet any of the validations.

4.2.9 Final APRM Channel Readings

APRM 1 \_\_\_\_\_ APRM 3 \_\_\_\_\_

APRM 2 \_\_\_\_\_ APRM 4 \_\_\_\_\_

PPL SUSQUEHANNA, LLC  
JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

S/RO 45.ON.1829.101 1 12/4/10 Generic 2.1.25 3.9/4.2  
Appl. JPM Number Rev. Date NUREG 1123 K/A No. K/A Imp.  
To No. Sys. No.

Task Title: Implement ON-145-004, "Reactor Water Level Anomaly", Determine Cause For Erroneous RPV Water Level Indications, And Identify Required Tech Spec Actions

Completed By: Validated:  
P. Moran 12/20/10 *Paul J Moran* 12/28/10  
Writer Date Instructor/Writer Date

Approval:  
*m. [signature] for m.d. h.* 01/03/11  
Nuclear Trng. Supv. Date

RO: 25

SRO: 35

Date of Performance: \_\_\_\_\_ Validation Time (Min.) \_\_\_\_\_ Time Taken (Min.) \_\_\_\_\_

JPM Performed By: \_\_\_\_\_

Student Name: \_\_\_\_\_  
Last First M.I. Employee # / S.S. #

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name: \_\_\_\_\_  
Signature Typed or Printed

Comments:

REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 45.ON.1829.101

**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 PPL 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. ON-145-004, "RPV Water Level Anomaly" (Rev 18)
- B. ON-117-001, "Loss Of Instrument Bus" (Rev 31)
- C. Tech Spec 3.3.3.1, PAM Instrumentation (Rev 2), and Bases (Rev 8)

**III. OPERATIONAL ACTIVITIES**

None

**IV. TASK CONDITIONS**

- A. Unit 1 is in MODE 1 at full power.
- B. The following 1C601 RPV Water Level indicators are ENERGIZED, but indicate FULL DOWNSCALE:
  - LI-14201B Extended Range
  - LI-14201B Wide Range
  - LI-14203B Extended Range
  - LI-14203B Wide Range

C. The following 1C651 RPV Water Level indicators are ENERGIZED, but indicate FULL DOWNSCALE:

- LI-14201B1 Extended Range
- LI-14201B1 Wide Range

D. UR-14201B is ENERGIZED, but ALL THREE (3) parameters are indicating FULL DOWNSCALE.

- LT-14201B, RPV Wide Range Level
- PT-14201B, RPV Wide Range Pressure
- LT-14202B, RPV Fuel Zone Level

E. RPV Water Level has been verified to be +36" on narrow range instruments.

**V. INITIATING CUE**

Implement ON-145-004 "RPV Water Level Anomaly" to determine the cause of the erroneous RPV Water Level Indicators.

*SRO CANDIDATES ONLY:* Determine the required Tech Spec actions.

Document your results on the task condition sheet in the space provide on the task condition sheet.

**VI. TASK STANDARD**

Identify that the faulty instrument readings are due to Instrument Bus 1Y125 breaker 05 tripped or de-energized.

SRO Only; Determine that Tech Spec 3.3.3.1, action A is applicable.

**VI. TASK SAFETY SIGNIFICANCE**

Post accident monitoring instrumentation is required by technical specifications to be operable. The operability of PAM instrumentation ensures that there is sufficient information available on selected parameters to monitor and assess plant status and behavior following an accident.



PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 45.ON.1829.101 Student Name: \_\_\_\_\_

| Step | Action   | Standard                                   | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>EVALUATOR NOTE:</u></b><br/>                     This JPM may be performed in the Classroom, Simulator, or other similar environment.<br/>                     Ensure a copy of ON-145-004, "RPV Water Level Anomaly" (rev 18), and Unit 1 Tech Specs &amp; Bases are available for candidate use.</p> <p><b><u>EVALUATOR CUE:</u></b><br/>                     Read the Task Conditions (for the list of erroneous W/L indicators refer the candidate to the task condition sheet provided), and the initiating cue.<br/>                     Provide the task condition sheet to the candidate.</p> |  |      |          |
| 1.   | <p>Obtain a controlled copy of ON-145-004.</p> <p><b><u>EVALUATOR CUE:</u></b><br/>                     Provide a copy of ON-145-004</p>   | Controlled copy obtained.                  |      |          |
| 2.   | Review procedure Symptoms and Observations.  | Review procedure.                          |      |          |
| 3.   | Record Date/Time   | Record date and time in procedure step 3.1 |      |          |
| 4.   | Determine steps 3.2, 3.3, 3.4 not applicable.  | Mark steps 3.2, 3.3, 3.4 N/A.              |      |          |

PERFORMANCE CHECKLIST

Appl. To: S/RO      JPM No.: 45.ON.1829.101      Student Name: \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| 5.   | Refer to Attachment B per step 3.5.1.  | Determine step 3.5 is applicable, and refer to Attachment B to perform step 3.5.1.  |      |          |
| ★6.  | Check for instruments with common REFERENCE leg condensing chambers or excess flow check valves (3.5.1.a). | Evaluate failed instruments against Attachment B page 1 and 2 to determine if the instruments share a common REFERENCE leg or excess flow check valve.<br>Determine that these instruments DO NOT share these components. |      |          |
| ★7.  | Check for instruments with common VARIABLE leg supplies or excess flow check valves (3.5.1.b)              | Evaluate failed instruments against Attachment B page 1 and 2 to determine if the instruments share a common VARIABLE leg or excess flow check valve.<br>Determine that these instruments DO NOT share these components.  |      |          |

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 45.ON.1829.101 Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| ★8.  | Check for instruments with common POWER SUPPLIES (3.5.1.c)                                 | <p>Evaluate failed instruments against Attachment B page 1 and 2 to determine if the instruments share a common POWER SUPPLIES.</p> <p>Determine that ALL the erroneous RPV indicators are provided signals by transmitters PT-14201B, LT-14201B, LT-14202B and LT-14203B and ALL are powered by 1Y125 breaker 05.</p> |      |          |
| 9.   | Check for automatic actions and alarms.  | Evaluate Attachment B and determine that there are NO automatic actions or alarms associated with these instruments.   |      |          |
| 10.  | Evaluate level, if level <u>cannot</u> be determined to be $\geq +13$ ", Enter EO-100-102. | Determine that level can be determined to be $\geq +13$ " by referring to task conditions provided.  |      |          |

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 45.ON.1829.101 Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| 11.  | <p>Comply with TS 3.3.1.1, 3.3.2.2, 3.3.6.1, 3.3.6.2, 3.3.5.1, 3.3.4.2, 3.3.5.2</p> <p><b><u>EVALUATOR CUE:</u></b><br/>Acknowledge report of Tech Spec review requirement.<br/><b><i>FOR RO ONLY:</i></b> This completes the JPM, ensure results are entered on task condition sheet.</p> | <p>Inform Unit Supervisor to refer to Technical Specifications for the failed instruments.</p>   |      |          |
| *12. | <p><i>SRO Candidates ONLY:</i><br/>Obtain and evaluate Tech Specs</p>  | <p>Evaluate Tech Spec 3.3.3.1, "PAM Instrumentation", and determine that Condition A is applicable since there are less than the required number of operable channels of Wide Range Pressure, Wide Range Level, Extended Range Level, and Fuel Zone Level in accordance with Table 3.3.3.1-1 Functions 1, 2a, 2b and 2c; and the following action is required:</p> <p>Restore required channels to OPERABLE status within 30 days.</p> |      |          |

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 45.ON.1829.101 Student Name: \_\_\_\_\_

| Step | Action  | Standard | Eval | Comments |
|------|---|----------|------|----------|
|      | <b><u>EVALUATOR CUE:</u></b><br>This completes the JPM; ensure results are entered on task condition sheet. |          |      |          |
|      | <b><u>EVALUATOR:</u></b><br>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?           |          |      |          |

**TASK CONDITIONS**

- A. Unit 1 is in MODE 1 at full power.
- B. The following 1C601 RPV Water Level indicators are ENERGIZED, but indicate FULL DOWNSCALE:
  - LI-14201B Extended Range
  - LI-14201B Wide Range
  - LI-14203B Extended Range
  - LI-14203B Wide Range
- C. The following 1C651 RPV Water Level indicators are ENERGIZED, but indicate FULL DOWNSCALE:
  - LI-14201B1 Extended Range
  - LI-14201B1 Wide Range
- D. UR-14201B is ENERGIZED, but ALL THREE (3) parameters are indicating FULL DOWNSCALE:
  - LT-14201B, RPV Wide Range Level
  - PT-14201B, RPV Wide Range Pressure
  - LT-14202B, RPV Fuel Zone Level
- E. RPV Water Level has been verified to be +36" on narrow range instruments.

**INITIATING CUE**

Implement ON-145-004 "RPV Water Level Anomaly" to determine the cause of the erroneous RPV Water Level Indicators.

*SRO CANDIDATES ONLY:* Determine the required Tech Spec actions (if any).

Document your results on the task condition sheet in the space provided below.

**Cause for Erroneous Instrument Readings:**

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**SRO ONLY; Tech Spec Required Actions (If Any):**

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PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

|       |                |          |          |            |         |          |
|-------|----------------|----------|----------|------------|---------|----------|
| S/RO  | 78.AD.2319.102 | 1        | 12/23/10 | Generic    | 2.2.14  | 4.3/3.9  |
| Appl. | JPM Number     | Rev. No. | Date     | NUREG 1123 | K/A No. | K/A Imp. |
| To    |                |          |          | Sys. No.   |         |          |

Task Title: Perform LPRM Upscale Alarm Operability Tracking In Accordance With OI-078-001 and Determine Required Actions.

Completed By: \_\_\_\_\_ Validated \_\_\_\_\_

|          |          |                     |          |
|----------|----------|---------------------|----------|
| P. Moran | 12/23/10 | <i>Paul J Moran</i> | 12/28/10 |
| Writer   | Date     | Instructor/Writer   | Date     |

Approval: \_\_\_\_\_

|                     |          |
|---------------------|----------|
| <i>M. J. ...</i>    | 01/03/11 |
| Nuclear Trng. Supv. | Date     |

|                            |                              |                         |
|----------------------------|------------------------------|-------------------------|
| RO: 30                     |                              |                         |
| SRO: 40                    |                              |                         |
| Date of Performance: _____ | Validation Time (Min.) _____ | Time Taken (Min.) _____ |

JPM Performed By: \_\_\_\_\_

Student Name: \_\_\_\_\_

|      |       |      |                     |
|------|-------|------|---------------------|
| Last | First | M.I. | Employee # / S.S. # |
|------|-------|------|---------------------|

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name: \_\_\_\_\_

|           |                  |
|-----------|------------------|
| Signature | Typed or Printed |
|-----------|------------------|

Comments: \_\_\_\_\_

**REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 78.AD.2319.102**

**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 PPL 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. OI-078-001 LPRM STATUS CONTROL, (Rev. 11)
- B. TRM 3.3.9. rev 3
- C. LCO 3.3.1.1 rev 3

**III. OPERATIONAL ACTIVITIES**

This JPM satisfies the requirements of Operational Activity(s):

None

**IV. TASK CONDITIONS**

- A. Unit 1 is in MODE 1 at 80% power.
- B. APRM 2 is INOP and bypassed.
- C. APRM Gain Calibration was last performed 5 days ago.
- D. LPRM detector 40-57A caused a downscale alarm, I & C determined the detector failed, and Reactor Engineering requested bypassing the detector.
- E. The PCOP has just bypassed LPRM detector 40-57A in the lower relay room.

**V. INITIATING CUE**

Perform LPRM Upscale Alarm operability tracking for LPRM detector 40-57A in accordance with OI-078-001.



## **VI. TASK STANDARD**

For RO and SRO:

- Zone 8 is identified as having LESS THAN 50% upscale alarms operable.
- APRM Channel 1 determined to be INOPERABLE based on < 3 operable LPRM inputs to the "A" Level.

For SROs only:

- Determine that LCO 3.3.3.1 IS NOT MET for APRM required channels, and TS action A.1 is required; place channel in trip within 12 hours.
- Determine that TRO 3.1.3 is NOT MET for APRM rod block functions, and TRM actions B.2 is required; place at least 1 inop channel in trip condition 7 days.

## **VII. TASK SAFETY SIGNIFICANCE**

Operability of the APRM system and associated LPRM detectors provides the primary indication of neutron flux within the core and the resulting Reactor Protection System inputs.

## PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 78.AD.2319.102

Student Name: \_\_\_\_\_

| Step | Action   | Standard                                       | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>EVALUATOR NOTE:</u></b></p> <p>Ensure the following material is available to support performance of this JPM:</p> <ul style="list-style-type: none"> <li>• A working copy of rev 11 of OI-078-001.</li> </ul> <p><b>CAUTION: Ensure the answer key, which precedes the two Cue Sheet pages in the JPM package, is NOT given to the student.</b></p> <ul style="list-style-type: none"> <li>• Previously filled out Attachments A -D (with zone 8 having exactly 50% operable LPRM upscale alarms.)</li> <li>• Blank copy of attachments A - D.</li> <li>• A copy of SO-100-008</li> </ul> |  |      |          |
|      | <p><b><u>EVALUATOR CUE:</u></b></p> <p>To begin this JPM, provide the candidate with:</p> <ul style="list-style-type: none"> <li>• Task Conditions and Initiating Cue Sheet</li> <li>• Working copy of OI-078-001, and blank attachments A - D</li> <li>• Previously filled out attachments A - D</li> </ul>   |  |      |          |
| 1.   | <p>Obtain a controlled copy of procedure.<br/>(Provided with initiating cue)</p>   | <p>Controlled copy of OI-078-001 obtained.</p> |      |          |

\*Critical Step

#Critical Sequence

Page 3 of 7

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 78.AD.2319.102

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| 2.   | Refer to correct section.  | Refer to section 4.  |      |          |
| 3.   | Determine current LPRM status.   | Refer to the previously completed copy of Attachments A & B.   |      |          |
| 4.   | Complete new Attachment A.   | Enter 1 for Unit.<br>Transfer the previous LPRM data to the new Attachment A   |      |          |
| 5.   | Enter a check (√) in column (2) for LPRM alarms determined inoperable or bypassed for all other reasons. | Place a checkmark in column 2 adjacent to LPRM detector 40-57A in Zone 8.  |      |          |
| *6.  | Determine if ≥50% of LPRM Upscale alarms in each zone are operable.                                      | Consider all LPRM Upscale Alarms with a check in column (1) or (2) of Attachment A as inoperable, and evaluate the number of inoperable LPRMs for each zone.<br><br>Circle YES for zone 1, 2, 3, 4, 5, 6, 7, and 9.<br><br>Conclude that there are LESS THAN 50% operable LPRMs in zone 8, AND circle NO for zone 8. |      |          |
| 7.   | Notify Reactor Engineering of all LPRM upscale alarms determined inoperable.                             | N/A<br><br>Previously stated in JPM task conditions.   |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 78.AD.2319.102

Student Name: \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
| 8.   | Evaluate the need to place placard to 1C651 indicating < required # of LPRM Upscale Alarms.<br><br><u>(requires completion of Attachments C &amp; D, which appears in Step 11, below.)</u>                              | Determine that placard is NOT required.  |      |          |
| *9.  | Complete an LPRM vs. APRM/LPRM Group Status Control Log (Attachment B) each time LPRM operability status is changed.<br><br>Circle all inoperable LPRM's on LPRM vs. APRM/LPRM Group Status Control Log (Attachment B). | Transfer the previous LPRM data to the new Attachment B.<br><br>Circle LPRM detector 40-57A for APRM 1, under the column 'A' Level, and enter today's date.  |      |          |
| *10. | Refer to weekly surveillance SO-100-008 to confirm APRM operability requirements maintained.  | Compare the following criteria to current APRM/LPRM operability status: <ul style="list-style-type: none"> <li>• ≥ 20 total operable LPRMs per APRM channel</li> <li>• ≥ 3 LPRM inputs per level (A, B, C, or D)</li> <li>• ≤ 9 LPRMs inop since last APRM gain calibration (after date provided in task conditions)</li> </ul> Determine that APRM channel 1 does NOT meet operability requirements due to LESS THAN 3 operable level "A" LPRMs.<br><br>(The only operable Level A LPRMs in APRM 1 are 40-17A and 08-49A) |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 78.AD.2319.102

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| 11   | Identifies Inoperable OPRM cells.  | <p>Transfers the previous LPRM data to the new Attachment C and circles "A LEVEL" for LPRM 40-57. Determines it inputs to APRM1 Cell 03</p> <p>Transfers the previous LPRM data to the new Attachment D and circles LPRM 40-57A in the Cell 03 row, in the LPRM#2 column.</p> <p>Determines OPRM cell remains operable due to at least two operable LPRMs.</p>   |      |          |
|      | <p><b><u>EVALUATOR CUE FOR ROs:</u></b></p> <p>This completes the JPM</p>  |  |      |          |
| 12.  | <p><b>SRO ONLY PORTION</b></p> <p><b><u>EVALUATOR NOTE:</u></b></p> <p>Direct the SRO candidate to determine actions required (if any).</p> <p>Evaluate Tech Spec 3.3.1.1 for RPS Instrumentation and TR 3.1.3 for Control Rod Block Instrumentation</p> | <p>Refer to Tech Spec 3.3.1.1 and determine that a minimum of 3 operable APRM channels are required in MODE 1 per table 3.3.1.1-1, therefore action A.1 is required; place channel in trip within 12 hours.</p> <p>Refer to TRM 3.1.3 and determine that a minimum of 3 operable APRM channels are required in MODE 1 per table 3.1.3-1, therefore action B.2 is required; place 1 channel in tripped condition within 7 days.</p> |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 78.AD.2319.102

Student Name: \_\_\_\_\_

| Step | Action  | Standard | Eval | Comments |
|------|---|----------|------|----------|
|      | <p><b><u>EVALUATOR CUE FOR SROs:</u></b><br/>This completes the JPM.</p>                                      |          |      |          |
|      | <p><b><u>EVALUATOR:</u></b><br/>Do you have ALL your JPM exam materials?<br/>Task Cue Sheets? Procedures?</p> |          |      |          |

\*Critical Step

#Critical Sequence

# JPM Key

(next 11 pages)

**Do Not Provide To  
Student**

(They are given the 11 pages that follow the  
2<sup>nd</sup> cue sheet.)

LPRM UPSCALE ALARM STATUS CONTROL LOG

UNIT 1

As least 50%  
 LPRMs  
 Operable per  
 Zone (Circle  
 YES or NO)

|        | (1)    | (2) | (1)    | (2) | (1)    | (2) | (1)    | (2) | (1)    | (2) | (1)    | (2) |        |   |        |        |        |  |          |
|--------|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|---|--------|--------|--------|--|----------|
| Zone 1 | 16-49A |     | 16-41A |     | 24-49A |     | 24-41A |     | 16-49B | √   | 16-41B |     | 24-49B |   | 24-41B |        |        |  | (YES/NO) |
|        | 16-49C |     | 16-41C | √   | 24-49C | √   | 24-41C |     |        |     |        |     |        |   |        |        |        |  |          |
| Zone 2 | 40-49A | √   | 40-41A | √   | 48-49A |     | 48-41A |     | 40-49B |     | 40-41B |     | 48-49B | √ | 48-41B | √      |        |  | (YES/NO) |
|        | 40-49C | √   | 40-41C | √   | 48-49C |     | 48-41C |     |        |     |        |     |        |   |        |        |        |  |          |
| Zone 3 | 16-17A |     | 16-25A |     | 24-17A |     | 24-25A |     | 16-17B |     | 16-25B |     | 24-17B |   | 24-25B |        |        |  | (YES/NO) |
|        | 16-17C |     | 16-25C |     | 24-17C |     | 24-25C |     |        |     |        | √   |        |   |        |        |        |  |          |
| Zone 4 | 40-17A |     | 40-25A |     | 48-17A |     | 48-25A |     | 40-17B |     | 40-25B |     | 48-17B |   | 48-25B |        |        |  | (YES/NO) |
|        | 40-17C |     | 40-25C |     | 48-17C |     | 48-25C |     |        |     |        |     | √      |   |        |        |        |  |          |
| Zone 5 | 24-33A |     | 32-25A |     | 32-33A |     | 32-41A |     | 24-33B |     | 32-25B |     | 32-33B |   | 32-41B |        | 40-33A |  | (YES/NO) |
|        | 24-33C |     | 32-25C |     | 32-33C |     | 32-41C |     |        |     |        |     |        | √ |        | 40-33B |        |  |          |
| Zone 6 | 16-09A |     | 24-09A |     | 32-09A |     | 40-09A |     | 16-09B |     | 24-09B |     | 32-09B |   | 40-09B |        | 32-17A |  | (YES/NO) |
|        | 16-09C |     | 24-09C | √   | 32-09C |     | 40-09C |     |        |     |        |     | √      |   | 40-09C | √      | 32-17B |  |          |
| Zone 7 | 08-17A | √   | 08-25A | √   | 08-33A |     | 08-41A |     | 08-17B |     | 08-25B |     | 08-33B |   | 08-41B |        | 16-33A |  | (YES/NO) |
|        | 08-17C |     | 08-25C |     | 08-33C | √   | 08-41C |     |        |     |        |     |        | √ | 08-41C |        | 16-33B |  |          |
| Zone 8 | 24-57A |     | 32-57A |     | 40-57A |     | 32-49A |     | 24-57B |     | 32-57B |     | 40-57B |   | 32-49B |        | 32-57C |  | (YES/NO) |
|        | 24-57C | √   | 32-57C |     | 40-57C |     | 32-49C |     |        |     |        |     |        | √ | 32-49C | √      |        |  |          |
| Zone 9 | 48-33A |     | 56-25A |     | 56-33A |     | 56-41A |     | 48-33B |     | 56-25B |     | 56-33B |   | 56-41B |        | 48-33C |  | (YES/NO) |
|        | 48-33C |     | 56-25C |     | 56-33C |     | 56-41C |     |        |     |        |     | √      |   | 56-41C |        |        |  |          |

LPRM Upscale Alarm Status Assessment Complete

Only an SRO signs here / ##/##/## / ####  
 Shift Supervision / Date / Time



LPRM vs. APRM Status Control Log  
(Inoperable LPRM's are circled)

| UNIT <u>1</u> or 2 (Circle Unit) | LPRM LOCATIONS |            |          |            |          |            |          |            |
|----------------------------------|----------------|------------|----------|------------|----------|------------|----------|------------|
| APRM CHANNEL                     | A LEVEL        | Date inop. | B LEVEL  | Date inop. | C LEVEL  | Date inop. | D LEVEL  | Date inop. |
| APRM1                            | (56-33A)       | 04/05/10   | (32-09B) | 06/15/10   | (08-33C) | 11/02/10   | 32-57D   |            |
|                                  | (40-49A)       | 06/10/10   | 16-25B   |            | 40-33C   |            | (16-41D) | 03/05/10   |
|                                  | 40-17A         |            | 16-57B   |            | 24-17C   |            | 48-09D   |            |
|                                  | (24-33A)       | 07/08/10   | 48-25B   |            | (24-49C) | 03/10/10   | 32-25D   |            |
|                                  | (08-17A)       | 09/10/10   | (32-41B) | 07/07/10   | 56-17C   |            | 16-09D   |            |
|                                  | 08-49A         |            | 32-33B   |            | 56-25C   |            | 48-41D   |            |
|                                  | (08-25A)       | 05/29/10   | 16-17B   |            | (40-41C) | 05/06/10   | (32-49D) | 05/07/10   |
|                                  | (40-57A)       | TO/DA/Y    | (16-49B) | 09/16/10   | 24-25C   |            | 32-17D   |            |
|                                  | (24-41A)       | 04/20/10   | 48-17B   |            | (24-57C) | 12/01/10   | 48-33D   |            |
|                                  | (24-09A)       | 10/26/10   | (48-49B) | 10/31/10   | 08-41C   |            | 16-33D   |            |
|                                  | (56-41A)       | 07/11/10   |          |            | (40-09C) | 10/25/10   |          |            |
|                                  | (40-25A)       | 09/09/10   |          |            |          |            |          |            |
|                                  | APRM2          | 32-57A     |          | 56-33B     |          | 32-09C     |          | 08-33D     |
| 16-41A                           |                |            | 40-17B   |            | 32-41C   |            | 24-17D   |            |
| 48-41A                           |                |            | 08-49B   |            | (16-25C) | 05/01/10   | 56-17D   |            |
| 32-25A                           |                |            | 40-49B   |            | 16-57C   |            | (40-33D) | 07/09/10   |
| 16-09A                           |                |            | (24-33B) | 08/08/10   | (48-25C) | 04/11/10   | 24-49D   |            |
| (48-09A)                         |                | 05/10/10   | 08-17B   |            | 56-41C   |            | 32-33D   |            |
| 08-41A                           |                |            | 32-17B   |            | 40-25C   |            | 48-49D   |            |
| 24-25A                           |                |            | (32-49B) | 05/07/10   | 24-09C   |            | 48-17D   |            |
| 40-09A                           |                |            | 16-33B   |            | 24-41C   |            | 16-17D   |            |
| 24-57A                           |                |            | 48-33B   |            | 40-57C   |            | (16-49D) | 09/10/10   |
| 56-25A                           |                |            |          |            | 08-25C   |            |          |            |
| 40-41A                           |                |            |          |            |          |            |          |            |
| APRM3                            | 08-33A         |            | (32-57B) | 06/05/10   | (56-33C) | 08/29/10   | 32-09D   |            |
|                                  | 24-49A         |            | 48-41B   |            | (24-33C) | 08/08/10   | 48-25D   |            |
|                                  | 24-17A         |            | 16-41B   |            | 40-49C   |            | (16-25D) | 08/12/10   |
|                                  | 40-33A         |            | 48-09B   |            | 08-17C   |            | 16-57D   |            |
|                                  | (56-17A)       | 04/01/10   | 32-25B   |            | 08-49C   |            | 32-41D   |            |
|                                  | 32-33A         |            | 16-09B   |            | 40-17C   |            | (08-25D) | 09/05/10   |
|                                  | 16-17A         |            | 56-25B   |            | (32-49C) | 05/07/10   | 24-41D   |            |
|                                  | 48-17A         |            | 40-41B   |            | 32-17C   |            | 24-09D   |            |
|                                  | 48-49A         |            | 24-57B   |            | 48-33C   |            | 56-41D   |            |
|                                  | 16-49A         |            | 24-25B   |            | 16-33C   |            | 40-57D   |            |
|                                  |                |            | 08-41B   |            |          |            | 40-25D   |            |
|                                  |                |            | 40-09B   |            |          |            |          |            |

LPRM vs. APRM Status Control Log  
 (Inoperable LPRM's are circled)

| UNIT <u>1</u> or 2 (Circle Unit) |               | LPRM LOCATIONS |               |          |        |  |               |          |
|----------------------------------|---------------|----------------|---------------|----------|--------|--|---------------|----------|
| APRM4                            | 32-09A        |                | 08-33B        |          | 32-57C |  | 56-33D        |          |
|                                  | 16-25A        |                | 24-49B        |          | 32-25C |  | 40-49D        |          |
|                                  | 48-25A        |                | 24-17B        |          | 16-41C |  | <u>08-17D</u> | 08/11/10 |
|                                  | 32-41A        |                | <u>56-17B</u> | 04/01/10 | 48-41C |  | 24-33D        |          |
|                                  | 16-57A        |                | 40-33B        |          | 16-09C |  | 08-49D        |          |
|                                  | 32-17A        |                | 56-41B        |          | 48-09C |  | 40-17D        |          |
|                                  | <u>32-49A</u> | 05/07/10       | 40-25B        |          | 32-33C |  | 08-41D        |          |
|                                  | 16-33A        |                | 24-41B        |          | 16-49C |  | <u>40-09D</u> | 04/12/10 |
|                                  | 48-33A        |                | 08-25B        |          | 48-49C |  | 24-25D        |          |
|                                  |               |                | <u>40-57B</u> | 05/30/10 | 16-17C |  | 56-25D        |          |
|                                  |               |                | 24-09B        |          | 48-17C |  | <u>24-57D</u> | 05/06/10 |
|                                  |               |                |               |          |        |  | 40-41D        |          |

LPRM Operability Assessment Complete

Only SROs sign here  
 Shift Supervision

/ ##/##/## /  
 Date

####  
 Time

| LPRM vs. OPRM Status |   |   |   |   |
|----------------------|---|---|---|---|
| LPRM                 | OPRM Cells (APRM/OPRM - Cell)           |   |   |   |
| 08-17                | A LEVEL<br>APRM1-Cell 21                | B LEVEL<br>2-21                         | C LEVEL<br>3-21                         | D LEVEL<br>4-21                         |
| 08-25                | A LEVEL<br>1-15<br>1-21                 | B LEVEL<br>4-15<br>4-21                 | C LEVEL<br>2-15<br>2-21                 | D LEVEL<br>3-15<br>3-21                 |
| 08-33                | A LEVEL<br>3-09<br>3-15                 | B LEVEL<br>4-09<br>4-15                 | C LEVEL<br>1-09<br>1-15                 | D LEVEL<br>2-09<br>2-15                 |
| 08-41                | A LEVEL<br>2-04<br>2-09                 | B LEVEL<br>3-04<br>3-09                 | C LEVEL<br>1-04<br>1-09                 | D LEVEL<br>4-04<br>4-09                 |
| 08-49                | A LEVEL<br>1-04                         | B LEVEL<br>2-04                         | C LEVEL<br>3-04                         | D LEVEL<br>4-04                         |
| 16-09                | A LEVEL<br>2-27                         | B LEVEL<br>3-27                         | C LEVEL<br>4-27                         | D LEVEL<br>1-27                         |
| 16-17                | A LEVEL<br>3-21<br>3-22<br>3-27         | B LEVEL<br>1-21<br>1-22<br>1-27         | C LEVEL<br>4-21<br>4-22<br>4-27         | D LEVEL<br>2-21<br>2-22<br>2-27         |
| 16-25                | A LEVEL<br>4-15<br>4-16<br>4-21<br>4-22 | B LEVEL<br>1-15<br>1-16<br>1-21<br>1-22 | C LEVEL<br>2-15<br>2-16<br>2-21<br>2-22 | D LEVEL<br>3-15<br>3-16<br>3-21<br>3-22 |
| 16-33                | A LEVEL<br>4-09<br>4-10<br>4-15<br>4-16 | B LEVEL<br>2-09<br>2-10<br>2-15<br>2-16 | C LEVEL<br>3-09<br>3-10<br>3-15<br>3-16 | D LEVEL<br>1-09<br>1-10<br>1-15<br>1-16 |
| 16-41                | A LEVEL<br>2-04<br>2-05<br>2-09<br>2-10 | B LEVEL<br>3-04<br>3-05<br>3-09<br>3-10 | C LEVEL<br>4-04<br>4-05<br>4-09<br>4-10 | D LEVEL<br>1-04<br>1-05<br>1-09<br>1-10 |
| 16-49                | A LEVEL<br>3-01<br>3-04<br>3-05         | B LEVEL<br>1-01<br>1-04<br>1-05         | C LEVEL<br>4-01<br>4-04<br>4-05         | D LEVEL<br>2-01<br>2-04<br>2-05         |
| 16-57                | A LEVEL<br>4-01                         | B LEVEL<br>1-01                         | C LEVEL<br>2-01                         | D LEVEL<br>3-01                         |
| 24-09                | A LEVEL<br>1-27<br>1-28                 | B LEVEL<br>4-27<br>4-28                 | C LEVEL<br>2-27<br>2-28                 | D LEVEL<br>3-27<br>3-28                 |
| 24-17                | A LEVEL<br>3-22<br>3-23<br>3-27<br>3-28 | B LEVEL<br>4-22<br>4-23<br>4-27<br>4-28 | C LEVEL<br>1-22<br>1-23<br>1-27<br>1-28 | D LEVEL<br>2-22<br>2-23<br>2-27<br>2-28 |

| LPRM vs. OPRM Status |                               |         |         |         |
|----------------------|-------------------------------|---------|---------|---------|
| LPRM                 | OPRM Cells (APRM/OPRM - Cell) |         |         |         |
| 24-25                | A LEVEL                       | B LEVEL | C LEVEL | D LEVEL |
|                      | APRM2-Cell16                  | 3-16    | 1-16    | 4-16    |
|                      | 2-17                          | 3-17    | 1-17    | 4-17    |
|                      | 2-22                          | 3-22    | 1-22    | 4-22    |
|                      | 2-23                          | 3-23    | 1-23    | 4-23    |
| 24-33                | A LEVEL                       | B LEVEL | C LEVEL | D LEVEL |
|                      | 1-10                          | 2-10    | 3-10    | 4-10    |
|                      | 1-11                          | 2-11    | 3-11    | 4-11    |
|                      | 1-16                          | 2-16    | 3-16    | 4-16    |
|                      | 1-17                          | 2-17    | 3-17    | 4-17    |
| 24-41                | A LEVEL                       | B LEVEL | C LEVEL | D LEVEL |
|                      | 1-05                          | 4-05    | 2-05    | 3-05    |
|                      | 1-06                          | 4-06    | 2-06    | 3-06    |
|                      | 1-10                          | 4-10    | 2-10    | 3-10    |
|                      | 1-11                          | 4-11    | 2-11    | 3-11    |
| 24-49                | A LEVEL                       | B LEVEL | C LEVEL | D LEVEL |
|                      | 3-01                          | 4-01    | 1-01    | 2-01    |
|                      | 3-02                          | 4-02    | 1-02    | 2-02    |
|                      | 3-05                          | 4-05    | 1-05    | 2-05    |
|                      | 3-06                          | 4-06    | 1-06    | 2-06    |
| 24-57                | A LEVEL                       | B LEVEL | C LEVEL | D LEVEL |
|                      | 2-01                          | 3-01    | 1-01    | 4-01    |
|                      | 2-02                          | 3-02    | 1-02    | 4-02    |
| 32-09                | A LEVEL                       | B LEVEL | C LEVEL | D LEVEL |
|                      | 4-28                          | 1-28    | 2-28    | 3-28    |
|                      | 4-29                          | 1-29    | 2-29    | 3-29    |
| 32-17                | A LEVEL                       | B LEVEL | C LEVEL | D LEVEL |
|                      | 4-23                          | 2-23    | 3-23    | 1-23    |
|                      | 4-24                          | 2-24    | 3-24    | 1-24    |
|                      | 4-28                          | 2-28    | 3-28    | 1-28    |
|                      | 4-29                          | 2-29    | 3-29    | 1-29    |
| 32-25                | A LEVEL                       | B LEVEL | C LEVEL | D LEVEL |
|                      | 2-17                          | 3-17    | 4-17    | 1-17    |
|                      | 2-18                          | 3-18    | 4-18    | 1-18    |
|                      | 2-23                          | 3-23    | 4-23    | 1-23    |
|                      | 2-24                          | 3-24    | 4-24    | 1-24    |
| 32-33                | A LEVEL                       | B LEVEL | C LEVEL | D LEVEL |
|                      | 3-11                          | 1-11    | 4-11    | 2-11    |
|                      | 3-12                          | 1-12    | 4-12    | 2-12    |
|                      | 3-17                          | 1-17    | 4-17    | 2-17    |
|                      | 3-18                          | 1-18    | 4-18    | 2-18    |
| 32-41                | A LEVEL                       | B LEVEL | C LEVEL | D LEVEL |
|                      | 4-06                          | 1-06    | 2-06    | 3-06    |
|                      | 4-07                          | 1-07    | 2-07    | 3-07    |
|                      | 4-11                          | 1-11    | 2-11    | 3-11    |
|                      | 4-12                          | 1-12    | 2-12    | 3-12    |
| 32-49                | A LEVEL                       | B LEVEL | C LEVEL | D LEVEL |
|                      | 4-02                          | 2-02    | 3-02    | 1-02    |
|                      | 4-03                          | 2-03    | 3-03    | 1-03    |
|                      | 4-06                          | 2-06    | 3-06    | 1-06    |
|                      | 4-07                          | 2-07    | 3-07    | 1-07    |

| LPRM vs. OPRM Status |                               |                |                |         |
|----------------------|-------------------------------|----------------|----------------|---------|
| LPRM                 | OPRM Cells (APRM/OPRM - Cell) |                |                |         |
| 32-57                | A LEVEL                       | <u>B LEVEL</u> | C LEVEL        | D LEVEL |
|                      | APRM2-Cell 02                 | 3-02           | 4-02           | 1-02    |
|                      | 2-03                          | 3-03           | 4-03           | 1-03    |
| 40-09                | A LEVEL                       | B LEVEL        | <u>C LEVEL</u> | D LEVEL |
|                      | 2-29                          | 3-29           | 1-29           | 4-29    |
|                      | 2-30                          | 3-30           | 1-30           | 4-30    |
| 40-17                | A LEVEL                       | B LEVEL        | C LEVEL        | D LEVEL |
|                      | 1-24                          | 2-24           | 3-24           | 4-24    |
|                      | 1-25                          | 2-25           | 3-25           | 4-25    |
|                      | 1-29                          | 2-29           | 3-29           | 4-29    |
|                      | 1-30                          | 2-30           | 3-30           | 4-30    |
| 40-25                | <u>A LEVEL</u>                | B LEVEL        | C LEVEL        | D LEVEL |
|                      | 1-18                          | 4-18           | 2-18           | 3-18    |
|                      | 1-19                          | 4-19           | 2-19           | 3-19    |
|                      | 1-24                          | 4-24           | 2-24           | 3-24    |
|                      | 1-25                          | 4-25           | 2-25           | 3-25    |
| 40-33                | A LEVEL                       | B LEVEL        | C LEVEL        | D LEVEL |
|                      | 3-12                          | 4-12           | 1-12           | 2-12    |
|                      | 3-13                          | 4-13           | 1-13           | 2-13    |
|                      | 3-18                          | 4-18           | 1-18           | 2-18    |
|                      | 3-19                          | 4-19           | 1-19           | 2-19    |
| 40-41                | <u>A LEVEL</u>                | B LEVEL        | <u>C LEVEL</u> | D LEVEL |
|                      | 2-07                          | 3-07           | 1-07           | 4-07    |
|                      | 2-08                          | 3-08           | 1-08           | 4-08    |
|                      | 2-12                          | 3-12           | 1-12           | 4-12    |
|                      | 2-13                          | 3-13           | 1-13           | 4-13    |
| 40-49                | <u>A LEVEL</u>                | B LEVEL        | <u>C LEVEL</u> | D LEVEL |
|                      | 1-03                          | 2-03           | 3-03           | 4-03    |
|                      | 1-07                          | 2-07           | 3-07           | 4-07    |
|                      | 1-08                          | 2-08           | 3-08           | 4-08    |
| 40-57                | <u>A LEVEL</u>                | <u>B LEVEL</u> | C LEVEL        | D LEVEL |
|                      | 1-03                          | 4-03           | 2-03           | 3-03    |
| 48-09                | A LEVEL                       | B LEVEL        | C LEVEL        | D LEVEL |
|                      | 2-30                          | 3-30           | 4-30           | 1-30    |
| 48-17                | A LEVEL                       | B LEVEL        | C LEVEL        | D LEVEL |
|                      | 3-25                          | 1-25           | 4-25           | 2-25    |
|                      | 3-26                          | 1-26           | 4-26           | 2-26    |
|                      | 3-30                          | 1-30           | 4-30           | 2-30    |
| 48-25                | A LEVEL                       | B LEVEL        | <u>C LEVEL</u> | D LEVEL |
|                      | 4-19                          | 1-19           | 2-19           | 3-19    |
|                      | 4-20                          | 1-20           | 2-20           | 3-20    |
|                      | 4-25                          | 1-25           | 2-25           | 3-25    |
|                      | 4-26                          | 1-26           | 2-26           | 3-26    |
| 48-33                | A LEVEL                       | B LEVEL        | C LEVEL        | D LEVEL |
|                      | 4-13                          | 2-13           | 3-13           | 1-13    |
|                      | 4-14                          | 2-14           | 3-14           | 1-14    |
|                      | 4-19                          | 2-19           | 3-19           | 1-19    |
|                      | 4-20                          | 2-20           | 3-20           | 1-20    |

| LPRM vs. OPRM Status |                               |                |                |         |
|----------------------|-------------------------------|----------------|----------------|---------|
| LPRM                 | OPRM Cells (APRM/OPRM - Cell) |                |                |         |
| 48-41                | A LEVEL                       | <u>B LEVEL</u> | C LEVEL        | D LEVEL |
|                      | APRM2-Cell 08                 | 3-08           | 4-08           | 1-08    |
|                      | 2-13                          | 3-13           | 4-13           | 1-13    |
|                      | 2-14                          | 3-14           | 4-14           | 1-14    |
| 48-49                | A LEVEL                       | <u>B LEVEL</u> | C LEVEL        | D LEVEL |
|                      | 3-08                          | 1-08           | 4-08           | 2-08    |
| 56-17                | A LEVEL                       | B LEVEL        | C LEVEL        | D LEVEL |
|                      | 3-26                          | 4-26           | 1-26           | 2-26    |
| 56-25                | A LEVEL                       | B LEVEL        | C LEVEL        | D LEVEL |
|                      | 2-20                          | 3-20           | 1-20           | 4-20    |
|                      | 2-26                          | 3-26           | 1-26           | 4-26    |
| 56-33                | <u>A LEVEL</u>                | B LEVEL        | <u>C LEVEL</u> | D LEVEL |
|                      | 1-14                          | 2-14           | 3-14           | 4-14    |
|                      | 1-20                          | 2-20           | 3-20           | 4-20    |
| 56-41                | <u>A LEVEL</u>                | B LEVEL        | C LEVEL        | D LEVEL |
|                      | 1-14                          | 4-14           | 2-14           | 3-14    |

| OPRM Status Control Log  |               |               |               |               |
|--|---------------|---------------|---------------|---------------|
| OPRM Cell Assignments for APRM 1   |               |               |               |               |
| LPRM(s): <u>40-57A</u> (to be bypassed)  |               |               |               |               |
| Impacted Cell(s): <u>3</u> (from Attachment C)   |               |               |               |               |
| Operable Cells: <u>24</u> (from ODA STABILITY display)   |               |               |               |               |
| Circle LPRMs inoperable in cell with LPRM(s) to be bypassed (already and one to be bypassed).  |               |               |               |               |
| CELL ID:   | LPRM #1       | LPRM #2       | LPRM #3       | LPRM #4       |
| 01   | 16-57B        | <u>24-57C</u> | <u>24-49C</u> | <u>16-49B</u> |
| 02   | <u>24-57C</u> | 32-57D        | 32-49D        | <u>24-49C</u> |
| 03   | 32-57D        | <u>40-57A</u> | 40-49A        | 32-49D        |
| 04   | 08-49A        | <u>16-49B</u> | 16-41D        | 08-41C        |
| 05   | <u>16-49B</u> | <u>24-49C</u> | <u>24-41A</u> | 16-41D        |
| 06   | <u>24-49C</u> | 32-49D        | <u>32-41B</u> | <u>24-41A</u> |
| 07   | 32-49D        | <u>40-49A</u> | <u>40-41C</u> | <u>32-41B</u> |
| 08   | <u>40-49A</u> | <u>48-49B</u> | 48-41D        | <u>40-41C</u> |
| 09   | 08-41C        | 16-41D        | 16-33D        | <u>08-33C</u> |
| 10   | 16-41D        | <u>24-41A</u> | <u>24-33A</u> | 16-33D        |
| 11   | <u>24-41A</u> | <u>32-41B</u> | 32-33B        | <u>24-33A</u> |
| 12   | <u>32-41B</u> | <u>40-41C</u> | 40-33C        | 32-33B        |
| 13   | <u>40-41C</u> | 48-41D        | 48-33D        | 40-33C        |
| 14   | 48-41D        | <u>56-41A</u> | <u>56-33A</u> | 48-33D        |
| 15   | <u>08-33C</u> | 16-33D        | 16-25B        | <u>08-25A</u> |
| 16   | 16-33D        | <u>24-33A</u> | 24-25C        | 16-25B        |
| 17   | <u>24-33A</u> | 32-33B        | 32-25D        | 24-25C        |
| 18   | 32-33B        | 40-33C        | <u>40-25A</u> | 32-25D        |
| 19   | 40-33C        | 48-33D        | 48-25B        | <u>40-25A</u> |
| 20   | 48-33D        | <u>56-33A</u> | 56-25C        | 48-25B        |
| 21   | <u>08-25A</u> | 16-25B        | 16-17B        | <u>08-17A</u> |
| 22   | 16-25B        | 24-25C        | 24-17C        | 16-17B        |
| 23   | 24-25C        | 32-25D        | 32-17D        | 24-17C        |
| 24   | 32-25D        | <u>40-25A</u> | 40-17A        | 32-17D        |
| 25   | <u>40-25A</u> | 48-25B        | 48-17B        | 40-17A        |
| 26   | 48-25B        | 56-25C        | 56-17C        | 48-17B        |
| 27   | 16-17B        | 24-17C        | 24-09A        | 16-09D        |
| 28   | 24-17C        | 32-17D        | <u>32-09B</u> | 24-09A        |
| 29   | 32-17D        | 40-17A        | <u>40-09C</u> | <u>32-09B</u> |
| 30   | 40-17A        | 48-17B        | 48-09D        | <u>40-09C</u> |
| <p>If bypassing LPRM will results in &lt; 2 LPRMs operable in impacted cell, the cell will become inoperable once the LPRM is bypassed.</p> <p><b>Inoperable Cells due to bypassing LPRM(s): None</b></p> <p><b>Operable Cells: <u>24</u></b> (following bypass of LPRM(s))</p> <p>If &lt;22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s).</p> |               |               |               |               |

| OPRM Cell Assignments for APRM 2  |         |         |         |         |
|---|---------|---------|---------|---------|
| LPRM(s): <u>40-57A</u> to be bypassed)  |         |         |         |         |
| Impacted Cell(s): <u>None</u> (from Attachment C)   |         |         |         |         |
| Operable Cells: <u>30</u> (from ODA STABILITY display)  |         |         |         |         |
| Circle LPRMs inoperable in cell with LPRM(s) to be bypassed (already and one to be bypassed).   |         |         |         |         |
| CELL ID:  | LPRM #1 | LPRM #2 | LPRM #3 | LPRM #4 |
| 1   | 16-57C  | 24-57A  | 24-49D  | 16-49D  |
| 2   | 24-57A  | 32-57A  | 32-49B  | 24-49D  |
| 3   | 32-57A  | 40-57C  | 40-49B  | 32-49B  |
| 4   | 08-49B  | 16-49D  | 16-41A  | 08-41A  |
| 5   | 16-49D  | 24-49D  | 24-41C  | 16-41A  |
| 6   | 24-49D  | 32-49B  | 32-41C  | 24-41C  |
| 7   | 32-49B  | 40-49B  | 40-41A  | 32-41C  |
| 8   | 40-49B  | 48-49D  | 48-41A  | 40-41A  |
| 9   | 08-41A  | 16-41A  | 16-33B  | 08-33D  |
| 10  | 16-41A  | 24-41C  | 24-33B  | 16-33B  |
| 11  | 24-41C  | 32-41C  | 32-33D  | 24-33B  |
| 12  | 32-41C  | 40-41A  | 40-33D  | 32-33D  |
| 13  | 40-41A  | 48-41A  | 48-33B  | 40-33D  |
| 14  | 48-41A  | 56-41C  | 56-33B  | 48-33B  |
| 15  | 08-33D  | 16-33B  | 16-25C  | 08-25C  |
| 16  | 16-33B  | 24-33B  | 24-25A  | 16-25C  |
| 17  | 24-33B  | 32-33D  | 32-25A  | 24-25A  |
| 18  | 32-33D  | 40-33D  | 40-25C  | 32-25A  |
| 19  | 40-33D  | 48-33B  | 48-25C  | 40-25C  |
| 20  | 48-33B  | 56-33B  | 56-25A  | 48-25C  |
| 21  | 08-25C  | 16-25C  | 16-17D  | 08-17B  |
| 22  | 16-25C  | 24-25A  | 24-17D  | 16-17D  |
| 23  | 24-25A  | 32-25A  | 32-17B  | 24-17D  |
| 24  | 32-25A  | 40-25C  | 40-17B  | 32-17B  |
| 25  | 40-25C  | 48-25C  | 48-17D  | 40-17B  |
| 26  | 48-25C  | 56-25A  | 56-17D  | 48-17D  |
| 27  | 16-17D  | 24-17D  | 24-09C  | 16-09A  |
| 28  | 24-17D  | 32-17B  | 32-09C  | 24-09C  |
| 29  | 32-17B  | 40-17B  | 40-09A  | 32-09C  |
| 30  | 40-17B  | 48-17D  | 48-09A  | 40-09A  |
| <p>If bypassing LPRM will results in &lt; 2 LPRMs operable in impacted cell, the cell will become inoperable once the LPRM is bypassed.</p> <p><b>Inoperable Cells due to bypassing LPRM(s): None</b></p> <p><b>Operable Cells: 30</b> (following bypass of LPRM(s))</p> <p>If &lt;22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s).</p> |         |         |         |         |



| OPRM Cell Assignments for APRM 3  |         |         |         |         |
|---|---------|---------|---------|---------|
| LPRM(s): <u>40-57A</u> to be bypassed)  |         |         |         |         |
| Impacted Cell(s): <u>None</u> (from Attachment C)   |         |         |         |         |
| Operable Cells: <u>29</u> (from ODA STABILITY display)  |         |         |         |         |
| Circle LPRMs inoperable in cell with LPRM(s) to be bypassed (already and one to be bypassed). |         |         |         |         |
| CELL ID:  | LPRM #1 | LPRM #2 | LPRM #3 | LPRM #4 |
| 1   | 16-57D  | 24-57B  | 24-49A  | 16-49A  |
| 2   | 24-57B  | 32-57B  | 32-49C  | 24-49A  |
| 3   | 32-57B  | 40-57D  | 40-49C  | 32-49C  |
| 4   | 08-49C  | 16-49A  | 16-41B  | 08-41B  |
| 5   | 16-49A  | 24-49A  | 24-41D  | 16-41B  |
| 6   | 24-49A  | 32-49C  | 32-41D  | 24-41D  |
| 7   | 32-49C  | 40-49C  | 40-41B  | 32-41D  |
| 8   | 40-49C  | 48-49A  | 48-41B  | 40-41B  |
| 9   | 08-41B  | 16-41B  | 16-33C  | 08-33A  |
| 10  | 16-41B  | 24-41D  | 24-33C  | 16-33C  |
| 11  | 24-41D  | 32-41D  | 32-33A  | 24-33C  |
| 12  | 32-41D  | 40-41B  | 40-33A  | 32-33A  |
| 13  | 40-41B  | 48-41B  | 48-33C  | 40-33A  |
| 14  | 48-41B  | 56-41D  | 56-33C  | 48-33C  |
| 15  | 08-33A  | 16-33C  | 16-25D  | 08-25D  |
| 16  | 16-33C  | 24-33C  | 24-25B  | 16-25D  |
| 17  | 24-33C  | 32-33A  | 32-25B  | 24-25B  |
| 18  | 32-33A  | 40-33A  | 40-25D  | 32-25B  |
| 19  | 40-33A  | 48-33C  | 48-25D  | 40-25D  |
| 20  | 48-33C  | 56-33C  | 56-25B  | 48-25D  |
| 21  | 08-25D  | 16-25D  | 16-17A  | 08-17C  |
| 22  | 16-25D  | 24-25B  | 24-17A  | 16-17A  |
| 23  | 24-25B  | 32-25B  | 32-17C  | 24-17A  |
| 24  | 32-25B  | 40-25D  | 40-17C  | 32-17C  |
| 25  | 40-25D  | 48-25D  | 48-17A  | 40-17C  |
| 26  | 48-25D  | 56-25B  | 56-17A  | 48-17A  |
| 27  | 16-17A  | 24-17A  | 24-09D  | 16-09B  |
| 28  | 24-17A  | 32-17C  | 32-09D  | 24-09D  |
| 29  | 32-17C  | 40-17C  | 40-09B  | 32-09D  |
| 30  | 40-17C  | 48-17A  | 48-09B  | 40-09B  |

If bypassing LPRM will results in < 2 LPRMs operable in impacted cell, the cell will become inoperable once the LPRM is bypassed.

Inoperable Cells due to bypassing LPRM(s): None .

Operable Cells: 29 (following bypass of LPRM(s))

If <22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s).

| <b>OPRM Cell Assignments for APRM 4</b>   |          |                     |          |             |
|---|----------|---------------------|----------|-------------|
| <b>LPRM(s):</b> <u>40-57A</u> (to be bypassed)  |          |                     |          |             |
| <b>Impacted Cell(s):</b> <u>None</u> (from Attachment C)  |          |                     |          |             |
| <b>Operable Cells:</b> <u>30</u> (from ODA STABILITY display)   |          |                     |          |             |
| Circle LPRMs inoperable in cell with LPRM(s) to be bypassed (already and one to be bypassed).   |          |                     |          |             |
| CELL ID:  | LPRM #1  | LPRM #2             | LPRM #3  | LPRM #4     |
| 1   | 16-57A   | 24-57D              | 24-49B   | 16-49C      |
| 2   | 24-57D   | 32-57C              | (32-49A) | 24-49B      |
| 3   | 32-57C   | (40-57B)            | 40-49D   | (32-49A)    |
| 4   | 08-49D   | 16-49C              | (16-41C) | 08-41D      |
| 5   | 16-49C   | 24-49B              | 24-41B   | (16-41C)    |
| 6   | 24-49B   | (32-49A)            | 32-41A   | 24-41B      |
| 7   | (32-49A) | 40-49D              | 40-41D   | 32-41A      |
| 8   | 40-49D   | 48-49C              | 48-41C   | 40-41D      |
| 9   | 08-41D   | (16-41C)            | 16-33A   | 08-33B      |
| 10  | (16-41C) | 24-41B              | 24-33D   | 16-33A      |
| 11  | 24-41B   | 32-41A              | 32-33C   | 24-33D      |
| 12  | 32-41A   | 40-41D              | 40-33B   | 32-33C      |
| 13  | 40-41D   | 48-41C              | 48-33A   | 40-33B      |
| 14  | 48-41C   | 56-41B              | 56-33D   | 48-33A      |
| 15  | 08-33B   | 16-33A              | 16-25A   | 08-25B      |
| 16  | 16-33A   | 24-33D              | 24-25D   | 16-25A      |
| 17  | 24-33D   | 32-33C              | 32-25C   | 24-25D      |
| 18  | 32-33C   | 40-33B              | 40-25B   | 32-25C      |
| 19  | 40-33B   | 48-33A              | 48-25A   | 40-25B      |
| 20  | 48-33A   | 56-33D              | 56-25D   | 48-25A      |
| 21  | 08-25B   | 16-25A              | 16-17C   | 08-17D      |
| 22  | 16-25A   | 24-25D              | 24-17B   | 16-17C      |
| 23  | 24-25D   | 32-25C              | 32-17A   | 24-17B      |
| 24  | 32-25C   | 40-25B              | 40-17D   | 32-17A      |
| 25  | 40-25B   | 48-25A              | 48-17C   | 40-17D      |
| 26  | 48-25A   | 56-25D              | 56-17B   | 48-17C      |
| 27  | 16-17C   | 24-17B              | 24-09B   | 16-09C      |
| 28  | 24-17B   | 32-17A              | 32-09A   | 24-09B      |
| 29  | 32-17A   | 40-17D              | 40-09D   | 32-09A      |
| 30  | 40-17D   | 48-17C              | 48-09C   | 40-09D      |
| If bypassing LPRM will results in < 2 LPRMs operable in impacted cell, the cell will become inoperable once the LPRM is bypassed.<br><b>Inoperable Cells due to bypassing LPRM(s):</b> <u>0</u> .<br><b>Operable Cells:</b> <u>30</u> (following bypass of LPRM(s))<br>If <22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s).<br>If <22 cells remain operable, the OPRM will become inoperable following bypass of LPRM(s). |          |                     |          |             |
| OPRM Operability Assessment Complete  |          | Only SROs sign here | /        | ###/###/### |
|   |          | Shift Supervision   | /        | ####        |
|   |          |                     | Date     | Time        |

### **TASK CONDITIONS**

- A. Unit 1 is in MODE 1 at 80% power.
- B. APRM 2 is INOP and bypassed
- C. APRM Gain Calibration was last performed 5 days ago.
- D. LPRM detector 40-57A caused a downscale alarm, I & C determined the detector failed, and Reactor Engineering requested bypassing the detector.
- E. The PCOP has just bypassed LPRM detector 40-57A in the lower relay room.

### **INITIATING CUE**

Perform LPRM Upscale Alarm operability tracking for LPRM detector 40-57A in accordance with OI-078-001.

### **TASK CONDITIONS**

- A. Unit 1 is in MODE 1 at 80% power.
- B. APRM 2 is INOP and bypassed
- C. APRM Gain Calibration was last performed 5 days ago.
- D. LPRM detector 40-57A caused a downscale alarm, I & C determined the detector failed, and Reactor Engineering requested bypassing the detector.
- E. The PCOP has just bypassed LPRM detector 40-57A in the lower relay room.

### **INITIATING CUE**

Perform LPRM Upscale Alarm operability tracking for LPRM detector 40-57A in accordance with OI-078-001.

PPL SUSQUEHANNA, LLC  
JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

SRO 00.AD.1018.001 1 12/23/10 Generic 2.3.11 4.3  
Appl. JPM Number Rev. Date NUREG 1123 K/A No. K/A Imp.  
To No. Sys. No.

Task Title: Respond to SGTS Exhaust High Radiation While Purging Primary Containment.

Completed By: P. Moran 12/23/10 Validated: *P. Moran* 12/28/10  
Writer Date Instructor/Writer Date

Approval: *Maryanne Form Diltz* 01/03/11  
Nuclear Trng. Supv. Date

Date of Performance: \_\_\_\_\_ Validation Time (Min.) 15 Time Taken (Min.) \_\_\_\_\_

JPM Performed By: \_\_\_\_\_

Student Name: \_\_\_\_\_  
Last First M.I. Employee # / S.S. #

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name: \_\_\_\_\_  
Signature Typed or Printed

Comments: \_\_\_\_\_

REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
SRO 00.AD.1018.001

**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 PPL 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. ON-070-001, "Abnormal Gaseous Radiation Release/Cam Alarms" Rev 16
- B. NDAP-QA-0309, "Primary Containment Access and Control", rev 26
- C. Tech Spec 3.3.6.1, "Primary Containment Isolation Instrumentation", rev 4
- D. TRM 3.6.1, "Containment Venting and Purging", rev 0
- E. OP-173-001, "Containment Atmosphere Control System", rev 38
- F. AR-016-001, "D/G D, ESW, RWMU, AND MISC LOAD CENTER 0C653", Rev 44
- G. AR-015-001, "13.8/4 KV SWITCHGEAR DISTRIBUTION AND DIESEL GENERATORS A, B, & C 0C653", rev 3

### III. OPERATIONAL ACTIVITIES

None

### IV. TASK CONDITIONS

- A. Unit 1 is in Mode 3.
- B. Suppression Chamber purge is being conducted in preparation for containment entry using the "B" SGTS Train.
- C. Annunciator AR-016-001 (C13), "CONTROL STRUCTURE PANEL 1C605 HI RADIATION" has illuminated, and the Standby Gas Treatment Room Area Radiation Monitor indicates 15 mR/hr, up slow
- D. The PCOP reports the following conditions:
  - 1. Radiation Recorder RR-D12-0R609, SGTS Exhaust Rad Monitors;
    - a. Channel A is 35 mR/hr, up slow
    - b. Channel B is 34 mR/hr, up slow
  - 2. Suppression Chamber purge in progress, SGTS B flow is steady at 10,100 scfm,.

### V. INITIATING CUE

Respond to the above conditions and determine what actions are required, if any. Document any actions required on the Task Condition sheet provided.

### VI. TASK STANDARD

- Determine that BOTH SGTS Exhaust Rad Monitors have exceeded their Hi-Hi radiation setpoints and failed to initiate the required Containment Atmosphere Control system isolation; AND that CAC should be isolated, and SGTS secured.
- Determine that the B SGTS room should be evacuated due to radiation conditions.
- Evaluate TS 3.3.6.1, and determine that BOTH SGTS Exhaust Radiation Monitors are required to be operable while purging containment in Mode 3, and:
  - BOTH failed channels must be placed in TRIP per TS LCO 3.3.6.1 action A.1 within 24 hours.
  - Automatic functions with isolation capability not maintained, the isolation capability must be restored per TS LCO 3.3.6.1 action B.1 within 1 hour.
- Evaluate TRM 3.6.1, and determine that Primary Containment Purge must be suspended IMMEDIATELY per action A.1, and NDAP-QA-0309.

**VII. TASK SAFETY SIGNIFICANCE**

High SGTS exhaust radiation indicates possible gross failure of the fuel cladding.



PERFORMANCE CHECKLIST

Appl. To: SRO JPM No.: 00.AD.1018.001 Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>EVALUATOR NOTE:</u></b><br/>                     This JPM should be performed in the classroom or similar environment.<br/>                     Ensure copies of the following are available for candidate use:</p> <ul style="list-style-type: none"> <li>• Unit 1 Tech Specs</li> <li>• Unit 1 TRM,</li> <li>• NDAP-QA-0309</li> <li>• ON-070-001</li> <li>• AR-015-001 (H01)</li> <li>• AR-016-001 (C13)</li> </ul> <p><b><u>EVALUATOR CUE:</u></b><br/>                     To begin this JPM, provide the candidate with the Task Conditions/Initiating Cue sheet.</p> <p>The steps of this JPM may be performed in any order.</p> |  |      |          |
| *1.  | Refer to AR-016-001 (C13), "Control Structure Panel 1C605 Hi Radiation", and evacuate B SGTS room.   | Refer to AR-016-001 (C13) and determine that the SGTS B room should be evacuated.<br><br>Document on task condition sheet. |      |          |

PERFORMANCE CHECKLIST

Appl. To: SRO JPM No.: 00.AD.1018.001 Student Name: \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
| *2.  | Recognize SGTS failure to isolate on Hi-Hi exhaust radiation. | <p>Determine that current SGTS exhaust rad levels exceed the isolation setpoint of 23 mR/hr (31 mR/hr TS allowable) and that SGTS and CAC are still in service as indicated by 10,100 scfm system flow.</p> <p>Determine that Containment Atmosphere Control should be manually isolated.</p> <p>Document on task condition sheet.</p> |      |          |
| 3.   | Enter ON-070-001.   | <p>Obtain and refer to ON-070-001, "Abnormal Gaseous Radiation Release/Cam Alarms". Start the standby SGTS train and stop the operating SGTS train.</p> <p>Document on task condition sheet</p>  |      |          |

PERFORMANCE CHECKLIST

Appl. To: SRO JPM No.: 00.AD.1018.001 Student Name: \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| *4.  | Evaluate Tech Spec 3.3.6.1   | Refer to TS 3.3.6.1 and determine:<br>- that action A.1 is required since BOTH required channels are inoperable, and must be placed in TRIP within 24 hours (function 2.e)<br>- that action B.1 is required with automatic functions with isolation capability not maintained, restore within 1 hour<br><br>Document on Task Condition sheet. |      |          |
| 5.   | Obtain and refer to NDAP-QA-0309 section 6.2.  | Obtain and refer to NDAP-QA-0309, section 6.2.  |      |          |
| *6.  | Determine that BOTH SGTS Exhaust Radiation High trips are required to be operable for containment purge in Mode 3. | Review step 6.2.3 and determine that insufficient SGTS Exhaust Rad Monitors are available to continue containment purge, and TRM 3.6.1 should be evaluated.<br><br>Document on Task Condition sheet.  |      |          |

PERFORMANCE CHECKLIST

Appl. To: SRO JPM No.: 00.AD.1018.001 Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
| *7.  | Evaluate TRM 3.6.1  | Refer to TRM 3.6.1, and determine that action A.1 is required with less than the minimum number of SGTS Exhaust High Radiation isolation channels operable, and primary containment purging must be immediately suspended.<br><br>Document on Task Condition sheet. |      |          |
|      | <b><u>EVALUATOR:</u></b><br>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures? |   |      |          |

**TASK CONDITIONS**

- A. Unit 1 is in Mode 3.
- B. Suppression Chamber purge is in progress in preparation for containment entry using the "B" SGTS Train.
- C. Annunciator AR-016-001 (C13), "CONTROL STRUCTURE PANEL 1C605 HI RADIATION" has illuminated, and the Standby Gas Treatment Room Area Radiation Monitor indicates 15 mR/hr, up slow
- D. The PCOP reports the following conditions:
  - 1. Radiation Recorder RR-D12-0R609, SGTS Exhaust Rad Monitors;
    - a. Channel A reads 35 mR/hr, up slow
    - b. Channel B reads 34 mR/hr, up slow
  - 2. SGTS B flow is 10,100 scfm, steady

**INITIATING CUE**

Respond to the above conditions and determine what actions are required, if any. Document any actions required on the Task Condition sheet provided.

**Required Action(s) (if any):**

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**THIS JPM IS COMPLETE WHEN YOUR CONCLUSIONS ARE DOCUMENTED ABOVE.**

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

SRO 00.EP.001.087 0 11/3/10 Generic 2.4.44 4.0  
Appl. JPM Number Rev. No. Date NUREG 1123 K/A No. K/A Imp.  
To Sys. No.

Task Title: Classify A Site Area Emergency Under Shutdown Conditions And Complete The  
Emergency Notification Report; Upgrade To A General Emergency And Make Protective  
Action Recommendations

Completed By: Tracy North 11/3/10 Validated M. Jacopetti 11/27/10  
Writer Date Instructor/Writer Date

Approval: M. Jacopetti for M.D.B. 11/3/10  
Nuclear Trng. Supv. Date

Time Critical #1: 15 Time Critical #1: \_\_\_\_\_  
Time Critical #2: 15 Time Critical #2: \_\_\_\_\_  
Time Critical #3: 15 Time Critical #3: \_\_\_\_\_

Date of Performance: \_\_\_\_\_ Validation Time (Min.) \_\_\_\_\_ Time Taken (Min.) \_\_\_\_\_

JPM Performed By:

Candidate Name: \_\_\_\_\_  
Last First M.I. Employee # / S.S. #

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name: \_\_\_\_\_  
Signature Typed or Printed

Comments:

REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
SRO 00.EP.001.087

**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 PPL 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, Revision 26
- B. EP-PS-100, Tab E, Revision 28
- C. Emergency Plan – Units 1 and 2
- D. EP-TP-001, Emergency Classification Level Manual, Revision 3
- E. EP-TP-001, Section C, Revision 3

**III. OPERATIONAL ACTIVITIES**

None

**IV. TASK CONDITIONS**

- A. Unit 1 in Mode 4.
- B. "A" RHR Pump is in service for Shutdown Cooling.
- C. A rigging incident inside the Containment resulted in damage to Recirc Loop 'A' suction piping causing a rapid reduction in RPV level.
- D. Division 2 Core Spray and LPCI are injecting full flow.
- E. Primary Containment was evacuated and the personnel hatch is closed with interlocks maintained prior to and during the transient.
- F. RPV level has been stabilized at -168 inches Fuel Zone.
- G. Secondary Containment pressure is -0.28 inches WG with Standby Gas Treatment in service.

**V. INITIATING CUE**

Classify the Event, and implement the Emergency Plan as the Control Room Emergency Director in accordance with EP-PS-100.

**VI. TASK STATEMENT**

- A. Declaration of a Site Area Emergency based on classification CS4 within 15 minutes.
- B. Declaration of a General Emergency based on classification CG4 within 15 minutes of second set of conditions.
- C. Make Protective Action Recommendation (PAR) [evacuate 0 to 2 miles, shelter 2 to 10 miles, and advise citizens take KI per state plans] within 15 minutes of declaring a General Emergency.

**VII. TASK SAFETY SIGNIFICANCE**

Proper Emergency Plan implementation is required to provide reasonable assurance that public health and safety is not endangered by operation of the facility, and that adequate protective measures can and will be taken in the event of an emergency.  
[10CFR50.47(c)(1)(iii)]



## PERFORMANCE CHECKLIST

Appl. To/JPM No.: SRO 00.EP.001.086

Candidate  
Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
|      | <p><b><u>EVALUATOR CUE:</u></b><br/>To begin this JPM provide the candidate with CUE SHEET#1:</p> <ul style="list-style-type: none"> <li>• When the candidate is ready to begin the JPM, inform the candidate that this is a TIME CRITICAL JPM.</li> </ul> <p>Record START TIME _____</p>   |   |      |          |
| * 1. | <p>Classify the emergency as conditions indicate.</p> <p><b><u>EVALUATOR CUE:</u></b><br/>If asked, conditions have not changed.</p> <p><b><u>EVALUATOR NOTE:</u></b><br/>When candidate declares the initial EAL classification,<br/>Record TIME _____</p> <p><b>Time to determine correct EAL must be within 15 minutes of START TIME</b></p> | <p>Evaluate updated information.</p> <p>Review Emergency Classification Level Manual, EP-TP-001.</p> <p>Declare a SITE AREA EMERGENCY in accordance with Classification CS4 (&lt; -161" with Secondary Containment)</p> |      |          |

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
| 2.   | Refer to EP-PS-100, "Emergency Director, Control Room; Emergency-Plan Position Specific Instruction"  | Obtain a copy of EP-PS-100 and refer to tab D, Manage the SITE AREA EMERGENCY.  |      |          |
| 3.   | Document and communicate the emergency classification.  | Announce to Control Room personnel<br><br>1) Assuming duties of Emergency Director<br><br>2) Emergency Classification<br><br>3) Time and Date of Classification |      |          |
| 4.   | Appoint E-Plan Communicator.<br><br><u><b>EVALUATOR CUE:</b></u><br>Acknowledge the appointment of the E-Plan Communicator, when given the ENR form indicate that the E-Plan Communicator will transmit the form. | Appoint E-Plan Communicator.<br><br>Instruct E-Plan Communicator to immediately perform EP-PS-126.  |      |          |
| 5.   | Appoint NRC Communicator.<br><br><u><b>EVALUATOR CUE:</b></u><br>Acknowledge the appointment of the NRC Communicator.   | Appoint NRC Communicator.<br><br>Instruct NRC Communicator to perform EP-PS-135, NRC Communicator.  |      |          |

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
| *6.  | <p>Generate and approve ENR Form for transmittal.</p> <p><b><u>EVALUATOR CUE:</u></b><br/>           If JPM is not performed in the simulator, when requested, inform the student that:</p> <ul style="list-style-type: none"> <li>• Wind Direction is 210 degrees</li> <li>• Wind Speed is 5 mph</li> </ul> <p>If performed in the Simulator, student should use current PICSY data.</p> | <p>Fill out ENR Form from Tab 9 and authorizes Form for transmittal.</p> <p>Review ENR Form with E-Plan Communicator prior to transmittal.</p>   |      |          |
|      | <p><b><u>EVALUATOR CUE:</u></b></p> <ol style="list-style-type: none"> <li>1. Inform the student that no further EP-PS-100 actions are required with respect to the previous classification.</li> <li>2. Provide candidate with CUE SHEET #2.</li> <li>3. Record START TIME _____</li> </ol>  |  |      |          |
| *7.  | <p>Refer to EP-TP-001 and evaluate the impact of new conditions.</p> <p><b><u>EVALUATOR NOTE:</u></b><br/>           When candidate identifies the upgrade EAL classification<br/>           Record TIME _____</p> <p><b>Time to determine correct EAL must be within 15 minutes of START TIME noted in 3., above.</b></p>  | <p>Refer to EP-TP-001 Category C, and determine that the HPCI blowout panel failure renders Secondary Containment NOT established and water level has been &lt; -161 inches for &gt;30 mins, AND an escalation to GENERAL EMERGENCY CG4 is now required;</p> <p>EP-PS-100 tab E must now be implemented.</p> |      |          |

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
| *8.  | Generate and approve ENR Form for transmittal.<br><br><u><b>EVALUATOR CUE:</b></u><br>If JPM is not performed in the simulator, when requested, inform the student that: <ul style="list-style-type: none"> <li>• Wind Direction is 205 degrees</li> <li>• Wind Speed is 7 mph</li> </ul> If performed in the Simulator, student should use current PICSY data. | Fill out ENR Form from Tab 9 and authorizes Form for transmittal.<br><br>Review ENR Form with E-Plan Communicator prior to transmittal. |      |          |
| 9.   | Refer to EP-PS-100  | Refer to EP-PS-100 tab E and determine that a PAR must also be performed in accordance with EP-PS-100-6                                 |      |          |
|      | <u><b>EVALUATOR CUE:</b></u><br>After the candidate determines a PAR is required, direct the candidate to determine the correct PAR for current plant conditions  |   |      |          |

|             |  |   |  |  |
|-------------|--|---|--|--|
| <p>*10.</p> | <p>Perform EP-PS-100 Tab 5, "PPL Emergency Dose Assessment and Protective Action Recommendation (PAR) Guide"</p> <p><b><u>EVALUATOR CUE:</u></b><br/>When asked, inform student that a valid offsite dose projection is <u>NOT</u> available yet.</p> <p><b><u>EVALUATOR NOTE:</u></b><br/>When candidate completes PAR and indicates need to transmit it to the Senior State Official:<br/>Record TIME _____</p> <p><b>Time to determine PAR must be within 15 minutes of General Emergency declaration time noted in Step 7.</b></p> | <p>Refer to EP-PS-100 Tab 5 and determine:</p> <ul style="list-style-type: none"> <li>• PA-2: Has a GE been declared? <b>YES</b></li> <li>• PA-3: Release via controlled direct containment vent &lt; 1 hr? <b>NO</b></li> <li>• PA-6: Valid Dose projection? <b>NO</b></li> <li>• Per PA-7:             <ul style="list-style-type: none"> <li>• <b>Evacuate 0-2 miles</b></li> <li>• <b>Shelter 2-10 miles</b></li> <li>• <b>Citizens take KI per state plans</b></li> </ul> </li> </ul> <p>Notify Senior State Official, using PAR State Notification Form, at 717-651-2148.</p> |  |  |
|             | <p><b><u>EVALUATOR CUE:</u></b><br/>When student indicates need to transmit PAR to Senior State Official, inform student "This completes the JPM."</p>   |   |  |  |
|             | <p><b><u>EVALUATOR:</u></b><br/>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?</p>  |   |  |  |

\*Critical Step

#Critical Sequence

00.EP.001.087  
Site Area Emergency **KEY**

FOR TRAINING USE ONLY

Tab 9  
EP-PS-100-9

**EMERGENCY NOTIFICATION REPORT**

Control # CR-1

1. Call Status:  **THIS IS A DRILL**       **THIS IS AN ACTUAL EVENT**

2. This is: \_\_\_\_\_ at PPL Susquehanna, LLC  
(Communicator's Name)

My telephone number is: 570-542 3  
570-759 4  
(Callback telephone number)

Notification time is: \_\_\_\_\_  
(Time notification initiated)

3. **EMERGENCY CLASSIFICATION:**

UNUSUAL EVENT

ALERT

The event has been terminated.

**SITE AREA EMERGENCY**

**GENERAL EMERGENCY**

UNIT:  ONE  
 TWO  
 ONE & TWO

Declaration Time: <TIME>  
(Time classification/  
termination declared)

DATE: <DATE>  
(Date classification/  
termination declared)

THIS REPRESENTS A/AN:

INITIAL DECLARATION  
 ESCALATION  
 NO CHANGE

} **IN CLASSIFICATION STATUS**

4. The Classification Designation is: CS4

**BRIEF NON-TECHNICAL DESCRIPTION OF THE:**

**EMERGENCY EVENT** (Initial declaration and escalations) OR

**OTHER SIGNIFICANT EVENT** (No change in emergency classification or classification time)

CS4-Plant operators have indications of a drop in water level inside the [Unit 1 ~~or Unit 2~~] reactor that could affect their ability to cool the reactor and keep the uranium fuel covered. The unit had been shut down prior to the event and remains shut down.

5. THERE IS:  NO

AN AIRBORNE

A LIQUID

} **RADIOLOGICAL RELEASE IN PROGRESS DUE TO THE EVENT**

A Rad Release is in Progress if: in the judgment of ED/RM radioactive material is being released to the environment or into an area of the plant that will result in a release to the environment that is a result of the event. Example conditions that result in a rad release: Fuel Clad Barrier AND Containment Barrier LOSS, RCS Barrier AND Containment Barrier LOSS, RG1, RS1, RA1, RU1, MU7, SGBT initiation on RB Vent hi-rad, an increase in the detected gaseous radiation effluents that is a result of the event, or any radioactive liquid released beyond the Protected Area that is a result of the event.

6. WIND DIRECTION IS 205 °. WIND SPEED IS: 7 mph. (Data from 10 meter meteorological tower, available on PICSY.)

(OR PICSY VALUES)

7. REPEAT:  **THIS IS A DRILL**       **THIS IS AN ACTUAL EVENT**

(When communicating form, request a repeat back by one of the agencies.)

APPROVED: <SIGN>  
(ED, RM, or EOFSS)

Time: <time>  
(Time form approved)

Date: <DATE>  
(Date form approved)

**KEY**

00-EP-001.087  
General Emergency  
Upgrade.

KEY FOR TRAINING USE ONLY

Tab 9  
EP-PS-100-9

### EMERGENCY NOTIFICATION REPORT

Control # CR-2

1. Call Status:  **THIS IS A DRILL**       **THIS IS AN ACTUAL EVENT**

2. This is: \_\_\_\_\_ at PPL Susquehanna, LLC  
(Communicator's Name)

My telephone number is: 570-542 3  
570-759 4  
(Callback telephone number)

Notification time is: \_\_\_\_\_  
(Time notification initiated)

3. **EMERGENCY CLASSIFICATION:**

- UNUSUAL EVENT
- ALERT
- The event has been terminated.
- SITE AREA EMERGENCY
- GENERAL EMERGENCY**

UNIT:  ONE      Declaration Time: <time>      DATE: <Date>  
 TWO      (Time classification/termination declared)      (Date classification/termination declared)  
 ONE & TWO

THIS REPRESENTS A/AN:  INITIAL DECLARATION } IN CLASSIFICATION STATUS  
 **ESCALATION**  
 NO CHANGE

4. The Classification Designation is: CG4

**BRIEF NON-TECHNICAL DESCRIPTION OF THE:**

- EMERGENCY EVENT** (Initial declaration and escalations) OR
- OTHER SIGNIFICANT EVENT**

[Empty box for description]

CG4-The water level inside the [Unit 1 or Unit 2] reactor has dropped and does not completely cover the uranium fuel. The unit had been shut down prior to the event and remains shut down. Protective actions will be recommended for the public.

5. THERE IS:  No } **RADIOLOGICAL RELEASE IN PROGRESS DUE TO THE EVENT**  
 AN AIRBORNE  
 A LIQUID

A Rad Release is in Progress if: in the judgment of ED/RM radioactive material is being released to the environment or into an area of the plant that will result in a release to the environment that is a result of the event. Example conditions that result in a rad release; Fuel Clad Barrier AND Containment Barrier LOSS, RCS Barrier AND Containment Barrier LOSS, RG1, RS1, RA1, RU1, MU7, SBTG initiation on RB Vent hi-rad, an increase in the detected gaseous radiation effluents that is a result of the event, or any radioactive liquid released beyond the Protected Area that is a result of the event.

6. WIND DIRECTION IS 205°. WIND SPEED IS: 7 mph (OR PICSY VALUES)  
(Data from 10 meter meteorological tower, available on PICSY.)

7. REPEAT:  **THIS IS A DRILL**       **THIS IS AN ACTUAL EVENT**

(When communicating form, request a repeat back by one of the agencies.)

APPROVED: <SIGN>      Time: <TIME>      Date: <DATE>  
(ED, RM, or EOFSS)      (Time form approved)      (Date form approved)

KEY

00 EP.001.087  
PAR

KEY FOR TRAINING USE ONLY

Tab 9  
EP-PS-100-9

PROTECTIVE ACTION RECOMMENDATION STATE NOTIFICATION FORM

- THIS IS A DRILL
- THIS IS AN ACTUAL EVENT

(This form is to be used to communicate PPL's Protective Action to the senior state official at 717-651-2148.)

1. This is <NAME> of the Susquehanna Steam Electric Station.  
(Fill in your name)

- 2. I am the:  Emergency Director at the Susquehanna SES Control Room
- Emergency Director at the Technical Support Center
- Recovery Manager at the Emergency Operations Facility

3. I am about to provide a Protective Action Recommendation. Do I have the Senior State Official on the line?

Name \_\_\_\_\_

4. A General Emergency has been declared as of <time of GE declaration>

5. This declaration was made due to:

CG4

6. The PPL Susquehanna Protective Action Recommendation is:

- Shelter in a 2 mile radius and 5 miles downwind (specify sector \_\_\_\_\_) and advise the general public in the sheltered areas to take KI in accordance with the state's emergency plans. Advise remainder of the EPZ to monitor EAS messages.
- Evacuate 0-10 miles and advise citizens to take KI in accordance with the state's emergency plans.
- Evacuate 0-2 miles and shelter 2-10 miles and advise citizens to take KI in accordance with the state's emergency plans.
- Divert Danville drinking water supply from the Susquehanna River.
- Evacuate beyond 10 miles (specify distance \_\_\_\_\_) and advise citizens to take KI in accordance with the state's emergency plans.

7. The wind direction is from: 205° and wind speed is: 7 mph (OR PICSY VALUES)

8. Date/Time: <date/time>

KEY



## **CUE SHEET #1:**

### **TASK CONDITIONS**

- A. Unit 1 in Mode 4.
- B. "A" RHR Pump is in service for Shutdown Cooling.
- C. A rigging incident inside the Containment resulted in damage to Recirc Loop 'A' suction piping causing a rapid reduction in RPV level.
- D. Division 2 Core Spray and LPCI are injecting full flow.
- E. Primary Containment was evacuated and the personnel hatch is closed with interlocks maintained prior to and during the transient.
- F. RPV level has been stabilized at -168 inches Fuel Zone.
- G. Secondary Containment pressure is -0.28 inches WG with Standby Gas Treatment in service.

### **INITIATING CUE**

Classify the Event, and implement the Emergency Plan as the Control Room Emergency Director in accordance with EP-PS-100.

**CUE SHEET #2: (Do not provide until directed to by JPM.)**

1. At time T= 40 minutes,
  - It has just been discovered by an NPO that the Unit 1 HPCI blowout panel has been dislodged and the HPCI room is open to outside atmosphere.
  - The Standby Gas Treatment system is now maintaining Secondary Containment at  $-0.16$  inches WG.
  
2. Assuming the other initial conditions are still valid, determine if this new condition will affect the current EAL classification, AND if so perform any other additional actions that may be required.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

S/RO 00.AD.3246.052 1 12/9/10 Generic 2.1.5 2.9/3.9  
Appl. JPM Number Rev. Date NUREG 1123 K/A No. K/A Imp.  
To No. Sys. No.

Task Title: Evaluate Overtime Request With Respect to Work Hour Limits per NDAP-QA-0025

Completed By: P. Moran 12/20/10 Paul Moran 12/20/10  
Writer Date Instructor/Writer Date

Approval: M. Diltz 01/03/11  
Nuclear Trng. Supv. Date

20  
Date of Performance: Validation Time (Min.) Time Taken (Min.)

JPM Performed By:

Student Name: Last First M.I. Employee # / S.S. #

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name: Signature Typed or Printed

Comments:

REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 00.AD.3246.052

**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 PPL 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-0025, Work Hour Limits for Station Staff, rev 8
- B. 10CFR26.205, Work Hours

**III. OPERATIONAL ACTIVITIES**

None

**IV. TASK CONDITIONS**

- A. Shift Supervision has contacted you on Sunday, 12/12 (a scheduled day off), to report to the control room to work a 12 hour overtime shift from 0600-1800.
- B. You were on vacation from 11/1/ through 11/27.
- C. Your work history for the previous 2 weeks is as follows (all hours worked performing licensed operator duties):

| Sunday<br>11/28     | Monday<br>11/29     | Tuesday<br>11/30    | Wednesday<br>12/1   | Thursday<br>12/2    | Friday<br>12/3      | Saturday<br>12/4    |
|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Worked<br>1200-1800 | Worked<br>0600-1800 | Worked<br>0600-1800 | Worked<br>0600-1000 | Worked<br>0600-1000 | Worked<br>0600-1000 | Worked<br>0600-1200 |
| Sunday<br>12/5      | Monday<br>12/6      | Tuesday<br>12/7     | Wednesday<br>12/8   | Thursday<br>12/9    | Friday<br>12/10     | Saturday<br>12/11   |
| Worked<br>0600-1800 | Worked<br>0600-1800 | OFF                 | Worked<br>0600-1800 | Worked<br>0600-1800 | Worked<br>0800-1600 | Worked<br>0600-2100 |

**V. INITIATING CUE**

Using the work history provided:

- 1. Determine whether or not you are able to cover the requested shift *and* whether any other work hour limits have already been violated
- 2. Document your conclusions on the Task Condition sheet provided.

**VI. TASK STANDARD**

The candidate determines that they are unable to work the requested shift without an approved waiver because they will not have had a 10 hour break prior to the work start; will exceed 26 hours worked within a 48 hour period, and they have not had a 34 hour break within a 9 day period from 11/28 through 12/6.

**VI. TASK SAFETY SIGNIFICANCE**

Federal requirements stated in 10CFR26.205 provide limitations on work hours for "covered workers" such as licensed operators in order to manage fatigue and prevent fatigue-related operator errors from threatening the health and safety of the public.

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 00.AD.3246.052 Student Name: \_\_\_\_\_

| Step | Action  | Standard                        | Eval | Comments |
|------|---|---------------------------------|------|----------|
|      | <p><b><u>EVALUATOR NOTE:</u></b><br/>                     This JPM should be performed in the classroom (or similar environment).<br/>                     Ensure a copy of the current revision of NDAP-QA-0025 is available for candidate use if requested.</p> <p><b><u>EVALUATOR CUE:</u></b><br/>                     To begin this JPM provide the task conditions/Initiating cue sheet to the candidate.</p> |                                 |      |          |
| 1.   | <p>The candidate may review NDAP-QA-0025, Work Hour Limits for Station Staff.</p> <p><b><u>EVALUATOR CUE:</u></b><br/>                     If asked, provide procedure.</p>   | Student refers to NDAP-QA-0025. |      |          |
| *2.  | Refer to work history and analyze for additional requested work hours   | Refer to and analyze work hours |      |          |

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 00.AD.3246.052 Student Name: \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments  |
|------|---|--|------|---|
| *3.  | Determine that working the requested shift will result in exceeding limits.   | Determine that the required 10 hour break between work periods will not be met, and that the additional hours will result in exceeding 26 hours worked within a 48 hour period |      | 12 hours Sunday 9/12 + 15 hours Saturday 9/11 = 27 hour in a 48 hour period. 2100 to 0600 = 9 hours vs. 10 hours. |
| *4.  | Determine that the previously worked schedule violates additional work hour rules   | Determine that during the previously worked schedule, there was NOT a 34 hour break in a 9 day period as required.   |      |   |
| 5.   | Report to Shift Supervision that the overtime request CANNOT be honored due to the 10 hour break between work periods will not be met and exceeding 26 hours within 48 hours if the requested hours were to be worked; and that the 34 hr break in a 9 day period rule was violated.<br><br><b><u>EVALUATOR CUE:</u></b><br>When candidate reports results, report that this JPM is complete. | Make report to shift supervision.  |      |   |
|      | <b><u>EVALUATOR NOTE:</u></b><br>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?  |  |      |   |

**TASK CONDITIONS**

- A. Shift Supervision has contacted you on Sunday, 12/12 (a scheduled day off), to report to the control room to work a 12 hour overtime shift from 0600-1800, as the Unit 1 PCOM.
- B. You were on vacation from 11/1/ through 11/27.
- C. Your work history for the previous 2 weeks is as follows (all hours worked performing licensed operator duties):

| Sunday<br>11/28         | Monday<br>11/29         | Tuesday<br>11/30        | Wednesday<br>12/1   | Thursday<br>12/2        | Friday<br>12/3          | Saturday<br>12/4        |
|-------------------------|-------------------------|-------------------------|---------------------|-------------------------|-------------------------|-------------------------|
| Worked<br>1200-<br>1800 | Worked<br>0600-<br>1800 | Worked<br>0600-<br>1800 | Worked<br>0600-1000 | Worked<br>0600-<br>1000 | Worked<br>0600-<br>1000 | Worked<br>0600-<br>1200 |
| Sunday<br>12/5          | Monday<br>12/6          | Tuesday<br>12/7         | Wednesday<br>12/8   | Thursday<br>12/9        | Friday<br>12/10         | Saturday<br>12/11       |
| Worked<br>0600-<br>1800 | Worked<br>0600-<br>1800 | OFF                     | Worked<br>0600-1800 | Worked<br>0600-<br>1800 | Worked<br>0800-<br>1600 | Worked<br>0600-<br>2100 |

**INITIATING CUE**

Using the work history provided:

1. Determine whether or not you are able to cover the requested shift *and* whether any other work hour limits have already been violated
2. Document your conclusions on the Task Condition sheet provided.

**Circle One: CAN / CANNOT work the requested shift.**

**Reason(s):** \_\_\_\_\_

**Additional violation(s) (if any):** \_\_\_\_\_



PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

|             |                       |          |                 |                        |               |            |
|-------------|-----------------------|----------|-----------------|------------------------|---------------|------------|
| <u>RO</u>   | <u>00.EP.1135.081</u> | <u>1</u> | <u>12/20/10</u> | <u>Generic</u>         | <u>2.4.43</u> | <u>3.2</u> |
| Appl.<br>To | JPM Number            | Rev. No. | Date            | NUREG 1123<br>Sys. No. | K/A No.       | K/A Imp.   |

Task Title: Control Room Communicator Emergency Notification

Completed By:

Validated:

P. Moran  
Writer

12/20/10  
Date

*Paul J Moran*  
Instructor/Writer

12/15/10  
Date

Approval:

*M. D. B.*  
Nuclear Trng. Supv.

01/05/11  
Date

**Time Critical 15 Minutes**

Date of Performance:

Validated Time (Min.)

Time Taken (Min.)

JPM Performed By:

Student Name:

Last

First

M.I.

Employee # / S.S. #

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name:

Signature

Typed or Printed

Comments:

**REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
RO 00.EP.1135.081**

**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 PPL 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 "Emergency Director, Control Room: Emergency-Plan-Position Specific Instruction" (Rev. 26)
- B. EP-PS-126, "Emergency Plan Communicator: Emergency Plan-Position Specific Instruction" (Rev. 27)
- C. EP-TP-003, "Communication Process" (Rev. 5)
- D. EP-AD-000-301, "Emergency Notification Report" (Rev. 12)

**III. REACTIVITY MANIPULATIONS**

This JPM satisfies the following Operational Activity(s):  
None

**IV. TASK CONDITIONS**

- A. A General Emergency has been declared due to "Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV" (CG4).
- B. An airborne release is in progress.

**V. INITIATING CUE**

You have been assigned as the Control Room Communicator.  
Transmit initial information about the Emergency Condition to required organizations, IAW the appropriate procedure.

**A. TASK STANDARD**

Identify the ENR form is incorrectly completed; Contact the offsite agencies within 15 minutes from "time of declaration"; Communicate the Emergency Classification, Unit, Declaration Time and Date to the offsite agencies.

**B. Task Safety Significance**

Proper notification of state and local agencies is essential to ensure the health and safety of the general public.

Appl. To/JPM No.: RO 00.EP.1135.081

Student Name: \_\_\_\_\_

| Step | Action   | Standard | Eval | Comments |
|------|--|----------|------|----------|
|      | <p><b><u>EVALUATOR NOTE:</u></b></p> <ul style="list-style-type: none"> <li>• This is a time critical JPM.</li> <li>• Ensure a copy of EP-PS-100, EP-TP-003, and EP-PS-126 are available to support performance of this JPM.</li> <li>• Have current, filled-out copy of ENR Form available <b>with the INCORRECT line 4 label attached. (a table C label CS5 should be used)</b></li> <li>• Ensure an ENR form with the correct CG4 label is available</li> </ul> |          |      |          |
|      | <p><b><u>EVALUATOR NOTE:</u></b></p> <p>To begin this JPM, provide the candidate with the Task Conditions and Initiating Cue Sheet.</p> <p>Role play as Control Room ED and give student filled-out ENR Form.</p> <p><b>Time ENR form is given: _____</b></p> <p><b>Start time is above time MINUS 5 MINUTES (declaration time).</b></p> <p><b>Enter time of declaration(start time): _____</b></p> <p><b>The TIME CRITICAL portion of the JPM begins.</b></p>     |          |      |          |

PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO 00.EP.1135.081

Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
| * 1. | Obtain and review Event Notification Report (ENR) form with the Shift Manager/ED.   | Review ENR form to verify Lines 1, 3, 4, 5, 6, and 7 are all filled out.<br><br><b>Determine that the line 4 label is NOT the correct label for CG4.</b><br><br>Report to ED that line 4 is incorrect |      |          |
| 2.   | <b><u>EVALUATOR CUE:</u></b><br><br>Role Play as ED and provide the ENR form with the correct CG4 label to the candidate.   | Reviews the ENR form with the correct CG4 label in block on line 4.   |      |          |
|      | <b><u>EVALUATOR NOTE:</u></b><br><br>If the JIC does not answer, do not wait. Transmit the ENR form information to the emergency agencies.<br><br>Do not communicate the control number to offsite agencies. This block is gray shaded on the ENR form. |   |      |          |

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: RO 00.EP.1135.081

Student Name: \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
| *3.  | <p>Within 15 minutes of declaration, using the purple colored phone button, dial "191" to transmit the ENR form to the following:<br/>(Dialing 191 will simultaneously connect the listed agencies in a conference call.)</p> <p><b><u>EVALUATOR CUE:</u></b></p> <p>If candidate is concerned about the button not being CLEARLY purple, Inform the candidate that the CTN 4915 button is PURPLE!</p> <p><b><u>EVALUATOR/BOOTH CUE:</u></b></p> <p>Role-play the receiving agencies and confirm each agency is on the line and you are "Ready to Copy"</p> <p><b><u>EVALUATOR NOTE:</u></b></p> <p><b>After contact with the FIRST offsite agency has been confirmed, the Time Critical Portion of the JPM ends.</b></p> <p>Record stop Time _____</p> | <p>Dial "191" on the purple colored button</p> <p>Verify the following agencies are on the line:</p> <ul style="list-style-type: none"> <li>(1) Penna. Emergency Management Agency</li> <li>(2) Columbia County EMA</li> <li>(3) Luzerne County EMA</li> <li>(4) Joint Information Center</li> </ul> <p><b>Within 15 minutes of "time of declaration" previously recorded.</b></p> |      |          |
|      | <p><b><u>EVALUATOR NOTE:</u></b></p> <p><b>When you communicate your phone number to the offsite agencies, the prefix for 4XXX numbers is (570) 759. (The 191 call originates from a 4XXX number, if the purple button is used.)</b></p>  |  |      |          |
|      |   |  |      |          |

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: RO 00.EP.1135.081

Student Name: \_\_\_\_\_

| Step | Action                          | Standard   | Eval | Comments |
|------|---------------------------------|--|------|----------|
| 3.   | Communicate ENR Form:<br>Line 1 | Communicate the following for line1 Call status:<br><br><b>This is a Drill</b>   |      |          |
| 4.   | Communicate Line 2              | Communicate the following for line 2:<br><br>This is: <b>Candidate's Name</b> at PPL Susquehanna, LLC.<br><br>My telephone number is: <b>570-759-4915</b><br><br>Notification time is: <b>Current Time</b> |      |          |

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: RO 00.EP.1135.081

Student Name: \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| *5.  | Communicate Line 3<br><br><u><b>EVALUATOR NOTE:</b></u><br>"Initial Declaration" statement is not critical | Communicate the following for line 3:<br>EMERGENCY CLASSIFICATION:<br><b>GENERAL EMERGENCY</b><br>UNIT:<br><b>ONE</b><br>Declaration Time:<br><b>FROM ENR FORM</b><br>DATE:<br><b>&lt;TODAY'S DATE&gt;</b><br>THIS REPRESENTS A/AN:<br><b>INITIAL DECLARATION</b>   |      |          |
| *6.  | Communicate Line 4   | Communicate the following for line 4:<br>The Classification Designation is:<br><b>CG4</b><br>BRIEF NON-TECHNICAL DESCRIPTION OF THE EVENT:<br><b>"The water level inside the Unit 1 reactor has dropped and does not completely cover the uranium fuel. The unit had been shut down prior to the event and remains shut down. Protective actions will be made for the public"</b> |      |          |



PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO 00.EP.1135.081

Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
| *7.  | Communicate Line 5  | Communicate the following for line 5:<br>THERE IS:<br><b>AN AIRBORNE RADIOLOGICAL RELEASE IN PROGRESS</b>         |      |          |
| 8.   | Communicate Line 6  | Communicate the following for line 6:<br>WIND DIRECTION IS FROM:<br><b>277°</b><br>WIND SPEED IS:<br><b>5 mph</b> |      |          |
| 9.   | Communicate Line 7  | Communicate the following for line 7:<br><b>THIS IS A DRILL</b>   |      |          |
|      | <b><u>EVALUATOR/BOOTH CUE:</u></b><br>Candidate may request one of the offsite agencies "REPEAT" back the communicated information. If necessary, role-play the offsite agency and "Repeat" back the information. |   |      |          |

PERFORMANCE CHECKLIST

Appl. To/JPM No.: RO 00.EP.1135.081

Student Name: \_\_\_\_\_

| Step | Action  | Standard | Eval | Comments |
|------|---|----------|------|----------|
|      | <p><b><u>EVALUATOR CUE:</u></b><br/>This completes the JPM</p>  |          |      |          |
|      | <p><b><u>EVALUATOR NOTE:</u></b><br/>In order for the candidate to pass the Time Critical element of this JPM, they must complete step 2 of this JPM within 15 minutes.</p> |          |      |          |
|      | <p><b><u>EVALUATOR:</u></b><br/>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?</p>   |          |      |          |

## **TASK CONDITIONS**

- A. A General Emergency has been declared due to "Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV" (CG4).
- B. An airborne release is in progress.

## **INITIATING CUE**

You have been assigned as the Control Room Communicator.  
Transmit initial information about the Emergency Condition to required organizations, IAW the appropriate procedure.

# EMERGENCY NOTIFICATION REPORT

Control # CR-1

1. Call Status:       **THIS IS A DRILL**                   **THIS IS AN ACTUAL EVENT**

2. This is: \_\_\_\_\_ at PPL Susquehanna, LLC

(Communicator's Name)

My telephone            570-542   3  

Notification time is: \_\_\_\_\_

number is:              570-759   4  

(Time notification  
initiated)

(Callback telephone number)

3. **EMERGENCY CLASSIFICATION:**

**UNUSUAL EVENT**

**SITE AREA EMERGENCY**

**ALERT**

**GENERAL EMERGENCY**

**The event has been terminated.**

**UNIT:**     **ONE**  
                    **TWO**  
                    **ONE & TWO**

**Declaration Time:** \_\_\_\_\_

(Time classification/  
termination declared)

**DATE:** TODAY

(Date classification/  
termination declared)

**THIS REPRESENTS A/AN:**

**INITIAL DECLARATION**  
 **ESCALATION**  
 **NO CHANGE**

} **IN CLASSIFICATION STATUS**

4. **The Classification Designation is:** CG4

**BRIEF NON-TECHNICAL DESCRIPTION OF THE:**

**EMERGENCY EVENT** (Initial declaration and escalations) **OR**

**OTHER SIGNIFICANT EVENT** (No change in emergency classification or classification time)

CS5-Plant operators have indications of a drop in water level inside the [Unit 1 or Unit 2] reactor that could affect their ability to cool the reactor and keep the uranium fuel covered during refueling. The unit had been shut down prior to the event and remains shut down.

5. **THERE IS:**     **No**  
                           **AN AIRBORNE**  
                           **A LIQUID**

} **RADIOLOGICAL RELEASE IN PROGRESS DUE TO THE EVENT**

A Rad Release is in Progress if: in the judgment of ED/RM radioactive material is being released to the environment or into an area of the plant that will result in a release to the environment that is a result of the event. Example conditions that result in a rad release; **Fuel Clad Barrier AND Containment Barrier LOSS, RCS Barrier AND Containment Barrier LOSS, RG1, RS1, RA1, RU1, MU7, SBGT** initiation on RB Vent hi-rad, an increase in the detected gaseous radiation effluents that is a result of the event, or any radioactive liquid released beyond the Protected Area that is a result of the event.

6. **WIND DIRECTION IS** \_\_\_\_\_ **WIND SPEED IS:** 277° 5 mph.

(Data from 10 meter meteorological tower, available on PICSY.)

7. **REPEAT:**     **THIS IS A DRILL**                   **THIS IS AN ACTUAL EVENT**

(When communicating form, request a repeat back by one of the agencies.)

**APPROVED:** \_\_\_\_\_  
                           (ED, RM, or EOFSS)

**Time:** \_\_\_\_\_  
                           (Time form approved)

**Date:** TODAY  
                           (Date form approved)

*Final Exam  
Received 1/11/11*

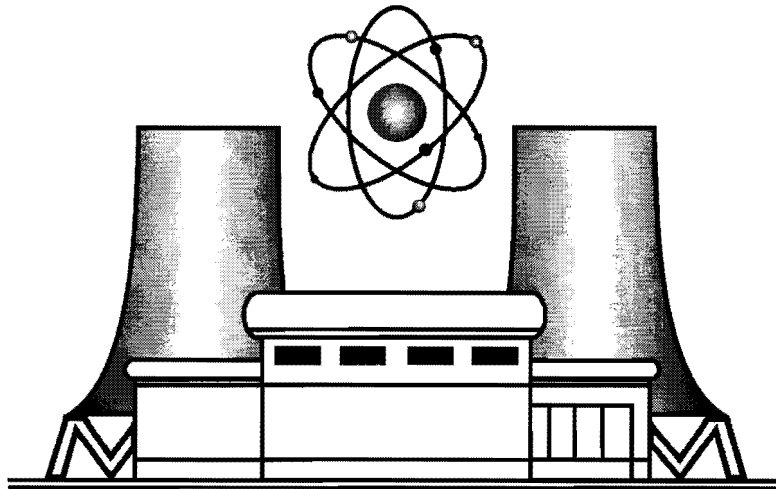


SUSQUEHANNA

**NRC RO & SRO**

**Simulator** *& In-Plant*

**Job Performance Measures  
~~and References~~**



**LOC-23**

January 2011

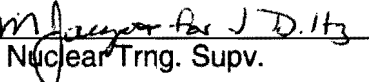
**PPL SUSQUEHANNA, LLC**  
**JOB PERFORMANCE MEASURE**

**APPROVAL AND ADMINISTRATIVE DATA SHEET**

|             |                       |             |                 |                        |              |                |
|-------------|-----------------------|-------------|-----------------|------------------------|--------------|----------------|
| <u>S/RO</u> | <u>44.ON.1792.101</u> | <u>0</u>    | <u>12/20/10</u> | <u>256000</u>          | <u>A4.08</u> | <u>3.7/3.7</u> |
| Appl.<br>To | JPM Number            | Rev.<br>No. | Date            | NUREG 1123<br>Sys. No. | K/A No.      | K/A Imp.       |

Task Title: Emergency Operation of Condensate System

Completed By: Bob Pudish Validated:   
Writer 12/20/10 Instructor/Writer 12/15/10  
Date Date

Approval:  
  
Nuclear Trng. Supv. 12-23-10  
Date

Date of Performance: \_\_\_\_\_ Validation Time (Min.) 20 Time Taken (Min.) \_\_\_\_\_

JPM Performed By: \_\_\_\_\_

Student Name: \_\_\_\_\_  
Last First M.I. Employee # / S.S. #

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name: \_\_\_\_\_  
Signature Typed or Printed

Comments: \_\_\_\_\_

**REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 44.ON.1792.101**

**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 PPL 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. ON-144-001, Emergency Operation of Condensate System (Rev. 10)
- B. OP-AD-001, Operations Standards for System and Equipment Operation (Rev. 44)

**III. OPERATIONAL ACTIVITIES**

None

**IV. TASK CONDITIONS**

- A. Unit 1 has experienced a loss of coolant accident.
- B. No injection sources are currently injecting into the Vessel.
- C. RPV pressure has been between 700-800 psig for 1 hour.
- D. RPV level is approximately -180 inches, steady on Compensated Fuel Zone Indicator.
- E. TBCCW is unavailable
- F. Instrument Air has been cross tied to U2.

**V. INITIATING CUE**

Restore and maintain RPV level > -161 inches on Compensated Fuel Zone Indicator, via LV-10641, using the Condensate system, in accordance with ON-144-001 (Emergency Operation of Condensate System).

**VI. TASK STANDARD**

RPV pressure is lowered below the shutoff head of the Condensate Pump to allow restoration of RPV level. Condensate is injected into the Vessel to raise Level.

**VII. TASK SAFETY SIGNIFICANCE**

Restoring and maintaining RPV level > -161 inches assures Adequate Core Cooling which will prevent Cladding Damage.

### PERFORMANCE CHECKLIST

Appl. To/ S/RO          JPM No 44.ON.1792.101          Student Name \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments  |
|------|--|--|------|---|
|      | <p>This JPM must be performed in the simulator.<br/>           Setup the simulator to IC-11.<br/>           Insert the following malfunctions:</p> <p><b>IMF mfHP152015</b><br/> <b>IMF mfRC150011</b><br/> <b>IMF mfAD183001</b><br/> <b>IMF cmfPM03_1P206A</b><br/> <b>IMF cmfPM03_1P206C</b><br/> <b>IMF cmfPM03_1P206B</b><br/> <b>IMF cmfPM03_1P206D</b><br/> <b>IMF cmfPM02_1P103A</b><br/> <b>IMF cmfPM02_1P103B</b><br/> <b>IMF cmfPM03_1P132A</b><br/> <b>IMF cmfPM03_1P132B</b><br/> <b>IRF rfIA019001 f:100</b></p> <p>Consider snapping an IC for multiple performances of this JPM.</p> <p>When student is ready to begin <b>JPM</b>, place the simulator in <b>RUN</b>.</p> <p>The simulator booth operator should role play as the NPO when required.</p> | <p>HPCI trip<br/>           RCIC trip<br/>           ADS failed<br/>           CS tripped<br/>           " "<br/>           " "<br/>           " "<br/>           CRD trip<br/>           " "<br/>           TBCCW trip<br/>           IA cross tied to U2<br/>           Recirc Leak 2% to obtain -180" on Comp FZWL then modify to 0%.<br/>           DW has been sprayed once to lower pressure.<br/>           MSIVs closed.<br/>           FV-10604A(B)(C) in Auto.<br/>           Shut off all Condensate Pumps immediately after Scram.<br/>           Start 'C' Condensate Pump immediately before beginning JPM.<br/>           Ensure FIC-10508 in Auto.<br/>           RPV pressure approx 700 psig</p> |      | <p>Setup was snapped to IC-396 for LOC-23 NRC Exam.</p> |

\*Critical Step

#Critical Sequence



## PERFORMANCE CHECKLIST

Appl. To/ S/RO JPM No 44.ON.1792.101 Student Name \_\_\_\_\_

| Step | Action   | Standard   | Eval                | Comments |
|------|--|--|---------------------|----------|
| 1.   | Obtain ON-144-001.   | Student obtains procedure. <ul style="list-style-type: none"> <li>• Reviews Notes</li> <li>• Determines Section 4.3 is applicable based on Plant conditions</li> </ul>   |                     |          |
| 2.   | Ensure a Rx Scram has been initiated.  | Student recognizes the Unit is scrambled. <ul style="list-style-type: none"> <li>• Mode Switch in Shutdown</li> <li>• All Rods In</li> </ul>   |                     |          |
| 3.   | If the Rx is Shutdown and any Rx Feed Pump is still in service...                              | N/A  |                     |          |
| 4.   | If the injection flow path is through any RFP Discharge Isolation Valve...                     | N/A  |                     |          |
| 5.   | Ensure all Rx Feed Pumps are tripped.  | Student confirms RFPs are tripped on HMI <ul style="list-style-type: none"> <li>• Pump Icon states Tripped</li> <li>• Pump Icon Gray</li> </ul>  |                     |          |
| *6.  | Ensure all RFP Recirc valves FV-10604A,B,C controller FIC-10604A,B,C are in Manual and Closed. | Student observes RFP Recirc valves FV-10604A,B,C are in Auto<br><br>Student closes the valves by: <ul style="list-style-type: none"> <li>• Opens the overlay for FV-10604A,B,C</li> <li>• Touches the Manual button</li> <li>• Observes controller output 0</li> </ul> | A<br><br>B<br><br>C |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/ S/RO JPM No 44.ON.1792.101 Student Name \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
| 7.   | If RPV pressure is < 650 psig...  | N/A  |      |          |
| 8.   | If RPV pressure > 650 psig: <ul style="list-style-type: none"> <li>Shutdown all but one Condensate Pump</li> </ul>  | Student observes Control Room indications and recognizes only one Cond Pump is running. (1 Red light on: 3 Amber lights on)  |      |          |
| *9.  | <ul style="list-style-type: none"> <li>Place the Condensate Recirc Flow controller FIC-10508 in Manual with a controller output of 0% (FW Startup/shutdown HMI screen)</li> </ul> | Student touches FV08 on HMI. <ul style="list-style-type: none"> <li>Touches MAN</li> <li>Sets % CTRLR OUTPUT to 0 by depressing DEC button</li> </ul>  |      |          |
| *10. | <ul style="list-style-type: none"> <li>Shutdown the last remaining in-service Condensate pumps.</li> </ul>  | Student depresses the Stop pushbutton. <ul style="list-style-type: none"> <li>Red light off, Amber light on</li> </ul>   |      |          |
|      | <b><u>EVALUATOR NOTE</u></b><br>Student may refer to OP-144-001, Section 2.8 to shut down the Condensate Pump.  |  |      |          |
| *11. | <ul style="list-style-type: none"> <li>Then lower RPV Pressure using Bypass Valves and/or SRVs.</li> </ul>  | Student lowers RPV pressure by either: <ul style="list-style-type: none"> <li>Opening Bypass valves (not an option due to MSIVs being closed)</li> <li>or</li> <li>Opens SRV(s): Switch to Open</li> </ul> Student observes RPV pressure lowering. |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/ S/RO JPM No 44.ON.1792.101 Student Name \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| *12. | <ul style="list-style-type: none"> <li>After RPV Pressure is &lt; 650 psig and RPV Level is at the lower range of the assigned band, Start a Condensate Pump.</li> </ul> | Student depresses Start pushbutton for one Condensate Pump after RPV Pressure is < 650 psig and Level is at the lower range of band. <ul style="list-style-type: none"> <li>RPV pressure &lt; 650 psig</li> <li>RPV level -180" on Comp FZWL</li> <li>One Condensate Pump "Start" pushbutton depressed (Red light on, Amber light off)</li> </ul> |      |          |
| *13. | Maintain RPV Pressure between 450-650 psig using Bypass Valves and/or SRVs.  | Student reduces RPV pressure to 450-650 psig by opening SRV(s).   |      |          |
| *14. | If feeding through LV-10641, Manually Throttle LV-10641 FW LOW LOAD VALVE to maximize Injection Flow and minimize time above 143 amps on in service Condensate Pump.     | Student manually throttles LV-10641 by: <ul style="list-style-type: none"> <li>Touches 641 on HMI</li> <li>Touches INC / DEC as necessary</li> <li>Monitors Cond Pump amps (minimize time above 143 amps)</li> </ul>  |      |          |
| 15.  | Ensure Condensate Recirc Flow controller FIC-10508 in Manual with a controller output of 0%.   | Student recognizes FIC-10508 already in manual from previous manipulation in procedure.   |      |          |
| 16.  | Dispatch Field Operators to Isolate the Condensate Recirc & Rx Feedpump Recirc Flow paths in accordance with Attachment F.   | Student contacts Field Operator to isolate Cond and RFP Recirc Flow paths.  |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/ S/RO JPM No 44.ON.1792.101 Student Name \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Role play as Field Operator and inform Student that you will isolate Condensate and Feedpump Recirc Flow paths.</p> |   |      |          |
| 17.  | Operate Condensate Pumps one at a time, sequentially, to maintain bearing temp below 265°F (PICSY display CNDPP)  | Student monitors Cond Pump bearing temp on PICSY display CNDPP. |      |          |
| 18.  | If the RPV injection is lost due to the degraded Instrument Air Header Pressure prior to completion of Attachment F...                                    | N/A   |      |          |
| 19.  | If reactor is not shutdown, maintain level per EO-100-113...  | N/A   |      |          |

\*Critical Step

#Critical Sequence

# PERFORMANCE CHECKLIST

Appl. To/ S/RO JPM No 44.ON.1792.101 Student Name \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| *20. | <p>If reactor is shutdown, to minimize condensate pump starts, Maintain a maximum level band of -129" to +54".</p> <ul style="list-style-type: none"> <li>• Shutdown condensate pump prior to reaching a bearing temperature of 265°F or when level reaches +54"</li> <li>• Start next sequential pump when RPV level drops to -129"</li> <li>• Repeat the previous Steps 4.3.15.a and b as necessary until there are no Condensate Pumps available for use or TBCCW has been restored.</li> </ul> | <p><b>Student raises RPV level above -161" by throttling LV-10641.</b></p> <ul style="list-style-type: none"> <li>• <b>RPV level &gt; -161" on Compensated Fuel Zone Level instrument</b></li> </ul> <p><b>(EVALUATOR: SEE CUE ON NEXT PAGE FOR TERMINATION CRITERIA)</b></p> <p>Student monitors Cond Pump bearing temp.</p> <p>Student monitors RPV level.</p> <p>Student shuts down Condensate Pump prior to bearing temp reaching 265°F.</p> <ul style="list-style-type: none"> <li>• Stop pushbutton depressed (Red light off, Amber light on)</li> </ul> <p>Student shuts down Condensate Pump when RPV level reaches +54".</p> <ul style="list-style-type: none"> <li>• Stop pushbutton depressed (Red light off, Amber light on)</li> </ul> |      |          |
| 21.  | Request TSC to pursue providing alternate means of cooling for TBCCW and/or Condensate Pumps.  | Student contacts TSC to pursue providing alternate means of cooling for TBCCW and/or Condensate Pumps.  |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Role Play as TSC that alternate means of cooling are being pursued.</p>  |   |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/ S/RO JPM No 44.ON.1792.101 Student Name \_\_\_\_\_

| Step | Action  | Standard | Eval | Comments |
|------|---|----------|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Once RPV level has been restored &gt; -161 inches on Compensated Fuel Zone Level indicator and showing a rising trend, inform the Candidate this completes the JPM.</p> |          |      |          |
|      | <p><b><u>EVALUATOR</u></b></p> <p>Do you have ALL your JPM exam materials?<br/>Task Cue Sheets? Procedures?</p>   |          |      |          |

\*Critical Step

#Critical Sequence

## **TASK CONDITIONS**

- Unit 1 has experienced a loss of coolant accident.
- No injection sources are currently injecting into the Vessel.
- RPV pressure has been between 700-800 psig for 1 hour.
- RPV level is approximately -180 inches, steady on Compensated Fuel Zone Indicator.
- TBCCW is unavailable
- Instrument Air has been cross tied to U2.

## **INITIATING CUE**

Restore and maintain RPV level > -161 inches on Compensated Fuel Zone Indicator, via LV-10641, using the Condensate system, in accordance with ON-144-001 (Emergency Operation of Condensate System).

## **TASK CONDITIONS**

- Unit 1 has experienced a loss of coolant accident.
- No injection sources are currently injecting into the Vessel.
- RPV pressure has been between 700-800 psig for 1 hour.
- RPV level is approximately -180 inches, steady on Compensated Fuel Zone Indicator.
- TBCCW is unavailable
- Instrument Air has been cross tied to U2.

## **INITIATING CUE**

Restore and maintain RPV level > -161 inches on Compensated Fuel Zone Indicator, via LV-10641, using the Condensate system, in accordance with ON-144-001 (Emergency Operation of Condensate System).



**PPL SUSQUEHANNA, LLC**  
**JOB PERFORMANCE MEASURE**

**APPROVAL AND ADMINISTRATIVE DATA SHEET**

|             |                       |             |                 |                        |              |                |
|-------------|-----------------------|-------------|-----------------|------------------------|--------------|----------------|
| <u>S/RO</u> | <u>64.OP.4841.101</u> | <u>0</u>    | <u>12/20/10</u> | <u>202001</u>          | <u>A4.01</u> | <u>3.7/3.7</u> |
| Appl.<br>To | JPM Number            | Rev.<br>No. | Date            | NUREG 1123<br>Sys. No. | K/A No.      | K/A Imp.       |

Task Title: Post SCRAM Recovery of "A" Reactor Recirculation Pump

Completed By:

Validated:

Bob Pudish  
Writer

12/20/10  
Date

*Bob Pudish*  
Instructor/Writer

12/15/10  
Date

Approval:

*Michael J. Deltz*  
Nuclear Trng. Supv.

12-23-10  
Date

|                             |                        |                          |
|-----------------------------|------------------------|--------------------------|
| <u>Date of Performance:</u> | <u>25</u>              | <u>Time Taken (Min.)</u> |
|                             | Validation Time (Min.) |                          |

JPM Performed By:

Student Name: \_\_\_\_\_  
Last First M.I. Employee # / S.S. #

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name: \_\_\_\_\_  
Signature Typed or Printed

Comments:

**REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 64.OP.4841.101**

**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 PPL 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-164-001, Reactor Recirculation System (Rev. 57)

**III. OPERATIONAL ACTIVITIES**

None

**IV. TASK CONDITIONS**

- A. A Reactor SCRAM has occurred and all control rods inserted.
- B. Both Reactor Recirculation Pumps have tripped due to -38 inches Reactor Water Level being reached during the scram.
- C. The "A" MG Set Generator and Drive Motor Lockout Relays have been reset.

**V. INITIATING CUE**

Restore the "A" Reactor Recirculation Pump to service in accordance with the OP-164-001 Hard Card.

**VI. TASK STANDARD**

The "A" Reactor Recirculation Pump is placed in service in accordance with OP-164-001.

**VII. TASK SAFETY SIGNIFICANCE**

Restoring the reactor recirculation pump to service provides forced circulation preventing thermal stratification in the reactor vessel.

### PERFORMANCE CHECKLIST

Appl. To/     S/RO     JPM No     64.OP.4841.101     Student Name                                 

| Step | Action   | Standard  | Eval | Comments  |
|------|--|---|------|---|
|      | <p>This JPM must be performed in the simulator. Setup the simulator to a full power IC. Insert a manual scram and perform the immediate operator actions. RRP's will trip on -38". Reset containment isolations to get cooling back to RRP's. Press and release the <b>STOP</b> pushbutton for <b>HS-14001A</b>, MG SET A DRV MTR BKR.</p> <p>Insert the following commands:<br/> <b>IRF rFRR164011 f:TRIP_RESET</b><br/> <b>IRF rFRR164011 f:NORM</b></p> <p>Assign the following Keys:<br/> <b>{Key[1]} IRF rFRP158035 f:CL_CB3A</b><br/> <b>{Key[2]} IRF rFRP158036 f:CL_CB4A</b></p> <p>Consider snapping an IC for multiple performances of this JPM.<br/>                     The simulator booth operator should role play as the NPO when required.<br/>                     When student is ready to begin <b>JPM</b>, place the simulator in <b>RUN</b>.</p> | <p>Resets 1C063A L/O relay.</p><br><br><p>Resets 1A101-10 L/O relay.</p><br><br><p>Resets RPT Breaker at 1C609 (URR)<br/>                     Resets RPT Breaker at 1C611 (LRR)</p> |      | <p>Setup was snapped to IC-394 for LOC-23 NRC Exam.</p> |
| 1.   | Obtains OP-164-001, Attachment D, Hard Card.   | Student obtains OP-164-001, Attachment D Hard Card.   |      |   |
| 2.   | Procedure section shall only be used to Startup the First Recirc Pump Post Scram.  | Student determines that no other Recirc Pump has been started post SCRAM.   |      |   |

\*Critical Step                      #Critical Sequence

## PERFORMANCE CHECKLIST

Appl. To/ S/RO JPM No 64.OP.4841.101 Student Name \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| 3.   | Recirculation pump trip is understood and trip condition has cleared and all control rods are fully inserted.  | Student determines from task conditions and state of the plant that the pump trip is understood, the trip condition has cleared and that all control rods are fully inserted.             |      |          |
| 4.   | MG Set Generator and Drive Motor Lockout Relays reset.   | Student determines from task conditions that the MG Set Generator and Drive Motor Lockout Relays are reset for "A" RRP only.  |      |          |
| 5.   | This section shall not be used when at power (mode 1 or 2).  | Student confirms that the plant is not in mode 1 or 2.  |      |          |
| 6.   | Ensure MG Set Ventilation System in operation.   | Student confirms MG Set Ventilation in operation.   |      |          |
| 7.   | Ensure Reactor Recirc Pump motor winding cooling water is aligned to "A" pump as follows: <ul style="list-style-type: none"> <li>• RRP A Clg Wtr OB Iso Valves HV-18791 A1/A2 <b>OPEN</b></li> <li>• RRP A Clg Wtr IB Iso Valves HV-18792 B1/B2 <b>OPEN</b></li> </ul> | Student confirms on 1C681: <ul style="list-style-type: none"> <li>• HV-18791 A1/A2 <b>OPEN</b></li> <li>• HV-18792 B1/B2 <b>OPEN</b></li> </ul>   |      |          |
| 8.   | Ensure Reactor Recirc Pump Seal Package cooling water is aligned to "A" pump as follows: <ul style="list-style-type: none"> <li>• RBCCW OB CONTN ISO MOV5 HV-11313/14 <b>OPEN</b></li> <li>• RBCCW IB CONTN ISO MOV5 HV-11345/46 <b>OPEN</b></li> </ul>                | Student confirms on 1C668: <ul style="list-style-type: none"> <li>• RBCCW OB CONTN ISO MOV5 HV-11313/14 <b>OPEN</b></li> <li>• RBCCW IB CONTN ISO MOV5 HV-11345/46 <b>OPEN</b></li> </ul> |      |          |

\*Critical Step

#Critical Sequence

# PERFORMANCE CHECKLIST

Appl. To/          S/RO          JPM No          64.OP.4841.101          Student Name         

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| 9.   | Ensure Reactor Recirc Pump RPT breakers at 1C609 (URR) 1A20501 and 1C611 (LRR) 1A20502 are closed by observing the RED indicating light illuminated. | Student contacts an NPO for confirmation that Reactor Recirc Pump RPT breakers at 1C609 (URR) 1A20501 and 1C611 (LRR) 1A20502 are closed. |      |          |
|      | <b><u>BOOTH OPERATOR CUE</u></b><br>Press {Key[1]} and {Key[2]} to ensure RPT breakers are closed at 1C609 (URR) and 1C611 (LRR).                    |   |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br>Role play as NPO and report that RRP RPT breakers at 1C609 (URR) and 1C611 (LRR) are closed.                          |   |      |          |
| *10. | Ensure Reactor Recirc Pump A Speed SY-B31-1R621A Controller in MANUAL with a speed setting of approximately 0%.                                      | At HMI student adjusts SY-B31-1R621A Controller in MANUAL to a controller output setting of approximately 0%.                             |      |          |
|      | <b><u>EVALUATOR NOTE</u></b><br>Controller SY-B31-1R621A is in a box located at the upper left of the HMI for "A" RRP.                               |   |      |          |
| 11.  | Comply with TRO 3.8.2.1.   | Student informs Shift Supervision to comply with TRO 3.8.2.1.   |      |          |

\*Critical Step

#Critical Sequence

# PERFORMANCE CHECKLIST

Appl. To/       S/RO       JPM No       64.OP.4841.101       Student Name \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b><br/>                     Role play as Shift Supervision indicating that TRO 3.8.2.1 will be taken for action that will be occurring in the next step.</p> |  |      |          |
| 12.  | Place Recirc A MOV OL BYPS HV-143-F031A / F032A switch to TEST position.   | Student places Recirc A MOV OL BYPS HV-143-F031A / F032A switch to TEST position. Student confirms Recirc Loop "A" Discharge Valves In Test annunciator ALARMS (AR-102-I02) along with BIS alarm located below RPV level indicator LI-14201B1. |      |          |
| 13.  | Ensure Recirc Pump "A" Suct HV-143-F023A OPEN.   | Student ensures Recirc Pump "A" Suct HV-143-F023A OPEN.  |      |          |
| 14.  | Ensure Recirc Pump "A" Dsch Byps HV-143-F032A OPEN.  | Student ensures Recirc Pump "A" Dsch Byps HV-143-F032A OPEN.   |      |          |
| *15. | Ensure CLOSED or CLOSE Recirc Pump "A" Dsch HV-143-F031A.  | Student CLOSES Recirc Pump "A" Dsch HV-143-F031A.  |      |          |
| 16.  | Depress Scoop Tube "A" Lock or Reset HS-B31-1S03A Reset pushbutton ~ 4 to 5 seconds (to allow position amplifier timer to clear and reset logic to seal in).                             | Student depresses Scoop Tube "A" Lock or Reset HS-B31-1S03A Reset pushbutton ~ 4 to 5 seconds.   |      |          |
| 17.  | Observe Recirc MG "A" Scoop Tube Drive Lock Annunciator NOT ALARMING.  | Confirms Recirc MG "A" Scoop Tube Drive Lock Annunciator <b>NOT ALARMING</b> (AR-102-D02).   |      |          |

\*Critical Step

#Critical Sequence

## PERFORMANCE CHECKLIST

Appl. To/         S/RO         JPM No         64.OP.4841.101         Student Name   

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
|      | <p style="text-align: center;"><b><u>NOTE (1)</u></b></p> <p>Utilize steam dome temperature, Comp. Pt. NFA05 or Steam Tables.</p> <p style="text-align: center;"><b><u>NOTE (2)</u></b></p> <p>RPV Bottom Head Drain temperature is valid even if RWCU is isolated.</p>   | (PICSY format: GD HUCD)   |      |          |
| *18. | <p>In Mode 3 or 4, within 15 minutes prior to recirculation pump start (SR 3.4.10.3 &amp; SR 3.4.10.4):</p> <ul style="list-style-type: none"> <li>• Record <math>\Delta T</math> between bottom head coolant temperature and reactor pressure vessel coolant temperatures in Unit 1 log.</li> <li>• Ensure <math>\Delta T</math> <b>between</b> bottom head coolant temperature and reactor vessel coolant temperature <math>\leq 145</math> °F.</li> <li>• Record <math>\Delta T</math> between reactor coolant temperature in recirculation loop to be started and reactor pressure <b>vessel</b> coolant temperature in Unit 1 log.</li> <li>• Ensure <math>\Delta T</math> between reactor coolant temperature in recirculation loop to be started and reactor pressure vessel coolant temperature <math>\leq 50</math> °F.</li> </ul> | Student records and confirms $\Delta T$ 's within limits specified. |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Inform Student that another Operator will record these values in eSOMS.</p>   |   |      |          |

\*Critical Step

#Critical Sequence

## PERFORMANCE CHECKLIST

Appl. To/   S/RO   JPM No   64.OP.4841.101   Student Name \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
|      | <b><u>EVALUATOR NOTE</u></b><br>Ensure the student <b>SIMULATES</b> the announcement over the page in the following step.   |  |      |          |
| 19.  | Announce twice over Plant PA System: "Attention all personnel, a recirc pump start is about to take place causing a potential loss of lighting, personnel should take precautions with work in progress".   | Student <b><u>SIMULATES</u></b> making the PA announcement.  |      |          |
| *20. | START Reactor Recirc Pump 1P401A by DEPRESSING MG SET A DRV MTR BKR HS-14001A START pushbutton ~ one (1) second (to allow start sequence relay to seal in).   | Student depresses MG SET A DRV MTR BKR HS-14001A START pushbutton for approximately one second.  |      |          |
| 21.  | Observe the following: <ul style="list-style-type: none"> <li>• MG SET A DRIVE MTR BKR <b>CLOSES</b></li> <li>• GEN 1A SPEED indication <b>INCREASES</b></li> <li>• After 11 seconds, GENERATOR A FIELD BREAKER closed indicator light <b>ILLUMINATES</b></li> <li>• RECIRC A DRIVE FLOW indication <b>INCREASES</b></li> </ul> | Student confirms the following actions occur: <ul style="list-style-type: none"> <li>• MG SET A DRIVE MTR BKR <b>CLOSES</b></li> <li>• GEN 1A SPEED indication <b>INCREASES</b></li> <li>• After 11 seconds, GENERATOR A FIELD BREAKER closed indicator light <b>ILLUMINATES</b></li> <li>• RECIRC A DRIVE FLOW indication <b>INCREASES</b></li> </ul> |      |          |
| *22. | WHEN GEN 1A SPEED indication and RECIRC A DRIVE FLOW indication reached a settled state, approximately 40-60 seconds, OPEN RECIRC PUMP A DSCH HV-143-F031A.   | When RECIRC A DRIVE FLOW indication reaches a settled state, student <b>OPENS</b> RECIRC PUMP A DSCH HV-143-F031A.   |      |          |

\*Critical Step

#Critical Sequence



# PERFORMANCE CHECKLIST

Appl. To/ S/RO JPM No 64.OP.4841.101 Student Name \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| 23.  | Slowly ADJUST REACTOR RECIRC PUMP A SPEED SY-B31-1R621A controller to achieve approximately 30% generator speed as indicated on SI-14032A. | At HMI, student slowly adjusts REACTOR RECIRC PUMP A SPEED SY-B31-1R621A controller to achieve ~ 30% generator speed as indicated on SI-14032A. |      |          |
| 24.  | After 2 minutes, place RECIRC A MOV OL BYPS HV-143-F031A / F032A switch to NORM position.  | After 2 minutes, student places RECIRC A MOV OL BYPS HV-143-F031A / F032A switch to NORM position.  |      |          |
| 25.  | Clear TRO 3.8.2.1.   | Student informs Shift Supervision that they may clear TRO 3.8.2.1.  |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br>Role play as Shift Supervision indicating that TRO 3.8.2.1 will be cleared.                                 |   |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br>This completes the JPM.   |   |      |          |
|      | <b><u>EVALUATOR</u></b><br>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?   |   |      |          |

\*Critical Step

#Critical Sequence

### **TASK CONDITIONS**

- A A Reactor SCRAM has occurred and all control rods inserted.
- B Both Reactor Recirculation Pumps have tripped due to -38 inches reached during the scram.
- C The "A" MG Set Generator and Drive Motor Lockout Relays have been reset.

### **INITIATING CUE**

Restore the "A" Reactor Recirculation Pump to service in accordance with the OP-164-001 Hard Card.

### **TASK CONDITIONS**

- A A Reactor SCRAM has occurred and all control rods inserted.
- B Both Reactor Recirculation Pumps have tripped due to -38 inches reached during the scram.
- C The "A" MG Set Generator and Drive Motor Lockout Relays have been reset.

### **INITIATING CUE**

Restore the "A" Reactor Recirculation Pump to service in accordance with the OP-164-001 Hard Card.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

|                     |                                     |                         |                         |   |                         |                            |
|---------------------|-------------------------------------|-------------------------|-------------------------|---|-------------------------|----------------------------|
| S/RO<br>Appl.<br>To | <u>34.EO.1619.101</u><br>JPM Number | <u>0</u><br>Rev.<br>No. | <u>12/21/10</u><br>Date | <u>400000</u><br>NUREG 1123<br>Sys. No. | <u>A4.01</u><br>K/A No. | <u>3.1/3.0</u><br>K/A Imp. |
|---------------------|-------------------------------------|-------------------------|-------------------------|---|-------------------------|----------------------------|

Task Title: Reset Drywell Cooling Isolation and Restore Drywell Cooling IAW ES-134-001 (Control Room Actions)

Completed By:

Validated:

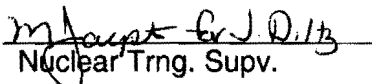
Bob Pudish  
Writer

12/21/10  
Date

  
Instructor/Writer

12/23/10  
Date

Approval:

  
Nuclear Trng. Supv.

12-23-10  
Date

|                      |                                     |                   |
|----------------------|-------------------------------------|-------------------|
| Date of Performance: | <u>20</u><br>Validation Time (Min.) | Time Taken (Min.) |
|----------------------|-------------------------------------|-------------------|

JPM Performed By:

Student Name: \_\_\_\_\_  
Last First M.I. Employee # / S.S. #

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name: \_\_\_\_\_  
Signature Typed or Printed

Comments:

**REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 34.EO.1619.101**

**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 PPL 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**

ES-134-001, Restoring Drywell Cooling With A LOCA Signal Present (Rev. 17)

**III. OPERATIONAL ACTIVITIES**

This JPM satisfies the requirements of Operational Activity(s):  
NONE

**IV. TASK CONDITIONS**

- A. An ATWS has occurred coincident with a loss of drywell cooling.
- B. EO-100-113 is being implemented for level/power control.
- C. EO-100-103 is being executed for primary containment control.
- D. ES-134-001 is being implemented and is complete through Step 4.2.
- E. Containment Instrument Gas has not been restored IAW ES-184-002.

**V. INITIATING CUE**

Reset Drywell Cooling Logic isolations and restore Drywell Cooling in accordance with ES-134-001.

**VI. TASK STANDARD**

CIG pressure restored, Drywell Cooling Logic isolations reset, and Drywell cooling restored.

**VII. TASK SAFETY SIGNIFICANCE**

Re-establish containment cooling.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 34.EO.1619.101

Student Name: \_\_\_\_\_

| Step | Action  | Standard                                | Eval | Comments  |
|------|---|---|------|---|
|      | <p><b><u>EVALUATOR NOTE</u></b></p> <ul style="list-style-type: none"> <li>• This JPM must be performed on the simulator.</li> <li>• Load a Mode 1 IC.</li> <li>• Set up simulator according to the task conditions.</li> <li>• Open 025125 on P&amp;ID IA5.</li> <li>• Shutdown both U1 IA compressors locally from Panel 1C140A.</li> <li>• Place the simulator in Freeze.</li> </ul> <p>Consider snapping an IC for multiple performances of this JPM.</p> <p>When student is ready to begin <b>JPM</b>, place the simulator in <b>RUN</b>.</p> <p>The ALTERNATE PATH in this JPM is preceded by a fault statement in <b>BOLD TYPE WITH ALL CAPITAL LETTERS</b>.</p> <p><b>Fill out and approve for use a blank copy of ES-134-001 up to step 4.3; Initial as SS, steps 4.1: the three bullets and 4.3. Check off Section 4.2 as complete.</b></p> <p><b>PROVIDE THIS TO THE STUDENT FOR USE IN COMPLETING THE TASK.</b></p> |   |      | <p>Setup was snapped to IC-392 for LOC-23 NRC Exam.</p> |
| 1.   | <p>Obtain a controlled copy of ES-134-001, RESTORING DRYWELL COOLING WITH A LOCA SIGNAL PRESENT.</p>  | <p>Student obtains Controlled copy.</p> |      |   |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 34.EO.1619.101

Student Name: \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
| 2.   | Review Sections 1.0 through 3.0.<br><ul style="list-style-type: none"> <li>• Section 1,2,3 reviewed.</li> </ul>           | Student review Sections 1.0 through 3.0.             |      |          |
| 3.   | Check for approval in Section 4.1.<br><ul style="list-style-type: none"> <li>• Approval verified.</li> </ul>              | Student verifies Shift Manager approval at step 4.1. |      |          |
| 4.   | Verify step 4.2 is marked as complete<br><ul style="list-style-type: none"> <li>• Step 4.2 verified completed.</li> </ul> | Student verifies step 4.2 is marked as complete.     |      |          |
| 5.   | Selects the correct section to perform.<br><ul style="list-style-type: none"> <li>• Goes to Section 4.3.</li> </ul>       | Student selects section 4.3.                         |      |          |
|      | <b><u>NOTE</u></b><br>Steps 4.3.1.a through d are performed at Panel 1C681, Heat and Ventilation Control Panel.           |  |      |          |

\*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 34.EO.1619.101

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| *6.  | <p>Ensure the following valves are closed prior to resetting isolation logic:</p> <p>A CLRS CLG WTR OB ISO VLVS HV-18781A1 and HV-18781A2.</p> <ul style="list-style-type: none"> <li>• Amber light LIT and red light NOT LIT</li> </ul> <p>A CLRS CLG WTR IB ISO VLVS HV-18782B1 and HV-18782B2.</p> <ul style="list-style-type: none"> <li>• Amber light LIT and red light NOT LIT</li> </ul> <p>*B CLRS CLG WTR OB ISO VLVS HV-18781B1 and HV-18781B2.</p> <ul style="list-style-type: none"> <li>• Initially: Amber light NOT LIT and red light LIT</li> <li>• Switch to Close : Amber light LIT and red light NOT LIT</li> </ul> <p>B CLRS CLG WTR IB ISO VLVS HV-18782A1 and HV-18782A2.</p> <ul style="list-style-type: none"> <li>• Amber light LIT and red light NOT LIT</li> </ul> | <p>Student verifies position of the following valves:</p> <p>A CLRS CLG WTR OB ISO VLVS HV-18781A1 and HV-18781A2.</p> <p>A CLRS CLG WTR IB ISO VLVS HV-18782B1 and HV-18782B2.</p> <p>B CLRS CLG WTR OB ISO VLVS HV-18781B1 and HV-18781B2.</p> <p><b>(Recognizes valves Initially Open, manually closes the valves)</b></p> <p>B CLRS CLG WTR IB ISO VLVS HV-18782A1 and HV-18782A2.</p> |      |          |
| 7.   | <p>If Containment Instrument Gas has not been restored by ES-184-002, Ensure the following are closed at Panel 1C601 prior to resetting isolation logic:</p> <p>INSTR GAS TO CONTN ISO SV-12651.</p> <p>INSTR GAS CMP IB SUCT ISO HV-12603.</p> <p>INSTR GAS CMP OB SUCT ISO SV-12605.</p>   | <p>Student closes valves SV-12651, HV-12603, and SV-12605:</p> <ul style="list-style-type: none"> <li>• Amber light LIT and red light NOT LIT</li> </ul>   |      |          |

\*Critical Step

#Critical Sequence



**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 34.EO.1619.101

Student Name: \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| *8.  | Reset Drywell Cooling (HVAC LOCA Trip 1A and 1B) Logic:<br>On 1C601 momentarily Depress CHAN A DRWL CLG HS-14141A RESET pushbutton. <ul style="list-style-type: none"> <li>• CHAN A DRWL CLG HS-14141A RESET push button depressed.</li> </ul> | Student resets A Isolation.                         |      |          |
| 9.   | Observe CHAN A DRWL CLG RESET green ISO light extinguishes. <ul style="list-style-type: none"> <li>• Green light above the pushbutton NOT LIT.</li> </ul>  | Student observes A Isolation reset.                 |      |          |
| *10. | On 1C601 momentarily Depress CHAN B DRWL CLG HS-14141B RESET pushbutton. <ul style="list-style-type: none"> <li>• CHAN B DRWL CLG HS-14141B RESET push button depressed.</li> </ul>  | Student resets B Isolation.                         |      |          |
| 11.  | Observe CHAN B DRWL CLG RESET green ISO light extinguishes. <ul style="list-style-type: none"> <li>• Green light above the pushbutton NOT LIT.</li> </ul>  | Student observes B Isolation reset.                 |      |          |
| *12. | On 1C681 Heat and Ventilation Control Panel momentarily Depress Chan A RBCW ISO VALVE POS RESET HS-14140A pushbutton. <ul style="list-style-type: none"> <li>• Chan A RBCW ISO VALVE POS RESET HS-14140A pushbutton depressed.</li> </ul>      | Student resets CHAN A RBCW ISO VALVE POS HS-14140A. |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 34.EO.1619.101

Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
| 13.  | Observe Chan A RBCW ISO VALVE POS RESET white Iso light extinguishes. <ul style="list-style-type: none"> <li>• White light NOT LIT.</li> </ul>  | Student observes A RBCW Isolation valve reset.  |      |          |
| *14. | On 1C681 Heat and Ventilation Control Panel momentarily Depress Chan B RBCW ISO VALVE POS RESET HS-14140B push button.  | Student resets CHAN B RBCW ISO VALVE POS HS-14140B.   |      |          |
| 15.  | Observe Chan B RBCW ISO VALVE POS RESET white Iso light extinguishes. <ul style="list-style-type: none"> <li>• White light NOT LIT.</li> </ul>  | Student observes B RBCW Isolation valve reset.  |      |          |
| 16.  | If Containment Instrument Gas has not been restored by ES-184-002, Restore CIG in accordance with section 4.4 of this procedure. <ul style="list-style-type: none"> <li>• Refer to section 4.4</li> </ul> | Student recalls from cue sheet and determines CIG has NOT been restored.                        |      |          |
| 17.  | If LOOP with a LOCA on either Unit, install jumper...   | Evaluate the status of the electric plant and determine step is N/A since NO LOOP has occurred. |      |          |
| 18.  | If necessary, restore Instrument Air...   | Observe sufficient Instrument Air pressure and determine step is N/A.                           |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 34.EO.1619.101

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b><br/>If asked about the status of IA, as Plant NPO, report that U1 IA system is in service with all systems normal.</p>  |  |      |          |
| *19. | <p>If necessary, restore Containment Instrument Gas, as follows:</p> <ul style="list-style-type: none"> <li>• *Open INST GAS CMP 1B SUCT ISO HV-12603</li> <li>• *Open INSTR GAS COMP OB SUCT ISO SV-12605</li> </ul>  | <p>Place valve control switches to the OPEN position and observe</p> <ul style="list-style-type: none"> <li>• Red light LIT and amber light NOT LIT</li> </ul> |      |          |
| *20. | <p>Restore CIG pressure using one of the following:</p> <ul style="list-style-type: none"> <li>• Start CIG compressors in <u>Hand</u> at 1C239 IAW OP-125-001</li> </ul> <p><b><u>OR</u></b></p> <ul style="list-style-type: none"> <li>• Cross-Tie Instrument Air to CIG 90# header IAW OP-125-001</li> </ul> | <p>Contact the US and determine which method should be used to restore CIG pressure.</p>   |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b><br/>When asked, as Unit Supervisor, direct candidate to start CIG compressor in <u>Hand</u>.</p>  |  |      |          |
| *21. | <p>Direct NPO to start the CIG compressor in <u>Hand</u> per OP-125-001.</p>   | <p>Contact NPO and direct action.</p>  |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 34.EO.1619.101

Student Name: \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
|      | <p><b><u>BOOTH OPERATOR CUE</u></b></p> <p>When directed, use PNOV to select CIG panel 1C239A/B, then use insert override to place 1K205A handswitch to MAN.</p> <p>When the compressor starts and loads, report "A" CIG compressor is running loaded.</p>                       |   |      |          |
| *22. | <p>When INST GAS SUPP PRESS PI-12642 is approximately 80 psig, perform the following:</p> <ul style="list-style-type: none"> <li>• For each MSIV that indicates full closed, place control switch to CLOSE position</li> <li>• *Open INSTR GAS TO CONTN ISO SV-12651.</li> </ul> | <p>Observe PI-12642 pressure, and when ≈ 80 psig:</p> <ul style="list-style-type: none"> <li>• Place any full closed MSIV control switch to CLOSE.</li> <li>• Place SV-12651 control switch to OPEN, and observe red light LIT and amber light NOT LIT</li> </ul> |      |          |
|      | <p align="center"><b><u>NOTE</u></b></p> <p>Following valves may not open if CIG header pressure is low.</p> <p>Drywell cooling will occur after the following steps if RBCCW is in service and the drywell cooling swap valves have re-aligned.</p>                             |   |      |          |

\*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 34.EO.1619.101

Student Name: \_\_\_\_\_

| Step        | Action   | Standard  | Eval | Comments |
|-------------|--|---|------|----------|
|             | <p><b><u>EVALUATOR NOTE</u></b></p> <p>Previously, in step 6 of this JPM, the Student may have placed the control switches to "CLOSE" for the valves listed in step 23 below. If the student placed these switches to "CLOSE", then it is "Critical" that they place the same control switches back to "OPEN" in step 23 below. At a minimum, the Control Switch for B CLRS CLG WTR OB ISO VLVS HV-18781B1 and HV-18781B2 must be taken to Open.</p>   |   |      |          |
| <p>*23.</p> | <p>On 1C681 Heat and Ventilation Control Panel, Ensure following valves open:</p> <p>A CLRS CLG WTR OB ISO VLVS HV-18781A1 and HV-18781A2.</p> <ul style="list-style-type: none"> <li>• Amber light NOT LIT and red light LIT.</li> </ul> <p>A CLRS CLG WTR IB ISO VLVS HV-18782B1 and HV-18782B2.</p> <ul style="list-style-type: none"> <li>• Amber light NOT LIT and red light LIT.</li> </ul> <p>*B CLRS CLG WTR OB ISO VLVS HV-18781B1 and HV-18781B2.</p> <ul style="list-style-type: none"> <li>• Control Switch to Open</li> <li>• Amber light NOT LIT and red light LIT.</li> </ul> <p>B CLRS CLG WTR IB ISO VLVS HV-18782A1 and HV-18782A2.</p> <ul style="list-style-type: none"> <li>• Amber light NOT LIT and red light LIT.</li> </ul> | <p>Student verifies position of the following valves:</p> <p>A CLRS CLG WTR OB ISO VLVS HV-18781A1 and HV-18781A2.</p> <p>A CLRS CLG WTR IB ISO VLVS HV-18782B1 and HV-18782B2.</p> <p>B CLRS CLG WTR OB ISO VLVS HV-18781B1 and HV-18781B2.</p> <p><b>(Recognizes valves Closed, manually opens the valves)</b></p> <p>B CLRS CLG WTR IB ISO VLVS HV-18782A1 and HV-18782A2.</p> |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 34.EO.1619.101

Student Name: \_\_\_\_\_

| Step | Action   | Standard | Eval | Comments |
|------|--|----------|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b><br/>This completes the JPM.</p>   |          |      |          |
|      | <p><b><u>EVALUATOR</u></b><br/>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?</p> |          |      |          |

\*Critical Step

#Critical Sequence

## **TASK CONDITIONS**

- A. An ATWS has occurred coincident with a loss of drywell cooling.
- B. EO-100-113 is being implemented for level/power control.
- C. EO-100-103 is being executed for primary containment control.
- D. ES-134-001 is being implemented and is complete through Step 4.2.
- E. Containment Instrument Gas has not been restored IAW ES-184-002.

## **INITIATING CUE**

Reset Drywell Cooling Logic isolations and restore Drywell Cooling in accordance with ES-134-001.

## **TASK CONDITIONS**

- A. An ATWS has occurred coincident with a loss of drywell cooling.
- B. EO-100-113 is being implemented for level/power control.
- C. EO-100-103 is being executed for primary containment control.
- D. ES-134-001 is being implemented and is complete through Step 4.2.
- E. Containment Instrument Gas has not been restored IAW ES-184-002.

## **INITIATING CUE**

Reset Drywell Cooling Logic isolations and restore Drywell Cooling in accordance with ES-134-001.



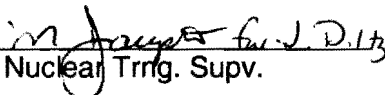
**PPL SUSQUEHANNA, LLC**  
**JOB PERFORMANCE MEASURE**  
**APPROVAL AND ADMINISTRATIVE DATA SHEET**

|             |                       |          |                 |                     |              |                |
|-------------|-----------------------|----------|-----------------|---------------------|--------------|----------------|
| <u>S/RO</u> | <u>04.ON.1203.251</u> | <u>0</u> | <u>12/20/10</u> | <u>262001</u>       | <u>A2.07</u> | <u>3.0/3.2</u> |
| Appl. To    | JPM Number            | Rev. No. | Date            | NUREG 1123 Sys. No. | K/A No.      | K/A Imp.       |

Task Title: Energize "Dead" 4KV ESS Bus '2D' (Alternate Path)

|                      |                 |  |                 |
|----------------------|-----------------|--|-----------------|
| <u>Completed By:</u> |                 | <u>Validated:</u>  |                 |
| <u>Bob Pudish</u>    | <u>12/20/10</u> |  | <u>12/15/10</u> |
| Writer               | Date            | Instructor/Writer  | Date            |

Approval:

|  |                 |
|--|-----------------|
|  | <u>12-23-10</u> |
| Nuclear Trng. Supv.  | Date            |

|                             |           |                               |
|-----------------------------|-----------|-------------------------------|
| <u>Date of Performance:</u> | <u>15</u> | <u>Validation Time (Min.)</u> |
|                             |           | <u>Time Taken (Min.)</u>      |

JPM Performed By:

Student Name: \_\_\_\_\_

|      |       |      |                     |
|------|-------|------|---------------------|
| Last | First | M.I. | Employee # / S.S. # |
|------|-------|------|---------------------|

Performance Evaluation:      (    ) Satisfactory      (    ) Unsatisfactory

Evaluator Name: \_\_\_\_\_

|           |                  |
|-----------|------------------|
| Signature | Typed or Printed |
|-----------|------------------|

Comments:

**REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 04.ON.1203.251**

**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 PPL 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. ON-004-002, Energizing Dead 4KV ESS Bus (Rev. 20)
- B. OP-024-001, Diesel Generators (Rev. 56)
- C. OP-AD-001, Operations Standards for System and Equipment Operation (Rev. 44)

**III. OPERATIONAL ACTIVITIES**

None

**IV. TASK CONDITIONS**

- A. Unit 2 is in a Shutdown Condition.
- B. An Electrical transient has occurred on the 2D ESS bus.
- C. DG D has failed to auto start and is in standby alignment.
- D. No electrical Bus fault is present.
- E. You are the On-Shift U2 PCOP.

**V. INITIATING CUE**

Implement ON-004-002 to re-energize the 2D ESS bus.

**VI. TASK STANDARD**

ESS Bus 2D is re-energized from DG 'D' iaw ON-004-002 (Energizing Dead 4KV ESS Bus) recognizing that the DG Output breaker fails to automatically close and ESW cooling water for the DG did not start.

**VII. TASK SAFETY SIGNIFICANCE**

ESS Busses are the power supply to ECCS components necessary to mitigate Core Damage. ESW is the cooling medium for the DG to prevent component damage.



**PERFORMANCE CHECKLIST**

Appl. To/ S/RO JPM No 04.ON.1203.251 Student Name \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
| 1.   | Select the correct section to perform.  | Student selects Attachment A Step 1.3.   |      |          |
| 2.   | Confirm the normal, alternate and DG breakers for the dead 4KV ESS bus are open.  | Student confirms the following breakers open: <ul style="list-style-type: none"> <li>• 2A20408 (Red light off–Amber light on)</li> <li>• 2A20401 (Red light off–Amber light on)</li> <li>• 2A20404 (Red light off–Amber light on)</li> </ul> |      |          |
| 3.   | Check status of following lockout relays: <ul style="list-style-type: none"> <li>• Determine if any relays Tripped.</li> <li>• Do Not reset any tripped relays.</li> <li>• If any relays Tripped: Perform Att B, Exit Att A.</li> </ul> | Student contacts an NPO to check the following Lockout relays not tripped: <ul style="list-style-type: none"> <li>• 86A-204</li> <li>• 86A1-204</li> <li>• 86A2-204</li> </ul>   |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Role Play as NPO and report <b>no</b> lockout relays are tripped.</p>   |  |      |          |
|      | <p><b><u>NOTE</u></b></p> <p>4.16 KV bus will shed all loads except 480 volt load centers (feeder breaker remains closed).</p>  |  |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/     S/RO     JPM No     04.ON.1203.251     Student Name \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| 4.   | Ensure appropriate breakers supplied from 4.16 KV ESS Bus 2D listed on Attachment D are open.  | Student contacts an NPO to check the following breakers open:<br><ul style="list-style-type: none"> <li>• 2A20405 (Red light off–Amber light on)</li> <li>• 2A20402 (Red light off–Amber light on)</li> <li>• 2A20403 (Red light off–Amber light on)</li> <li>• 2A20409 (Red light off–Amber light on)</li> </ul> |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Role Play as NPO and report <b>all</b> breakers listed on Attachment D are open.</p>                                 |   |      |          |
| 5.   | Ensure DG 'D' aligned for Standby Automatic operation iaw OP-024-001.  | Student recalls from Task Conditions that DG 'D' is aligned for standby operation.  |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>If necessary, role play as the Unit Supervisor and report that the DG 'D' is available for manual operation.</p>     |   |      |          |
| 6.   | If DG failure has occurred, if possible substitute DG E for affected DG iaw OP-024-004.<br><ul style="list-style-type: none"> <li>• N/A</li> </ul>         | N/A, DG failure has not occurred.   |      |          |
| *7.  | To start diesel at 0C653, perform the following:<br><ul style="list-style-type: none"> <li>• Place HS-00055D DG D Gov Mode Sel switch to ISOCH.</li> </ul> | Student places HS-00055D DG D Gov Mode Sel switch in ISOCH position.  |      |          |

\*Critical Step

#Critical Sequence

## PERFORMANCE CHECKLIST

Appl. To/ S/RO JPM No 04.ON.1203.251 Student Name \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| 8.   | To start diesel at 0C653, perform the following (continued): <ul style="list-style-type: none"> <li>• Ensure HS-00056D DG D Volt Reg Mode Sel switch to Auto.</li> </ul> | Student ensures HS-00056D DG D Volt Reg Mode Sel switch is in Auto.  |      |          |
| *9.  | To start diesel at 0C653, perform the following (continued): <ul style="list-style-type: none"> <li>• Depress HS-00051D DG D Start pushbutton.</li> </ul>                | Student depresses HS-00051D DG D Start pushbutton.   |      |          |
|      | <b><u>FAULT STATEMENT</u></b><br><br><b>THE NEXT STEP HAS THE DG OUTPUT BREAKER FAILING TO AUTO CLOSE, STUDENT SHOULD RECOGNIZE FAILURE AND MANUALLY CLOSE BREAKER.</b>  |  |      |          |
| 10.  | Observe DG D starts and DG D to Bus 2D Bkr 2A20404 automatically closes.   | Student observes: <ul style="list-style-type: none"> <li>• DG D volts and Hz rise to 4160V and 60 Hz.</li> <li>• Bkr 2A20404 did <b>NOT</b> close (Red light off-Amber light on).</li> </ul> |      |          |
| 11.  | Observe white ESS Bus available light illuminated on mimic bus on Panel 0C653.   | Student observes white ESS Bus available light <b>NOT</b> illuminated on mimic bus on Panel 0C653.   |      |          |

\*Critical Step

#Critical Sequence

## PERFORMANCE CHECKLIST

Appl. To/       S/RO                            JPM No       04.ON.1203.251                            Student Name \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| *12. | If DG D to Bus 2D Bkr 2A20404 did not close automatically, manually close DG D Output Breaker 2A20404 onto dead 4.16KV Bus 2D as follows: <ul style="list-style-type: none"> <li>• Ensure all synchroscope switches off on 0C653.</li> </ul> | Student recognizes Bkr 2A20404 did <b>NOT</b> close automatically. <ul style="list-style-type: none"> <li>• Student ensures all synchroscope switches off on 0C653.</li> </ul> |      |          |
| *13. | <ul style="list-style-type: none"> <li>• Place HS-00042B DG D to Bus 2D Synch Sel keyswitch to On.</li> </ul>  | Student places HS-00042B DG D to Bus 2D Synch Sel keyswitch to On.   |      |          |
| *14. | <ul style="list-style-type: none"> <li>• Close DG D to Bus 2D Bkr 2A20404.</li> </ul>  | Student closes DG D to Bus 2D Bkr 2A20404 (Red light on-amber light off).  |      |          |
| 15.  | <ul style="list-style-type: none"> <li>• Observe voltage on 4.16KV Bus 2D.</li> </ul>  | Student observes voltage on 4.16KV Bus 2D.   |      |          |
| 16.  | <ul style="list-style-type: none"> <li>• Observe white ESS Bus available light illuminated on mimic bus on Panel 0C653.</li> </ul>   | Student observes white ESS Bus available light illuminated on mimic bus on Panel 0C653.  |      |          |
| *17. | <ul style="list-style-type: none"> <li>• Place HS-00042B DG D to Bus 2D Synch Sel keyswitch to Off.</li> </ul>   | Student places HS-00042B DG D to Bus 2D Synch Sel keyswitch to Off.  |      |          |
|      | <p><b><u>FAULT STATEMENT</u></b></p> <p><b>THE NEXT STEP HAS THE STUDENT ENSURE ESW IS SUPPLYING ADEQUATE COOLING TO THE DIESEL. STUDENT SHOULD RECOGNIZE THAT 'D' ESW PUMP HAS FAILED TO AUTO START AND SHOULD MANUALLY START IT.</b></p>   |  |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/ S/RO JPM No 04.ON.1203.251 Student Name \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
| 18.  | Ensure ESW supplying adequate cooling to DG iaw OP-054-001.   | Student recognizes ESW Pump D not running.<br><br>May inform SRO.  |      |          |
| 19.  | Select correct procedure / section.   | Student selects OP-054-001 Section 2.2.<br><b>Student may start ESW Pumps without referring to OP due to auto action failing to occur.</b> |      |          |
| *20. | Place ESW Loop B in service by depressing ESW Pump D or B Run pushbutton.                                 | Student depresses ESW Pump D or B Run pushbutton (Red light on-Amber light off).   |      |          |
| 21.  | Place ESW Loop A in service by depressing ESW Pump A or C Run pushbutton.                                 | Student depresses ESW Pump A or C Run pushbutton (Red light on-Amber light off).   |      |          |
| 22.  | As soon as possible, station Operator at DG to monitor conditions that would cause normal shutdown of DG. | Student dispatches NPO to monitor DG parameters.   |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br><br>Role play as NPO and report conditions normal for DG D.                |  |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br><br>This completes the JPM.  |  |      |          |

\*Critical Step

#Critical Sequence



**PERFORMANCE CHECKLIST**

Appl. To/ S/RO JPM No 04.ON.1203.251 Student Name \_\_\_\_\_

| Step | Action  | Standard | Eval | Comments |
|------|---|----------|------|----------|
|      | <b><u>EVALUATOR</u></b><br><br>Do you have ALL your JPM exam materials?<br>Task Cue Sheets? Procedures? |          |      |          |

\*Critical Step

#Critical Sequence

## **TASK CONDITIONS**

- Unit 2 is in a Shutdown Condition.
- An Electrical transient has occurred on the 2D ESS bus.
- DG D has failed to auto start and is in standby alignment.
- No electrical Bus fault is present.
- You are the On-Shift U2 PCOP.


## **INITIATING CUE**

Implement ON-004-002 to re-energize the 2D ESS bus.

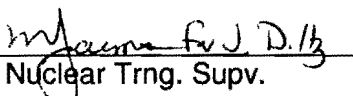
**PPL SUSQUEHANNA, LLC**  
**JOB PERFORMANCE MEASURE**  
**APPROVAL AND ADMINISTRATIVE DATA SHEET**

|             |                       |          |                 |               |              |                |
|-------------|-----------------------|----------|-----------------|---------------|--------------|----------------|
| <u>S/RO</u> | <u>35.ON.1662.101</u> | <u>0</u> | <u>12/20/10</u> | <u>233000</u> | <u>A2.02</u> | <u>3.1/3.3</u> |
| Appl.       | JPM Number            | Rev.     | Date            | NUREG 1123    | K/A No.      | K/A Imp.       |
| To          |                       | No.      |                 | Sys. No.      |              |                |

Task Title: Add Water to Fuel Pool via RHRSW IAW ON-135-001

|                      |                 |  |                 |
|----------------------|-----------------|--|-----------------|
| <u>Completed By:</u> |                 | <u>Validated:</u>  |                 |
| <u>Bob Pudish</u>    | <u>12/20/10</u> |  | <u>12/15/10</u> |
| Writer               | Date            | Instructor/Writer  | Date            |

Approval:

|  |                 |
|--|-----------------|
|  | <u>12-23-10</u> |
| Nuclear Trng. Supv.  | Date            |

|                             |           |                               |
|-----------------------------|-----------|-------------------------------|
| <u>Date of Performance:</u> | <u>20</u> | <u>Validation Time (Min.)</u> |
|                             |           | <u>Time Taken (Min.)</u>      |

JPM Performed By:

Student Name: \_\_\_\_\_

|      |       |      |                     |
|------|-------|------|---------------------|
| Last | First | M.I. | Employee # / S.S. # |
|------|-------|------|---------------------|

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name: \_\_\_\_\_

|           |                  |
|-----------|------------------|
| Signature | Typed or Printed |
|-----------|------------------|

Comments:

**REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 35.ON.1662.101**

**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 PPL 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**

ON-135-001, Loss Fuel Pool Cooling / Coolant Inventory (Rev. 30)

**III. OPERATIONAL ACTIVITIES**

This JPM satisfies the requirements of Operational Activity(s):  
NONE

**IV. TASK CONDITIONS**

- A. A Seismic event has occurred.
- B. Unit 1 is in Mode 3
- C. Unit 1 Fuel Pool inventory is lowering due to a system breach.
- D. Normal Fuel Pool makeup is unavailable.
- E. A system walkdown was unable to locate the leak, however the rate of inventory loss is not severe.
- F. The Unit 1 Fuel Pool Cooling System has been shutdown.
- G. The Cask Storage Pit Gate is closed
- H. The Unit 1 Fuel Pool has been isolated from Non-Q piping by another operator.
- I. Adding water to the fuel pool was attempted using the ESW System, but was unsuccessful.
- J. Current Unit 1 Pool level is 21' 11" down slow.

**V. INITIATING CUE**

Add water to the Unit 1 Fuel Pool via RHRSW through RHR Loop 'A' IAW ON-135-001.

**VI. TASK STANDARD**

Water is added to Fuel Pool using the RHRSW system.

**VII. TASK SAFETY SIGNIFICANCE**

Maintaining Fuel Pool inventory will prevent fuel element overheating and cladding damage.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 35.ON.1662.101

Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments  |
|------|---|---|------|---|
|      | <p><b><u>EVALUATOR NOTE</u></b></p> <ul style="list-style-type: none"> <li>• This JPM must be performed on the simulator.</li> <li>• Insert the following malfunctions:<br/> <b>IMF annAR016G06 f:ALARM_ON</b><br/> <b>IMF annAR016H14 f:ALARM_ON</b><br/> <b>IMF annAR016H16 f:ALARM_ON</b><br/> <b>IMF annAR106A17 f:ALARM_ON</b></li> <li>• Insert the following remote function:<br/> <b>IRF rFP135007 f:RHR_BACKUP</b></li> <li>• Insert the following over-ride:<br/> <b>IOR aoLRTR15347A f:815.92</b></li> <li>• This JPM uses the following Event Trigger:<br/> <b>aet 35ON1662101</b><br/>                     Which consists of conditions:<br/> <b>diHS11275A.CurrValue = #OR.diHS11275A.OPEN</b><br/>                     And linked commands:<br/> <b>DOR aoLRTR15347A</b></li> <li>• Assign the following Keys:<br/> <b>{Key[1]} MOR aoLRTR15347A r:30:00 i:Asls f:815.75</b><br/> <b>{Key[2]} IRF rRH149026 f:100</b></li> <li>• Place the simulator in Run, take the M/S to S/D, override HPCI and RCIC, perform immediate operator actions following a scram to control FW.</li> <li>• Place the simulator in Freeze.</li> <li>• Consider snapping an IC for multiple performances of this JPM.</li> <li>• When student is ready to begin <b>JPM</b>, place the simulator in <b>RUN</b>.</li> <li>• Press <b>{Key[1]}</b> to begin lowering the level in the fuel pool.</li> </ul> | <p>Turns on the annunciator for seismic.<br/>Turns on the annunciator for 0C211.<br/>Turns on the annunciator for 0C207.<br/>Turns on the annunciator for 1C206.</p> <p>Closes suction valve to trip FPC Pps.</p> <p>Sets fuel pool level at 21'11".</p> <p>Delete FP lowering when HV112F075A is open.</p> <p>Start lowering level in the fuel pool.</p> <p>Open manual valve151070.</p> |      | <p>Setup was snapped to IC-393 for LOC-23 NRC Exam.</p> |

\*Critical Step

#Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 35.ON.1662.101

Student Name: \_\_\_\_\_

| Step | Action  | Standard                             | Eval | Comments |
|------|---|--------------------------------------|------|----------|
| 1.   | Obtain a controlled copy of ON-135-001, Loss of Fuel Pool Cooling / Coolant Inventory.  | Student obtains Controlled copy.     |      |          |
| 2.   | Review Sections 1.0 through 3.0.<br><ul style="list-style-type: none"> <li>• Sections 1 through 3 reviewed.</li> </ul>  | Student review Sections 1 through 3. |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>If asked about Step 3.2, inform Candidate that Unit 1 is in Mode 3 and that TS are being complied with.</p> <p>If asked about Step 3.3.2, inform Candidate that TS are being complied with.</p> |                                      |      |          |
| 3.   | Selects the correct section to perform.<br><ul style="list-style-type: none"> <li>• Goes to Section 3.6.</li> </ul>   | Student selects section 3.6.         |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 35.ON.1662.101

Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
| 4.   | Ensure the following valves are Closed:<br>(a) HV-151F023 RHR Rx Head Spray Flow Cntrl Vlv.<br>• Amber light On, Red light Off<br>(b) HV-151F015A RHR Loop A Inj OB Iso Vlv.<br>• Amber light On, Red light Off<br>(c) HV-151F010A RHR Loop A Cross-tie.<br>• Amber light <b>Off</b> , Red light <b>Off</b><br>(d) HV-151F010B RHR Loop B Cross-tie.<br>• Amber light <b>Off</b> , Red light <b>Off</b><br>(e) HV-11210A U1 RHRSW Hx A Inlet.<br>• Amber light On, Red light Off<br>(f) HV-21210A U2 RHRSW Hx A Inlet.<br>• Amber light On, Red light Off | Student checks valve positions.<br><br>This valve is normally closed and de-energized.<br>This valve is normally closed and de-energized.<br><br>Student contacts Unit 2 PCOP and asks for the position of HV-21210A. |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>If asked about the position of valves HV-151F010A/B, Role Play as Unit Supervisor and report that the valves were determined to be closed by the current surveillance.</p> <p>Role Play as Unit 2 PCOP and report valve HV-21210A is Closed.</p>  |   |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 35.ON.1662.101

Student Name: \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| 5.   | Momentarily place HS-E11-1S17A LOCA Isolation Manual Override Keylock Switch to override. <ul style="list-style-type: none"> <li>• Key inserted</li> <li>• Switch turned to Override</li> </ul>  | Student overrides LOCA Iso logic.   |      |          |
| 6.   | Observe the following: <p>(a) LOCA Isolation Manual Override White Indicating Light Illuminated.</p> <ul style="list-style-type: none"> <li>• White light momentarily LIT (only when key is in override position)</li> </ul> <p>(b) LOCA Iso Switch Loop A Manual Override Annunciator Alarmed.</p> <ul style="list-style-type: none"> <li>• Annunciator AR-109-C05 NOT LIT (N/A)</li> </ul> | Student observes override light is lit only when key is in the override position. When the key is released the override light will go out.<br><br>The annunciator will not come in due to No LOCA signal being present. |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> If asked about LOCA Isolation Manual Override not sealing in, Role Play as Unit Supervisor and ask if you would expect to have to override LOCA isolations based on initial conditions.   |   |      |          |

\*Critical Step

#Critical Sequence



**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 35.ON.1662.101

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| *7.  | Close the following valves:<br>(a) HV-151F048A RHR Hx Shell Side Bypass Vlv.<br>• Switch to Close<br>• Amber light LIT, Red light NOT LIT<br>(b) HV-151F017A RHR Loop A Injection Flow Cntrl Vlv.<br>• Switch to Close<br>• Amber light LIT, Red light NOT LIT<br>(c) HV-151F003A RHR Hx A Shell Side Outlet Vlv.<br>• Switch to Close<br>• Amber light LIT, Red light NOT LIT | Student begins lineup.   |      |          |
| 8.   | Ensure the following valves Closed:<br>(a) HV-151F016A RHR Loop A Drwl Spray OB Iso Vlv.<br>• Amber light LIT, Red light Not Lit<br>(b) HV-151F028A RHR Loop A Supp Cbr Spray Test Shutoff Vlv.<br>• Amber light LIT, Red light Not Lit  | Student verifies lineup.   |      |          |
|      | <p><b><u>EVALUATOR NOTE</u></b></p> The following valves are located In-Plant. Student will contact In-Plant Operator and direct these valves opened.  |  |      |          |
| 9.   | Open the following valves:<br>(a) 151070 - RHR to Refuel Pool Clg and Clnup Return<br>(b) 153070A - Fuel Pool Fill Vlv from RHR<br>(c) 153070B - Fuel Pool Fill Vlv from RHR   | Student directs an In-Plant Operator to open these valves.<br>(RB 683' in 'B' RHR pipeway)<br>(RB 749' in FP pump & Hx room)<br>(RB 749' in FP pump & Hx room) |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 35.ON.1662.101

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>BOOTH OPERATOR CUE</u></b><br/>                     Press {Key[2]} to open manual valve 151070. (Found on P&amp;ID RH1)<br/>                     Valves 153070A/B are already open. (Found on P&amp;ID FP1)</p> |  |      |          |
|      | <p><b><u>BOOTH OPERATOR CUE</u></b><br/>                     Role Play as In-Plant Operator and report the valves are Open.</p>  |  |      |          |
| 10.  | <p>If necessary, Momentarily Place HS-11202A3 RHRSW Pump A LOCA-Trip to Reset.</p> <ul style="list-style-type: none"> <li>• Switch to Reset not necessary</li> </ul>   | <p>Student does not need to reset LOCA-trip logic to RHRSW Pump.</p> |      |          |
|      | <p><b><u>EVALUATOR NOTE</u></b><br/>                     AR-109-H03 and H04 will come in when 1P506A is started.</p>   |  |      |          |
| *11. | <p>Start 1P506A RHRSW Pump A.</p> <ul style="list-style-type: none"> <li>• Control Switch to Start</li> <li>• Red light LIT, Amber light Not LIT</li> </ul>  | <p>Student starts pump.</p>  |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 35.ON.1662.101

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| *12. | Open HV112F073A RHRSW Crosstie. <ul style="list-style-type: none"> <li>• Switch to Open</li> <li>• Red light LIT, Amber light Not LIT</li> </ul> | Student opens HV112F073A RHRSW Crosstie.                   |      |          |
| *13. | Open HV112F075A RHRSW Crosstie. <ul style="list-style-type: none"> <li>• Switch to Open</li> <li>• Red light LIT, Amber light Not LIT</li> </ul> | Student opens HV112F075A RHRSW Crosstie.                   |      |          |
| 14.  | Ensure HV-112F074A RHRSW/RHR Loop A Crosstie Drain Vlv Closes (Rm I-104 29-645').  | Student contacts an NPO to ensure that HV-112F074A Closes. |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br>As In-Plant operator, when asked about valve HV-112F074A, report valve is closed.                                 |  |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br>This completes the JPM.   |  |      |          |
|      | <b><u>EVALUATOR</u></b><br>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?   |  |      |          |

\*Critical Step

#Critical Sequence

## **TASK CONDITIONS**

- A. A Seismic event has occurred.
- B. Unit 1 Fuel Pool inventory is lowering due to a system breach.
- C. Normal Fuel Pool makeup is unavailable.
- D. A system walkdown was unable to locate the leak, however the rate of inventory loss is not severe.
- E. The Unit 1 Fuel Pool Cooling System has been shutdown.
- F. The Cask Storage Pit Gate is closed.
- G. The Unit 1 Fuel Pool has been isolated from Non-Q piping by another operator.
- H. Adding water to the fuel pool was attempted using the ESW System, but was unsuccessful.
- I. Current Unit 1 Pool level is 21' 11" down slow.

## **INITIATING CUE**

Add water to the Unit 1 Fuel Pool via RHRSW through RHR Loop 'A' IAW ON-135-001.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

S/RO 55.ON.2000.152 3 12/20/10 201003 A2.01 3.4/3.6  
Appl. JPM Number Rev. Date NUREG 1123 K/A No. K/A Imp.  
To No. Sys. No.

Task Title: Respond to a Stuck Control Rod IAW ON-155-001

Completed By: Bob Pudish 12/20/10 Validated: [Signature] 12/15/10  
Writer Date Instructor/Writer Date

Approval: [Signature] 12-23-10  
Nuclear Trng. Supv. Date

Date of Performance: \_\_\_\_\_ Validation Time (Min.) 25 Time Taken (Min.) \_\_\_\_\_

JPM Performed By: \_\_\_\_\_

Student Name: \_\_\_\_\_  
Last First M.I. Employee # / S.S. #

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name: \_\_\_\_\_  
Signature Typed or Printed

Comments: \_\_\_\_\_

**REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 55.ON.2000.152**

**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 PPL 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. ON-155-001, CONTROL ROD PROBLEMS (Rev. 34)

**III. OPERATIONAL ACTIVITIES**

This JPM satisfies the requirements of Operational Activity(s):

None

**IV. TASK CONDITIONS**

- A. Unit 1 is at 90% power.
- B. A rod pattern adjustment is scheduled.

**V. INITIATING CUE**

The Unit Supervisor directs you to perform the rod pattern adjustment by **SINGLE NOTCH** Withdrawing Rods in accordance with the reactivity manipulation request form and control rod movement sheet. The reactivity briefing for this power change has been completed.

**VI. TASK STANDARD**

Rods 22-39 withdrawn to notch 12; Rod 38-39 withdrawn to notch 08.

**VII. TASK SAFETY SIGNIFICANCE**

Ability to safely add positive Reactivity with control rod motion.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 55.ON.2000.152

Student Name: \_\_\_\_\_

| Step | Action  | Standard | Eval | Comments  |
|------|---|----------|------|---|
|      | <p><b><u>Simulator Setup</u></b></p> <ul style="list-style-type: none"> <li>• Load MODE 1 IC-20.</li> <li>• Place Simulator in RUN, lower power to ~90% with rods and RRP's.</li> <li>• Insert the following malfunction:<br/> <b>IMF mfRD1550063839 f:Asls</b></li> <li>• Ensure FWFE is on LEFM.</li> <li>• Ensure PICYS screen is on CRDA.</li> <li>• Clear / acknowledge all RWM alarms.</li> <li>• Place the simulator in Freeze.</li> </ul> <p>Have a reactivity manipulation request form and control rod movement sheet ready.</p> <p>Consider snapping an IC for multiple performances of this JPM.</p> <p>The FAULTED step in this JPM is preceded by a fault statement in <b>BOLD TYPE WITH ALL CAPITAL LETTERS.</b></p> <p>When student is ready to begin <b>JPM</b>, place the simulator in <b>RUN</b>.</p> <p><b><u>EVALUATOR NOTE</u></b></p> <p><b>DO NOT PASS OUT ON-155-001 INITIALLY TO STUDENT.</b></p> |          |      | <p>Setup was snapped to IC-391 for LOC-23 NRC Exam.</p> |

\* Critical Step      # Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.ON.2000.152

Student Name: \_\_\_\_\_

| Step | Action                           | Standard   | Eval | Comments |
|------|----------------------------------|--|------|----------|
| *1.  | Selects Rod 22-39 for withdraw.  | Depresses 22 – 39<br>Verifies 22 and 39:<br>White lights – LIT<br>Four rod display reads notch 06.   |      |          |
| #2.  | Withdraws Rod 22-39 to notch 12. | Depresses W/DRAW ROD pushbutton.<br>Verifies:<br>Four rod display changes to notch 08.<br>Depresses W/DRAW ROD pushbutton.<br>Verifies:<br>Four rod display changes to notch 10.<br>Depresses W/DRAW ROD pushbutton.<br>Verifies:<br>Four rod display changes to notch 12. |      |          |
| *3.  | Selects Rod 38-39 for withdraw.  | Depresses 38-39<br>Verifies 38 and 39:<br>White lights – LIT<br>Four rod display reads notch 06.   |      |          |

\* Critical Step          # Critical Sequence



**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.ON.2000.152

Student Name: \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
|      | <p><b><u>FAULT STATEMENT</u></b><br/> <b>ROD 38-39 WILL NOT MOVE IN THE NEXT STEP.</b></p>  |  |      |          |
| 4.   | Withdraws Rod 38-39 to notch 12.  | Depresses W/DRAW ROD pushbutton.<br>Verifies:<br>Four rod display <b>DID NOT CHANGE</b> to notch 08. |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b><br/>                     Student may request permission to attempt to move rod <b>ONE MORE</b> time before proceeding to the Off-Normal procedure. IF necessary, Role-play Unit Supervisor and grant permission to attempt <b>ONE MORE</b> withdrawal sequence. If necessary, Role-Play Unit Supervisor and direct entry into ON-155-001.</p>                    |  |      |          |
| 5.   | <p>Proceed to applicable section of OFF-Normal procedure ON-155-001, Control Rod Problems as indicated.</p> <ul style="list-style-type: none"> <li>• Stuck Control Rod Step 4.3</li> <li>• Rod Drift or Rod Scram Step 4.4</li> <li>• Rod Overtravel Step 4.5</li> <li>• Mispositioned Rod Step 4.6</li> <li>• Multiple Rod Notching Step 4.7</li> <li>• Slow to Settle Rod Step 4.8</li> </ul> | Determines step 4.3 is applicable based on initial conditions.                                       |      |          |

\* Critical Step      # Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.ON.2000.152

Student Name: \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
|      | <p><b><u>EVALUATOR NOTE</u></b><br/>                     Student should not use the FULL IN / FULL OUT display to determine rod position in the next step.</p>   |   |      |          |
| 6.   | <p>IF rod position indication does not change when valid withdraw OR insert signal applied, Perform the following:<br/>                     Confirm control rod position using any 3 of the available rod position indication as follows:</p> <ul style="list-style-type: none"> <li>• CRT and SIP 4 ROD DISPLAY.</li> <li>• FULL IN/FULL OUT DISPLAY push button.</li> <li>• OD 7</li> <li>• Alarm logging printer, System Event Display Message</li> <li>• RWM Main Display when below Low Power Alarm Point.</li> </ul> | <p>Uses any 3 of the following to confirm Rod 38-39 is <b>STILL AT NOTCH 06</b>.</p> <ul style="list-style-type: none"> <li>• CRT and SIP 4 ROD DISPLAY.</li> <li>• FULL IN/FULL OUT DISPLAY push button.</li> <li>• OD 7</li> <li>• Alarm logging printer, System Event Display Message</li> <li>• RWM Main Display when below Low Power Alarm Point.</li> </ul> |      |          |
|      | <p align="center"><b><u>CAUTION</u></b></p> <p>Scramming a stuck control rod will cause damage to CRD mechanism.</p>   |   |      |          |

\* Critical Step      # Critical Sequence

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 55.ON.2000.152

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| 7.   | <p><u>IF</u> rod failed to move, Attempt to move control rod, as follows:<br/>Complete rod data on Attachment A.</p>   | <p>Records the following on Attachment A<br/>Date<br/>Time<br/>Rod 38-39<br/>Reactor Pressure<br/>"S" for Stuck<br/>Position 06</p>                        |      |          |
| *8.  | <p>In ~ 50 psid increments, Increase drive water pressure<br/><u>AND</u><br/>Perform following at each increment until <math>\leq</math> 350 psid reached:</p> | <p>Places DRIVE WTR PRESS THLTG PV-146F003 to CLOSE<br/><u>UNTIL</u><br/>DRIVE WATER DIFF PRESSURE PDI-C12-1R602<br/>INCREASES FROM ~250 TO ~300 PSID.</p> |      |          |
|      | <p><b><u>BOOTH OPERATOR CUE</u></b><br/><b>Remove ROD 38-39 Stuck Rod malfunction by deleting the malfunction:</b><br/><b>DMF mFRD1550063839</b></p>           |  |      |          |
|      | <p><b><u>CAUTION</u></b><br/>Elevated drive pressure increases the risk of multiple notch movement.</p>  |  |      |          |

\* Critical Step      # Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.ON.2000.152

Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
| *9.  | Attempt to operate drive one notch in intended direction, authorized by procedure governing original Control Rod motion, while observing drive water flows (4 gpm insert/2.5 gpm withdraw).                 | Depresses W/DRAW ROD pushbutton<br>Verifies:<br>Full core display FOR ROD 38-39<br><b>CHANGES to notch 08</b><br><br>AND<br><br>Verifies:<br>DRIVE WATER FLOW FI-C12-1R604<br>RAISE to ~2.5 gpm<br><br>Reports ROD 38-39 is at NOTCH 08 to Unit Supervisor. |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br><br>Normally, another operator would be assigned to observe drive water flows. If necessary, inform student that drive water flow was 2.5 gpm during the withdrawal attempt. |   |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br><br>Role-play Unit Supervisor and acknowledge the report and direct student to complete the ON procedure.  |   |      |          |
| 10.  | IF rod moves one notch in intended direction, Go to step 4.3.1.f.   | Proceeds to step 4.3.1.f.   |      |          |

\* Critical Step      # Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.ON.2000.152

Student Name: \_\_\_\_\_

| Step  | Action  | Standard  | Eval | Comments |
|---|---|---|------|----------|
| 11.   | Record drive water pressure required to move control rod on Attachment A.                             | Records the following on Attachment A:<br>300 psid drive water pressure required to move control rod. |      |          |
| 12.   | Record drive water flow that is indicated while attempting to move stuck control rod on Attachment A. | Records the following on Attachment A:<br>Indicated drive water flow required to move control rod.    |      |          |
| <p align="center"><b><u>NOTE (1):</u></b></p> <p><u>IF</u> control rod testing is being performed IAW TP-055-001 or TP-055-006, multiple control rod notch movement is allowed at elevated drive water pressure. Drive water pressure must be returned to 250 psid prior to testing next control rod.</p> <p align="center"><b><u>NOTE (2):</u></b></p> <p>Multiple notch movement is permitted for control rods with identified friction (except during startup single notch restraint). If excessive control rod speed is observed, control rod movement must be stopped and drive pressure returned to 250 psid.</p> |   |   |      |          |

\* Critical Step      # Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.ON.2000.152

Student Name: \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
| *13. | Return drive water pressure to ~ 250 psid, for each subsequent rod notch. Document on Attachment A. | Places DRIVE WTR PRESS THLTG PV-146F003 to OPEN<br><br>UNTIL<br><br>DRIVE WATER DIFF PRESSURE PDI-C12-1R602<br><br>DECREASES TO ~250 PSID<br><br>AND<br><br>Records the following on Attachment A:<br><br>250 psid |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br>This completes the JPM.  |  |      |          |
|      | <b><u>EVALUATOR</u></b><br>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?    |  |      |          |

\* Critical Step      # Critical Sequence

## TASK CONDITIONS

- A. Unit 1 is at 90% power
- B. A control rod pattern adjustment is scheduled.

## INITIATING CUE

The Unit Supervisor directs you to perform the control rod pattern adjustment by **SINGLE NOTCH** Withdrawing Rods in accordance with the reactivity manipulation request form and control rod movement sheet. The reactivity briefing for this power change has been completed.

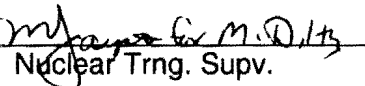
**PPL SUSQUEHANNA, LLC**  
**JOB PERFORMANCE MEASURE**  
**APPROVAL AND ADMINISTRATIVE DATA SHEET**

|             |                       |          |                 |               |              |                |
|-------------|-----------------------|----------|-----------------|---------------|--------------|----------------|
| <u>S/RO</u> | <u>78.OP.3680.101</u> | <u>0</u> | <u>12/20/10</u> | <u>215005</u> | <u>A2.04</u> | <u>3.8/3.9</u> |
| Appl.       | JPM Number            | Rev.     | Date            | NUREG 1123    | K/A No.      | K/A Imp.       |
| To          |                       | No.      |                 | Sys. No.      |              |                |

Task Title: Inserting APRM Rod Block and Scram Setpoints for Single Loop Ops IAW OP-178-002

|                      |                 |  |                 |
|----------------------|-----------------|--|-----------------|
| <u>Completed By:</u> |                 | <u>Validated:</u>  |                 |
| <u>Bob Pudish</u>    | <u>12/20/10</u> |  | <u>12/15/10</u> |
| Writer               | Date            | Instructor/Writer  | Date            |

Approval:

|   |                 |
|---|-----------------|
|  | <u>12-23-10</u> |
| Nuclear Trng. Supv.   | Date            |

|                             |           |                               |                          |
|-----------------------------|-----------|-------------------------------|--------------------------|
| <u>Date of Performance:</u> | <u>10</u> | <u>Validation Time (Min.)</u> | <u>Time Taken (Min.)</u> |
|-----------------------------|-----------|-------------------------------|--------------------------|

JPM Performed By:

Student Name: \_\_\_\_\_

|      |       |      |                     |
|------|-------|------|---------------------|
| Last | First | M.I. | Employee # / S.S. # |
|------|-------|------|---------------------|

Performance Evaluation:      (    )    Satisfactory      (    )    Unsatisfactory

Evaluator Name: \_\_\_\_\_

|           |                  |
|-----------|------------------|
| Signature | Typed or Printed |
|-----------|------------------|

Comments:



**REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 78.OP.3680.101**

**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 PPL 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-178-002, PRNMS (Rev. 2)

**III. OPERATIONAL ACTIVITIES**

This JPM satisfies the requirements of Operational Activity(s):  
NONE

**IV. TASK CONDITIONS**

- A. Unit 1 has entered Single Loop Operation (SLO) 1 hour ago.
- B. Condition C of TS LCO 3.4.1 is to be performed.

**V. INITIATING CUE**

Insert APRM Rod block and Scram Setpoints for Single Loop Operation for APRM 3 in accordance with OP-178-002.

**VI. TASK STANDARD**

SLO setpoints are inserted for APRM 3.

**VII. TASK SAFETY SIGNIFICANCE**

Correct APRM Rod Block and Scram setpoints are required for Single Loop operation.

PERFORMANCE CHECKLIST

Appl. To/JPM No.: S/RO 78.OP.3680.101

Student Name: \_\_\_\_\_

| Step | Action   | Standard                                      | Eval | Comments   |
|------|--|---|------|--|
|      | <p><b><u>EVALUATOR NOTE</u></b></p> <ul style="list-style-type: none"> <li>• This JPM must be performed on the simulator.</li> <li>• Reset to Single Loop IC with SLO setpoints NOT inserted yet.</li> <li>• Due to Simulator modeling, APRM 3 is the only Module that is modeled.</li> <li>• <b>ENSURE THAT ALL APRM VOTERS ARE RESET FOR TRIP / INOP MEMORY.</b></li> <li>• Place the simulator in Freeze.</li> <li>• When student is ready to begin <b>JPM</b>, place the simulator in <b>RUN</b>.</li> </ul> |   |      | Setup was snapped to IC-393 for LOC-23 NRC Exam. |
| 1.   | Obtain a controlled copy of OP-178-002, PRNMS.   | Student obtains Controlled copy.              |      |  |
| 2.   | Selects the correct section to perform. <ul style="list-style-type: none"> <li>• Goes to Section 2.5</li> </ul>  | Student selects section 2.5.                  |      |  |
| 3.   | Review Pre-reqs, Precautions, Notes. <ul style="list-style-type: none"> <li>• Pre-reqs, Precautions, Notes reviewed</li> </ul>   | Student reviews Pre-reqs, Precautions, Notes. |      |  |
|      | <p style="text-align: center;"><b><u>NOTE</u></b></p> <p>This section revises APRM trip and alarm setpoints as required by Tech. Spec. for single loop operation in accordance with LCO 3.4.1.</p>   |   |      |  |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 78.OP.3680.101

Student Name: \_\_\_\_\_

| Step | Action  | Standard                                 | Eval | Comments |
|------|---|--|------|----------|
| 4.   | Insert APRM setpoints for SLO:<br>(a) Establish communication with PCO.   | Student establishes coms with PCO.       |      |          |
|      | <p><b><u>BOOTH OPERATOR CUE</u></b></p> Role Play as PCO using the page and inform Student coms are established.  |  |      |          |
| *5.  | (b) Request PCO bypass APRM to be adjusted.<br>• APRM Bypass Joystick to 3 position   | Student requests that PCO bypass APRM 3. |      |          |
|      | <p><b><u>BOOTH OPERATOR CUE</u></b></p> Place <b>APRM BYPASS</b> switch in the <b>-BLK-</b> position using the software (or go to the Control Room and manually place the switch in position "3") and inform the Student that APRM 3 is bypassed. |  |      |          |
| 6.   | (c) Confirm at All four 2/4 Voters, Bypassed LEDs for bypassed APRM Illuminated.  | Student acknowledges cue.                |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> Inform Student that All four 2/4 Voters, Bypassed LEDs for APRM 3 are Illuminated.   |  |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 78.OP.3680.101

Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
| *7.  | (d) Press ETC soft key as required until Enter Set Mode is shown above soft key pushbutton across bottom of display. <ul style="list-style-type: none"> <li>• Enter Set Mode is displayed</li> </ul>    | Student presses ETC soft key as required until Enter Set Mode is displayed. |      |          |
|      | <p align="center"><b><u>NOTE</u></b></p> The password for entry into OPER-SET mode of the NUMAC must be entered within approximately 10 seconds or the screen will revert to the main bargraph display. |   |      |          |
| *8.  | (e) Press Enter Set Mode soft key. <ul style="list-style-type: none"> <li>• Enter Set Mode soft key pressed</li> <li>• Password entry display screen appears</li> </ul>                                 | Student presses Enter Set Mode soft key.                                    |      |          |
| *9.  | (f) Enter Password "1234" and Press Ent. <ul style="list-style-type: none"> <li>• 1 2 3 4 depressed</li> <li>• Ent depressed</li> </ul>   | Student enters Password "1234" and Press Ent.                               |      |          |
| 10.  | (g) Confirm Oper-Set mode indicated at APRM or ODA. <ul style="list-style-type: none"> <li>• Oper-Set confirmed at either APRM or ODA</li> </ul>  | Student confirms Oper-Set mode indicated at APRM or ODA.                    |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 78.OP.3680.101

Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
| *11. | (h) Select Single Loop Operation using (↑↓) Cursor keys to scroll.<br><ul style="list-style-type: none"> <li>• Single Loop Operation selected.</li> </ul>               | Student selects Single Loop Operation using (↑↓) Cursor keys.                 |      |          |
| *12. | (i) Press Set Parameters soft key.<br><ul style="list-style-type: none"> <li>• Set Parameter pressed</li> </ul>   | Student presses Set Parameters soft key.                                      |      |          |
| 13.  | (j) Ensure APRM indicates Set Parameters: Single Loop Operation.<br><ul style="list-style-type: none"> <li>• Set Parameters: Single Loop Operation displayed</li> </ul> | Student ensures APRM indicates Set Parameters: Single Loop Operation.         |      |          |
| *14. | (k) Change the Desired: Enabled field to YES using the (↑↓) Cursor keys.<br><ul style="list-style-type: none"> <li>• YES displayed</li> </ul>                           | Student changes the Desired: Enabled field to YES using the (↑↓) Cursor keys. |      |          |
| *15. | (l) Press Accept soft key.<br><ul style="list-style-type: none"> <li>• Accept soft key pressed</li> </ul>   | Student presses Accept soft key.  |      |          |
| 16.  | (m) Confirm Present:Enabled field changed to YES.<br><ul style="list-style-type: none"> <li>• Yes displayed</li> </ul>  | Student confirms Present:Enabled field changed to YES.                        |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 78.OP.3680.101

Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
| 17.  | (n) Press Exit soft key.<br><ul style="list-style-type: none"> <li>• Exit depressed</li> </ul>  | Student presses Exit soft key.                              |      |          |
| 18.  | (o) Press Exit Set Mode soft key.<br><ul style="list-style-type: none"> <li>• Exit Set Mode depressed</li> </ul>  | Student presses Exit Set Mode soft key.                     |      |          |
| 19.  | (p) Press Yes soft key.<br><ul style="list-style-type: none"> <li>• Yes soft key depressed</li> </ul>   | Student presses Yes soft key.                               |      |          |
| 20.  | (q) Confirm the APRM display header indicated Operate.<br><ul style="list-style-type: none"> <li>• Operate displayed</li> </ul>   | Student confirms the APRM display header indicates Operate. |      |          |
| 21.  | (r) Confirm the APRM display header indicates SLO.<br><ul style="list-style-type: none"> <li>• SLO displayed</li> </ul>   | Student confirms the APRM display header indicates SLO.     |      |          |
|      | <p><b><u>EVALUATOR NOTE</u></b></p> <p><b>The simulator contains only one 2 out of 4 voter module. Three others would normally be verified by the PCO.</b></p>          |   |      |          |
| 22.  | (s) Confirm TRIP LEDs on all four 2/4 Voters are NOT ILLUMINATED for the selected APRM.<br><ul style="list-style-type: none"> <li>• TRIP LED not illuminated</li> </ul> | Student confirms TRIP LED is NOT ILLUMINATED for APRM 3.    |      |          |

\*Critical Step

#Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 78.OP.3680.101

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| 23.  | (t) If required, Depress TRIP MEMORY RESET on ALL four 2/4 Voters to clear MEM LEDs.<br><ul style="list-style-type: none"> <li>• MEM LEDs not illuminated</li> </ul>   | Student depresses TRIP MEMORY RESET to clear MEM LEDs.         |      |          |
| 24.  | (u) Confirm TRIP condition for the selected APRM NOT present on ALL four 2/4 Voters.<br><ul style="list-style-type: none"> <li>• TRIP LED not illuminated</li> </ul>   | Student confirms TRIP LED is NOT ILLUMINATED for APRM 3.       |      |          |
| *25. | (v) Remove applicable APRM from Bypass.<br><ul style="list-style-type: none"> <li>• APRM 3 Bypass Joystick taken out of Bypass</li> </ul>  | Student contacts PCO to remove APRM 3 from bypass position.    |      |          |
|      | <p><b><u>BOOTH OPERATOR CUE</u></b></p> <p>Place <b>APRM BYPASS</b> switch in the <b>OFF</b> position using the software (or go to the Control Room and manually place the switch in center position) and inform the Student that the bypass is removed from APRM 3.</p> |  |      |          |
| 26.  | (w) Confirm at ALL four 2/4 Voters BYPASSED LEDs Not illuminated.<br><ul style="list-style-type: none"> <li>• BYPASSED LED not illuminated</li> </ul>  | Student confirms that BYPASSED LED not illuminated for APRM 3. |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>This completes the JPM.</p>  |  |      |          |
|      | <p><b><u>EVALUATOR</u></b></p> <p>Do you have ALL your JPM materials? Task Cue Sheets? Procedures?</p>   |  |      |          |

\*Critical Step

#Critical Sequence

### **TASK CONDITIONS**

- A. Unit 1 has entered Single Loop Operation (SLO) 1 hour ago.
- B. Condition C of TS LCO 3.4.1 is to be performed.

### **INITIATING CUE**

Insert APRM Rod block and Scram Setpoints for Single Loop Operation for APRM 3 in accordance with OP-178-002.



**PPL SUSQUEHANNA, LLC**  
**JOB PERFORMANCE MEASURE**

**APPROVAL AND ADMINISTRATIVE DATA SHEET**

|             |                       |          |                   |                     |              |                |
|-------------|-----------------------|----------|-------------------|---------------------|--------------|----------------|
| <u>S/RO</u> | <u>93.EO.1129.151</u> | <u>0</u> | <u>12/21/2010</u> | <u>241000</u>       | <u>A4.02</u> | <u>4.1/4.1</u> |
| Appl. To    | JPM Number            | Rev. No. | Date              | NUREG 1123 Sys. No. | K/A No.      | K/A Imp.       |

Task Title: Perform Alternate Rapid Depressurization Using Main Turbine Bypass Valves (alternate path)

Completed By:

Validated:

Bob Pudish  
Writer

12/21/2010  
Date

*Bob Pudish*  
Instructor/Writer

12/15/10  
Date

Approval:

*M. J. Ditz*  
Nuclear Eng. Supv.

12-23-10  
Date

|                             |                                     |                          |
|-----------------------------|-------------------------------------|--------------------------|
| <u>Date of Performance:</u> | <u>10</u><br>Validation Time (Min.) | <u>Time Taken (Min.)</u> |
|-----------------------------|-------------------------------------|--------------------------|

JPM Performed By:

Student Name:

|             |              |             |                            |
|-------------|--------------|-------------|----------------------------|
| <u>Last</u> | <u>First</u> | <u>M.I.</u> | <u>Employee # / S.S. #</u> |
|-------------|--------------|-------------|----------------------------|

Performance Evaluation: (     ) Satisfactory     (     ) Unsatisfactory

Evaluator Name:

|                  |                         |
|------------------|-------------------------|
| <u>Signature</u> | <u>Typed or Printed</u> |
|------------------|-------------------------|

Comments:

**REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 93.EO.1129.151**

**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 PPL 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. EO-000-112, "Rapid Depressurization", Rev 5
- B. EO-100-112-1, "Rapid Depressurization (Unit 1 flowchart)", Rev 6
- C. OP-183-001, "Automatic Depressurization System And Safety Relief Valves", Rev 16
- D. OP-193-001, "Main Turbine Operation", Rev 38

**III. OPERATIONAL ACTIVITIES**

None

**IV. TASK CONDITIONS**

- A. Unit 1 has experienced a transient requiring Rapid Depressurization.
- B. The Unit Supervisor is directing actions in accordance with EO-100-112, "Rapid Depressurization".

**V. INITIATING CUE**

The Unit Supervisor directs you to open 6 (six) ADS valves.

**VI. TASK STANDARD**

- Recognize that ADS and ALL but one SRV are unavailable for rapid depressurization.
- Determine that BPVs, HPCI, RFPTs, SJAEs, MSL drains are available for alternate rapid depressurization
- Fully open Main Turbine Bypass Valves to rapidly depressurize the RPV such that RPV pressure is lowering

**VI. TASK SAFETY SIGNIFICANCE**

Rapid depressurization is a significant emergency action required to ensure adequate core cooling and/or protect the health and safety of the public.

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 93.EO.1129.151 Student Name: \_\_\_\_\_

| Step | Action   | Standard | Eval | Comments  |
|------|--|----------|------|---|
|      | <p><b><u>EVALUATOR NOTE</u></b><br/>                     This JPM must be performed in the simulator.</p> <ul style="list-style-type: none"> <li>• Initialize the simulator to any full power IC, insert a manual scram and allow the plant to stabilize with BPVs controlling RPV pressure and RFPs controlling RPV level.</li> <li>• Danger tag RCIC out of service.</li> <li>• Insert a bottom head drain leak of 1% until DW pressure ~2.0 psig, then remove leak.</li> <li>• Reset Main Generator L/Os prior to reaching 1.72 psig in the DW.</li> <li>• Place both divisions of RHR in SPC.</li> <li>• Enter overrides to prevent ALL but the "G" SRV from operating in ANY mode and to prevent the ADS manual initiation switches from working.</li> <li>• Enter the malfunction for the failure of ADS to initiate.</li> <li>• Crosstie IA to CIG.</li> </ul> <p><b>For the SROs, have EO-112 out on the table and marked up to step RD-8.</b></p> |          |      | <p>Setup was snapped to IC-397 for LOC-23 NRC Exam.</p> |

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 93.EO.1129.151 Student Name: \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b><br/>To begin this JPM provide the candidate with the task conditions and initiating cue sheet #1.</p>   |   |      |          |
|      | <p><b><u>ALTERNATE PATH (FAULT) STATEMENT</u></b><br/><b>ALL BUT ONE SRV AND THE ADS LOGIC WILL FAIL TO OPERATE AND WILL BE UNAVAILABLE FOR RAPID DEPRESSURIZATION. THE CANDIDATE WILL BE REQUIRED TO RECOGNIZE THIS FAILURE FOLLOWING THE USE OF VARIOUS METHODS TO OPEN SRVS.</b><br/><b>THE CANDIDATE MUST THEN ASSIST THE US IN DETERMINING THE BEST AVAILABLE ALTERNATE METHOD TO PERFORM RD.</b></p> |   |      |          |
| *1.  | <p>Attempt to manually initiate ADS using "ADS Manual Initiation" pushbuttons and recognize failure.</p> <p><b><u>EVALUATOR NOTE</u></b><br/>This action is normally performed from memory. OP-183-001 contains the steps to be performed. The candidate is not required to refer to this procedure prior to taking action.</p>  | <p>Attempt to manually initiate ADS by Arming &amp; Depressing ADS Manual Initiation pushbuttons A, B, C, and D.</p> <p>Observe ADS valve solenoid position indicators, acoustic monitor LEDs and/or RPV pressure indication, and determine that only one ADS valve opened and report to Unit Supervisor.</p> |      |          |

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 93.EO.1129.151 Student Name: \_\_\_\_\_

| Step       | Action   | Standard   | Eval | Comments |
|------------|--|--|------|----------|
|            | <p><b><u>EVALUATOR CUE</u></b><br/>                     Role Play as Unit Supervisor and ask if all ADS valves are open. (RD-9)</p>                    | <p>Student replies no.</p>   |      |          |
|            | <p><b><u>EVALUATOR CUE</u></b><br/>                     Role Play as Unit Supervisor and direct the Student to open SRVs until 6 are open. (RD-10)</p> |  |      |          |
| <p>*2.</p> | <p>Attempt to open 6 SRVs using individual control switches on 1C601.</p>  | <p>When directed, place control switches for SRVs to OPEN at 1C601, starting with ADS SRVs and continuing until ALL SRVs have been attempted.<br/>                     Observe SRV solenoid position indication, and determine only one SRV can be opened.</p> |      |          |
|            | <p><b><u>EVALUATOR CUE</u></b><br/>                     Role Play as Unit Supervisor and ask if 4 or more SRVs are open. (RD-11)</p>                   |  |      |          |

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 93.EO.1129.151 Student Name: \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| 3.   | <p>Report SRV failure to Unit Supervisor.</p> <p><b><u>EVALUATOR CUE</u></b><br/>As Unit Supervisor, acknowledge report, and you may direct student to dispatch an NPO to open ADS valves from the Upper or Lower Relay Room.</p> <p><b><u>EVALUATOR NOTE</u></b><br/>Student may direct the NPO to start with <i>either</i> the upper <i>or</i> lower relay room. 6 ADS valves can be operated from <i>either</i> location. Ultimately <i>both</i> locations may be attempted before the determination that only one SRV could be opened.</p> | <p>Make report to US that only one SRV could be opened.</p>   |      |          |
| 4.   | <p>May direct NPO to open ADS valves from the Upper (lower) Relay Room.</p> <p><b><u>BOOTH OPERATOR CUE</u></b><br/>As NPO, acknowledge request, then report (<i>using time compression</i>) that all 6 ADS valve keylock switches are in the OPEN position.</p>   | <p>May direct NPO to attempt to open ADS SRVs G, J, K, L, M, N from the Upper (lower) Relay Room ADS panel 1C628 using keylock switches.</p>                  |      |          |
| 5.   | <p>Determine ADS valve position following remote operation from Upper (lower) relay room.</p>  | <p>Determine that ALL but one ADS SRVs are still shut by observing ADS SRV solenoid position, acoustic monitor LEDs, and/or observing RPV pressure trend.</p> |      |          |

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 93.EO.1129.151 Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| 6.   | May direct NPO to open ADS valves from the Lower (upper) Relay Room.<br><br><u><b>BOOTH OPERATOR CUE</b></u><br>As NPO, acknowledge request, then report ( <i>using time compression</i> ) that all 6 ADS valve keylock switches are in the OPEN position. | May direct NPO to attempt to open ADS SRVs G, J, K, L, M, N from the Lower (upper) Relay Room ADS panel 1C631 using keylock switches.                  |      |          |
| 7.   | Determine ADS valve position following remote operation from Lower (upper) relay room.   | Determine that ALL but one ADS SRVs are still shut by observing ADS SRV solenoid position, acoustic monitor LEDs, and/or observing RPV pressure trend. |      |          |
| 8.   | Report to Unit Supervisor that only one SRV can be opened.   | Report to Unit Supervisor that only one SRV is open, and RD was NOT successful.  |      |          |
|      | <u><b>EVALUATOR CUE</b></u><br>As Unit Supervisor, acknowledge report, and ask the student if RPV pressure < 95 PSID above Suppression Chamber pressure. <b>(RD-12)</b>  | Student replies no.  |      |          |

PERFORMANCE CHECKLIST

Appl. To: S/RO

JPM No.: 93.EO.1129.151

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b><br/> <b><u>FOR ROs ONLY</u></b><br/>                     As Unit Supervisor, acknowledge report, then provide candidate with <b>CUE SHEET #2</b>.</p> <p><b><u>FOR SROs ONLY</u></b><br/>                     As Unit Supervisor, acknowledge report, then direct Student to refer to EO-100-112 on the table and determine the best alternate depressurization system.</p> |  |      |          |
| *9.  | <p>Evaluate availability of systems needed for alternate rapid depression.</p> <p><b><u>EVALUATOR NOTE</u></b><br/>                     EO-000-112 basis reserves remote operation of SRVs as a last option and its use would typically be evaluated by the E-plan organization prior to implementation. This evaluation is beyond the scope of RO tasks, therefore is not required for this JPM.</p>      | <p>Refer to EO-100-112 step RD-13 (provided with cue sheet #2) and evaluate each system listed for use in alternate RD:</p> <p>Determine that:</p> <ul style="list-style-type: none"> <li>• <b>BPVs, RFPTs, MSL DRAINS, SJAES <u>ARE AVAILABLE</u></b> for alternate RD</li> <li>• RCIC is NOT available due to tagout</li> <li>• HPCI is NOT available due to DW pressure &gt; 1.72 psig (unless ES-152-001 is performed)</li> <li>• Remote SRV operation is likely not available based on previously observed SRV/ADS failures.<br/> <i>(assessment of remote operation of SRVs is not required for this JPM)</i></li> </ul> |      |          |



PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 93.EO.1129.151 Student Name: \_\_\_\_\_

| Step  | Action   | Standard  | Eval | Comments |
|-------|--|---|------|----------|
| 10.   | Report system availability to Unit Supervisor.   | Report to Unit Supervisor the best system available for alternate RD.   |      |          |
|       | <p><b><u>EVALUATOR CUE</u></b><br/>                     When report of available systems is provided, <b>AND</b> if BPVs were correctly determined to be available, direct candidate to perform alternate RD using BPVs.</p>   |   |      |          |
| * 11. | Fully open Main Turbine Bypass Valves.   | At panel 1C651 fully open all bypass valves by depressing the <b>INCREASE</b> button on Bypass Valve Opening Jack until ALL bypass valves indicate full open. |      |          |
|       | <p><b><u>EVALUATOR NOTE</u></b><br/>                     This action is normally performed from memory. OP-193-001 contains the steps to be performed but is classified as "information only". The candidate may refer to this procedure prior to taking action, but it is NOT required.</p> |   |      |          |
| 12.   | Verify RPV pressure lowering.  | Observe RPV pressure lowering on any main control room RPV pressure indicator.  |      |          |

PERFORMANCE CHECKLIST

Appl. To: S/RO JPM No.: 93.EO.1129.151 Student Name: \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| 13.  | Report to Unit Supervisor.   | Report that alternate RD is in progress, all BPVs are full open and RPV pressure is lowering. |      |          |
|      | <u><b>EVALUATOR CUE</b></u><br>This completes this JPM.  |   |      |          |
|      | <u><b>EVALUATOR</b></u><br>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures? |   |      |          |

# Initiating Cue Sheet #1

## TASK CONDITIONS

- A. Unit 1 has experienced a transient requiring Rapid Depressurization
- B. The Unit Supervisor is directing actions in accordance with EO-100-112, "Rapid Depressurization".

## INITIATING CUE

The Unit Supervisor directs you to open 6 (six) ADS valves.

# FOR ROs ONLY

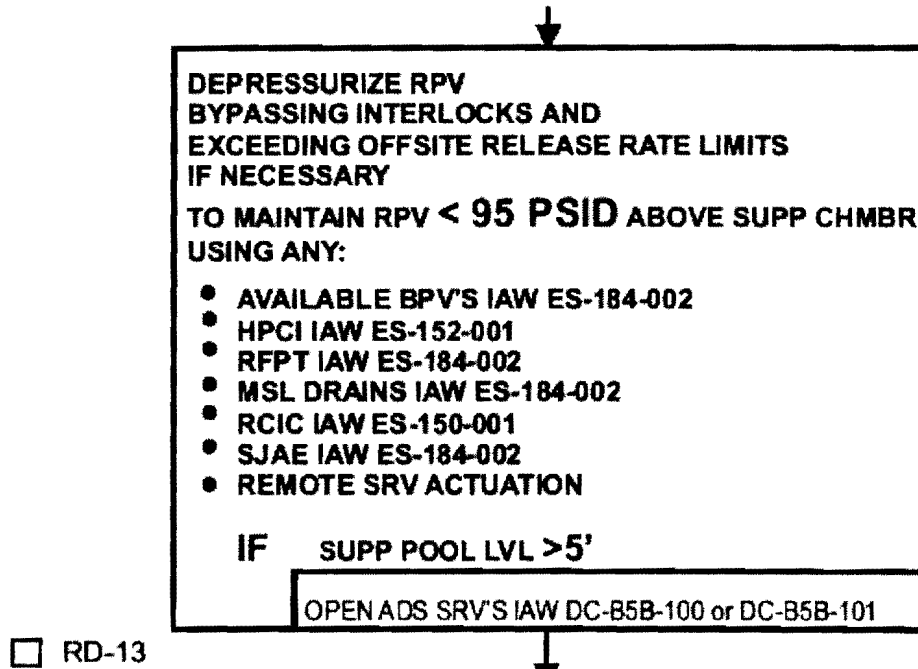
## Initiating Cue Sheet #2

### TASK CONDITIONS

A. Plant conditions are as stated in cue sheet #1 and as currently observed.

### INITIATING CUE

The Unit Supervisor directs you assist in evaluating EO-100-112, "Rapid Depressurization", step RD-13 (shown below) and determine the best alternate depressurization system available:



PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

|       |                |      |          |            |         |          |
|-------|----------------|------|----------|------------|---------|----------|
| S/RO  | 24.OP.1443.051 | 0    | 11/24/10 | 264000     | A4.04   | 3.7/3.7  |
| Appl. | JPM Number     | Rev. | Date     | NUREG 1123 | K/A No. | K/A Imp. |
| To    |                | No.  |          | Sys. No.   |         |          |

Task Title: Manual Emergency Shutdown of Diesel Generator 'A' from Panel 0C521A (Alt Path)

Completed By:

Validated:

Bob Pudish  
Writer

11/24/10  
Date

*m. j. [signature]*  
Instructor/Writer

12/13/10  
Date

Approval:

*m. j. [signature] for M.D. [signature]*  
Nuclear Prng. Supv.

12/16/10  
Date

|                      |           |                        |                   |
|----------------------|-----------|------------------------|-------------------|
| Date of Performance: | <u>20</u> | Validation Time (Min.) | Time Taken (Min.) |
|----------------------|-----------|------------------------|-------------------|

JPM Performed By:

Student Name: \_\_\_\_\_  
Last First M.I. Employee # / S.S. #

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name: \_\_\_\_\_  
Signature Typed or Printed

Comments:

**REQUIRED TASK INFORMATION**  
**JOB PERFORMANCE MEASURE**  
**S/RO 24.OP.1443.051**

**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, OPERATIONS STANDARDS FOR SHIFT OPERATIONS.
- B. All applicable safety precautions shall be taken in accordance with established PPL 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 JPM performance, 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-024-001 Diesel Generators (Rev. 56)

**III. OPERATIONAL ACTIVITIES**

N/A

**IV. TASK CONDITIONS**

- A. The Rx has experienced a small Loss of Coolant Accident.
- B. Drywell pressure is 2.1 psig up slow.
- C. All Emergency Diesel Generators (DG) have started in Emergency Mode.
- D. DG 'A' output breaker failed to close and cannot be closed.
- E. There is no Emergency Service Water (ESW) cooling being supplied to DG 'A'.

**V. INITIATING CUE**

Perform Manual Emergency Shutdown of Diesel Generator 'A' in accordance with OP-024-001.

**VI. TASK STANDARD**

DG 'A' is shutdown using the Overspeed Fuel Shutdown Valve and Fuel Quadrant Lever due to Emergency Stop pushbutton failing to stop DG 'A'.

**VII. TASK SAFETY SIGNIFICANCE**

DG operation without cooling would lead to catastrophic failure of engine.

**PERFORMANCE CHECKLIST**

Appl. To/         S/RO         JPM No         24.OP.1443.051         Student Name   

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
|      | <p style="text-align: center;"><b><u>NOTE</u></b><br/> <b>All steps of this JPM are to be simulated.</b><br/> <b>No component manipulations are to be made.</b></p>                               |  |      |          |
| 1.   | <p>Obtains OP-024-001.</p> <ul style="list-style-type: none"> <li>• Reviews Notes, Prerequisites, Precautions, Caution sections.</li> </ul>   | <p>Student executes OP-024-001, Section 2.7.</p>                     |      |          |
|      | <p style="text-align: center;"><b><u>CAUTION</u></b><br/>                     LOCA auto start signal is bypassed in local mode.</p>   |  |      |          |
| 2.   | <p>If diesel generator running in Emergency Mode, place DG 'A' 43CM Control Mode Select Switch in Local.</p> <ul style="list-style-type: none"> <li>• 43CM simulated in Local position</li> </ul> | <p>Student simulates positioning 43CM switch clockwise to Local.</p> |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b><br/>                     43CM switch "clicks" and is simulated in the Local position.</p>  |  |      |          |
| 3.   | <p>At Diesel engine Control Panel 0C521A 5ES, Depress Emergency Stop pushbutton.</p> <ul style="list-style-type: none"> <li>• Emergency Stop pushbutton simulated depressed</li> </ul>            | <p>Student simulates depressing the Emergency Stop pushbutton.</p>   |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/         S/RO         JPM No         24.OP.1443.051         Student Name   

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Spring resistance is felt as Emergency Stop pushbutton is depressed. Emergency Stop pushbutton "bottoms out" or stops inward motion. Emergency Stop pushbutton spring returns to full out / normal position.</p>                           |  |      |          |
|      | <p><b><u>FAULT STATEMENT</u></b></p> <p><b>THE NEXT STEP HAS THE STUDENT OBSERVE THE DG STOPS. THE EVALUATOR WILL CUE THE STUDENT THAT THE DG CONTINUES TO RUN. THE STUDENT WILL TAKE FURTHER ACTIONS TO SHUTDOWN THE DG.</b></p>  |  |      |          |
| 4.   | <p>At Diesel Engine Control Panel 0C521A, Observe following:</p> <ul style="list-style-type: none"> <li>a. Master Trip Circuit Tripped Green light Illuminates</li> <li>b. Running Idle light Extinguishes</li> <li>c. At 280 rpm, DG 'A' Pre-Lube Pump 0P532A Starts</li> </ul> | <p>Student monitors for DG shutdown.</p> <p>Student determines, from Evaluator Cue, that DG is still running and continues in procedure.</p> |      |          |

\* = Critical Step      # = Critical Sequence



## PERFORMANCE CHECKLIST

24.OP.1443.051

Appl. To/ S/RO \_\_\_\_\_

JPM No \_\_\_\_\_

Student Name \_\_\_\_\_

| Step | Action   | Standard | Eval | Comments |
|------|--|----------|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b></p> <ul style="list-style-type: none"><li>a. Master Trip Circuit Tripped Green light <b>NOT LIT</b></li><li>b. Running Idle light <b>LIT</b></li><li>c. Engine speed <b>600 rpm</b></li></ul> |          |      |          |
|      | <p style="text-align: center;"><b><u>CAUTION</u></b></p> <p>Personnel safety must be considered before proceeding with this step. Do not perform if area is not safe.</p>  |          |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Inform student that Maintenance is present to assist in the following step.</p>  |          |      |          |

\* = Critical Step      # = Critical Sequence



**PERFORMANCE CHECKLIST**  
24.OP.1443.051

Appl. To/         S/RO         JPM No                                 

Student Name   

| Step  | Action  | Standard  | Eval | Comments |
|-------|---|---|------|----------|
| *6. # | <p>b. Pull the fuel quadrant lever down and hold until the engine comes to a complete stop. The fuel quadrant lever is located on the engine left side above the turning gear motor.</p> <p>Fuel quadrant lever simulated pulled down and held after the pushbutton is depressed</p>  | <p>Student simulates pulling and holding Fuel quadrant lever. There is a pushbutton on top of the lever that needs to be depressed to allow movement.</p> |      |          |
|       | <p><b><u>EVALUATOR CUE</u></b></p> <p>If Student depresses the pushbutton on the lever, provide this cue: Fuel quadrant lever is simulated pulled down to end of travel and is being held in that position. The sound of the engine's speed is lowering. The engine has stopped.</p> <p>If Student does not depress the pushbutton on the lever, provide this cue: Fuel quadrant lever did not move</p> |   |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/         S/RO         JPM No         24.OP.1443.051         Student Name   

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| 7.   | When diesel generator comes to stop,<br>Depress Emergency Stop Reset pushbutton <ul style="list-style-type: none"> <li>• Emergency Stop Reset pushbutton simulated depressed</li> </ul>  | Student simulates depressing<br>Emergency Stop Reset pushbutton.   |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> Spring resistance felt while depressing<br>Emergency Stop Reset pushbutton.<br>Pushbutton "bottomed out" and stays latched<br>when released.  |  |      |          |
| 8.   | Depress Reset pushbutton for Annunciator<br>and System Reset to reset emergency trip. <ul style="list-style-type: none"> <li>• Reset pushbutton simulated depressed</li> </ul>   | Student simulates depressing Reset<br>pushbutton.  |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> If Student asks if any Protective Relays are<br>tripped on 0C519A, inform student all relays<br>on 0C519A are as is.<br><br>Spring resistance felt while depressing Reset<br>pushbutton. Pushbutton "bottomed out" and<br>returned to normal when released. | Red label next to Reset pushbutton<br>states, "Protective Relay Seal-In Reset<br>Pushbutton (0C519) must be Reset Prior<br>to Ann & System Reset". It is not<br>necessary to perform this if no relays are<br>tripped. |      |          |
| 9.   | Observe DG A Master Trip Circuit Reset<br>Amber light Illuminates. <ul style="list-style-type: none"> <li>• Amber light simulated LIT</li> </ul>   | Student simulates observing DG A<br>Master Trip Circuit Reset Amber light<br>Illuminated.  |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**  
24.OP.1443.051

Appl. To/                    S/RO                    JPM No                    Student Name                   

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
| 9.   | Observe DG A Master Trip Circuit Reset Amber light Illuminates.<br><ul style="list-style-type: none"> <li>• Amber light simulated LIT</li> </ul>        | Student simulates observing DG A Master Trip Circuit Reset Amber light Illuminated.    |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br>Amber light is lit.  |  |      |          |
| 10.  | Observe DG A Master Trip Circuit Tripped Green light extinguishes.<br><ul style="list-style-type: none"> <li>• Green light simulated NOT LIT</li> </ul> | Student simulates observing DG A Master Trip Circuit Tripped Green light extinguished. |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br>Green light is not lit.  |  |      |          |
| 11.  | Comply with TS 3.8.1 for Unit 1 and Unit 2.<br><ul style="list-style-type: none"> <li>• SRO simulated informed of TS LCO</li> </ul>                     | Student simulates informing SRO of TS.   |      |          |
|      | <b><u>EVALUATOR CUE</u></b><br>SRO has been informed.   |  |      |          |
| 12.  | Ensure auto initiation signal Reset.  | Student inquires about DW pressure.  |      |          |

\* = Critical Step     # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/ S/RO JPM No 24.OP.1443.051 Student Name \_\_\_\_\_

| Step | Action   | Standard | Eval | Comments |
|------|--|----------|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b><br/>                     High DW pressure condition still present.<br/>                     No further DG manipulations required.</p> |          |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b><br/>                     This completes the JPM.</p>  |          |      |          |
|      | <p><b><u>EVALUATOR</u></b><br/>                     Do you have ALL your JPM exam materials?<br/>                     Task Cue Sheets? Procedures?</p>               |          |      |          |

\* = Critical Step      # = Critical Sequence

## **TASK CONDITIONS**

- A. The Rx has experienced a small Loss of Coolant Accident.
- B. Drywell pressure is 2.1 psig up slow.
- C. All Emergency Diesel Generators (DG) have started in Emergency Mode.
- D. DG 'A' output breaker failed to close and cannot be closed.
- E. There is no Emergency Service Water (ESW) cooling being supplied to DG 'A'.

## **INITIATING CUE**

Perform Manual Emergency Shutdown of Diesel Generator 'A' in accordance with OP-024-001.





**REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 55.EO.1995.201**

**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 PPL 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-255-001 Venting CRD to Insert Control Rods (Rev. 13)
- B. EO-000-113-2, Sheet 2 (Rev. 11)

**III. OPERATIONAL ACTIVITIES**

NONE.

**IV. TASK CONDITIONS**

- A. Unit 2 was at 100 percent power when a transient occurred.
- B. A hydraulic ATWS is in progress.
- C. All but the following seven Control Rods have been fully inserted.  
2C2227; 2C2231; 2C2631; 2C2635; 2C2643; 2C3031; 2C3035
- D. The CRD Hydraulic system main supply header ruptured and has been shutdown.
- E. All scram valves are open.
- F. Power to RPS bus A and B is unavailable.
- G. The Unit Supervisor has authorized performance of ES-255-001.

**V. INITIATING CUE**

Insert Control Rods in accordance with ES-255-001.

**VI. TASK STANDARD**

Control rods correctly grouped on Attachment A of ES-255-001, one control rod fully inserted IAW ES-255-001.

**VII. TASK SAFETY SIGNIFICANCE**

ES-255-001 provides a method of inserting the control rods using the differential pressure available between the reactor and the reactor building atmosphere. This method is used only when all other methods for inserting control rods are unsuccessful because it is difficult, time consuming, dangerous or could cause the spread of contamination.

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.EO.1995.201

Student Name: \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
|      | <p><b><u>EVALUATOR NOTE</u></b></p> <p>This JPM must be performed in the Plant. It is acceptable to have the student complete the initial administrative portions of the task prior to entering the RCA for ALARA reasons.</p> <p>Consider signing out an HCU ES Tool Box key in advance to permit ready access during the JPM.</p> <p>Have a copy of ES-255-001 available for the student.</p> |  |      |          |
| 1.   | Obtain a controlled copy of ES-255-001.   | Controlled copy obtained   |      |          |
| 2.   | <p>Obtains keys to HCU ES Tool Box.</p> <ul style="list-style-type: none"> <li>• Informs Evaluator how to obtain</li> </ul>   | Obtains HCU ES Tool Box key from Shift Manager's office or FUS office key locker.                                |      |          |
|      | <p><b><u>EVALUATOR NOTE</u></b></p> <p>Have student demonstrate ability to obtain proper key. It is not necessary to sign out the key.</p>  |  |      |          |
| 3.   | Review the precautions and limitations.   | <p>Follows all precautions as applicable.</p> <p>Notes US authorization to perform procedure from Cue Sheet.</p> |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.EO.1995.201

Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
| 4.   | Check Off, on Attachment A, HCU's to be vented. <ul style="list-style-type: none"> <li>• Marks Attachment A to reflect the 7 HCU's to be vented:</li> <li>• 2C2227 – Group A</li> <li>• 2C2231 – Group B</li> <li>• 2C2631 – Group C</li> <li>• 2C2635 – Group D</li> <li>• 2C2643 – Group B</li> <li>• 2C3031 – Group A</li> <li>• 2C3035 – Group B</li> </ul> | Student fills out Attachment A of ES-255-001.   |      |          |
| 5.   | Confirmed By...<br><u><b>EVALUATOR CUE</b></u><br>Role-play the second operator, and inform the student that you confirm the HCU's to be vented.<br><b>Do not agree or disagree with Student marks.</b>   | Contacts a second operator to confirm the correct HCU's have been identified on Attachment A. |      |          |
| 6.   | Notify HP that CRDs will be vented.   | Uses plant page or telephone to contact HP and report that CRDs will be vented.               |      |          |
|      | <u><b>EVALUATOR CUE</b></u><br>Role-play HP and acknowledge the report.   |   |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.EO.1995.201

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| *7.  | Install floor drain plug with quick disconnect fitting (located in ES tool Box): <ul style="list-style-type: none"> <li>• Locate Floor Drain</li> <li>• Remove floor drain cover</li> <li>• Remove drain plug and obstructions, if any</li> <li>• Install threaded floor drain plug with quick disconnect fitting into floor drain.</li> <li>• Connect Stainless Steel hose to floor drain quick disconnect</li> </ul> | Locates Floor Drain.<br><br>Removes floor drain cover.<br><br>Removes drain plug and obstructions, if any.<br><br>Installs threaded floor drain plug with quick disconnect fitting into floor drain.<br><br>Connects Stainless Steel hose to floor drain quick disconnect. |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Stainless Steel hose to floor drain connected with quick disconnect, and drain plug installed with no obstructions.</p>  |  |      |          |
| 8.   | Perform following for all HCU's checked off on Attachment A: <ul style="list-style-type: none"> <li>• Establish AND Maintain communication with the Control Room Operator.</li> </ul>  | Contacts control room, using plant radio, and reports that the first HCU is about to be vented.  |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Role-play PCO in Control Room and acknowledge communications.</p>  |  |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.EO.1995.201

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>EVALUATOR NOTE</u></b></p> <p>247F102 is located at top right of upper platform area above the valve bank on the line connecting to the 102 valve.</p>  |  |      |          |
| 9.   | <p>Refer to Attachment B for HCU's location on Reactor Building elevation 719'.</p> <ul style="list-style-type: none"> <li>• Select the correct HCU for rod to be inserted.</li> </ul>                                 | Physically locates in the plant first HCU (26-43) in group to be inserted. |      |          |
|      | <p><b><u>EVALUATOR NOTE</u></b></p> <p>Student should select group B for insertion first since there are three rods in the group.</p> <p><b><u>EVALUATOR CUE</u></b></p> <p>Direct Student to begin with HCU 26-43</p> |  |      |          |
|      | <p align="center"><b><u>CAUTION</u></b></p> <p>Potential Exists For Possible Personnel Contamination And Unisolable Primary System Leak When Removing Threaded Vent Plug (A). Ensure Proper PPE Is Worn.</p>           | Student reviews CAUTION.   |      |          |
| 10.  | Don appropriate PPE.   | At a minimum, Dons: Rubber gloves and Face Shield.                         |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.EO.1995.201

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>After Student states PPE minimum requirement, inform Student that PPE is donned.</p>   |  |      |          |
| *11. | <p>Referring to Attachment D, Remove threaded vent plug (A) from top of HCU's Withdraw Line High Point Vent Valve 2F102, to gain access to Needle Valve operator.</p>  | <p>Attaches adjustable wrench to threaded vent plug (A) <b>AND SLOWLY</b> turns wrench in the counter clockwise (CCW) direction.</p> <p>Verifies <b>NO</b> leakage present while removing threaded vent plug (A).</p> <p>Removes threaded vent plug (A).</p> |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>As Student simulates removing plug, inform Student that plug is twisting in the CCW direction, <b>NO</b> leakage observed.</p> <p>Threaded vent plug (A) is removed.</p> |  |      |          |
| 12.  | <p><u>IF</u> leakage is present during removal of vent plugs, Perform Step 4.4.7 to restore plugs.</p>   | <p>N/A. Determines venting may proceed.</p>  |      |          |
| 13.  | <p>Ensure Needle Valve closed.</p>   | <p>Installs high Point Vent Operator onto Needle valve <b>AND</b> turns high Point Vent Operator in the Clockwise (CW) direction.</p>  |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.EO.1995.201

Student Name: \_\_\_\_\_

| Step         | Action   | Standard   | Eval | Comments |
|--------------|--|--|------|----------|
|              | <p><b><u>EVALUATOR CUE</u></b></p> <p>High Point Vent Operator fully clockwise and hard resistance is now felt.</p>  |  |      |          |
|              | <p align="center"><b><u>CAUTION</u></b></p> <p>Potential Exists For Possible Personnel Contamination And Unisolable Primary System Leak When Removing Threaded Vent Plug (A). Ensure Proper PPE Is Worn.</p> | <p>Student reviews CAUTION.</p>  |      |          |
| <p>* 14.</p> | <p>Referring to Attachment D, Cautiously Remove threaded vent plug (B) from Withdraw Line High Point Vent Valve 2F102.</p>   | <p>Attaches adjustable wrench to threaded vent plug (B) <b>AND SLOWLY</b> turns wrench in the counter clockwise (CCW) direction.</p> <p>Verifies <b>NO</b> leakage present while removing threaded vent plug (B).</p> <p>Removes threaded vent plug (B).</p> |      |          |
|              | <p><b><u>EVALUATOR CUE</u></b></p> <p>Vent plug B is moving in the CCW direction. <b>NO</b> leakage observed. Threaded vent plug (B) is removed.</p>   |  |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.EO.1995.201

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
| 15.  | If any leakage is present, Perform following: <ul style="list-style-type: none"> <li>• Immediately Retighten threaded vent plug to stop leak.</li> <li>• On Attachment A, Record location of HCU with leaking 2F102 valve.</li> <li>• Notify following of a leak location:                             <ol style="list-style-type: none"> <li>1. Health Physics.</li> <li>2. Mechanical Maintenance.</li> </ol> </li> <li>• <u>IF</u> required, Replace threaded vent plug (A) in top of HCU Withdraw Line High Point Vent Valve 2F102.</li> </ul> | N/A. Determines venting may proceed.   |      |          |
| *16. | Install quick disconnect fitting to Vent Plug (B) at Withdraw Line High Point Vent Valve 2F102 (Attachment D).   | Attaches quick disconnect fitting to Vent Plug (B) at Withdraw Line High Point Vent Valve 2F102. |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Quick disconnect fitting ATTACHED to Vent Plug (B) at Withdraw Line High Point Vent Valve 2F102.</p>   |  |      |          |
| *17. | Connect Stainless Steel Hose to quick disconnect at Withdraw Line High Point Vent Valve 2F102.   | Attaches stainless Steel Hose to quick disconnect at Withdraw Line High Point Vent Valve 2F102.  |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Stainless Steel Hose ATTACHED to quick disconnect at Withdraw Line High Point Vent Valve 2F102.</p>  |  |      |          |

\* = Critical Step      # = Critical Sequence



**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.EO.1995.201

Student Name: \_\_\_\_\_

| Step  | Action   | Standard   | Eval | Comments |
|-------|--|--|------|----------|
|       | <p style="text-align: center;"><b><u>CAUTION</u></b></p> <p>Fully Opening Withdraw Line High Point Vent Valve 2F102 With Locking Ring Not Installed May Result In Following:</p> <ul style="list-style-type: none"> <li>• Primary System Unisolable Leak</li> <li>• Valve Damage</li> <li>• Eject Needle Valve Operator</li> </ul> | <p>Student reviews CAUTION.</p>  |      |          |
| * 18. | <p>Using High Point Vent Lock Ring Operator, Ensure Withdraw Line High Point Vent Valve 2F102 locking ring installed and remains stationary.</p>   | <p>High Point Vent Lock Ring Operator is used to ensure Withdraw Line High Point Vent Valve 2F102 locking ring installed and remains stationary.</p> |      |          |
|       | <p><b><u>EVALUATOR CUE</u></b></p> <p>Withdraw Line High Point Vent Valve 2F102 locking ring is installed and did not move.</p>  |  |      |          |
| 19.   | <p>Notify Control Room Operator to observe rod motion and reactor power response, <b>THEN</b></p>  | <p>Contacts control room, using plant radio, and requests PCO to observe rod motion and reactor power response.</p>                                  |      |          |
|       | <p><b><u>EVALUATOR CUE</u></b></p> <p>Role-play PCO in Control Room and acknowledge the request.</p>   |  |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.EO.1995.201

Student Name: \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
| *20. | Using High Point Vent Operator, Crack Open Withdraw Line High Point Vent Valve 2F102.   | Installs High Point Vent Operator onto Needle valve <b>AND SLOWLY</b> turns High Point Vent Operator in the Counter Clockwise (CCW) direction. |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>2F102 is "cracked" open.</p>  |  |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Role-play PCO in Control Room and report slow inward rod motion, <b>THEN</b> report rod fully inserted, rod motion stopped.</p> |  |      |          |
| *21. | When Control Room Operator communicates inward rod motion has stopped, Close Withdraw Line High Point Vent Valve 2F102 with High Point Vent Operator.                 | Installs High Point Vent Operator onto Needle valve <b>AND SLOWLY</b> turns High Point Vent Operator in the Clockwise (CW) direction.          |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>High Point Vent Operator fully clockwise.</p>   |  |      |          |
| 22.  | <p>Confirm HCU vented by recording initials in applicable space on Attachment A.</p> <ul style="list-style-type: none"> <li>• Initials Att A</li> </ul>               | Initials venting completed column on Attachment A for the vented HCU.  |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 55.EO.1995.201

Student Name: \_\_\_\_\_

| Step | Action  | Standard   | Eval | Comments |
|------|---|--|------|----------|
| 23.  | Remove Stainless Steel Hose from quick disconnect at Withdraw Line High Point Vent Valve 2F102.   | Removes Stainless Steel Hose from quick disconnect at Withdraw Line High Point Vent Valve 2F102. |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Stainless Steel Hose from quick disconnect at Withdraw Line High Point Vent Valve 2F102 is removed.</p> |  |      |          |
| *24. | <p><b><u>EVALUATOR QUESTION TO STUDENT:</u></b></p> <p>Ask Student: "Which HCU will be vented next"?</p>                                      | Student must state one of the remaining Group B HCU's, either 22-31 or 30-35 is acceptable.      |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>This completes the JPM.</p>   |  |      |          |
|      | <p><b><u>EVALUATOR</u></b></p> <p>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?</p>                                   |  |      |          |

\* = Critical Step      # = Critical Sequence

## **TASK CONDITIONS**

- A. Unit 2 was at 100 percent power when a transient occurred.
- B. A hydraulic ATWS is in progress.
- C. All but the following seven Control Rods have been fully inserted.
  - 2C2227
  - 2C2231
  - 2C2631
  - 2C2635
  - 2C2643
  - 2C3031
  - 2C3035
- D. The CRD Hydraulic system main supply header ruptured and has been shutdown.
- E. All scram valves are open.
- F. Power to RPS bus A and B is unavailable.
- G. The Unit Supervisor has authorized performance of ES-255-001.

## **INITIATING CUE**

Insert Control Rods in accordance with ES-255-001.

PPL SUSQUEHANNA, LLC

JOB PERFORMANCE MEASURE

APPROVAL AND ADMINISTRATIVE DATA SHEET

S/RO 73.OP.2289.103 0 11/24/10 223001 A2.01 4.3/4.4  
Appl. JPM Number Rev. Date NUREG 1123 K/A No. K/A Imp.  
To No. Sys. No.

Task Title: Start a Containment H<sub>2</sub> Recombiner in Manual IAW OP-173-001

Completed By: Bob Pudish 11/24/10 *m. jaysuta* 12/13/10  
Writer Date Instructor/Writer Date

Approval:  
*m. jaysuta for M.D. Itz* 12-16-10  
Nuclear Trng. Supv. Date

20  
Date of Performance: Validation Time (Min.) Time Taken (Min.)

JPM Performed By:

Student Name: \_\_\_\_\_  
Last First M.I. Employee # / S.S. #

Performance Evaluation: ( ) Satisfactory ( ) Unsatisfactory

Evaluator Name: \_\_\_\_\_  
Signature Typed or Printed

Comments:

**REQUIRED TASK INFORMATION  
JOB PERFORMANCE MEASURE  
S/RO 73.OP.2289.103**

**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 PPL 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-173-001, CONTAINMENT ATMOSPHERE CONTROL SYSTEM (Rev. 38)

**III. OPERATIONAL ACTIVITIES**

None

**IV. TASK CONDITIONS**

- A. The plant is in a post-LOCA condition 24 hours after an event.
- B. Containment pressure is 7.0 psig, steady.
- C. Containment temperature was 135°F before the LOCA.
- D. H<sub>2</sub>/O<sub>2</sub> concentrations are below combustible limits.

**V. INITIATING CUE**

Start Containment Hydrogen Recombiner 1E440A in Manual in accordance with OP-173-001.

**VI. TASK STANDARD**

Selected Recombiner operating manually IAW OP-173-001.

**VII. TASK SAFETY SIGNIFICANCE**

Recombiners are the primary means of hydrogen reduction in containment post-LOCA. Failure to place the Recombiner(s) in service post-LOCA may result in excessive hydrogen concentrations in containment and raise the risk of containment damage due to hydrogen detonation deflagration.

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 73.OP.2289.103

Student Name: \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
|      | This JPM must be performed in the Plant.<br><br><u><b>EVALUATOR NOTE</b></u><br><br>Recombiner A is in the Upper Relay Room.   |   |      |          |
| 1.   | Obtain a controlled copy of OP-173-001.  | Controlled copy obtained.   |      |          |
| 2.   | Select the correct procedure section to perform.   | Selects Section 2.10.   |      |          |
| 3.   | Review the prerequisites / precautions.  | Ensures all prerequisites have been met.<br>Reviews precautions.  |      |          |
|      | <u><b>EVALUATOR CUE</b></u><br><br>Inform student that all prerequisites have been met.  |   |      |          |
| 4.   | Ensure H2 Recombiner aligned as follows prior to startup:<br><br><ul style="list-style-type: none"> <li>• Turn H2 Rcb A Heater Power Adj Control HC-15796A in counter clockwise direction until potentiometer STOPS</li> </ul> | Student turning H2 Rcb A Heater Power Adj Control HC-15796A in counter clockwise direction until potentiometer STOPS. |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 73.OP.2289.103

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Control turned counter clockwise until potentiometer STOPS.</p>  |  |      |          |
| 5.   | <ul style="list-style-type: none"> <li>Set H2 Rcb A Heater Power Adj Control HC-15796A to ZERO (000)</li> </ul>  | Student sets H2 Rcb A Heater Power Adj Control HC-15796A to ZERO (000).                            |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Control set to ZERO (000).</p>   |  |      |          |
| 6.   | <ul style="list-style-type: none"> <li>Observe H2 RCB A Power In Available White light illuminated indicating MCC feeder closed</li> </ul>   | Student observes H2 RCB A Power In Available White light illuminated indicating MCC feeder closed. |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>White light illuminated indicating MCC feeder is closed.</p>   |  |      |          |
| *7.  | <p>To start H2 Recombiner in Manual:</p> <p>a) Place H2 Rcb A Temp Ctl Select HSS-15796A to Man.</p> <ul style="list-style-type: none"> <li>H2 Rcb A Temp Ctl Select HSS-15796A placed to Man</li> </ul> | Student simulates placing H2 Rcb A Temp Ctl Select HSS-15796A to Man.                              |      |          |

\* = Critical Step      # = Critical Sequence



**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 73.OP.2289.103

Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Switch clicks and is in Man position.</p>   |   |      |          |
| *8.  | <p>b) Place H2 Rcb A Power Out Switch HS-15796A to ON.</p> <ul style="list-style-type: none"> <li>• H2 Rcb A Power Out Switch HS-15796A placed to ON</li> </ul> | <p>Student simulates placing H2 Rcb A Power Out Switch HS-15796A placed to ON.</p>                  |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Switch clicks and is in ON position. Red light is ON.</p>   |   |      |          |
| 9.   | <p>Determine required power setting from Attachment A.</p> <ul style="list-style-type: none"> <li>• 56KW is determined to be power setting</li> </ul>           | <p>Student determines required power setting from ATT A to be 56KW based on Initial Conditions.</p> |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 73.OP.2289.103

Student Name: \_\_\_\_\_

| Step        | Action  | Standard  | Eval | Comments |
|-------------|---|---|------|----------|
|             | <p align="center"><b><u>NOTE</u></b></p> <p>Potentiometer settings vary from recombiner to recombiner. Initial power increase may occur at settings as low as 70 and as high as 170. The actual setting value is not important as long as proper power level is observed on the "Power Out to Heater" Wattmeter.</p>  | <p>Student reviews NOTE.</p>  |      |          |
|             | <p align="center"><b><u>CAUTION</u></b></p> <p>Turn H2 RCB Power Adj Control Slowly because there is a lag between Power Out Indication and potentiometer adjustment. Power out indication must be continuously monitored when power level is being changed.</p>  | <p>Student reviews CAUTION.</p>   |      |          |
| <p>*10.</p> | <p>Increase power out to heater as follows:</p> <p>1) Adjust H2 RCB A Heater Power Adj Control HC-15796A until H2 Rcb A Power Out to Heater XI-15796A indicates 5 KW.</p> <ul style="list-style-type: none"> <li>• H2 RCB A Heater Power Adj Control HC-15796A slowly adjusted in the CW direction until H2 Rcb A Power Out to Heater XI-15796A indicates 5 KW</li> </ul> | <p>Students simulates slowly adjusting H2 RCB A Heater Power Adj Control HC-15796A until H2 Rcb A Power Out to Heater XI-15796A indicates 5 KW.</p> |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 73.OP.2289.103

Student Name: \_\_\_\_\_

| Step | Action   | Standard   | Eval | Comments |
|------|--|--|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Inform Student HC-15796A is slowly turning in the CW direction. KW indication is rising. KW indication reads 5KW.</p>  | <p>Note: Time compression will be utilized for the following wait times.</p>   |      |          |
| *11. | <p>2) After 10 minutes, Adjust HC-15796A until XI-15796A indicates 10 KW.</p>  | <p>Student simulates waiting 10 min based on Evaluator Cue then simulates slowly adjusting H2 RCB A Heater Power Adj Control HC-15796A until H2 Rcb A Power Out to Heater XI-15796A indicates 10 KW.</p> |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Inform the Student: "10 minutes has elapsed."</p>  |  |      |          |
|      | <p>After Evaluator Cue, HC-15796A is slowly adjusted CW until XI-15796A indicates 10 KW.</p>   |  |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Inform Student HC-15796A is slowly turning in the CW direction. KW indication is rising. KW indication reads 10KW.</p> |  |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 73.OP.2289.103

Student Name: \_\_\_\_\_

| Step | Action   | Standard  | Eval | Comments |
|------|--|---|------|----------|
| *12. | 3) After 10 minutes, Adjust HC-15796A until XI-15796A indicates 20 KW.   | Student simulates waiting 10 min based on Evaluator Cue then simulates slowly adjusting H2 RCB A Heater Power Adj Control HC-15796A until H2 Rcb A Power Out to Heater XI-15796A indicates 20 KW. |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Inform the Student: "10 minutes has elapsed."</p>  |   |      |          |
|      | After Evaluator Cue, HC-15796A is slowly adjusted CW until XI-15796A indicates 20 KW.  |   |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Inform Student HC-15796A is slowly turning in the CW direction. KW indication is rising. KW indication reads 20KW.</p> |   |      |          |
| *13. | 4) After 5 minutes, Adjust HC-15796A until required power setting determined in 2.10.5.c of this procedure observed on XI-15796A.                            | Student simulates waiting 5 min based on Evaluator Cue then simulates slowly adjusting H2 RCB A Heater Power Adj Control HC-15796A until H2 Rcb A Power Out to Heater XI-15796A indicates 56 KW.  |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 73.OP.2289.103

Student Name: \_\_\_\_\_

| Step       | Action   | Standard   | Eval | Comments |
|------------|--|--|------|----------|
|            | <p><b><u>EVALUATOR CUE</u></b></p> <p>Inform the Student: "5 minutes has elapsed."</p>   |  |      |          |
|            | <p>After Evaluator Cue, HC-15796A is slowly adjusted CW until XI-15796A indicates 56 KW.</p>   |  |      |          |
|            | <p><b><u>EVALUATOR CUE</u></b></p> <p>Inform Student HC-15796A is slowly turning in the CW direction. KW indication is rising. KW indication reads 56KW.</p>   |  |      |          |
| <p>14.</p> | <p>Monitor temperature periodically placing H<sub>2</sub> Rcb A Temp Chan Select TSS-15796A in following while observing temperature:</p> <p>(1) Position #1</p> <p>(2) Position #2</p> <p>(3) Position #3</p> | <p>Student simulates placing TSS-15796A in Positions #1, #2, and #3.</p> |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 73.OP.2289.103

Student Name: \_\_\_\_\_

| Step | Action  | Standard  | Eval | Comments |
|------|---|---|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b><br/>                     As the Student simulates positioning the switch, inform the Student at each position the following:</p> <ul style="list-style-type: none"> <li>• "Temp Chan Select TSS-15796A clicks into position 1, temperature is rising towards 1250°F."</li> <li>• "Temp Chan Select TSS-15796A clicks into position 2, temperature is rising towards 1250°F."</li> <li>• "Temp Chan Select TSS-15796A clicks into position 3, temperature is rising towards 1250°F."</li> </ul> |   |      |          |
| 15.  | <p>Adjust HC-15796A between 0 KW and calculated required power setting to maintain following:</p> <p>a) H2 Recombiner temp ~ 1250°F not to exceed 1400°F</p> <p>b) Required power setting on H2 Rcb A Power Out to Heater XI-15796A not to exceed 75KW.</p>   | <p>Student verifies TIC-15796A temperature is rising towards 1250°F not to exceed 1400°F.</p> |      |          |

\* = Critical Step      # = Critical Sequence

**PERFORMANCE CHECKLIST**

Appl. To/JPM No.: S/RO 73.OP.2289.103

Student Name: \_\_\_\_\_

| Step | Action   | Standard | Eval | Comments |
|------|--|----------|------|----------|
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>Inform the Student: "Temperature is 1250°F steady."</p> <p>Inform the Student that they are relieved by another Operator to monitor Rcb operation.</p> |          |      |          |
|      | <p><b><u>EVALUATOR CUE</u></b></p> <p>This completes the JPM.</p>  |          |      |          |
|      | <p><b><u>EVALUATOR</u></b></p> <p>Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?</p>  |          |      |          |

\* = Critical Step      # = Critical Sequence

## **TASK CONDITIONS**

- The plant is in a post-LOCA condition 24 hours after an event.
- Containment pressure is 7.0 psig, steady.
- Containment temperature was 135°F before the LOCA.
- H<sub>2</sub>/O<sub>2</sub> concentrations are below combustible limits.

## **INITIATING CUE**

Start Containment Hydrogen Recombiner 1E440A in Manual in accordance with OP-173-001.





**PPL-SUSQUEHANNA, LLC  
LEARNING CENTER**

**SIMULATOR SCENARIO**

**Scenario Title:** LOC23 NRC SCENARIO 1

**Scenario Duration:** 90 Minutes

**Scenario Number:** LOC23 NRC-1

**Revision/Date:** Rev. 2, 12/20/2010

**Course:**

**Prepared By:**

D. Kelly / M. Jacopetti

Instructor

12/20/10

Date

**Reviewed By:**

*M. Jacopetti for J.D. H.*  
Operations Training Supervisor

12/21/10

Date

**Approved By:**

*A.E. Knight*  
Supervising Manager/Shift Manager

12/21/10

Date

## NRC Scenario #1 Summary

The Crew takes the shift with the Rx operating at approximately 75%. Activities for the shift are to secure RHR Suppression Pool cooling and return the Rx to Full Power.

After the Suppression Pool cooling lineup is secured, the Standby Liquid Control Injection Valve, HV-148-F006, comes "off" its Full Open seat. This will result in the SRO determining that two SBLC subsystems are Inoperable and enter TS 3.1.7.

Once the SRO has determined TS 3.1.7 is applicable, the Crew will begin raising Rx Power. During the power ascension the Crew will recognize that the Control Valves begin to oscillate. The Crew will enter ON-193-001 (Turbine EHC System Malfunction). The Off Normal procedure directs Rx power to be lowered and Load Limit Set reduced to transfer the oscillations to the Bypass Valves.

After actions are taken to address the EHC malfunction, the High Pressure Coolant Injection (HPCI) pump inadvertently starts and injects into the RPV. The Crew will enter ON-156-001 (Unanticipated Reactivity Change) and secure the HPCI pump. The SRO will consult TS 3.5.1.

Following the HPCI transient, Auxiliary Bus 11A de-energizes due to an electrical fault condition. This results in a loss of Reactor Recirc Pump 1A, Circ Water Pumps A and C, Condensate Pumps A and C and Service Water Pump A. The trip of the CWP \ Cond Pump causes a runback of RRP B on Limiter #2 to 48%. Reactor power will stabilize at approximately 50% and the crew will enter ON-103-003 (13.8 KV Bus 11A and 11B Loss of Bus Load Shedding on Undervoltage) and ON-164-002 (Loss of Recirculation Flow). The crew will insert rods in accordance with the CRC book until less than the 60% rod line and the SRO will evaluate TS 3.4.1 and determine setpoints need to be reset within 12 hours.

Once control rods are being inserted per the CRC, condenser vacuum will degrade at a rate faster than that of just a loss of Offgas. The crew will enter ON-143-001 (Main Condenser Vacuum and Offgas System Off-Normal Operation) and begin a power reduction in an attempt to maintain Turbine Exhaust Pressure within limits. After dispatching people to investigate the cause of the vacuum loss they will receive a report that there is tear on the boot between the turbine and condenser and that it can not be repaired. The crew will perform Scram-Scram Imminent actions and attempt to Scram the Rx prior to the Main Turbine Low Vacuum trip, however, the Reactor fails to scram when the Mode Switch is placed in Shutdown.

Immediate Operator Actions of ON-100-101 (Scram-Scram Imminent) directs the Operator to Arm and Depress the Manual Scram pushbuttons, which also fails to Scram the Reactor, and initiate Alternate Rod Insertion (ARI). ARI results in all Rods fully inserting. EO-000-102 (RPV Control) will be entered and executed.

Following the Reactor Scram the Condenser Vacuum leak increases significantly, causing the Reactor Feed Pumps to trip and the Turbine Bypass Valves and Main Steam Isolation valves to close. The crew will initially use RCIC for RPV level control, then Condensate once RPV pressure is below shutoff head, and Safety Relief Valves (SRV) for RPV pressure control.

When the first SRV is manually opened, its Tailpipe will rupture and the SRV will not close. This results in Suppression Chamber pressure, then Drywell pressure rising fairly fast (the SRV sticks open). EO-000-103 (Primary Containment Control) will be executed and the SRO will monitor the PSL Curve. The crew will initiate Suppression Chamber Sprays then, when Suppression Chamber pressure exceeds 13 psig, they will initiate Drywell Sprays.

The Scenario will be terminated when DW Sprays are in service and RPV level is in assigned band.

## NRC Scenario #1 Summary

### Critical Tasks

- ★ Manually initiate ARI.  
(BOP)
- ★ Spray the Drywell when Suppression Chamber pressure exceeds 13 psig.  
(BOP)
- ★ Limits Drywell Spray flow to between 1000 and 2800 gpm for the first 30 seconds.  
(BOP)

### Qualitative Attributes

|                          |   |
|--------------------------|---|
| Total Malfs (5-8):       | 7 (SBLC valve, EHC osc, HPCI inadvertent start, Loss Aux Bus 11A, Loss Condenser Vacuum, Failure Auto Scram, Failure of Scram pushbuttons, SRV tailpipe break)                  |
| Malf > EOP (1-2):        | 1 (SRV tailpipe break)  |
| ABN Events (2-4):        | 4 (EHC Malf, Loss Aux Bus 11A, HPCI start, Main Cond Vac)   |
| MAJ Events (1-2):        | 1 (SRV Tailpipe rupture-PC pressure)  |
| EOPs entered (1-2):      | 2 (RPV Control, PC Control)   |
| EOP Contingencies (0-2): | 0 (None)  |
| Critical Tasks (2-3):    | 3 (Manually initiate ARI, Spray the Drywell when Suppression Chamber pressure exceeds 13 psig, Limits Drywell Spray flow to between 1000 and 2800 gpm for the first 30 seconds) |

## NRC Scenario #1 Summary

| <u>Event</u> | <u>Description</u>                | <u>Event Type</u> | <u>Who</u>      |
|--------------|-----------------------------------|-------------------|-----------------|
| 1            | Secure Supp Pool cool             | N                 | BOP             |
| 2            | SBLC inj valve                    |                   | TS SRO          |
| 3            | Raise Rx power                    | N                 | SRO, ATC        |
| 4            | EHC oscillation                   | C<br>R            | SRO, BOP<br>ATC |
| 5            | HPCI inadvertent start            | C                 | SRO, BOP, TS    |
| 6            | Loss Aux Bus 11A                  | C                 | All             |
| 7            | Loss of Main Cond Vac             | R                 | SRO, ATC        |
| 8            | Failure to Scram                  | I                 | ATC             |
| 9            | SRV tailpipe rupture \ stuck open | M                 | All             |

### Scenario # 1 Applicant "Event count"

| <u>Position</u> | <u>RX</u> | <u>NOR</u> | <u>I/C</u> | <u>MAJ</u> | <u>TS</u> |
|-----------------|-----------|------------|------------|------------|-----------|
| SRO             | 7         | 3          | 4,5,6      | 9          | 2,5       |
| ATC             | 4,7       | 3          | 6,8        | 9          |           |
| BOP             |           | 1          | 4,5,6      | 9          |           |

SRO (U) needs minimum total for all Scenarios of:

RX: 0  
 NOR: 1  
 I/C: 2  
 MAJ: 1  
 TS: 2

SRO (I) needs minimum total for all Scenarios of:

RX: 1  
 NOR: 1  
 I/C: 4  
 MAJ: 2  
 TS: 2

RO needs minimum total for all Scenarios of:

RX: 1  
 NOR: 1  
 I/C: 4  
 MAJ: 2  
 TS: 0

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## SCENARIO SUMMARY

The Crew takes the shift with the Rx operating at approximately 75%. Activities for the shift are to secure RHR Suppression Pool cooling and return the Rx to Full Power.

After the Suppression Pool cooling lineup is secured, the Standby Liquid Control Injection Valve, HV-148-F006, comes "off" its Full Open seat. This will result in the SRO determining that two SBLC subsystems are Inoperable and enter TS 3.1.7.

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Once control rods are being inserted per the CRC, condenser vacuum will degrade at a rate faster than that of just a loss of Offgas. The crew will enter ON-143-001 (Main Condenser Vacuum and Offgas System Off-Normal Operation) and begin a power reduction in an attempt to maintain Turbine Exhaust Pressure within limits. After dispatching people to investigate the cause of the vacuum loss they will receive a report that there is tear on the boot between the turbine and condenser and that it can not be repaired. The crew will perform Scram-Scram Imminent actions and attempt to Scram the Rx prior to the Main Turbine Low Vacuum trip, however, the Reactor fails to scram when the Mode Switch is placed in Shutdown.

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When the first SRV is manually opened, its Tailpipe will rupture and the SRV will not close. This results in Suppression Chamber pressure, then Drywell pressure rising fairly fast (the SRV sticks open). EO-000-103 (Primary Containment Control) will be executed and the SRO will monitor the PSL Curve. The crew will initiate Suppression Chamber Sprays then, when Suppression Chamber pressure exceeds 13 psig, they will initiate Drywell Sprays.

The Scenario will be terminated when DW sprays are in service and RPV level is being maintained between 13" and 54".

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## SCENARIO OBJECTIVES

The objective of this scenario is to evaluate the Licensed Operator Candidate's ability to respond to the scenario events. These events will require each candidate to demonstrate the following:

- Knowledge of integrated plant operations
- Ability to diagnose abnormal plant conditions
- Ability to work together as a team
- Ability to mitigate plant transients that exercise their knowledge and use of ONs and EOPs
- Ability to utilize Technical Specifications (SRO Only)

To meet this objective, the Licensed Operator Candidates must demonstrate proficiency in the following competencies:

### Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings.
2. Comply with and use procedures, references, and Technical Specifications.
3. Operate the control boards.
4. Communicate and interact with other crew members.

### Senior Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings.
2. Comply with and use procedures and references.
3. Operate the control boards (N/A to upgrade candidates).
4. Communicate and interact with the crew and other personnel.
5. Direct shift operations.

Comply with and use Technical Specifications.



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## **CRITICAL TASKS**

★ **Manually initiate ARI.**

**Safety Significance**

Control rod insertion initiates power reduction immediately

**Consequences for Failure to Perform Task**

Failure to insert control rods 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**

Insert Control Rods by one or more of the following methods:

Maximize CRD to drift control rods.

Drive control rods after bypassing RWM.

Reset and Scram again by performing ES-158-002 Bypass RPS logic trips.

De-energizing RPS solenoids by performing ES-158-001.

Local venting of Scram Air Header.

Arm and Depress ARI Pushbuttons

**Performance Feedback**

Successful insertion of control rods will be indicated by:

Rod position full in indication for manual insertion of control rods, venting scram air header or de-energizing RPS solenoids.

Rod position full in after resetting scram, draining scram discharge volume and re-scram.

★ **Spray the Drywell when Suppression Chamber pressure exceeds 13 psig.**

**Safety Significance**

Maintenance of primary containment integrity.

Actions are taken to spray the Drywell during a LOCA when the Suppression Chamber pressure exceeds 13 psig. From the Susquehanna Emergency Operating Procedures basis document, EO-000-103, "The value of 13 psig is the lowest suppression chamber pressure which can occur when 95% of the non-condensables (Nitrogen) in the drywell have been transferred to the suppression chamber." At 13 psig suppression chamber pressure, 5% of the non-condensables remain in the drywell. This 5% value is the limit established to preclude "chugging" – the cyclic condensation of steam at the downcomer openings of the drywell vents. Values in excess of 13 psig are indicative of more non-condensables in the drywell, meaning chugging is more probable.

Chugging (steam bubble collapse at the downcomer exit resulting in a water in-rush to fill the voided areas) induces stresses at the junction of the downcomers and the drywell floor. Repeated such stresses may result in failure of these joints, creating a direct bypass from drywell to suppression chamber. Bypassing the suppression pool will directly pressurize the primary containment during a LOCA may result in failure.

By requiring drywell sprays at 13 psig in the suppression chamber (5% non-condensables in the drywell), a drywell non-condensable value of >1% will be maintained and chugging should not occur.

From Appendix D of NUREG-1021, Draft Revision 9, the critical task listed above has essential safety action that correctly completed, will prevent "degradation of any barrier to fission product release" and the crew will take action to "effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition describe in the previous paragraph."

**Consequences of Failure to Perform the 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]

*Drywell spray operation may affect the availability of electrical equipment located in the drywell. Therefore, suppression chamber sprays are given the maximum time allowable to reduce primary containment pressure before operation of drywell sprays is required.*

*The allowable time is determined by the suppression chamber pressure which is equated to the amount of non-condensables remaining in the drywell.*

*The value of 13 psig is the lowest suppression chamber pressure which can occur when 95% of the non-condensables (N<sub>2</sub>) in the drywell have been transferred to the suppression chamber. That is, at least 5% non-condensables remain in the drywell when suppression chamber pressure reaches 13 psig. This non-condensable concentration limit is established to preclude chugging - the cyclic condensation of steam at the downcomer openings of the drywell vents. A suppression chamber pressure greater than 13 psig could be indicative of*

*a lower concentration of non-condensables in the drywell, thereby meaning that chugging is more probable.*

*Chugging occurs when a steam bubble collapses at the exit of the downcomers, the rush of water drawn into the downcomers to fill the void induces stresses at the junction of the downcomers and the drywell floor. Repeated occurrence of such stresses could cause fatigue failure of these joints, thereby creating a direct path between the drywell and suppression chamber. Steam discharged through the downcomers could then bypass the suppression pool and directly pressurize the primary containment. Scale model tests have demonstrated that chugging will not occur so long as the drywell contains at least 1% non-condensables. To preclude conditions under which chugging may occur, drywell sprays are conservatively required when at least 5% non-condensables remain in the drywell, i.e., suppression chamber pressure reaches 13 psig.*

*Both wide range and narrow range suppression chamber pressure indication is available in the control room. Wide range suppression chamber pressure indication is available locally on Containment H2/O2 Analyzer Panel if analyzer is selected to suppression chamber.*

#### **Indications/Cues for the Event Requiring Critical Task**

Multiple control board and control room indications of suppression chamber and drywell pressures.

#### **Performance Criteria**

Start an operable RHR loop  
Perform a valve alignment to provide a flowpath for spray.

#### **Performance Feedback**

RHR pump, valve and system flow indications are available.  
Multiple indications of Drywell pressure dropping

★ **Limits Drywell Spray flow to between 1000 and 2800 gpm for the first 30 seconds.**

**Safety Significance**

Maintenance of primary containment integrity.

Actions are taken to limit the system flowrates when first initiating drywell sprays (1000 to 2800 gpm for the first 30 seconds). The reason for this restriction is to limit the magnitude of the drywell pressure reduction such that it will not go less than atmospheric (prevents air from being drawn in to containment) and ensures a margin to the negative design pressure of the containment.

The BWR Owners Group Emergency Operating Procedures Basis document discusses drywell spray limitations utilizing a Drywell Spray Initiation Limit Curve to protect against containment damage from exceeding the design drywell to suppression chamber differential pressure. From the Susquehanna Emergency Operating Procedures basis document, EO-000-103, "A drywell spray initiation limit has been developed by PPL" which provides the same protection guarantees without necessitating the use of an additional curve on the EOP flowcharts. "By limiting drywell spray flow to between 1000 and 2800 gpm for the first 30 seconds of drywell spray operation, drywell sprays can be initiated without concern" in all regions of the BWR Owners Group curve. "After 30 seconds of operation, the drywell atmosphere contains sufficient vapor to allow full drywell sprays flow." In other words, spraying the drywell within these limits will not result in a drywell pressure rapid reduction such that the differential pressure limit would be challenged.

From Appendix D of NUREG-1021, Draft Revision 9, the critical task listed above has essential safety action that correctly completed, will prevent "degradation of any barrier to fission product release" and the crew will take action to "effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition describe in the previous paragraph."

**Consequences of Failure to Perform the Task**

Potential failure of primary containment.

**SSSES EOP Basis for:**

PC/P-7      SHUT DOWN DW COOLERS  
                 SHUT DOWN RECIRC PUMPS  
                 INITIATE DW SPRAYS  
                 UNLESS PUMPS CONTINUOUSLY NEEDED  
                 FOR ADEQUATE CORE COOLING  
                 LIMITING FLOW TO BETWEEN 1000 AND 2800 GPM  
                 FOR FIRST 30 SEC

*A DWSIL (Drywell Spray Initiation Limit) has been developed by PPL which provides protection against containment damage from exceeding the design differential pressure, yet does not restrict operation of the drywell sprays. By limiting drywell spray flow to between 1000 and 2800 gpm for the first 30 seconds of drywell spray operation, drywell sprays can be initiated without concern in all regions of this curve. After 30 seconds, the drywell atmosphere contains sufficient vapor to allow full drywell sprays flow. For this reason, the curve is not included.*

**Indications/Cues for the Event Requiring Critical Task**

The Unit Supervisor will direct drywell sprays be initiated, limiting flow to between 1000 and 2800 gpm for the first 30 seconds. The PCO will initiate drywell sprays monitoring the flowrate on available digital and analog indications on 1C601, limiting flow to between 1000 and 2800 gpm for at least the first 30 seconds of operation before increasing flow.

**Performance Criteria**

Manually throttle HV151-F016A and B and monitor drywell spray  
Use clock to determine 30 seconds has elapsed

**Performance Feedback**

Monitor Drywell spray flow indications during first 30 seconds of drywell spray operation

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## SCENARIO REFERENCES

1. OP-149-005 RHR Suppression Pool Cooling
2. AR107-001 (D03) SBLC Injection HV-148-F006 not fully open
3. TS 3.1.7 Standby Liquid Control System
4. GO-100-012 Power Maneuvers
5. ON-193-001 Turbine EHC System Malfunction
6. ON-156-001 Unanticipated Reactivity Change
7. OP-152-001 HPCI System
8. TS 3.5.1 ECCS Operating
9. ON-103-003 13.8 KV Bus 11A and 11B Loss of Bus Load Shedding on Undervoltage
10. ON-164-002 Loss of Recirculation Flow
11. TS 3.4.1 Reactor Recirculation Operating
12. ON-178-002 Core Flux Oscillations
13. AR-121-001 (F02) SJAE Condenser Discharge Hi Press
14. ON-143-001 Main Condenser Vacuum and Offgas Sys Off-Normal Operation
15. EO-100-102 RPV Control
16. EO-100-103 Primary Containment Control
17. OP-149-004 RHR Containment Cooling
18. ON-183-001 Stuck Open Safety Relief Valve



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**SCENARIO SPECIAL INSTRUCTIONS**

1. Initialize the simulator to **IC-376**: Unit 1 at 75 percent power EOL, Unit 2 in Startup.
2. Load SCN file **LOC23 NRC Scenario 1**
3. Place simulator in **RUN** and verify the following pre-inserts and Key assignments

| MF  | RF  | OR  | SCN | ET  | Conditions |
|-----|-----|-----|-----|-----|------------|
| 1:1 | 0:0 | 4:4 | 0   | 1:0 | 20         |

**aet ETLOC23SRVA** Light: Safety Relief Valve A PSV141F013A  
Condition: doHS14113A1\_2.CurrValue = #OR.doHS14113A1\_2.ON  
Linked Commands: IMF mfMS183010A f:100 IMF mfMS183013A f:25  
**IMF mfRP158003** RPS Fails To Auto Actuate  
**IOR diHSC72A1S03AA f:NORM** RPS Manual Scram Fails  
**IOR diHSC72A1S03BB f:DISARM** “ “  
**IOR diHSC72A1S03CB f:DISARM** “ “  
**IOR diHSC72A1S03DA f:NORM** “ “  
{Key[1]} IMF cmfMV08\_HV151F028A f:.0001 Leak by to simulate loop venting  
{Key[1]} IMF cmfMV08\_HV151F024A r:60 f:.00000001 Leak by to simulate loop venting  
{Key[2]} MMF cmfMV08\_HV151F028A f:0 Remove leak by  
{Key[2]} IMMF cmfMV08\_HV151F024A f:0 Remove leak by  
{Key[3]} MMF cmfMV08\_HV151F028A Delete leak by  
{Key[3]} IMMF cmfMV08\_HV151F024A Delete leak by  
{Key[4]} IMF cmfMV07\_HV148F006 f:10 SBLC Inj Vlv Off Open Seat  
{Key[5]} IMF mfTC193026 f:10.0 EHC Steam Flow Gain Unit  
{Key[6]} IMF mfHP152004 HPCI Inadvertent Start  
{Key[7]} IMF cmfRL02\_86A1101 Bus 1A101 Lockout Relay Fail Energized  
{Key[8]} IRF rfDB105008 f:CLOSE Closes 1B140-042 Tie Breaker to 1B150  
{Key[8]} IRF rfDB105051 d:1 f:OPEN Opens 1B140-012 Feeder from 1X140  
{Key[9]} IRF rfDB105009 f:CLOSE Closes 1B100-042 Tie Breaker to 1B110  
{Key[9]} IRF rfDB105030 d:1 f:OPEN Opens 1B100-012 Feeder from 1X100  
{Key[10]} IRF rfDB105006 f:CLOSE Closes 1B120-042 Tie Breaker to 1B130  
{Key[10]} IRF rfDB105041 d:1 f:OPEN Opens 1B120-012 Feeder from 1X120  
{Key[11]} IMF mfMC143001 f:0.2 Main Condenser Air In Leakage  
{Key[12]} MMF mfMC143001 i:10 f:50 Increase Main Cond Air In Leakage  
{Key[14]} IMF mfHP152015 HPCI Turbine trip  
{Key[15]} IMF cmfRV06\_PSV141F13A Pull “A” SRV fuses F019 & F020

4. **ENSURE** Eccentricity recorder, XR-10116, on 1C652 is displaying BPV POS and CV POS trends.
5. Prepare a turnover sheet indicating:
  - Unit 1 is at 75% power, following a Rod Pattern Adjustment. Unit 2 in Startup ~ 1 hour from synchronizing to the grid
  - Supp Pool Cooling is in service with RHR Loop ‘A’ with OP-149-005 is complete up to Step 2.1.20.
  - Shutdown Suppression Pool cooling and leave RHR SW and ESW in service per WWM’s request.
  - Once Suppression Pool Cooling is secured, commence returning Rx Power to 100% using Recirc
  - RE directions: raise Power law Form OP-AD-338-1 (1% / min from 75% to 85%, then hold until RE verifications completed)

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**SCENARIO EVENT DESCRIPTION FORM**

**Initial Conditions:** Initialize the simulator to IC-376 Ensure the SCN File is executed per the Special Instructions Sheet. Assign Shift positions. Direct the Crew to begin a five-minute panel walk down.

| EVENT | TIME   | DESCRIPTION                       |  |
|-------|--------|-----------------------------------|--|
| 1     | 1 min  | Secure Supp Pool cooling          | (Normal: BOP)                              |
|       |        |                                   |  |
| 2     | 10 min | SBLC Inj Vlv Off Open Seat        | (TS SRO)                                   |
|       |        |                                   |  |
| 3     | 15 min | Raise Rx power                    | (Normal: SRO, ATC)                         |
|       |        |                                   |  |
| 4     | 25 min | EHC oscillation                   | (Component: SRO, BOP)<br>(Reactivity: ATC) |
|       |        |                                   |  |
| 5     | 40 min | HPCI inadvertent start            | (Component: SRO, BOP + TS)                 |
|       |        |                                   |  |
| 6     | 50 min | Aux Bus 11A de-energize           | (Component: ALL)                           |
|       |        |                                   |  |
| 7     | 70 min | Loss of Main Cond Vac             | (Reactivity: SRO, ATC)                     |
|       |        |                                   |  |
| 8     | 75 min | Failure to Scram                  | (Instrument: ATC)                          |
|       |        |                                   |  |
| 9     | 80 min | SRV tailpipe rupture \ stuck open | (Major: ALL)                               |
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**SCENARIO EVENT FORM**

Event No: 1  
 Brief Description: Secure Suppression Pool cooling

| POSITION | TIME | STUDENT ACTIVITIES  |
|----------|------|---|
| SRO      |      | Direct Suppression Pool cooling secured per OP-149-005 Section 2.1.<br>Direct not to secure RHRSW and ESW after RHR pump shutdown due to subsequent support of scheduled RHR Surveillance Test<br>Steps up to Step 2.1.20 are complete.<br>Enters TRO 3.8.2.1 for Motor Overload Bypass   |
| BOP      |      | Remove Div 1 RHR from Suppression Pooling Cooling, as follows: <ul style="list-style-type: none"> <li>▪ Obtains OP-149-005.</li> <li>▪ Reviews procedure</li> <li>▪ Begin at Step 2.1.20</li> <li>▪ Informs SRO to enter TRO 3.8.2.1</li> <li>▪ Place HS-E11-1S62A to Test, Confirm BIS light illuminates and Confirm Annunciator RHR Loop A Out of Service alarms AR109-001 (B09)</li> <li>▪ Close HV-151-F024A by holding control switch in Close for at least 10 seconds after Amber Closed illuminates</li> <li>▪ Observe HV-151-F007A opens ~30 sec after 3000 gpm flow reached</li> <li>▪ Stops RHR Pump 1P202A</li> <li>▪ Closes HV-151-F028A</li> <li>▪ Ensures HV-151-F017A open</li> <li>▪ Opens HV-151-F048A</li> <li>▪ Observes RHR Pump Room Cooler stops</li> <li>▪ Directs NPO to fill and vent RHR iaw OP-149-001</li> <li>▪ After 2 minutes, places HS-E11-1S62A to Normal</li> <li>▪ Confirms BIS light extinguishes</li> <li>▪ Confirms Annunciator RHR Loop A Out of Service clears</li> <li>▪ Directs SRO to exit TRO 3.8.2.1</li> </ul> |
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| <b>NOTES:</b>                                  |  |
| Note: Special logs not maintained in Simulator |  |
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**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

**Event No:** 1  
**Brief Description:** Secure Suppression Pool cooling

**INSTRUCTOR ACTIVITY:**

When directed as RB NPO to fill and vent RHR iaw OP-149-001 Step 2.5.3, acknowledge directions, then:

1. On PNOV Panel\_601A insert, monitor INLET PRESS TO HX A PI-E11-1R606A1.
2. Depress soft **Key #1**:

|  |                                  |
|--|----------------------------------|
| <b>Key 1 IMF cmfMV08_HV151F028A f:.0001</b>          | Leak by to simulate loop venting |
| <b>Key 1 IMF cmfMV08_HV151F024A r:60 f:.00000001</b> | Leak by to simulate loop venting |

3. When pressure drops to 150 psig, depress soft **Key #2**, then **Key#3**:

|   |                           |
|---|---------------------------|
| <b>Key 2 MMF cmfMV08_HV151F028A f:0</b> | Simulate venting complete |
| <b>Key 2 MMF cmfMV08_HV151F024A f:0</b> | Simulate venting complete |
| <b>Key 3 DMF cmfMV08_HV151F028A</b>     | Simulate venting complete |
| <b>Key 3 DMF cmfMV08_HV151F024A</b>     | Simulate venting complete |

4. Once above actions are taken, contact the control room via radio and report, "Div 1 RHR is filled and vented."

**ROLE PLAY:**

As necessary.

**SCENARIO EVENT FORM**

Event No: 2  
Brief Description: SBLC Injection Valve off open seat

| POSITION | TIME | STUDENT ACTIVITIES  |
|----------|------|---|
| BOP      |      | Report annunciator AR107-001 (D03) SBLC Injection HV-148-F006 not fully open and dual indication for valve position.<br>Dispatch NPO to check status of HV-148-F006.  |
| SRO      |      | Acknowledge report<br>Contact Work Week Manager concerning status of HV-148-F006.<br>Enter LCO 3.1.7 Condition C (Two SLC subsystems inoperable) Required action C.1, restore one system to operable within 8 hours.) |
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| <b>NOTES:</b> |  |
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**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 2  
Brief Description: SBLC Injection Valve off open seat

**INSTRUCTOR ACTIVITY:**

When the crew completes shutdown of Suppression Pool Cooling, and on Lead Evaluator's cue, insert SBLC injection valve off open seat by activating soft **Key #4**:

{Key[4]} IMF cmfMV07\_HV148F006 f:10                      SBLC Inj Vlv Off Open Seat

**ROLE PLAY:**

1. When contacted to determine the status of SLC HV-148-F006, acknowledge the direction, wait two minutes, contact the control room via radio, and report "HV-148-F006 appears to be off its open seat."
2. If asked for the valve position, report "It appears to be about 90% open."
3. If directed to manually open it, report "I can not engage the clutch."
4. If crew has not started power increase, call the Unit Supervisor as Reactor Engineering and request that they begin the power increase as soon as possible due to Xenon building in.
5. As necessary.



**SCENARIO EVENT FORM**

**Event No:** 3  
**Brief Description:** Raise Rx Power

| POSITION | TIME | STUDENT ACTIVITIES  |
|----------|------|---|
| SRO      |      | Performs Crew Brief for Rx Manip on U1 <ul style="list-style-type: none"> <li>▪ Prepares to raise Rx Power using Recirc flow.</li> <li>▪ Conduct Reactivity Brief (overview, actual Brief occurred prior to Shift)</li> <li>▪ Directs power raised per RE instructions and GO-100-012, beginning at Step 5.4</li> </ul>   |
| ATC      |      | Raises Rx power by increasing Recirc flow iaw OP-164-002 (approx 1%/min), as follows: <ul style="list-style-type: none"> <li>▪ On Recirc HMI, ensure Manual Mode Selected and Manual buttons are yellow for "A" and "B" Recirc Pumps</li> <li>▪ Slowly adjust RRP 'A' and 'B' Speed Controller Demand with the (Double Chevron) INC pushbuttons as required.</li> <li>▪ Observes % indications increase</li> <li>▪ Observe Rx power rises</li> <li>▪ Monitor Plant response.</li> <li>▪ Plots position on the Power to Flow Map.</li> </ul> |
| BOP      |      | Provide Peer Check of Recirc HMI operation<br>Monitors Plant response.<br>Maintain Load Set at approximately 100 MWe above actual generator output by depressing Load Selector Decrease pushbutton and watching Load Set meter.<br>Balance the Main Generator Manual Voltage Regulator with the auto regulator by adjusting Man Volt Reg Adjust HC-10002, as necessary  |
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| <b>NOTES:</b> |  |
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**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 3  
Brief Description: Raise Rx Power

**INSTRUCTOR ACTIVITY:**

None

**ROLE PLAY:**

As necessary

SCENARIO EVENT FORM

Event No: 4  
 Brief Description: EHC oscillation

| POSITION | TIME | STUDENT ACTIVITIES  |
|----------|------|---|
| ATC      |      | Reports oscillating reactor power, level, and pressure.<br>Reports oscillating generator output.<br>Reports oscillating Turbine Control Valve positions<br>Ceases raising Rx power<br>Depresses TRA Init Button on PCO desk to initiate Transient Recording Analysis.   |
| SRO      |      | Acknowledges ATC reports<br>Ensures Rx power raise halted<br>Enters ON-193-001 (Turbine EHC System Malfunction) and directs BOP to perform the ON.<br>Contacts Work Week Manager \ I&C concerning EHC problem<br>Enters ON-156-001 Unanticipated Reactivity Change  |
| ATC      |      | Implements ON-193-001 Section 3.4<br>Reduces Reactor Power with Recirc flow by 5% with RRP "A" and "B" (Double Chevron) DEC buttons   |
| BOP      |      | Once power is reduced 5%, adjusts EHC to transfer oscillations from the Control Valves to the Bypass Valves, by: <ul style="list-style-type: none"> <li>▪ Noting initial Load Limit Setpoint value.</li> <li>▪ Decreases Load Limit Setpoint, by slowly turning it counter clockwise, until the Load Limit Limiting Light illuminates.</li> <li>▪ Continues to slowly lower Load Limit Setpoint to open bypass valves enough to stop the control valve oscillations. <b>(Note 1)</b></li> <li>▪ Check Control Valve oscillations Stop</li> <li>▪ <b>(Note 2)</b></li> </ul> |
| SRO      |      | Contacts WWM to have FIN investigate the cause of Control Valve oscillations and to notify the Duty Manager.<br><b>(Note 3)</b>   |

★ Denotes Critical Task

| NOTES:  |
|---|
| #1: The off-normal directs reducing load limit setpoint until one BPV is 50% open. This is not enough to stop the control valve oscillations.   |
| #2: Crew may contact I & C to have the backup pressure regulator placed in service due to control room indications showing pressure regulator oscillations. This is caused by the scenario's EHC malfunction. |
| #3: The SRO may refer to TS 3.7.8, Main Turbine Pressure Regulation System, if the crew believes the cause of the oscillations is due to the in-service regulator.  |

**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

**Event No:** 4  
**Brief Description:** EHC oscillation

**INSTRUCTOR ACTIVITY:**

After Rx power has been raised by 3% and on the Lead Evaluator's cue, insert the EHC Steam Flow Gain Unit oscillations by activating soft **Key #5:**

**{Key[5]} IMF mfTC193026 f:10.0**

EHC Steam Flow Gain Unit

**ROLE PLAY:**

1. When contacted as WWM concerning EHC malfunction, report "FIN has been notified and are in route to investigate."
2. Five minutes after the above call, contact the Control Room via the PA as I&C (Delroy Artman) and say, "The Unit 1 EHC problem appears to be with the EHC Steam Flow Gain Unit, not the inservice pressure regulator. We need to develop a work package and should be able to repair it within the hour."
3. As necessary.

**SCENARIO EVENT FORM**

Event No: 5  
 Brief Description: HPCI inadvertent start

| POSITION | TIME | STUDENT ACTIVITIES   |
|----------|------|--|
| BOP      |      | Reports HPCI start.<br>Verifies adequate core cooling by two independent means and ensures Drywell pressure is < 1.72 psig<br>Obtains SRO permission to Override HPCI  |
| SRO      |      | Verifies no valid initiation signal exists<br>Direct HPCI overridden per OP-152-001<br>Directs BOP to enter ON-156-001.<br>Declares HPCI Inoperable<br>Enter TS LCO 3.5.1 Condition D, Required Action D.1: Verify RCIC Operable immediately and Required Action D.2: restore HPCI to Operable within 14 days, Contacts Work Week Manger concerning the HPCI injection, requests FIN support, and notification of the Duty Manager.  |
| BOP      |      | Executes OP-152-001 Section 2.16 or Hard Card<br>Overrides HPCI and prevents uncontrolled injection <ul style="list-style-type: none"> <li>▪ Places HPCI Aux Oil Pump switch to Start</li> <li>▪ Places HPCI Turbine Flow Control FC-E41-1R600 in Manual</li> <li>▪ Depresses Close button to reduce discharge pressure less than RPV pressure.</li> <li>▪ Ensures HPCI Min Flow to Supp Pool opens when flow &lt; 500 gpm and discharge pressure &gt; 125 psig</li> </ul> |
| SRO      |      | Directs BOP to enter ON-156-001.<br>Declares HPCI Inoperable<br>Enter TS LCO 3.5.1 Condition D, Required Action D.1: Verify RCIC Operable immediately and Required Action D.2: restore HPCI to Operable within 14 days, Contacts Work Week Manger concerning the HPCI injection, requests FIN support, and notification of the Duty Manager.   |
| ATC      |      | Refers to ON-156-001 and determines no other reactivity control systems were responsible for the power increase.   |
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| <b>NOTES:</b> |  |
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**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 5  
Brief Description: HPCI inadvertent start

**INSTRUCTOR ACTIVITY:**

When the crew has completed actions to address the EHC malfunctions, and on the Lead Evaluator's cue, insert HPCI inadvertent start by activating soft **Key #6**:

**{Key[6]} IMF mfHP152004**

HPCI Inadvertent Start

**ROLE PLAY:**

1. When contacted as the Work Week Manager, state "I will contact FIN to investigate and notify the Duty Manager (if directed to do so)".
2. As necessary.

**SCENARIO EVENT FORM**

Event No: 6  
 Brief Description: Aux Bus 11A de-energize

| POSITION | TIME | STUDENT ACTIVITIES   |
|----------|------|--|
| BOP      |      | Report Aux Bus 11A de-energized<br>AR015-B-02 (13.8 KV Supply Bkr to Bus 11A Trip)   |
| ATC      |      | Report trip of RRP 1A (AR102-B-02, Recirc MG 'A' Drive Mtr Trip)<br>Report runback of RRP 1B on Limiter #2   |
| SRO      |      | Enter ON-103-003 13.8 KV Bus 11A and 11B Loss of Bus Load Shedding<br>Enter ON-164-002 Loss of Reactor Recirculation Flow<br>Enter ON-156-001 Unanticipated Reactivity Change<br>Enter ON-178-002 Core Flux Oscillations   |
| BOP      |      | Execute ON-103-003 <ul style="list-style-type: none"> <li>• Informs Crew of loss of 1A RRP, CWP A&amp;C, Cond Pump A &amp; C, and SWP A.</li> <li>• Informs Crew of guidance to perform ON-164-002, cross tie load centers, and perform rapid start of the Common Recombiner.</li> <li>• Notes major impact on other plant equipment, to include: loss of EHC Pump A and "A" RB HVAC fans.</li> <li>• Performs Attachment A:               <ul style="list-style-type: none"> <li>○ Directs NPO to check Bus 11A protective relays status</li> <li>○ Dispatch Operators to cross-tie TB and RB load centers</li> <li>○ Dispatch NPO to perform a Rapid Start of the Common Recombiner iaw ON-143-001 Att. A.</li> <li>○ Ensure Condensate, Feedwater, Service Water and Circ Water system parameters are within limits</li> <li>○ Confirm status of RFP HPU &amp; Kidney Pumps at ICS HMI monitor</li> <li>○ Dispatch Operator to perform local checks at RFP HPU skid</li> <li>○ Monitor Condenser vacuum</li> <li>○ Perform ON-134-001, Loss of RBCW</li> <li>○ Ensure generator current is &lt; 19000 amps due to loss of bus duct cooling</li> </ul> </li> </ul> |
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| <b>NOTES:</b> |  |
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**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

**Event No:** 6  
**Brief Description:** Aux Bus 11A de-energize

**INSTRUCTOR ACTIVITY:**

When HPCI is overridden, the SRO has addressed Tech Specs, and on the Lead Evaluator's cue, insert the Aux Bus 11A lockout by activating soft **Key #7**:

**{Key[7]} IMF cmfRL02\_86A1101**                      Bus 1A101 Lockout Relay Fail Energized

When directed as TB NPO to crosstie load centers, wait three minutes, then:

- For 1B140 / 1B150, pull up P&ID DB5 and then activate soft **Key #8**:

|   |                                       |
|---|---------------------------------------|
| <b>{Key[8]} IRF rfDB105008 f:CLOSE</b>    | Closes 1B140-042 Tie Breaker to 1B150 |
| <b>{Key[8]} IRF rfDB105051 d:1 f:OPEN</b> | Opens 1B140-012 Feeder from 1X140     |

- For 1B100 / 1B110, pull up P&ID DB1, wait one minute, and then activate soft **Key #9**:

|   |                                       |
|---|---------------------------------------|
| <b>{Key[9]} IRF rfDB105009 f:CLOSE</b>    | Closes 1B100-042 Tie Breaker to 1B110 |
| <b>{Key[9]} IRF rfDB105030 d:1 f:OPEN</b> | Opens 1B100-012 Feeder from 1X100     |

- For 1B120 / 1B130, pull up P&ID DB4, wait one minute, and then activate soft **Key #10**:

|  |                                       |
|--|---------------------------------------|
| <b>{Key[10]} IRF rfDB105006 f:CLOSE</b>    | Closes 1B120-042 Tie Breaker to 1B130 |
| <b>{Key[10]} IRF rfDB105041 d:1 f:OPEN</b> | Opens 1B120-012 Feeder from 1X120     |

**ROLE PLAY:**

1. When directed as TB NPO to check Aux Bus 11A status, wait two minutes and report "Lockout relay 86A1-101 is tripped"
2. Once Turbine Building load centers are cross-tied, contact the Control Room and report "1B140 is being fed from 1B150, 1B100 from 1B110, and 1B120 from 1B130".
3. When directed as the RB NPO to cross-tie load centers 1B250 / 1B260 and 1B270 / 1B280, acknowledge direction and take no further action.
4. When directed as the TB NPO to perform a rapid start of the Common Recombiner, acknowledge the call, wait four minutes and report "I am not able to get the Common Recombiner to transfer from Standby to Prestart. The FUS contacted FIN to investigate."
5. As necessary



**SCENARIO EVENT FORM**

Event No: 6  
 Brief Description: Aux Bus 11A de-energize (continued)

| POSITION | TIME | STUDENT ACTIVITIES  |
|----------|------|---|
| ATC      |      | Execute ON-164-002: <ul style="list-style-type: none"> <li>• Determine actual core flow by plotting PICSY computer point NJP51 on GO-100-009-2 (Att B)</li> <li>• Plot position on Power/Flow Map (core flow and APRM power)</li> <li>• Determines core is operating outside Region 2.</li> <li>• Ensure thermal power reduced to &lt; 60% rod line by inserting rods iaw the CRC book beginning with step 185.</li> <li>• Inform SRO to comply with COLR Section 8.0</li> <li>• Inform SRO to comply with TS LCO 3.4.1</li> <li>• Place Recirc A MOV OL Bypass HV-143-F031A/32A key switch to Test</li> <li>• Ensure Recirc Pump A Discharge Bypass HV-143-F032A Open</li> <li>• Close Recirc Pump A Discharge HV-143-F031A</li> <li>• Within 5 minutes, re-open Recirc Pump A Discharge HV-143-F031A</li> <li>• After 2 minutes place Recirc A MOV OL Bypass HV-143-F031A/32A key switch to Norm</li> <li>• Notify SRO to clear TR 3.8.2.1</li> </ul> |
| SRO      |      | Directs ATC to insert rods to less than the 60% rod line per the CRC book.<br>Comply with TR 3.8.2.1 MOV Thermal Overload Protection<br>Refer to TS 3.4.1 (Note 1)<br>Inform Work Week Manager of Loss of Aux Bus 11A   |
| ATC      |      | Inserts control rods in accordance with the CRC book, beginning at step 180 (30-15). Depresses Insert Rod pushbutton until selected rods reach position 00. Monitors position on Power / Flow Map.  |
|          |      |   |
|          |      |   |
|          |      |   |
|          |      |   |
|          |      |   |
|          |      |   |
|          |      |   |

★ Denotes Critical Task

|   |
|---|
| <b>NOTES:</b>   |
| #1: Due to timing, SRO may not have the opportunity to evaluate Tech Spec requirements for single loop operation. If that is the case, a follow-up is not required since there were already two Tech Spec events. |

**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 6  
Brief Description: Aux Bus 11A de-energize (continued)

**INSTRUCTOR ACTIVITY:**

**ROLE PLAY:**

1. As necessary

**SCENARIO EVENT FORM**

**Event No:** 7,8  
**Brief Description:** Loss Main Condenser Vacuum, Failure to Scram

|       |   |
|-------|---|
| All   | Recognize MWe lowering, elevated Offgas Flow, and lowering Main Condenser vacuum. <b>(Note 1)</b>   |
| SRO   | Enter ON-143-001 Main Condenser Vacuum and Offgas Sys Off-Normal, and direct BOP to perform the ON.<br>Brief Crew on plant system response to loss of vacuum and informs them they will Scram prior to 7.5" Turbine Trip<br>Direct Rx Power reduced iaw GO-100-012 to maintain Turbine Exhaust Pressure within limits of Attachment E or PICSY Display VAC<br>Refer to ON-143-001 Att A |
| Crew  | Contact field operators and/or Work Week Manager to investigate loss of vacuum,   |
| SRO   | On report of un-isolable vacuum leak directs Scram Imminent Actions, updates crew on Pressure \ Level strategy after MSIV closure, and directs ATC to Scram the reactor.  |
| ATC   | When directed, places Mode Switch to Shutdown<br>Reports Failure to Scram<br>Arms and depresses Manual Scram Pushbuttons<br>Reports Failure to Scram<br>Inserts SRMs and IRMs   |
| BOP ★ | <b>Manually initiate ARI</b> <ul style="list-style-type: none"> <li>▪ Arms and Depresses Div 1 and 2 HS-147103A1 and B1</li> <li>▪ Reports ARI went to completion.</li> </ul>   |
| ATC   | Monitors for Rod Drift alarm, reports rods moving, and when all rods full in.   |
|       |   |
|       |   |
|       |   |
|       |   |

★ Denotes Critical Task

|  |  |
|--|--|
| <b>NOTES:</b>  |  |
| #1: Initially, the loss of vacuum will be difficult to see on PR-10502 HP/IP/LP Condenser or PI-10502 CDSR C Vacuum indications. Crew may not recognize problem until Condenser High Pressure alarm received |  |

**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

**Event No:** 7,8

**Brief Description:** Loss Main Condenser Vacuum, Failure to Scram

**INSTRUCTOR ACTIVITY:**

As the crew is responding to the loss of the 11A Aux Bus, control rods are being inserted, and on the Lead Evaluator's cue, insert Loss of Main Condenser Vacuum by activating soft **Key #11**:

**{Key[11]} IMF mfMC143001 f:0.2** Main Condenser Air In Leakage

**When all rods are in**, increase Condenser Air Leak by activating **Key #12**:

**{Key[12]} MMF mfMC143001 i:10 f:50** Increase Main Cond Air In Leakage

**ROLE PLAY:**

1. When contacted as the Work Week Manager concerning the noise, state "I am dispatching FIN to investigate."
2. If contacted to investigate the loss of vacuum, wait five minutes and contact the control room via the radio / PA as the person sent to investigate, and report "There is a tear in the boot between the Unit 1 LP Turbine and Condenser and it is getting worse. I am leaving the area."
3. As necessary.

**SCENARIO EVENT FORM**

Event No: 9  
 Brief Description: SRV Tailpipe rupture-Stuck Open

| POSITION | TIME | STUDENT ACTIVITIES  |
|----------|------|---|
| SRO      |      | Enters EO-100-102<br>Directs ATC to maintain RPV level between 13" and 54" using Feedwater.<br>Once RFPs trip due to low vacuum directs using RCIC to maintain level band.<br>Directs ATC to place Feedwater / Condensate in Startup Level Control.<br>May direct BOP to close MSIVs due to lowering Condenser vacuum<br>Directs BOP to control RPV pressure between 800-1,087 psig using SRVs.<br>Directs BOP to reset the Main Generator Lockouts   |
| ATC      |      | Executes ON-100-101 Hard Card<br>Align FW for SULC per OP-145-001 Att A, as follows: <ul style="list-style-type: none"> <li>• Ensures two Condensate Pumps running</li> <li>• Ensures "A" RFPT transfers to the Discharge Pressure (Note 1)</li> <li>• Ensures "B" and "C" align to Idle Mode.</li> <li>• Trips one of the Idle RFPTs by depressing its Trip pushbutton.</li> <li>• Using the HMI display, Reset Setpoint Setdown.</li> <li>• Slowly raise LIC-C32-1R602 setpoint to 35"</li> </ul> Reports loss of Feed pumps due to low condenser vacuum.<br>Manually initiates RCIC, by arming and depressing manual initiation pushbuttons, and adjusts flow using FC-E51-1R600 to maintain 13" to 54". |
| BOP      |      | Opens "A" SRV to maintain RPV pressure in band.<br>Recognizes and reports rapid DW pressure rise and SC pressure leading DW.<br>Attempts to close "A" SRV and reports it failed to close  |
| SRO      |      | Enters ON-183-001, Stuck Open SRV, and directs BOP to perform the ON.   |
| BOP      |      | Executes ON-183-001 as follows: <ul style="list-style-type: none"> <li>• Places "A" SRV hand switch to Off and notes acoustic monitor light still on.</li> <li>• With SRO permission, places "A" SRV handswitch to open, then to off.</li> <li>• Determines SRV still open</li> <li>• Directs NPO to pull Fuses B21C-F019 and F020 for 'A' SRV iaw ON-183-001 Att A in the URR</li> </ul>   |

★ Denotes Critical Task

|   |  |
|---|--|
| <b>NOTES:</b>   |  |
| #1: If 1B140 / 150 were not previously cross-tied, then "A" RFPT will remain in the Flow Control Mode due to loss of power to the 51A and 03A |  |
| E-Plan classification: MA3 ATWS and ARI reduces power to < 5%   |  |

**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 9  
Brief Description: SRV Tailpipe rupture-Stuck Open

**INSTRUCTOR ACTIVITY:**

1. When SRV 'A' is opened, the tailpipe breaks and sticks open by **aet ETLOC23SRVA:**

**IMF mfMS183010A f:100**  
**IMF mfMS183013A f:25**

SRV 'A' Stuck Open  
SRV 'A' Tail Pipe Rupture

2. When \ if Operator attempts to place HPCI in Pressure Control Mode, trip HPCI by activating **Key #14:**

**{Key[14]} IMF mfHP152015**

HPCI Turbine trip

3. When directed to pull SRV fuses, wait one minute then call the Control Room on the page and tell them you are ready to pull the fuses, then activate following **Key #15:**

**{Key[15]} IMF cmfRV06\_PSV141F13A**

Pull SRV fuses F019 & F020

4. If directed to close "A" RFP Discharge Valve, HV10603A, acknowledge the call, then on PNOV **FW12** select HV-10603A and insert an instructor selected valve position of 0% with a ramp of 20 minutes. Monitor valve position and report when the valve is closed.

**ROLE PLAY:**

As necessary.

SCENARIO EVENT FORM

Event No: 9

Brief Description: SRV Tailpipe rupture \ stuck open (continued)

| POSITION | TIME | STUDENT ACTIVITIES   |
|----------|------|--|
| SRO      |      | Enters EO-100-103 (Primary Containment Control)<br>Directs BOP to initiate Suppression Chamber Sprays<br>Directs BOP to monitor for 13 psig Supp Chamber pressure.<br>Monitors PSL Curve   |
| BOP      |      | Sprays Suppression Chamber iaw OP-149-004 Att. A, as follows: <ul style="list-style-type: none"> <li>• Places HS-E11-1S17A(B) to Override</li> <li>• Opens HV-151-F028A(B)</li> <li>• Closes HV-151-F017A(B)</li> <li>• Starts RHR Pump A or C (B or D)</li> <li>• Throttles open HV-151-F027A(B) to maintain ≤500 gpm on FI-15120A(B)</li> <li>• Places RHRSW in service iaw OP-149-004 Att A, section 4.0, as time permits.</li> </ul>   |
| ★SRO     |      | <b>When Supp Chamber pressure &gt; 13 psig, directs:</b> <ul style="list-style-type: none"> <li>• ATC to shut down the DW Coolers and Fans</li> <li>• ATC to shut down Reactor Recirc Pumps</li> <li>• <b>BOP to initiate DW Sprays, limiting flow between 1,000 and 2,800 gpm for first 30 seconds.</b></li> </ul>  |
| ATC      |      | Shutdown Recirc Pumps by depressing HS014001A and B.<br>Places all Drywell Cooler / Fan hand switches on 1C681 to Stop   |
| BOP      |      | <b>Spray the DW:</b><br>Using OP149-004, Att A: <ul style="list-style-type: none"> <li>• <b>Opens HV-151-F021A(B)</b></li> <li>• Ensures both RRP's are shutdown</li> <li>• Ensures DW Coolers and Fans are shutdown</li> <li>• <b>Throttles HV-151-F016A(B) to establish between 1,000 and 2,800 gpm for the first 30 seconds.</b> [indicated on FI-15120A(B)]</li> <li>• After 30 sec, throttles open HV-151-F016A(B) to between 9,500 and 10,000 gpm</li> <li>• Throttles DW spray by closing HV-151F016A(B) to ensure DW pressure does not drop to zero psig.</li> </ul> |
| ★        |      |  |
| ★        |      |  |

★ Denotes Critical Task

|               |  |
|---------------|--|
| <b>NOTES:</b> |  |
|---------------|--|

**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 9

Brief Description: SRV Tailpipe rupture \ stuck open (continued)

**INSTRUCTOR ACTIVITY:**

None

**ROLE PLAY:**

As necessary.

**TERMINATION CUE:**

The Scenario will be terminated when DW sprays are in service and RPV level is being maintained between 13" and 54".

**Post-scenario Evaluator Activity:**

Follow-up question for SRO to determine E-plan classification. For this scenario:

- Initial classification: **Alert** (MA3) ATWS and ARI reduces power to < 5%





**PPL-SUSQUEHANNA, LLC  
LEARNING CENTER**

**SIMULATOR SCENARIO**

|                           |                      |
|---------------------------|----------------------|
| <b>Scenario Title:</b>    | LOC23 NRC SCENARIO 2 |
| <b>Scenario Duration:</b> | 90 Minutes           |
| <b>Scenario Number:</b>   | LOC23 NRC-2          |
| <b>Revision/Date:</b>     | Rev. 2, 12/20/2010   |
| <b>Course:</b>            |                      |
|                           |                      |

|                     |                                   |            |
|---------------------|-----------------------------------|------------|
| <b>Prepared By:</b> | Don Kelly / Mike Jacopetti        | 12/20/2010 |
|                     | Instructor                        | Date       |
| <b>Reviewed By:</b> | <i>M. Jacopetti</i> for J. Diltz  | 12/21/10   |
|                     | Operations Training Supervisor    | Date       |
| <b>Approved By:</b> | <i>H.E. Knipf</i>                 | 12/21/10   |
|                     | Supervising Manager/Shift Manager | Date       |

## NRC Scenario #2 Summary

The Crew takes the Shift with Rx power at approximately 100%. Scheduled activities for the shift are to place the Standby Turbine Building Closed Cooling Water (TBCCW) pump in service and the secure the running pump.

Once TBCCW pumps are swapped, Instrument Bus 1Y115 de-energizes. This loss results in numerous Plant instruments being unavailable. The Crew will enter ON-117-001 (Loss of Instrument Bus) and attempt to restore power to the Bus. However, only a portion of the affected instruments are able to be recovered. Tech Spec 3.3.3.1 (Post Accident Monitoring Instrumentation) will be evaluated due to loss of the PAM instrumentation.

After the crew completes response to the loss of instrument bus, they will be notified that a Minimum Generation Emergency has been declared and that a 50 MWe reduction for Unit One is requested ASAP. The Crew will reduce power iaw OI-AD-029 (Emergency Load Control) and GO-100-012 (Power Maneuvers). Coincident with Min Gen Emergency, Control Power to Control Room Emergency Outside Air Supply System (CREOASS) Fan 'A' is lost. The alarm response will be addressed and the standby fan placed in Lead.

Following the Load reduction, the Hydraulic Fluid Temperature Controller for Reactor Recirc Pump 'A' Motor Generator set will fail to automatically control temperature. This failure results in a high temperature condition and the Crew will manually restore temperature of the hydraulic fluid to the RRP MG set.

Once RRP MG temps are stabilized, a loss of Extraction Steam to 4B Feedwater Heater occurs. The Crew will enter ON-147-001, Loss of Feedwater Heater Extraction Steam. The Crew will lower Rx power to approximately 70% and consult MCPR LCO 3.2.2.

Following the power reduction, four Control Rods will drift into the Core. This condition requires an Immediate Operator Action to Scram the Rx per OP-AD-055 and ON-155-001 (Control Rod Problems). The attempt to scram the Rx fails, resulting in a high power Anticipated Transient Without Scram (ATWS). The Crew will enter EO-000-113 (Level/Power Control). When Standby Liquid Control is injected the SBLC pump trips and the Reactor Water Cleanup (RWCU) system fails to automatically isolate. The crew will start the other SBLC pump, recognize significantly reduced flow, and manually isolate RWCU.

As the Crew is taking actions to mitigate the ATWS, a malfunction of the Electro-Hydraulic Control (EHC) system occurs, resulting in a Turbine Trip and a failure of the Turbine Bypass Valves to open. This will force the Crew to utilize SRVs for pressure control. Suppression Pool temperature will exceed 90°F, EO-000-103 (Primary Containment Control) will be entered and Suppression Pool cooling will be placed in service.

The crew will lower RPV water level and insert Control Rods. Actions for Control Rod insertion will be iaw EO-000-113 Sheet 2. The heat input into the

## NRC Scenario #2 Summary

Suppression Pool results in temperature exceeding the HCTL, however Rapid Depressurization will be postponed until all rods are in. An order for venting the Scram Air Header will be directed and when the Scram Air Header is vented, all Control Rods fully insert. The Crew will exit EO-000-113, then enter EO-000-102 (RPV Control) and EO-000-112 (Rapid Depressurization). The crew will rapidly depressurize the RPV due to HCTL being exceeded and restore RPV water level to +13 to +54 inches.

The Scenario will be terminated once all Rods are in, Rapid Depressurization is initiated, and direction is given to restore RPV level to between 13" and 54" with Condensate.

### Critical Tasks

- ★ Inhibits ADS  
(BOP)
- ★ Lower RPV level to <-60" but >-161"  
(ATC)
- ★ Inserts control rods IAW EO-000-113 Sh. 2.  
(ATC)
- ★ Rapidly Depressurizes RPV, Once Reactor Is Shutdown, Due to Exceeding HCTL Curve  
(BOP)

### Qualitative Attributes

|                          |  |
|--------------------------|--|
| Total Malfs (5-8):       | 9 (Loss 1Y115, CREOASS inop, RRP MG controller, loss FW heat, 4 Rods Drift, ATWS, EHC malfunction, SBLC degradation, RWCU fails to auto isolate)       |
| Malf > EOP (1-2):        | 2 (SBLC degradation, RWCU fails to auto isolate)   |
| ABN Events (2-4):        | 2 (Loss FW Heating, Control Rod Problems)  |
| MAJ Events (1-2):        | 2 (ATWS, HCTL)   |
| EOPs entered (1-2):      | 1 (Primary Containment Control)  |
| EOP Contingencies (0-2): | 2 (Level Power Control, Rapid Depressurization)  |
| Critical Tasks (2-3):    | 4 (Inhibits ADS, Lower RPV level to < -60" but > -161", Inserts control rods IAW EO-100-113 Sht. 2, Perform Rapid Depressurization once HCTL exceeded) |

## NRC Scenario #2 Summary

| <u>Event</u> | <u>Description</u>   | <u>Event Type</u> | <u>Who</u>   |
|--------------|----------------------|-------------------|--------------|
| 1            | Swap TBCCW           | N                 | SRO, BOP     |
| 2            | Loss 1Y115           | C                 | SRO, BOP, TS |
| 3            | Min Gen Emerg        | R                 | SRO, ATC     |
| 4            | CREOASS inop         | C                 | BOP          |
| 5            | RRP MG hi temp       | C                 | SRO, BOP     |
| 6            | Loss FW Heating      | C                 | SRO, ATC, TS |
| 7            | 4 Rods Drift         | C                 | ATC          |
| 8            | ATWS                 | M                 | All          |
| 9            | SBLC degradation     | C                 | BOP          |
| 10           | RWCU fail to isolate | C                 | BOP          |
| 11           | EHC malfunction      | C                 | SRO, BOP     |
| 12           | RD due to HCTL       | M                 | SRO, BOP     |

### Scenario #2 Applicant "Event count"

| <u>Position</u> | <u>RX</u> | <u>NOR</u> | <u>I/C</u>    | <u>MAJ</u> | <u>TS</u> |
|-----------------|-----------|------------|---------------|------------|-----------|
| SRO             | 3         | 1          | 2,5,6,11      | 8,12       | 2,6       |
| ATC             | 3         |            | 6,7           | 8          |           |
| BOP             |           | 1          | 2,4,5,9,10,11 | 8,12       |           |

SRO (U) needs minimum total for all Scenarios of:

RX: 0  
 NOR: 1  
 I/C: 2  
 MAJ: 1  
 TS: 2

SRO (I) needs minimum total for all Scenarios of:

RX: 1  
 NOR: 1  
 I/C: 4  
 MAJ: 2  
 TS: 2

RO needs minimum total for all Scenarios of:

RX: 1  
 NOR: 1  
 I/C: 4  
 MAJ: 2  
 TS: 0

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## SCENARIO SUMMARY

The Crew takes the Shift with Rx power at approximately 100%. Scheduled activities for the shift are to place the Standby Turbine Building Closed Cooling Water (TBCCW) pump in service and the secure the running pump.

Once TBCCW pumps are swapped, Instrument Bus 1Y115 de-energizes. This loss results in numerous Plant instruments being unavailable. The Crew will enter ON-117-001 (Loss of Instrument Bus) and attempt to restore power to the Bus. However, only a portion the affected instruments are able to be recovered. Tech Spec 3.3.3.1 (Post Accident Monitoring Instrumentation) will be evaluated due to loss of the PAM instrumentation.

After the crew completes response to the loss of instrument bus, they will be notified that a Minimum Generation Emergency has been declared and that a 50 MWe reduction for Unit One is requested ASAP. The Crew will reduce power iaw OI-AD-029 (Emergency Load Control) and GO-100-012 (Power Maneuvers). Coincident with Min Gen Emergency, Control Power to Control Room Emergency Outside Air Supply System (CREOASS) Fan 'A' is lost. The alarm response will be addressed and the standby fan placed in Lead.

Following the Load reduction, the Hydraulic Fluid Temperature Controller for Reactor Recirc Pump 'A' Motor Generator set will fail to automatically control temperature. This failure results in a high temperature condition and the Crew will manually restore temperature of the hydraulic fluid to the RRP MG set.

Once RRP MG temps are stabilized, a loss of Extraction Steam to 4B Feedwater Heater occurs. The Crew will enter ON-147-001, Loss of Feedwater Heater Extraction Steam. The Crew will lower Rx power to approximately 70% and consult MCPR LCO 3.2.2.

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As the Crew is taking actions to mitigate the ATWS, a malfunction of the Electro-Hydraulic Control (EHC) system occurs, resulting in a Turbine Trip and a failure of the Turbine Bypass Valves to open. This will force the Crew to utilize SRVs for pressure control. Suppression Pool temperature will exceed 90°F, EO-000-103 (Primary Containment Control) will be entered and Suppression Pool cooling will be placed in service.

The crew will lower RPV water level and insert Control Rods. Actions for Control Rod insertion will be iaw EO-000-113 Sheet 2. The heat input into the Suppression Pool results in temperature exceeding the HCTL, however Rapid Depressurization will be postponed until all rods are in. An order for venting the Scram Air Header will be directed and when the Scram Air Header is vented, all Control Rods fully insert. The Crew will exit EO-000-113, then enter EO-000-102 (RPV Control) and EO-000-112 (Rapid Depressurization). The crew will rapidly depressurize the RPV due to HCTL being exceeded and restore RPV water level to +13 to +54 inches.

The Scenario will be terminated once all Rods are in, Rapid Depressurization is initiated, and direction is given to restore RPV level to between 13" and 54" with Condensate.

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## SCENARIO OBJECTIVES

The objective of this scenario is to evaluate the Licensed Operator Candidate's ability to respond to the scenario events. These events will require each candidate to demonstrate the following:

- Knowledge of integrated plant operations
- Ability to diagnose abnormal plant conditions
- Ability to work together as a team
- Ability to mitigate plant transients that exercise their knowledge and use of ONs and EOPs
- Ability to utilize Technical Specifications (SRO Only)

To meet this objective, the Licensed Operator Candidates must demonstrate proficiency in the following competencies:

### Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings.
2. Comply with and use procedures, references, and Technical Specifications.
3. Operate the control boards.
4. Communicate and interact with other crew members.

### Senior Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings.
2. Comply with and use procedures and references.
3. Operate the control boards (N/A to upgrade candidates).
4. Communicate and interact with the crew and other personnel.
5. Direct shift operations.
6. Comply with and use Technical Specifications.



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**CRITICAL TASKS**

★ **Inhibits ADS**

**Safety Significance**

Inhibiting ADS prevents uncontrolled injection of large amounts of relatively cold, unborated low pressure ECCS water when the reactor is not shutdown with control rods.

**Consequences for Failure to Perform Task**

Failure to inhibit ADS can result in large amounts of positive reactivity addition due to boron dilution and cold water injection.

? <sup>STEF</sup>  
OK.

**SSES EOP Basis for:**

LQ/Q-3      **IF**      INITIAL ATWS PWR > 5%  
OR CANNOT BE DETERMINED INJECT SLC AND INHIBIT ADS

*When scram and ARI have failed, reactor power must be considered to determine if immediate boron injection is required. If initial ATWS power was greater than 5%, then a relatively large number of control rods have failed to insert. The seriousness of this condition requires immediate injection of boron to positively terminate the ATWS event.*

*ADS initiation may result in the injection of large amounts of relatively cold, unborated water from low pressure injection systems. With the reactor either critical or shutdown on boron, the positive reactivity addition due to boron dilution and temperature reduction through the injection of cold water may result in a reactor power excursion large enough to cause substantial core damage. Preventing ADS is therefore appropriate whenever boron injection is required.*

**Indications/Cues for Event Requiring Critical Task**

ATWS with initial reactor power level greater than 5% APRM power.

**Performance Criteria**

Inhibit ADS by placing 1C601 keylock switches to INHIBIT

**Performance Feedback**

Successful ADS inhibiting is indicated by Green Indicating Light at switch illuminating.

**Lowers RPV level to < -60" but > -161".**

**Safety Significance**

Core damage due to unstable operation can be prevented or at least mitigated by promptly reducing feedwater flow so that level is lowered below the feedwater spargers.

**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.

**SSES EOP Basis for:**

LQ/L-13      MAINTAIN LVL BETWEEN -60" AND -161"  
                  USING TABLE 15 SYSTEMS  
                  BYPASSING INTERLOCKS AS NECESSARY IAW ANY:

*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.*

*Operation outside the target area has the following disadvantages:*

*The basis for an upper level of -60" is given in LQ/L-6.*

*A lower level of -110" is specified for the following reasons:*

- 1. Provides a margin for core coverage.*
- 2. Avoids operation near TAF where core power is more responsive to RPV pressure fluctuations.*
- 3. Makes level control easier by maintaining level above the narrow region of the downcomer.*

*Below -110" the downcomer free area reduces from 300 ft<sup>2</sup> to 88 ft<sup>2</sup> resulting in increased magnitude of indicated level oscillations.*

4. *Maintains sufficient core flow to carry liquid boron from lower plenum upward into the core.*

*As level is decreased below -110", boron mixing efficiency is reduced because the natural circulation flow rate through the jet pumps is reduced and not as efficient at carrying the injected boron from the lower plenum upward into the core.*

*At very low downcomer water levels near or below top of active fuel, there is little water available in the region above the jet pump throat for mixing with boron injected via RCIC. In this situation, there is concern that boron may accumulate in the stagnant region of the downcomer which is below the jet pump throat.*

5. *Water level can be determined from wide range level instrumentation.*
6. *Avoids MSIV isolation setpoint of -129".*

*RPV level below TAF is not, by itself, a determination of whether or not level can be maintained > -161". The determination that level cannot be maintained > -161" must be made based upon:*

- *availability of high pressure injection systems, and,*
- *present level trend*

*This decision must not be made prematurely since depressurization of a critical core results in destabilizing affects and has a potential to cause core damage.*

*Controlling reactor pressure, power and level with condensate and SRVs at 500 psig is difficult because all 3 parameters affect each other. Therefore, rapid depressurization is recommended when high pressure injection cannot be obtained.*

*The initial influence of reactor depressurization is stabilizing since the additional flashing of liquid phase required for depressurization introduces excess voids in the reactor core which can essentially terminate the fission process if the rate of depressurization is high enough. Once the depressurization is complete, however, the result is the immediate initiation of power excursions. Core damage is expected to occur from high clad stresses induced by: temperature excursions above the rewet temperature, PCI, cyclic fatigue, burnout or having the fuel enthalpy exceed the cladding failure threshold.*

#### **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.

★ **Inserts control rods IAW EO-100-113 Sht. 2.**

**Safety Significance**

Control rod insertion initiates power reduction immediately

**Consequences for Failure to Perform Task**

Failure to insert control rods 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**

Insert Control Rods by one or more of the following methods:

Maximize CRD to drift control rods.

Drive control rods after bypassing RWM.

Reset and Scram again by performing ES-158-002 Bypass RPS logic trips.

De-energizing RPS solenoids by performing ES-158-001.

Local venting of Scram Air Header.

**Performance Feedback**

Successful insertion of control rods will be indicated by:

Rod position full in indication for manual insertion of control rods, venting scram air header or de-energizing RPS solenoids.

Rod position full in after resetting scram, draining scram discharge volume and re-scram.

★ **Rapidly Depressurizes RPV, Once Reactor Is Shutdown, Due to Exceeding HCTL Curve**

**Safety Significance**

If RPV pressure, suppression pool temperature and suppression pool level cannot be maintained below the HCTL, the primary containment vent valve opening pressure may be exceeded following RPV depressurization.

**Consequences for Failure to Perform Task**

If the RPV is not depressurized, and HCTL is exceeded, the primary containment vent valves may not be able to be opened due to increased Containment pressure as a result of incomplete condensing of the steam from the RPV depressurization event.

**SSES EOP Basis for:**

SP/T-5          **WHEN**      INITIAL ATWS PWR  $\leq$  5%  
   OR  
   RX SHUTDOWN WITH CONTROL RODS

CONTINUE

*Intent of this step is to prohibit execution of subsequent steps if ATWS condition exists.*

*Fuel damaging, large amplitude power excursions may occur at low RPV pressures if reactor power is  $>$  5%. Also, development of the HCTL assumes that the reactor is shutdown. Therefore, depressurization due to HCTL or PSL is restricted to either: 1) ATWS when initial ATWS power was  $\leq$  5%; or 2) reactor is shutdown with control rods.*

*The 5% determination is based on "initial ATWS power," or reactor power before any other steps to reduce reactor power are performed. Refer to LQ-4 for more information on "initial ATWS power level."*

*This step does not prohibit rapid depressurization when it is required by another step. For example, when two or more area radiation levels exceed Max Safe with a primary system discharging, rapid depressurization is required for that reason and is not prohibited by this step.*

SP/T-8      **WHEN**      RPV PRESS  
   SUPP POOL TEMP AND  
   SUPP POOL LVL  
   CANNOT BE MAINTAINED BELOW  
   FIG 2 HCTL

RAPID DEPRESS IS REQ'D

*If initial ATWS power was > 5%, performance of this step would have been restricted. If, following an ATWS of > 5% power, control rods subsequently insert shutting down the reactor, the HCTL must be re-evaluated. If suppression pool temperature and level are above the HCTL, rapid depressurization is required; it may not be deferred to see if parameters will drop below the HCTL*

*The HCTL (Heat Capacity Temperature Limit) plots RPV pressure against two suppression pool parameters: temperature and level. This presentation eliminates the need for two curves. (The alternative is to plot suppression pool temperature against RPV pressure on one curve, and suppression pool temperature against suppression pool level on another.) Seven RPV pressure limits are presented, each applicable to a range of RPV pressures. To comply with the HCTL: 1) Observe the current RPV pressure; 2) Select the applicable RPV pressure limit; 3) Ensure the suppression pool temperature and level are maintained below the RPV pressure limit; 4) As RPV pressure changes, select the next applicable RPV pressure limit.*

*If RPV pressure, suppression pool temperature and suppression pool level cannot be maintained below the HCTL, the primary containment vent valve opening pressure may be exceeded following RPV depressurization.*

**Indications/Cues for Event Requiring Critical Task**

Reactor is shutdown and combination of RPV Pressure, Suppression Pool Temperature, and Suppression Pool Level result in exceeding the Heat Capacity Temperature Limit Curve.

**Performance Criteria**

Determine Heat Capacity Temperature Limit Curve, Figure 2 HCTL, is exceeded.

Initiate Rapid Depressurization of the RPV by opening all ADS Valves.

## SCENARIO REFERENCES

1. OP-115-001 TBCCW
2. ON- 117-001 Loss of Instrument Bus
3. TS 3.3.3.1 Post Accident Monitoring (PAM) Instrumentation
4. OI-AD-029 Emergency Load Control
5. GO-100-012 Power Maneuvers
6. AR-029-001 A01 CS Emer OA Sup Fan Failed
7. AR-102-001 (C03) Recirc MG 'A' Fluid Drive Oil Hi-Lo Temp
8. ON-147-001 Loss Fw Heating Extraction Steam
9. ON-164-002 Loss Recirc Flow
10. ON-155-001 Control Rod Problems
11. EO-100-102 RPV Control
12. EO-100-103 Primary Containment Control
13. EO-100-112 Rapid Depressurization
14. EO-100-113 Level/Power Control
15. OP-149-004 RHR Containment Cooling
16. OP-145-001 RFP AND RFP Lube Oil System
17. OP-183-001 Automatic Depressurization System And Safety Relief Valves
18. OP-184-001, ATT A EO Hard Card-Bypass MSIV And CIG Interlocks
19. OP-150-001, ATT A EO Hard Card-Overriding RCIC Injection
20. OP-152-001, ATT C EO Hard Card-Overriding HPCI Injection
21. OP-145-001, ATT C EO Hard Card-ATWS Power\Level Reduction Strategy
22. OP-149-004, ATT A EO Hard Card-Initiate Containment Cooling



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**SCENARIO SPECIAL INSTRUCTIONS**

1. Initialize the simulator to **IC-20**: Unit 1 at 100 percent power EOL, Unit 2 in MODE 1.
2. Load SCN file **LOC23 NRC Scenario 2**; verify the following pre-inserts and Key assignments:

| MF  | RF  | OR  | SCN | ET  | Conditions |
|-----|-----|-----|-----|-----|------------|
| 4:4 | 0:0 | 4:4 | 0   | 0:0 | 21         |

|   |   |
|---|---|
| <b>IMF mfrP158003</b>                             | RPS FAILS TO AUTO ACTUATE                   |
| <b>IOR diHSC72A1S03AA f:NORM</b>                  | RPS MANUAL SCRAM FAILS                      |
| <b>IOR diHSC72A1S03BB f:DISARM</b>                | “ “   |
| <b>IOR diHSC72A1S03CB f:DISARM</b>                | “ “   |
| <b>IOR diHSC72A1S03DA f:NORM</b>                  | “ “   |
| <b>IMF cmfRL03_63X114725D1</b>                    | ARI FAILS TO ACTUATE                        |
| <b>IMF cmfRL03_63X214725D1</b>                    | “ “   |
| <b>IMF cmfMV06_HV144F004</b>                      | RWCU Valve F004 Fails to Auto Isolate       |
| <b>{Key[1]} IMF cmfEB01_1Y115</b>                 | 1Y115 Overcurrent Bus Fault                 |
| <b>{Key[2]} IRF rfDB157001 f:ALT</b>              | HSE111505 to Alternate                      |
| <b>{Key[3]} IRF rfDB117165 f:OPEN</b>             | 1Y216-33 (Alt Feed to HSE111501) Trips      |
| <b>{Key[4]} IMF cmfPM01_0V101A</b>                | CREOASS Loss Control Pwr                    |
| <b>{Key[5]} IMF cmfCN02_TIC11016A f:0</b>         | RRP MG Hyd Fluid Temp Controller            |
| <b>{Key[6]} IMF cmfMV05_HV10241B</b>              | Loss FW Heat to 4B                          |
| <b>{Key[7]} IMF mfrD1550041839 f:100</b>          | Rod Drift                                   |
| <b>{Key[7]} IMF mfrD1550041835 f:100</b>          | Rod Drift                                   |
| <b>{Key[7]} IMF mfrD1550041807 f:100</b>          | Rod Drift                                   |
| <b>{Key[7]} IMF mfrD1550041031 f:100</b>          | Rod Drift                                   |
| <b>{Key[7]} IMF cmfMV07_PV146F003 d:60 f:4.72</b> | Prevents Opening CRD PCV (can't drift rods) |
| <b>{Key[8]} IMF cmfPM02_1P208A</b>                | SBLC 'A' Thermal Overload                   |
| <b>{Key[8]} IRF rfSL153006 f:1.5</b>              | SBLC 'B' Reduced Flow                       |
| <b>{Key[9]} IMF cmfPM02_1P208B</b>                | SBLC 'B' Thermal Overload                   |
| <b>{Key[9]} IRF rfSL153005 f:1.5</b>              | SBLC 'A' Reduced Flow                       |
| <b>{Key[10]} IMF mfTC193001</b>                   | Turbine Trip                                |
| <b>{Key[10]} IMF mfTC193025</b>                   | TBVs Fail Closed                            |
| <b>{Key[11]} IRF rfrD155025 r:1 f:0</b>           | Vents Scram Air Header                      |
| <b>{Key[11]} IRF rfrD155016 r:5 f:100</b>         | “ “   |
| <b>{Key[12]} IRF rfrD155025 f:100</b>             | Restores Scram Air Header                   |
| <b>{Key[12]} IRF rfrD155016 f:0</b>               | “ “   |

3. Prepare a turnover sheet indicating the following:
  - a. U1 at 100%, U2 at full power
  - b. Scheduled activity for the shift is to swap TBCCW pumps
  - c. Maintain full power operation
4. Make a copy of shift assignments.
5. Place the Simulator in **RUN**.

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**SCENARIO EVENT DESCRIPTION FORM**

**Initial Conditions:** Initialize the simulator to **IC-20** Ensure the SCN File is executed per the Special Instructions Sheet. Assign Shift positions. Direct the Crew to begin a five-minute panel walk down.

| EVENT | TIME   | DESCRIPTION          |                            |
|-------|--------|----------------------|----------------------------|
| 1     | 2 min  | Swap TBCCW           | (Normal: SRO, BOP)         |
| 2     | 10 min | Loss of 1Y115        | (Component: SRO, BOP + TS) |
| 3     | 25 min | Min Gen Emerg        | (Reactivity: SRO, ATC)     |
| 4     | 35 min | CREOASS inop         | (Component: BOP)           |
| 5     | 45 min | RRP MG hi temp       | (Component: SRO, BOP)      |
| 6     | 50 min | Loss FW Heating      | (Component: SRO, ATC + TS) |
| 7     | 65 min | Four Rods Drift      | (Component: ATC)           |
| 8     | 65 min | ATWS                 | (Major: ALL)               |
| 9     | 70 min | SBLC degradation     | (Component: BOP)           |
| 10    | 70 min | RWCU fail to isolate | (Component: BOP)           |
| 11    | 70 min | EHC malfunction      | (Component: SRO, BOP)      |
| 12    | 85 min | RD due to HCTL       | (Major: SRO, BOP)          |
|       | 90 min | Termination          |                            |

SCENARIO EVENT FORM

Event No: 1  
 Brief Description: Swap TBCCW

| POSITION | TIME | STUDENT ACTIVITIES  |
|----------|------|---|
| SRO      |      | Direct TBCCW Pump swap iaw OP-115-001.  |
| BOP      |      | Swap TBCCW Pumps: <ul style="list-style-type: none"> <li>▪ Obtain OP-115-001, review procedure, and begin at Section 2.2</li> <li>▪ Start TBCCW PP 1P103B by depressing Run pushbutton</li> <li>▪ Directs TB1 NPO to slowly close TBCCW PP 'A' discharge valve 114011</li> <li>▪ Have NPO check pump discharge pressure between 86 and 100 psig</li> <li>▪ Stop TBCCW PP 1P103A by depressing Stop pushbutton</li> <li>▪ Check HX outlet temp 92-98F</li> <li>▪ Check system pressure stabilizes at approx 64 psig</li> <li>▪ Directs TB1 NPO to open TBCCW PP 'A' discharge valve 114011</li> <li>▪ Refer to Attachment A as necessary to verify proper flowrates / temps</li> </ul> |
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★ Denotes Critical Task

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| <b>NOTES:</b> |  |
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| <b>INSTRUCTOR ACTIVITIES, ROLE PLAY,<br/>AND INSTRUCTOR'S PERSONAL NOTES</b> |
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**Event No:** 1  
**Brief Description:** Swap TBCCW pumps

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**INSTRUCTOR ACTIVITY:**

Select P & ID TW1, then close and open "A" TBCCW Pump Discharge Valve 114011, as directed.

**ROLE PLAY:**

1. As NPO at TBCCW, when requested, report "1B TBCCW Pump is ready for a start."
2. When directed to close, then open 114011, report doing so after taking actions as directed above.
3. When directed to report "B" TBCCW Pump Discharge pressure, report "B" TBCCW pump discharge pressure is 98 psig, steady."

**SCENARIO EVENT FORM**

Event No: 2  
 Brief Description: Loss of 1Y115

| POSITION | TIME | STUDENT ACTIVITIES  |
|----------|------|---|
| ATC/BOP  |      | Report Loss of Div 1 Post Accident Monitoring Instrumentation on 1C651 and 1C601 panels. (Note 1)   |
| SRO      |      | Enters ON-117-001, Loss Instrument Bus.<br>Directs ATC to perform ON-117-001 for the loss of 1Y115.<br>Contact Work Week Manager concerning loss of Instrument Bus 1Y115  |
| BOP      |      | Perform ON-117-001, section 3.9: <ul style="list-style-type: none"> <li>• Refers to Attachment M for functions/instrumentation lost and recommended actions. (Note 1)</li> <li>• Dispatch operator to check 1D614030 closed</li> <li>• Dispatch Operator to 1D115 for status of Master and Slave Unit Indicating lights</li> <li>• After report that 1D115 Indicating Lights are extinguished:               <ol style="list-style-type: none"> <li>1. Directs NPO to place HSE-111505, on 1C661-A1, in Alternate</li> <li>2. At 1C690A, place HSE-111502 in Alternate</li> <li>3. At 1C601-18C, places HSE-111501 in Alternate</li> </ol> </li> <li>• Reports powered restored to instrumentation, then reports loss of 1C651 / 1C601 PAM instrumentation.</li> <li>• Per Attachment M determines Div 2 PAM instruments remain operable / usable. (Note 2)</li> <li>• Directs NPO to check status of 1Y216-33</li> </ul> |
| SRO      |      | Brief Crew on status of Instrumentation impacted.<br>Refers to Tech Spec 3.3.3.1 (Post Accident Monitoring Instrumentation) and enters Condition A for each of the functions (1 though 10). Determines Required Action A.1 is to restore all instruments to operable within 30 days.  |

★ Denotes Critical Task

| NOTES:   |
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| <p>#1: PAM instruments initially lost (those that return on transfer to alternate are in bold):</p> <ul style="list-style-type: none"> <li>▪ On 1C601 (BOP): UR-15776A (Sup Pool level), UR-142001A (RPV Wide Range &amp; Fuel Zone level and Rx Pressure), LI-14201A (RPV Wide and Extended level), PI-14204A (RPV pressure), LI-15775A (Sup Pool Level), TI-15127A (RHR Hx Temps), FI-15120A (Containment Spray), TIAH-15751 (Div 1 SPOTMOS), UR-15776A (Containment Rads), UR-15701A (Containment Temp and Pressure)</li> <li>▪ On 1C651 (ATC): LI-14201A1 (RPV Wide and Extended level), PI-14202A1 (RPV pressure)</li> <li>▪ On 0C653: <b>PI-01107A</b> (ESW Pp A/C Discharge pressure), <b>TI-01106A</b> (ESW Pp A/C Discharge temp), and <b>FI-01109A</b> (ESW Pp A/C Loop Flow)</li> <li>▪ On 1C690A: <b>TX-15751</b> (Div 1 SPOTMOS)</li> </ul> <p>#2: May reference ON-117-001 Attachment A to determine Normal and Alternate power supplies to instrumentation.</p> |

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| <b>INSTRUCTOR ACTIVITIES, ROLE PLAY,<br/>AND INSTRUCTOR'S PERSONAL NOTES</b> |
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**Event No:** 2  
**Brief Description:** Loss of 1Y115

**INSTRUCTOR ACTIVITY:**

Once the TBCCW Pump swap is complete, and on Lead Evaluator's cue, insert loss of 1Y115 by activating soft **Key #1**:

**{Key [1]} IMF cmfEB01\_1Y115**                      1Y115 Overcurrent Bus Fault

As NPO when directed to place HSE-111505 at 1C661-A1 in Alternate, wait one minute, then activate soft **Key #2**:

**{Key[2]} IRF rFDB157001 f:ALT**                      HSE111505 to Alternate

Once Key 2 is activated, contact the control room via page and report "HSE-111505 is in the Alternate position."

Approximately one minute after ATC transfers HSE-111501 (power restored to 1C601 PAM instruments), activate soft **Key #3**:

**{Key[3]} IRF rFDB117165 f:OPEN**                      1Y216-33 (Alt Feed to HSE111501) Trips

**ROLE PLAY:**

1. As NPO dispatched to 1D115 for status of Master and Slave Unit Indicating lights, wait two minutes and report, "Indicating lights at 1D115 are Extinguished."
2. As the NPO Dispatched to check 1D614030, wait two minutes, and report, "1D614-30 feed to 1D115 is closed."
3. As the Work Week Manager, reply "I will contact FIN to investigate."
4. As the NPO dispatched to check status of 1Y216-033, wait two minutes and report "1Y216-033 is tripped." If directed to reset it, report it will not reset.
5. As necessary.



**SCENARIO EVENT FORM**

Event No: 3,4

Brief Description: Min Generation Emergency, Loss of CREOASS Fan 'A' Control Power

| POSITION | TIME | STUDENT ACTIVITIES  |
|----------|------|---|
| ATC      |      | Report Min Gen Emergency request from GCC to lower output by 50 MWe.  |
| SRO      |      | Brief Crew on Power Reduction plan<br>Refer to OI-AD-029 Att. D, and CRC Book<br>Direct ATC to reduce power with Recirc at a rate of 1% / minute until MWe is lowered by 50. (Note 1)<br>Refer to GO-100-012<br>Provide Reactivity oversight<br>Contact the Work Week Manager to notify the Duty Manager and Reactor Engineering.   |
| ATC      |      | Reduce power as directed by the SRO: <ul style="list-style-type: none"> <li>▪ Using the RRP Dual Screen HMI, lower "A" and "B" Recirc speeds by depressing the double chevron DEC buttons, as necessary, to reduce power at approximately 1% / minute.</li> <li>▪ Observe Controller Output, Gen Demand, and Scoop Tube Position lowers</li> <li>▪ Monitor Plant response \ MWe.</li> <li>▪ Plot power reduction on Power to Flow Map.</li> </ul> |
| BOP      |      | Provide peer check of RRP speed reduction.<br>Maintain Load Set at approximately 100 MWe above actual generator output by depressing Load Selector Decrease pushbutton and watching Load Set meter.<br>Balance the Main Generator Manual Voltage Regulator with the auto regulator by adjusting Man Volt Reg Adjust HC-10002, as necessary.   |
| BOP      |      | Report HVAC Div 1 Control Panel 0C681 System Trouble alarm, and: <ul style="list-style-type: none"> <li>▪ Report CREOASS Fan 'A' alarm</li> <li>▪ Refer to AR-029-001 (A01), CS EMER OA SUP FAN FAILED, amber light out</li> <li>▪ Dispatch Operator to Investigate 0B136-063</li> <li>▪ Places 0V101B fan hand switch in Auto Lead and informs SRO. (Note 3)</li> </ul>  |
| SRO      |      | Contact Work Week Manager to inform him of 'A' CREOASS status and to run EOOS. (Note 2)   |

★ Denotes Critical Task

| NOTES:   |
|--|
| #1: Crew may use insert rods iaw CRC book until below 98% rod line, then reduce Recirc flow. |
| #2: Scenario will progress before SRO addresses TS 3.7.3 Condition A, Required Action A.1    |
| #3: Crew may place "A" CREOASS fan handswitch in Stop.                                       |

**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

**Event No:** 3,4

**Brief Description:** Min Generation Emergency, Loss of CREOASS Fan 'A' Control Power

**INSTRUCTOR ACTIVITY:**

When actions are complete for loss of 1Y115, and on Lead Instructors cue, contact the U-1 Control Room via the GCC direct line and state, "This is John Smith. A Minimum Generation Emergency is required and we need Unit 1 Susquehanna to reduce output by 50 MWe as quickly as possible."

When MWe has been reduced by approximately 15 MWe (~1295 MWe), and on Lead Evaluator's cue, insert CREOASS control power loss by activating **Key 4**:

{Key[4]} IMF cmfPM01\_0V101A

CREOASS Loss Control Pwr

**ROLE PLAY:**

1. As Operator dispatched to investigate CREOASS Fan, wait three minutes and report: "Breaker 0B136-063 is closed and looks normal."
2. As Work Week Manager-when contacted concerning CREOASS state, "I will contact FIN to investigate."
3. As FIN wait five minutes and report: "It appears that the 0B136-063 Control Power Fuse is blown".

**SCENARIO EVENT FORM**

**Event No:** 5  
**Brief Description:** RRP MG HI Temp

| POSITION | TIME | STUDENT ACTIVITIES  |
|----------|------|---|
| ATC      |      | Report RRP MG set high temp alarm and refer to: <ul style="list-style-type: none"> <li>▪ AR-102-001 (C05), Recirc MG 'A/B' Brg or Fluid Drive Oil Hi Temp</li> <li>▪ AR-102-001 (C03, Recirc MG 'A' Fluid Drive Oil Hi-Lo Temp</li> </ul>   |
| BOP      |      | Check MG Set A Hyd Fluid Clr Temp TIC11016A and report that demand is a 0 and temperature is rising based on controller indication and "A" MG Set Hydraulic Fluid Temperature on TI-14020A.<br>Place TIC11016A in Manual and depress the Open button to restore demand to approximately the original value. Adjust controller as necessary to restore temperature to normal of approximately 125°F. |
| SRO      |      | Direct BOP to take manual control of "A" RR MG Set Hydraulic Oil temperature controller.<br>Inform Work Week Manager of the controller malfunction  |
| ATC      |      | Monitor "A" Recirc Pump operation using Recirc HMI screen / PICSY display.  |
| BOP      |      | Take manual control of TIC11016A by placing it in Manual and depressing the Open button to restore demand to approximate pre-failure value. Adjust controller as necessary to restore temperature to normal of approximately 125°F.<br>(Note 1)   |
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| <b>NOTES:</b>   |  |
| #1: If manual control is not taken and temperature reduced, MG Set Drive Motor breaker will trip at 210° F. |  |
|   |  |

**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

**Event No:** 5  
**Brief Description:** RRP MG Hi Temp

**INSTRUCTOR ACTIVITY:**

Once the CREOASS Fan failure is addressed, and on Lead Instructor cue, insert Recirc MG 'A' Fluid Drive Oil automatic Controller failure by activating soft **Key #5**:

**{Key[5]} IMF cmfCN02\_TIC11016A f:0**                      RRP MG Hyd Fluid Temp Controller

**ROLE PLAY:**

If contacted as TB1 NPO to investigate the 'A' MG Set Lube Oil temperature controller, report the valve is closed (if PCO has not taken manual control yet) (Monitor temperatures on P&ID SW3)

**SCENARIO EVENT FORM**

Event No: 6  
 Brief Description: Loss FW Heating

| POSITION | TIME | STUDENT ACTIVITIES  |
|----------|------|---|
| BOP      |      | Reports FW Loop B Panel 1C102 Trouble Alarm AR120-001 (H07) then (D07) Reports 4B Heater, HV-10241B, is closed and dispatches NPO to 1C102.   |
| ATC      |      | Reports RPV power, pressure, and level.   |
| SRO      |      | Enter ON-147-001 (Loss FW Heating Extraction Steam) <ul style="list-style-type: none"> <li>▪ Direct immediate Power reduction iaw RE Instructions in CRC Book to <math>\leq 71\%</math> (NOTE 1)</li> <li>▪ Enter ON-156-001 (Unanticipated Reactivity Change) and ON-164-002 (Loss Recirc Flow)</li> </ul>   |
| ATC      |      | Reduces power to $\leq 71\%$ power, based on SRO's direction, as follows: <ul style="list-style-type: none"> <li>▪ If directed to reduce Recirc first, per the CRC book, then performs one of the following using the Recirc HMI screen:               <ol style="list-style-type: none"> <li>1. Initiates a Manual Rx Recirc Limiter #2 Runback by touching Manual Flow Reduction Initiation, then Limiter #2 48%, and then Initiate RRP Flow Reduction.</li> <li style="text-align: center;"><b>or</b></li> <li>2. Touches the double chevron DEC buttons on the RRP A &amp; B Speed controllers as required to establish the final Core Flow value stated in CRC Book</li> </ol> </li> <li>▪ If directed to insert rods first to get <math>&lt; 98\%</math> rod line, then selects control rods beginning with the first one in the CRC book (30-31), depresses the Insert Rod pushbutton, monitors rod position, and releases the button after 00 is observed. Documents move in CRC, then proceeds with in sequence rods.</li> <li>▪ Insert additional Rods iaw CRC to reduce \ maintain <math>&lt; 71\%</math> power.</li> <li>▪ Plots position on Power to Flow Map using Core Flow and APRM power.</li> </ul> |
| BOP      |      | Provides peer check of Recirc / Control Rod manipulations.<br>Per ON-147-001, once $\leq 71\%$ power, closes HV-10242B Extraction Steam to 5B FW Heater (coordinates with ATC due to power increase)  |
| ATC      |      | Maintain Rx power $\leq 71\%$ by inserting Control Rods iaw the CRC Book.   |
| SRO      |      | Refer to MCPR LCO 3.2.2. Determine extraction steam must be restored within two hours or the string must be isolated.<br>Contact Reactor Engineering and WWM  |

★ Denotes Critical Task

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| <b>NOTES:</b>  |  |
| #1: SRO may direct ATC to insert control rods first per ON-147-001 guidance, then reduce power using Recirc. |  |

**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 6  
Brief Description: Loss FW Heating

**INSTRUCTOR ACTIVITY:**

When the RRP MG temp is returned to normal, and on Lead Instructor cue, insert Loss of FW Heating by activating soft **Key #6**:

{Key[6]} IMF cmfMV05\_HV10241B                      Loss FW Heat to 4B

**ROLE PLAY:**

1. When contacted as the TB NPO to investigate 1C102 panel alarm, wait three minutes, then select the 1C102 PNOV display. Report alarms currently in. **Do not** report the closed indication for HV-10241B unless the crew has already identified it has closed.
2. When contacted as the WWM concerning isolation of U1 4B Extraction Steam, reply "I will contact FIN to investigate.
3. As FIN, wait five minutes after WWM was contacted and call the U-1 Control Room via the PA. State, "This is Bill Brown, FIN. I am not sure why HV-10241B closed. I will inform you as soon as I find anything."

Event No: 7,8,9,10

Brief Description: Rods Drift, ATWS, SBLC degradation, RWCU fails to auto isolate

| POSITION | TIME | STUDENT ACTIVITIES  |
|----------|------|---|
| ATC      |      | Reports Rod Drift alarm AR-104-001 (G05)<br>Depresses Display Rods Drifting pushbutton<br>Reports four control rods are drifting<br>Perform immediate operator action per OP-AD-055 or ON-155-001 by placing Mode Switch to Shutdown.<br>Reports failure to Scram, and takes immediate operator actions: <ul style="list-style-type: none"> <li>▪ Arms and Depresses the four Manual Scram Pushbuttons</li> <li>▪ Report failure to Scram</li> <li>▪ Inserts SRMs and IRMs by selecting each detector, depressing Power On and the Drive In pushbuttons.</li> </ul>   |
| BOP      |      | Initiates ARI by arming and depressing Manual pushbuttons HS-147103A1 and B1 and observes vent and block valve positions.<br>Reports failure of ARI to insert Rods  |
| SRO      |      | Enters EO-100-102 (RPV CONTROL), and exit to EO-100-113 (LEVEL/POWER CONTROL), and: <ul style="list-style-type: none"> <li>▪ Ensures Mode Switch in S/D and ARI initiated.</li> <li>▪ Requests and record Initial ATWS power.</li> <li>▪ Direct SBLC injected and ADS inhibited (BOP)</li> </ul>  |
| BOP      |      | Injects SLC: <ul style="list-style-type: none"> <li>▪ Turns SLC Man Initiation key lock switch to Start A (Start B)</li> </ul> Recognize the A(B) SBLC pump started, then tripped<br>Start B(A) SBLC pump <ul style="list-style-type: none"> <li>▪ Turns SLC Man Initiation key lock switch to Start B (Start A)</li> <li>▪ Verifies SBLC Pump Dsch Press PI-C41-1R600 is greater than Rx pressure.</li> <li>▪ Reports SBLC flow is significantly less than 42 gpm (~ 5) and monitors SLC Tank level lowering on LI/FI-14806.</li> <li>▪ Recognizes RWCU HV-144-F004 failed to close and closes it, or has ATC close it.</li> <li>▪ Directs NPO to investigate SBLC.</li> </ul> |
| SRO      |      | Contact Work Week Manager to investigate SBLC.<br>Directs implementation of ES-150-002, Inject Boron With RCIC.   |
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★ Denotes Critical Task

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| <b>NOTES:</b> |  |
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**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 7,8,9,10

Brief Description: Rods Drift, ATWS, SBLC degradation, RWCU fails to auto isolate

**INSTRUCTOR ACTIVITY:**

When FW Heating issue has been stabilized, and on Lead Instructor cue, drift four Control Rods and disable the Drive Water Pressure Control Valve by activating soft **Key #7**:

|  |   |
|--|---|
| {Key[7]} IMF mFRD1550041839 f:100          | Rod Drift                                   |
| {Key[7]} IMF mFRD1550041835 f:100          | Rod Drift                                   |
| {Key[7]} IMF mFRD1550041807 f:100          | Rod Drift                                   |
| {Key[7]} IMF mFRD1550041031 f:100          | Rod Drift                                   |
| {Key[7]} IMF cmfMV07_PV146F003 d:60 f:4.72 | Prevents Opening CRD PCV (can't drift rods) |

When the SBLC pump is started, insert motor overload / reduce flow by activating appropriate key as noted below:

If '**A**' SLC Pump is injecting, activate soft **Key #8**:

|  |
|--|
| {Key[8]} IMF cmfPM02_1P208A ; SBLC 'A' Motor Overload    |
| {Key[8]} IRF rfSL153006 f:1.5      SBLC 'B' Reduced Flow |

If '**B**' SLC Pump is injecting, activate soft **Key #9**:

|  |
|--|
| {Key[9]} IMF cmfPM02_1P208B ; SBLC 'B' Motor Overload    |
| {Key[9]} IRF rfSL153005 f:1.5      SBLC 'A' Reduced Flow |

**ROLE PLAY:**

1. If contacted as the RB NPO to investigate the "A"(B) SLC Pump trip and reduced flow, wait two minutes and report "The 'A' ('B') SLC pump is extremely hot and it sounds like the relief valve on the discharge of 'B' ('A') pump is lifting."
2. When contacted as Work Week Manager concerning SBLC, report: "I am contacting FIN to investigate."
3. When directed to implement ES-150-002, Inject Boron With RCIC, acknowledge request and take no further action.
4. As necessary



Event No: 8,11  
 Brief Description: ATWS, EHC Malfunction,

| POSITION  | TIME | STUDENT ACTIVITIES   |
|-----------|------|--|
| BOP ★     |      | <b>Inhibit ADS:</b> <ul style="list-style-type: none"> <li>▪ Depress HS-B21-1S13A and B (not required)</li> <li>▪ <b>Places ADS A and B Logic Control keylock switches to Inhibit</b></li> <li>▪ Observe AR-110-001 (A01) and (A03) extinguished (not required)</li> <li>▪ Depress HS-B21-1S13A and B (not required)</li> </ul>  |
| SRO       |      | Directs ATC to ensure Recirc run back to minimum. Once action completed, directs tripping both Recirc pumps, one at a time.<br>Directs BOP to maximize CRD in an attempt to drift rods.  |
| BOP       |      | <b>Maximize CRD:</b> <ul style="list-style-type: none"> <li>▪ Places CRD Pump 1P132B hand switch to Run</li> <li>▪ Places CRD Flow Controller FC-C12-1R600 in Manual and depresses Open button until demand is at 100.</li> <li>▪ Attempts to open Drive Water Pressure Control Valve PV-146-F003 by turning its hand switch to open. Reports that the valve does not appear to be opening because drive water DP is not changing, and dispatches NPO to investigate.</li> </ul> |
| ATC       |      | Runs back Recirc to Minimum, then trips both pumps: <ul style="list-style-type: none"> <li>▪ On Recirc HMI screen: touches Manual flow Reduction Initiation, touches RRP speed to Minimum, then touches Initiate RRP Flow Reduction</li> <li>▪ Once RRP speeds at ~ 20%, trips both RRP's one at a time by depressing MG Set A(B) Drv Mtr Bkr HS-14001A(B) and ensuring RPV level swell has peaked before tripping the other pump.</li> </ul>                                    |
| ATC / BOP |      | Reports Main Turbine Trip and Bypass Valves failed to open.  |
| SRO       |      | Directs BOP to maintain RPV pressure between 800 and 1,087 psig using SRVs in alphabetical order.  |
| BOP       |      | Manually open SRVs to maintain RPV pressure between 800 and 1,087 psig.  |
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★ Denotes Critical Task

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| <b>NOTES:</b>  |  |
| E-Plan Classification: Site Area Emergency (MS3) due to ATWS $\geq$ 5% and failure of RPS and ARI. |  |

**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 8,11  
Brief Description: ATWS, EHC Malfunction

**INSTRUCTOR ACTIVITY:**

When both RRP's are tripped, insert Turbine Trip and TBVs to fail closed by activating soft **Key #10**:

{Key[10]} IMF mfTC193001  
{Key[10]} IMF mfTC193025

Turbine Trip  
TBVs Fail Closed

**ROLE PLAY:**

As RB NPO directed to investigate CRD Drive Water Pressure Control Valve, PV-146-F003, wait four minutes and report via the radio, "I am unable to turn the handwheel on the U-1 CRD Drive Water PCV and am going to get help."

As necessary

Event No: 8,11  
 Brief Description: ATWS, EHC Malfunction (continued)

| POSITION | TIME | STUDENT ACTIVITIES   |
|----------|------|--|
| SRO ★    |      | <b>Directs Throttle injection and Prevent injection until Level between -60" and -110":</b> <ul style="list-style-type: none"> <li>▪ Directs BOP to override RCIC and HPCI</li> <li>▪ Directs ATC to lower RPV level to between -60" and -110" using Feedwater.</li> </ul> Directs BOP to bypass MSIV and CIG interlocks.  |
| BOP ★    |      | <b>Overrides RCIC and HPCI to prevent injection:</b> <ul style="list-style-type: none"> <li>▪ For RCIC, closes HV-15012</li> <li>▪ For HPCI, places FC-E41-1R600 in Manual and reduces demand to 0%</li> </ul>   |
| ATC ★    |      | <b>Throttle and Prevent Injection until Level is between -60" and -110"</b><br><b>Lowers RPV level to Target Band iaw OP-145-001 Att C Hard Card as follows:</b> <ul style="list-style-type: none"> <li>▪ Places LV-10641 controller LIC-10641 to manual and reduces controller demand to 0%. (If OP-145-001 Att C was used to reduce Recirc Speeds, this is already done)</li> <li>▪ Places LIC-C32-1R600 (Master) in Manual</li> <li>▪ Using LIC-C32-1R600, lowers Feedwater flow to &lt; 1 Mlbm\hr less than Steam Flow.</li> <li>▪ For the RFP that will control level (most likely A), touches the RFPT Man Viv Ctl button, touches the Pump Icon, touches Man on SIC-C32-1R601A(B)(C).</li> <li>▪ For remaining RFPs (most likely B &amp; C), touches RFP button, and touches RFPT Idle Mode.</li> <li>▪ Depresses the DEC button on SIC-C32-1R601A(B)(C) to reduce feed flow and monitors approach to directed level band.</li> </ul> |
| BOP      |      | <b>Bypass MSIV and CIG interlocks iaw OP-184-001 Att A Hard Card, as follows:</b> <ul style="list-style-type: none"> <li>▪ At 1C645 places HS-B21-S38A and C, HS-12694 &amp; 95 to Bypass.</li> <li>▪ At 1C644 places HS-12696 to Bypass.</li> </ul> Informs SRO MSIV and CIG interlocks are bypassed.   |
| SRO      |      | Enters EO-100-103 when Suppression Pool temperature is > 90° F.<br>Directs ATC to maximize Suppression Pool Cooling.<br>Monitors Suppression Pool Temp and HCTL.   |

★ Denotes Critical Task

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| <b>NOTES:</b> |  |
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**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 8,11

Brief Description: ATWS, EHC Malfunction (continued)

**INSTRUCTOR ACTIVITY:**

**ROLE PLAY:**

As necessary

Event No: 8,11  
 Brief Description: ATWS, EHC Malfunction (continued)

| POSITION | TIME | STUDENT ACTIVITIES   |
|----------|------|--|
| BOP      |      | Maximizes Suppression Pool cooling iaw OP-149-004, Att A., as follows: <ul style="list-style-type: none"> <li>▪ Open HV-151-F028A(B)</li> <li>▪ Close HV-151-F017A(B)</li> <li>▪ Start RHR Pump A or C (B or D)</li> <li>▪ Throttle open HV-151-F024A(B) to establish total loop flow of 9,500 to 10,000 gpm on FI-E11-1R603A(B).</li> <li>▪ Places RHRSW in service iaw OP-149-004 Att A, section 4.0.</li> </ul>   |
| SRO ★    |      | <b>Direct Control Rod insertion per Sh 2:</b> <ul style="list-style-type: none"> <li>▪ <b>Directs ATC to insert control rods in accordance with directions on EO-113 Sheet 2.</b></li> <li>▪ <b>Directs BOP to have Scram Air Header Vented</b></li> <li>▪ <b>Contacts FUS to perform ES-158-001.</b></li> </ul>   |
| ATC ★    |      | <b>Insert Control Rods per EO-000-113 Sh2 (Note 1)</b> <ul style="list-style-type: none"> <li>▪ <b>Bypasses RWM by placing Normal \ bypass keylock to Bypass</b></li> <li>▪ <b>Establish approx 63 gpm Cooling Water flow and approx 350 psid Drive Water pressure, as necessary</b></li> <li>▪ <b>Starting with Intermediate, then Full Out Rods, select Rods in rotating quadrants</b></li> <li>▪ <b>Depress Continuous Insert until Rod is Full In</b></li> <li>▪ <b>Directs NPO to vent Unit 1 Scram Air Header</b></li> </ul> |
| BOP      |      | Reports NPO venting Scram Air Header<br>Monitors for Low Scram Air Pressure Alarm<br>Monitors for drifting Rods  |
| ATC      |      | Reports all control rods full in.  |
| SRO      |      | Directs ATC to have Scram Air Header restored and to stop SLC Pump.<br>Contacts the FUS to stop performance of ES-158-001 and ES-150-002.<br>Exits EO-100-113<br>Enters EO-100-102<br>Directs ATC to slowly restore RPV level to 13" to 54" using Condensate.  |
| ATC      |      | Contacts NPO to restore Scram Air Header.<br>Places SLC Pump handswitch to Stop.   |

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| <b>NOTES:</b>  |  |
| <b>#1: Scram Air Header will not be vented until after HCTL is exceeded.</b> |  |
|  |  |

**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

**Event No:** 8,11  
**Brief Description:** ATWS, EHC Malfunction (continued)

**INSTRUCTOR ACTIVITY:**

Monitor HCTL using SPDS. Once it is exceeded, actions are complete to lower RPV level into the ATWS target band of -60" to -110", several rods have been inserted to position 00, **and on the Lead Evaluator's cue**, contact Control room via the radio and report that you are ready to vent the U1 Scram Air Header iaw Posted Instructions.

Once directed by Lead Evaluator to vent the Scram Air Header, activate soft **Key #11**:

|                                    |                        |
|------------------------------------|------------------------|
| {Key[11]} IRF rFRD155025 r:1 f:0   | Vents Scram Air Header |
| {Key[11]} IRF rFRD155016 r:5 f:100 | " "                    |

Once Key 11 is activated, contact the control room and report, "I vented the Unit 1 Scram Air Header and no longer hear any air."

When directed to restore U1 Scram Air Header, activate soft **Key #12**:

|                                |                           |
|--------------------------------|---------------------------|
| {Key[12]} IRF rFRD155025 f:100 | Restores Scram Air Header |
| {Key[12]} IRF rFRD155016 f:0   | " "                       |

Once Key 12 is activated, contact the control room and report, "I restored the Unit 1 Scram Air Header."

**ROLE PLAY:**

See above for specific communications.

As necessary

Event No: 12  
 Brief Description: HCTL Exceeded

| POSITION | TIME | STUDENT ACTIVITIES   |
|----------|------|--|
| SRO ★    |      | <p><b>Once all control rods are full in determines rapid depressurization is now required (Reactor shutdown with control rods and HCTL exceeded).</b><br/>           Enters EO-100-112, Rapid Depressurization<br/>           Directs ATC to prevent uncontrolled Feedwater / Condensate injection.<br/> <b>Directs BOP to initiate ADS.</b></p> |
| BOP ★    |      | <p>When directed to initiate ADS:</p> <ul style="list-style-type: none"> <li>▪ <b>Arms and depresses ADS Manual Initiation Pushbuttons on division the has RHR Pump permissive met, using HS-B21-1S30A and C (B and D)</b></li> <li>▪ Checks acoustic monitors to ensure six ADS valves are open.</li> <li>▪ Monitors RPV pressure.</li> </ul>   |
| ATC      |      | <p>Monitors FW Lo Load Valve, LV-10641, position.<br/>           Places LIC-C32-1R602 in manual and adjusts using the INC/DEC buttons as necessary to restore and maintain RPV level between 13" and 54".</p>  |
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★ Denotes Critical Task

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| <b>NOTES:</b>  |  |
| Upgrade: <b>General Emergency</b> (MG3) due to ATWS ≥ 5%, failure of RPS and ARI, and HCTL exceeded. |  |

**INSTRUCTOR ACTIVITIES, ROLE PLAY,  
AND INSTRUCTOR'S PERSONAL NOTES**

Event No: 12  
Brief Description: HCTL Exceeded

**INSTRUCTOR ACTIVITY:**

**ROLE PLAY:**

As necessary

**TERMINATION CUE:** All Rods are in, Rapid Depressurization is initiated, and direction is given to restore RPV level to between 13" and 54" with Condensate.

**Post-scenario Evaluator Activity:**

Follow-up question for SRO to determine E-plan classification. For this scenario:

- Initial classification: **Site Area Emergency** (MS3) due to ATWS  $\geq$  5% and failure of RPS and ARI.
- Upgrade: **General Emergency** (MG3) due to ATWS  $\geq$  5%, failure of RPS and ARI, and HCTL exceeded.