

WCGS-SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

ADMIN TASK: Perform an RCS Inventory Balance

TASK #: EPE009002

K/A #s: 2.1.23

References: STS BB-004, Rev. 22

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ SRO\_\_ RO\_\_  
NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 20 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Classroom

Method of Performance: Perform

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

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Notes: **ADMIN JPM**

The exam group shall verify that the procedure revision for this JPM is current and that any change against the referenced procedure does not invalidate this JPM.

Provide an "Information Only" copy of STS BB-004 with cover sheet. Ensure initial conditions are signed off. Ensure the procedure signed off up through step 9.5 and Attachment A has initial and final data filled in.

**Initial Conditions:**

You are a Relief Crew Licensed Operator; the plant is stable at 100% power. The operating crew has indications of a leak in Containment.

**Initiating Cues:**

The Control Room Supervisor had the RO perform a 4 hour STS BB-004 for RCS leakage and has completed the data collection. The CRS directs you to complete STS BB-004 calculations, beginning at Step 9.6, to determine if there is an RCS leak. The CRS provides you with the following information.

Chemistry performed no sampling or chemical additions.

STN CH-020 results are < 0.815 gallons per day.

STS PE-019, RCS Pressure Isolation valve Leakage, is 0.145 gpm.

**READ TO EXAMINEE:**

If you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

When you have completed the JPM inform your evaluator that you are done by handing this Initial Conditions/Initiating Cues sheet back to him.

**TASK STANDARD:**

Upon completion of this JPM the operator will have calculated the leak rate on the RCS per STS BB-004. Final Value for unidentified leakage is 0.485 gpm  $\pm$  .05 gpm, and Identified T.S. Leakage of 0.164 gpm  $\pm$  .05 gpm.

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Element #	Step #	Element	Standard	Score
1.*	9.7	Calculate RCS leakage using Attachment B and log the results in the Control Room Log.	Complete calculations.	S U

Cue:

Comments: Logging the results in the Control Room Log is not required for this JPM.

2.	9.8	If individual component leakage is to be determined then perform Attachment C. If not mark this step N/A.	Ask CRS if individual component leakage needs to be determined.	S U
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Cue: Reply as CRS that individual component leakage will not be determined.

Comments:

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Termination: Calculation of RCS leakage completes this JPM.

Stop Time \_\_\_\_\_

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NOTE: Calculated values should be as follow:

- Step B.1.2 = 6.142 gallons
- Step B.2.2 = -295.8 gallons
- Step B.3.3 = -19.25 gallons
- Step B.4.3 = 430 gallons
- Step B.4.6 = 0 gallons
- Step B.5 = 121.092 gallons
- Step B.6.2 = 0.5045 gpm
- Step B.7.3.2 = 4.508 gallons
- Step B.7.5 = .0188 gpm
- Step B.7.8 = Total Identified Leakage ≈0.0188 gpm.
- Step B.8.1 = Unidentified Leakage Rate ≈0.4852 gpm.
- Step B.9.1 = Total Identified T.S. Leakage 0.1643 gpm.

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Initial Conditions:

You are a Relief Crew Licensed Operator; the plant is stable at 100% power. The operating crew has indications of a leak in Containment.

Initiating Cues:

The Control Room Supervisor had the RO perform a 4 hour STS BB-004 for RCS leakage and has completed the data collection. The CRS directs you to complete STS BB-004 calculations, Step 9.7, to determine if there is an RCS leak. The CRS provides you with the following information.

Chemistry performed no sampling or chemical additions.

STN CH-020 results are 0.815 gallons per day.

STS PE-019, RCS Pressure Isolation valve Leakage, is 0.145 gpm.

Notes:

If you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

When you have completed the JPM inform your evaluator that you are done by handing this Initial Conditions/Initiating Cues sheet back to him.

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**ADMIN TASK:** Manually Determine Quadrant Power Tilt Ratio (QPTR).

TASK: 01500032.

K/A #s: 2.1.20

References: STS RE-012, Rev. 7

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_ SRO\_\_\_\_  
RO\_\_\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be:

SATISFACTORY \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if UNSATISFACTORY:

Estimated JPM Completion Time: 20 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Classroom

Method of Performance: Perform

Tools and Equipment: None

Evaluators Signature: \_\_\_\_\_

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JOB PERFORMANCE MEASURE EVALUATION FORM

Notes:

The examiner shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

The Examiner must verify that the Normalization Factors listed in the Curves and Tables book will work with the current values in Attch. A

Ensure an information only copy of STS RE-012, "QPTR Determination," with cover sheet and prerequisites is available.

Ensure a copy of the Curves and Tables book is available.

Ensure a completed copy of STS RE-012, "QPTR Determination," is available as an answer key.

Initial Conditions:

You are the Reactor Operator, the plant has been stable at 100% power for the last 24 hours. The NPIS computer is out of service.

Initiating Cues:

The Control Room Supervisor directs you to determine Quadrant Power Tilt Ratio using section 8.5 of STS RE-012.

Provide the information only copy of STS RE-012 to the examinee and the table of the present NIS detector currents, Attachment A to this JPM.

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Element #	Step #	Element	Standard	Score
1.*	8.5.1	Start Time _____ Record the Normalization factor for each of the upper (detector A) and lower (detector B) detectors from page 7.5 of the Curve Book.	Locate the Wolf Creek Generating Station Control Room Operating Curves and Tables Reference Manual. Record the normalization factors for the upper and lower detectors for step 8.5.1. in the space provided in the procedure.	S U

Comments: Tables will not be provided in the element boxes.

2.*	8.5.2	Record the present values of the NIS detector currents.	Record the values provided by the examiner in the procedure.	S U
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Cue: **Provide Attachment A to the examinee.**

Comments:

3.*	8.5.3	Normalize each of the detector currents recorded in 8.5.2 by dividing each current by the corresponding normalization factor recorded in 8.5.1.	Normalize each of the detector currents by dividing each current by the corresponding normalization factor. Record the values in the space provided in the procedure.	S U
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Comments: All recorded values should be within  $\pm .005$  of the values in the Answer Key.

3.a.*	8.5.3.1.	Calculate the average of the upper normalized currents.	Calculate the average of the upper normalized currents ( N41 Upper + N42 Upper + N43 Upper + N44 Upper) divided by 4. Record the values in the space provided in the procedure. (See Answer Key)	S U
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Comments: All recorded values should be within  $\pm .005$  of the values in the Answer Key.

3.b.*	8.5.3.2.	Calculate the average of the lower normalized currents.	Calculate the average of the lower normalized currents (N41 Lower + N42 Lower + N43 Lower + N44 Lower) divided by 4. Record the values in the space provided in the procedure. (See Answer Key)	S U
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Comments: All recorded values should be within  $\pm .005$  of the values in the Answer Key.

\* Critical Step

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Element #	Step #	Element	Standard	Score
4.*	8.5.4	Calculate the upper tilts by dividing each of the upper normalized currents in step 8.5.3 by the average of the upper normalized currents in 8.5.3.1.	Calculate the upper tilts by dividing each upper normalized current by the average upper normalized current from step 8.5.3.1. Record the values in the space provided in the procedure. (See Answer Key)	S U

Comments: All recorded values should be within  $\pm .005$  of the values in the Answer Key.

5.*	8.5.5	Calculate the lower tilts by dividing each of the lower normalized currents in 8.5.3 by the average of the lower normalized currents in 8.5.3.2.	Calculate the lower tilts by dividing each lower normalized current by the average lower normalized current from step 8.5.3.2. Record the values in the space provided in the procedure. (See Answer Key)	S U
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Comments: All recorded values should be within  $\pm .005$  of the values in the Answer Key.

6.*	8.5.6	Record the maximum radial flux tilt.	Record in the space provided in the procedure the highest radial flux tilt indicated from the upper tilt values and the lower tilt values. (See Answer Key)	S U
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Comments: All recorded values should be within  $\pm .005$  of the values in the Answer Key.

7.	8.5.7	Proceed to Section 8.7	Same as Element	
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Comments

8.	8.7	Verification that QPTR is within Limits	Complete section 8.7	
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Comments

9.*	8.7.1/2	Recognize QPTR is within Limits	Initial Step 8.7.1 and N/A Step 8.7.2.	
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Comments

Termination: Completing Section 8.7 as being within limits completes the JPM.

Stop Time \_\_\_\_\_

\* Critical Step



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Initial Conditions:

You are the Reactor Operator, the plant has been stable at 100% power for the last 24 hours. The NPIS computer is out of service.

Initiating Cues:

The Control Room Supervisor directs you to determine Quadrant Power Tilt Ratio using section 8.5 of STS RE-012.

Notes:

If you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

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**Attachment A**

**Training Use Only**

	<b>N41</b>	<b>N42</b>	<b>N43</b>	<b>N44</b>
<b>I<sub>top</sub></b>	238	237	246	249
<b>I<sub>bot</sub></b>	240	234	265	259

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**ADMIN RO-A3**  
**Questions**

ID #	RO-A.3.1
NRC KA reference	2.2.22 LCO's and Safety Limits (CFR 43.2/45.2, RO 3.4) Ability to explain and apply all system limits and precautions.
Question Source	NEW
WCGS objective tie	Objective 7, SY 13 002 00, Tech. Specs and Operational Requirements.
WCGS lesson plan reference	SY 13 002 00, Rev. 10, Reactor Coolant System LO17 327 00, Rev. 004 Introduction to Technical Specifications (Contractor provided Class)
WCGS reference	WCGS Technical Specifications, Section 2.0
Question	A plant transient with a loss of load caused a power reduction.  From analysis the peak transient conditions occurred at 95 % power when Tavg reached 629 degrees and RCS pressure was at 2235 psig.  Determine what actions would be required?
Answer	Restore the condition and be in Mode 3 within 1 hour.
Comment section	OPEN REFERENCE QUESTION

**ADMIN RO-A3**  
**Questions**

**QUESTION: RO-A.3.1**

**OPEN REFERENCE QUESTION**

A plant transient with a loss of load caused a power reduction. The plant is currently stable.

From analysis the peak transient conditions occurred at 95 % power when Tavg reached 629 degrees and RCS pressure was at 2235 psig.

Determine what actions would be required?

**OPEN REFERENCE QUESTION**

**ADMIN RO-A3  
Questions**

ID #	RO-A.3.2
NRC KA reference	2.2.25 (CFR 43.2, RO 2.5) Bases for LCO's and Safety Limits.
Question Source	NEW
WCGS objective tie	SY 13 006 00, Objective 13, Technical Specifications
WCGS lesson plan reference	SY 13 006 00, Rev. 08, Emergency Core Cooling System. LO17 327 00, Rev. 004 Introduction to Technical Specifications (Contractor provided Class)
WCGS reference	WCGS Technical Specifications and Bases.
Question	During Surveillance Testing it is determined that the motor on BG HV-8357A is shorted and the valve will not open.  How does this affect the Operability of "A" CCP?
Answer	Words to the effect of:  Per the Bases for T.S. 3.5.2, BG HV-8357A and BG HV-8357B are specifically listed as not affecting the operability of their associated CCP. "A" CCP is still operable.
Comment section	OPEN REFERENCE QUESTION

**ADMIN RO-A3**  
**Questions**

**QUESTION: RO-A.3.2**

**OPEN REFERENCE QUESTION**

During Surveillance Testing it is determined that the motor on BG HV-8357A is shorted and the valve will not open.

How does this affect the Operability of "A" CCP?

**OPEN REFERENCE QUESTION**

WCGS-SRO/RO/NSO TRAINING PROGRAM  
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ADMIN TASK: Determine Max Stay Time and Protective Clothing Requirements

TASK #:2.3-1

K/A #s:2.3.2 Facility ALARA practices.

References: Rad Worker II Training

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_-\_\_\_\_-\_\_\_\_ SRO\_\_ RO\_\_ NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 15 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Plant

Method of Performance: Perform

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

WCGS -SRO/RO/NSO TRAINING PROGRAM  
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Notes:

The exam group shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

**PROVIDE** Training Only copies of the RWP and the Survey Map to the Examinee.

Initial Conditions:

You are the Auxillary Building Operator, the Control Room request you to manually control BG FCV-121 locally in the Normal Charging Pump Room.

Initiating Cues:

Given a Survey Map of the NCP Room and a copy of the RWP, determine the maximum stay time you would be allowed and the Protective Clothing requirements.

**Task Standard:** Upon Completion of this JPM, the operator will have determined a maximum stay time of 40 minutes and that a full set of Anti-C's are required to remain in the area.



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Element #	Step #	Element	Standard	Score
1.	N/A	Using the Survey map determine the highest dose in the contaminated area is 30 mrem per hour. Using the RWP determine that the maximum dose allowed is 20 mrem.	Determine stay time to be 20/30 mrem per hour would equal a 40 minute stay time.	S U

Cue:

Comments:

2	N/A	Using the Survey map determine that there is a contaminated area around BG FCV-121 and the highest contamination level inside the contaminated area is 45k. Using the RWP determine the protective clothing requirements.	Determine that a full set of PC's is required.	S U
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Cue:

Comments: IF asked by Examinee state that the controller can not be reached from outside the boundary and they will have to remain in the area..

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Termination: Determining Stay Time and Protective clothing requirements completes this JPM.

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WCGS -SRO/RO/NSO TRAINING PROGRAM  
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Initial Conditions:

You are the Auxillary Building Operator, the Control Room request you to manually control BG FCV-121 locally in the Normal Charging Pump Room.

Initiating Cues:

Given a Survey Map of the NCP Room and a copy of the RWP, determine the maximum stay time you would be allowed and the Protective Clothing requirements.

Notes:

Plant equipment should not be operated, if you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

When you have completed the JPM inform your evaluator that you are done by handing the Initial Conditions/Initiating Cues sheet back to him.

**ADMIN RO-A5  
Questions**

ID #	RO-A.5.1
NRC KA reference	2.4.27. (CFR 41.10/43.5/45.13, RO 3.0) Plant Fire Procedures.
Question Source	NEW
WCGS objective tie	Objective 3. Explain the major actions accomplished by this procedure.
WCGS lesson plan reference	LO 17 324 26, Rev. 06. OFN KC-016, Fire Response
WCGS reference	OFN KC-016, Rev. 05. Fire Response, Steps 4, 11, and 15
Question	Given a fire has occurred in the plant, what are the time limits for when the Off Site Fire Department must be called in to assist?
Answer	All Three Required  <ol style="list-style-type: none"> <li>1. Full Fire Brigade strength not at the seen within 12 minutes of callout.(step 4)</li> <li>2. Fire <u>not</u> under control within 10 minutes of Fire Brigade arrival. (step 11)</li> <li>3. Fire Pump Pressure Less than 80 psig at the Circ Water Screen House, Continuous Action. (step 15)</li> </ol>
Comment section	OPEN REFERENCE QUESTION

**ADMIN RO-A5  
Questions**

**QUESTION: RO-A.5.1**

**OPEN REFERENCE QUESTION**

Given a fire has occurred in the plant, what are the time limits for when the Off Site Fire Department must be called in to assist?

**OPEN REFERENCE QUESTION**

**ADMIN RO-A5  
Questions**

ID #	RO-A.5.2
NRC KA reference	2.4.49 (CFR 41.10/43.2/45.6, RO 4.0) Perform Immediate Actions.
Question Source	NEW
WCGS objective tie	Objective 3: Explain the mitigation strategies used in OFN RP-017
WCGS lesson plan reference	LO 17324 27, Rev. 06.
WCGS reference	OFN RP-017 Rev. 15, Attachment C, Steps C1-C5.
Question	You are the Reactor Operator. A fire has occurred in the Lower Cable Spreading Room leading to spurious actuations and causing the Shift Manager to evacuate the Control Room.  What are the Immediate Actions of the Reactor Operator?
Answer	
Comment section	CLOSED REFERENCE QUESTION

**ADMIN RO-A5**  
**Questions**

**QUESTION: RO-A.5.2**

**CLOSED REFERENCE QUESTION**

You are the Reactor Operator. A fire has occurred in the Lower Cable Spreading Room leading to spurious actuations and causing the Shift Manager to evacuate the Control Room.

What are the Immediate Actions of the Reactor Operator?

**CLOSED REFERENCE QUESTION**

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ADMIN TASK: Perform an RCS Inventory Balance

TASK #: EPE009002

K/A #s: 2.1.23

References: STS BB-004, Rev. 22

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ SRO\_\_ RO\_\_  
NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 20 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Classroom

Method of Performance: Perform

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

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Notes: **ADMIN JPM**

The exam group shall verify that the procedure revision for this JPM is current and that any change against the referenced procedure does not invalidate this JPM.

Provide an "Information Only" copy of STS BB-004 with cover sheet. Ensure initial conditions are signed off. Ensure the procedure signed off up through step 9.5 and Attachment A has initial and final data filled in.

**Initial Conditions:**

You are a Relief Crew Licensed Operator; the plant is stable at 100% power. The operating crew has indications of a leak in Containment.

**Initiating Cues:**

The Control Room Supervisor had the RO perform a 4 hour STS BB-004 for RCS leakage and has completed the data collection. The CRS directs you to complete STS BB-004 calculations, beginning at Step 9.6, to determine if there is an RCS leak. The CRS provides you with the following information.

Chemistry performed no sampling or chemical additions.

STN CH-020 results are < 0.815 gallons per day.

STS PE-019, RCS Pressure Isolation valve Leakage, is 0.145 gpm.

**READ TO EXAMINEE:**

If you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

When you have completed the JPM inform your evaluator that you are done by handing this Initial Conditions/Initiating Cues sheet back to him.

**TASK STANDARD:**

Upon completion of this JPM the operator will have calculated the leak rate on the RCS per STS BB-004. Final Value for unidentified leakage is 0.485 gpm  $\pm$  .05 gpm, and Identified T.S. Leakage of 0.164 gpm  $\pm$  .05 gpm.



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Element #	Step #	Element	Standard	Score
1.*	9.7	Calculate RCS leakage using Attachment B and log the results in the Control Room Log.	Complete calculations.	S U

Cue:

Comments: Logging the results in the Control Room Log is not required for this JPM.

2.	9.8	If individual component leakage is to be determined then perform Attachment C. If not mark this step N/A.	Ask CRS if individual component leakage needs to be determined.	S U
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Cue: Reply as CRS that individual component leakage will not be determined.

Comments:

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Termination: Calculation of RCS leakage completes this JPM.

Stop Time \_\_\_\_\_

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NOTE: Calculated values should be as follow:

- Step B.1.2 = 6.142 gallons
- Step B.2.2 = -295.8 gallons
- Step B.3.3 = -19.25 gallons
- Step B.4.3 = 430 gallons
- Step B.4.6 = 0 gallons
- Step B.5 = 121.092 gallons
- Step B.6.2 = 0.5045 gpm
- Step B.7.3.2 = 4.508 gallons
- Step B.7.5 = .0188 gpm
- Step B.7.8 = Total Identified Leakage ≈0.0188 gpm.
- Step B.8.1 = Unidentified Leakage Rate ≈0.4852 gpm.
- Step B.9.1 = Total Identified T.S. Leakage 0.1643 gpm.

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Initial Conditions:

You are a Relief Crew Licensed Operator; the plant is stable at 100% power. The operating crew has indications of a leak in Containment.

Initiating Cues:

The Control Room Supervisor had the RO perform a 4 hour STS BB-004 for RCS leakage and has completed the data collection. The CRS directs you to complete STS BB-004 calculations, Step 9.7, to determine if there is an RCS leak. The CRS provides you with the following information.

Chemistry performed no sampling or chemical additions.

STN CH-020 results are 0.815 gallons per day.

STS PE-019, RCS Pressure Isolation valve Leakage, is 0.145 gpm.

Notes:

If you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

When you have completed the JPM inform your evaluator that you are done by handing this Initial Conditions/Initiating Cues sheet back to him.

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**ADMIN TASK:** Determine the estimated time to boiling, estimated time to onset of core uncover, and estimated time to core uncover.

TASK: APE025004

K/A #: 2.1.25

References: OFN EJ-015, Rev. 8

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_ SRO\_\_\_\_  
RO\_\_\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be:

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 10 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Classroom

Method of Performance Perform

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

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Notes:

The examiner shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

Ensure a copy of Attachment A of this JPM is available.

Initial Conditions:

You are a spare SRO in the Control Room for Outage Support. The plant is in Mode 5 with water level in the reactor vessel at 3.5 feet below the vessel flange. Train "A" Residual Heat Removal (RHR) is in operation cooling the reactor core. Train "B" RHR System is in Standby. Reactor Coolant System temperature is 180°F. It has been 9 days since the reactor was shutdown.

Initiating Cues:

Train "A" Residual Heat Removal pump tripped. Attempts to start "B" RHR pump are unsuccessful. The Control Room Supervisor directs you to determine the following using Step 30 of OFN EJ-015,"LOSS OF RHR COOLING":

1. the time to boiling
2. the time to start of core uncover.
3. the time to complete core uncover.

Provide a copy of Attachment A to the examinee.

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Element #	Step #	Element	Standard	Score
1.*	30.a.	Start Time _____ Check plant - IN REDUCED INVENTORY CONDITION.	Recognize the initiating cues stated the water level in the reactor vessel is 3.5 feet below the vessel flange. <i>Answer: YES</i>	S U

Comments:

2.*	30.b.	Estimate time to boiling using FIGURE 5.	Locate Figure 5 of OFN EJ-015. Recognize it has been 9 days since shutdown and that the vessel is not pressurized. <i>Answer: 14 minutes ± 1.</i>	S U
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Comments:

3.*	30.c.	Estimate time to onset of core uncovering using FIGURE 6.	Locate Figure 6 of OFN EJ-015. Recognize it has been 9 days since shutdown. Utilize the ONSET OF CORE UNCOVERING graph line. <i>Answer: 127 minutes ± 5.</i>	S U
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Comments:

4.*	30.d.	Estimate time to complete core uncovering using FIGURE 6.	Locate Figure 6 of OFN EJ-015. Recognize it has been 9 days since shutdown. Utilize the COMPLETE CORE UNCOVERING graph line. <i>Answer: 268 minutes ± 5.</i>	S U
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Comments:

Termination: Locating the estimated time to complete core uncovering completes the JPM.

Stop Time \_\_\_\_\_

\* Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Initial Conditions:

You are a spare SRO in the Control Room for Outage Support. The plant is in Mode 5 with water level in the reactor vessel at 3.5 feet below the vessel flange. Train "A" Residual Heat Removal (RHR) is in operation cooling the reactor core. Train "B" RHR System is in Standby. Reactor Coolant System temperature is 180°F. It has been 9 days since the reactor was shutdown.

Initiating Cues:

Train "A" Residual Heat Removal System pump tripped. Attempts to start "B" RHR pump are unsuccessful. The Control Room Supervisor directs you to determine the following using Step 30 of OFN EJ-015,"LOSS OF RHR COOLING":

1. the time to boiling
2. the time to start of core uncover.
3. the time to complete core uncover.

Notes:

If you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

When you have completed the JPM inform your evaluator that you are done by handing this Initial Conditions/Initiating Cues sheet back to him.

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

ATTACHMENT A

PARAMETER	VALUE
Estimated time to boiling	
Estimated time to onset of core uncover	
Estimated time complete core uncover	

WCGS-SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

**ADMIN TASK:** Given a sequence of events determine the end time of an LCO using any extensions that would be allowed by ITS 3.0.4.

TASK #: 2.1-3

K/A #s: 2.2.23, Ability to Track LCO's.

References: WCGS Integrated Technical Specifications and Bases, LCO 3.5.2 and Section 1.3.

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_-\_\_\_\_-\_\_\_\_ SRO\_\_ RO\_\_ NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 15 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Classroom

Method of Performance: Perform

Tools and Equipment:None

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_



WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

**ADMIN JPM**

Notes:

The exam group shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

Initial Conditions:

You are the Control Room Supervisor, the plant is stable in Mode 1.

Initiating Cues:

The "A" train SI pump has been declared inoperable. The time of discovery is 1000 on 12/08/2001. The "B" train SI is OPERABLE.

Twelve (12) hours after the "A" train SI is declared inoperable, the "B" train RHR pump is declared inoperable.

At 1000 on 12/09/2001, the "A" train SI pump is restored to OPERABLE status.

When must the "B" train RHR pump be restored to OPERABLE status to avoid a unit shutdown, including any extensions permitted by Technical Specifications?

Task Standard: Upon Completion of this JPM, the operator will have determined that the extensions allowed by section 1.3, "Completion Times", would apply and that LCO 3.5.2 must be exited by 2200 on 12/11/2001.

**ADMIN SRO-A.3**

WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
1.	N/A	“A” train SI pump declared inoperable 1000 on 12/08/2001. The “B” train SI is OPERABLE. Enter LCO 3.5.2.	Action A. 72 hours to restore. 100% capacity of ECCS is still available. Restore by 1000 12/11/2001.	

Cue:

Comments:

		“B” train RHR pump is declared inoperable 2200 12/08/2001.	Still in LCO 3.5.2, Action A. 100% capacity of ECCS is still available. Restoration still 1000 12/11/2001.	S U
--	--	--	--	-----

Cue:

Comments:

		At 1000 on 12/09/2001, the “A” train SI pump is restored to OPERABLE status.	Since the first component causing entry into LCO 3.5.2 was restored first, an extension to the completion time of 3.5.2 can be applied. Per Section 1.3, Extension is 24 hours from the original end or the time limit of the second component, whichever is less. Completion time would be extended 12 hours to 2200 12/11/2001.	S U
--	--	--	---	-----

Cue:

Comments:

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Termination: Determining that the “B” RHR must be restored by 2200 on 12/11/2001 completes this JPM.

Stop Time \_\_\_\_\_

---

\*Critical Step

WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Initial Conditions:

You are the Control Room Supervisor, the plant is stable in Mode 1.

Initiating Cues:

The "A" train SI pump has been declared inoperable. The time of discovery is 1000 on 12/08/2001. The "B" train SI is OPERABLE.

Twelve (12) hours after the "A" train SI is declared inoperable, the "B" train RHR pump is declared inoperable.

At 1000 on 12/09/2001, the "A" train SI pump is restored to OPERABLE status.

When must the "B" train RHR pump be restored to OPERABLE status to avoid a unit shutdown, including any extensions permitted by Technical Specifications?

WCGS-SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

TASK: Determine Max Stay Time and Protective Clothing Requirements

TASK #:2.3-1

SAFETY FUNCTION #:N/A

K/A #:2.3.2 Facility ALARA practices.

References: Rad Worker II Training

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_-\_\_\_\_-\_\_\_\_ SRO\_\_ RO\_\_ NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 15 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Plant

Method of Performance: Perform

Tools and Equipment: None

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Notes:

The exam group shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

**PROVIDE** Training Only copies of the RWP and the Survey Map to the Examinee.

Initial Conditions:

You are the Auxillary Building Operator, the Control Room request you to manually control BG FCV-121 locally in the Normal Charging Pump Room.

Initiating Cues:

Given a Survey Map of the NCP Room and a copy of the RWP, determine the maximum stay time you would be allowed and the Protective Clothing requirements.

Task Standard: Upon Completion of this JPM, the operator will have determined a maximum stay time of 40 minutes and that a full set of Anti-C's are required to remain in the area.

WCGS -SRO/RO/NSO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
1.	N/A	Using the Survey map determine the highest dose in the contaminated area is 30 mrem per hour. Using the RWP determine that the maximum dose allowed is 20 mrem.	Determine stay time to be 20/30 mrem per hour would equal a 40 minute stay time.	S U

Cue:

Comments:

2	N/A	Using the Survey map determine that there is a contaminated area around BG FCV-121 and the highest contamination level inside the contaminated area is 45k. Using the RWP determine the protective clothing requirements.	Determine that a full set of PC's is required.	S U
---	-----	---	--	-----

Cue:

Comments: IF asked by Examinee state that the controller can not be reached from outside the boundary.

---

Termination: Determining Stay Time and Protective clothing requirements completes this JPM.

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WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Initial Conditions:

You are the Auxillary Building Operator, the Control Room request you to manually control BG FCV-121 locally in the Normal Charging Pump Room.

Initiating Cues:

Given a Survey Map of the NCP Room and a copy of the RWP, determine the maximum stay time you would be allowed and the Protective Clothing requirements.

Notes:

Plant equipment should not be operated, if you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

When you have completed the JPM inform your evaluator that you are done by handing the Initial Conditions/Initiating Cues sheet back to him.

WCGS-SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

**ADMIN TASK:** Classify an Event using the Emergency Plan

TASK #: OFN060011

K/A #: 2.4.41

References: APF 06-002-01

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_-\_\_\_\_-\_\_\_\_ SRO\_\_ RO\_\_  
NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be:

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 15 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Simulator

Method of Performance: Perform

Tools and Equipment: Simulator

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_



WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Notes:

The examiner shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

This Classification will take place at the conclusion of the scenario where the applicant fills the SRO position.

Initial Conditions:

- 1) You have just seen an event(s) take place on the simulator. You are free to look at your notes and look at any reference material.
- 2) Classify the event per the EALs.
- 3) To pass the JPM you must classify at the right level on the correct tree and complete the Emergency Notification Form blocks 1 through 8..

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Start Time \_\_\_\_\_

SCENARIO #	CLASSIFICATION	EAL TREE
1	ALERT	EAL-4, Main Steam Line Break MSLB-1 -2 -5 -6 - ALERT
2	ALERT	EAL-3, Loss of Reactor Coolant Boundary LRCB-1 -2 -3 -5 -6 -7 -- ALERT
3	ALERT	EAL-6, Loss of Electrical Power LEP/AC 1 -2 -5 - ALERT
4	SITE AREA EMERGENCY	EAL-3, Loss of Reactor Coolant Boundary LRCB 1 -2 -3 -4 -8 - SAE
5	ALERT	EAL-2, Steam Generator Tube Failure SGTF - 1 -2 -9 -10 -12 -- ALERT.
6	NOTIFICATION OF UNUSUAL EVENT	EAL-4, Main Steam Line Break MSLB 1 -2 -5 -7 -NUE.

Comments: The Critical Step is to correctly classify the event, NOT the time limit.

Classifying the event terminates the JPM

Stop Time \_\_\_\_\_



**WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM**

**Initial Conditions:**

- 1) You have just seen an event(s) take place on the simulator. You are free to look at your notes and look at any reference material.
- 2) Classify the event per the EALs.
- 3) To pass the JPM you must classify at the right level on the correct tree and complete the Emergency Notification Form blocks 1 through 8..



WCGS-SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

TASK: Bypass an ESF System.

SAFETY FUNCTION: #7

TASK #: 01300004

K/A #s: 013 K5.01, K5.02.

References: N/A

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_ SRO\_\_ RO\_\_  
NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 5 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Control Room  Simulator \_\_\_ Plant \_\_\_\_\_

Method of Performance: Simulate  Perform \_\_\_\_\_

Tools and Equipment: Simulator

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

## Notes:

The exam group shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

## Initial Conditions:

You are the Reactor Operator, the plant is stable in Mode 1.

## Initiating Cues:

The Control Room Supervisor (CRS) directs you to place GT RE-31 in bypass for a filter change out.

**READ TO EXAMINEE**

Plant equipment should not be operated, if you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

Upon arriving at a component, describe to your evaluator what you expect to see (e.g. how valve, breaker, etc. position is) and what you expect to do (e.g. turn switch to run, rotate handwheel clockwise to open, etc.) and what you expect to happen (e.g. push button will light, red light will light, handwheel will rotate until valve is open, etc.).

When you have completed the JPM inform your evaluator that you are done by handing this Initial Conditions/Initiating Cues sheet back to him.

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Element Number	Element	Standard	Score
1.	Start Time _____  Obtain the correct key from the holders hanging to the right of the CRS Desk by the E-plan Communicators station.	The Rad Monitor Bypass keys are hanging from magnetic clips on cabinets on the West wall of the Control Room. The Examinee must ensure they obtain the key for GT RE-31/ GT RE-32.	S U

Cue:

Comments: It is sufficient for the examinee to show the evaluator where the key is located and which key is the correct one.

2.*	Locate Bistable Key Switch for GT RE-31.	Locate the switch on panel SA036E, located behind the Control Boards, on the west side, third row of panels. Point out the Bistable Key Switch for GT RE-31.	S U
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Cue:

Comments

3.	Remove the placard for GT RE-31.	The placard is removed and is taken to the Control Room after the monitor is bypassed.	S U
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Cue: The placard is removed.

Comments: Placards are kept above the computer screen on RL004 or above the CRS Gaitronics as a visual reminder.

4.*	Bypass GT RE-31.	The key is inserted in the switch and is turned to the BYPASS position.	S U
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Cue: Switch is in bypass position.

Comments:

5.	Verify the proper annunciators are lit.	Ann. 047F, "ESFAS NOT NORMAL" and 049F, "B TRAIN ESFAS", will come in.	S U
----	---	--	-----

Cue: Annunciators, 047F, "ESFAS NOT NORMAL" and 049F, "B TRAIN ESFAS", are lit

Comments:



WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element Number	Element	Standard	Score
6.	Take the placard for GT RE-31 to the Control Room Supervisor.	The placard is taken to the CRS and then placed on RL004 or the CRS Gaitronics box.	S U

Cue:

Comments: Accept examinee stating he would place plaque on RL004 or give to the CRS.

<p>Termination: Describing key insertion and turning switch to bypass completes the JPM</p> <p>Stop Time _____.</p>
---

\*Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Initial Conditions:

You are the Reactor Operator, the plant is stable in Mode 1.

Initiating Cues:

The Control Room Supervisor directs you to place GT RE-31 in bypass for filter change out.

Notes:

Plant equipment should not be operated, if you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

Upon arriving at a component, describe to your evaluator what you expect to see (e.g. how valve, breaker, etc. position is) and what you expect to do (e.g. turn switch to run, rotate handwheel clockwise to open, etc.) and what you expect to happen (e.g. push button red light will light, handwheel will rotate until valve is open, etc.).

When you have completed the JPM inform your evaluator that you are done by handing this Initial Conditions/Initiating Cues sheet back to him.

WCGS-SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

TASK: Isolate ESW Drains

TASK #:00007703

**SAFETY FUNCTION #: 4**

K/A #: NEW

References: OFN SG-003 "Natural Events", DCP 07225 "Emergency Makeup Water Requirement For AFW From ESW/UHS."

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_-\_\_\_\_-\_\_\_\_ SRO\_\_ RO\_\_  
NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 15 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Control Room \_\_\_\_\_ Simulator \_\_\_\_\_ Plant X

Method of Performance: Simulate X Perform \_\_\_\_\_

Tools and Equipment: None

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Notes:

The exam group shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

READ TO EXAMINEE

Plant equipment should not be operated, if you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

Upon arriving at a component, describe to your evaluator what you expect to see (e.g. how valve, breaker, etc. position is determined), what you will do (e.g. turn switch to run, rotate handwheel clockwise to open, etc.) and what you expect to happen (e.g. pump will start and red light will rotate until valve is open, etc.).

When you have completed the JPM inform your evaluator that you are done by handing the Initial Conditions/Initiating Cues sheet back to him.

When recording data on Data Sheets, indicate the instrument used and vocalize the value you will record for each parameter.

Initial Conditions:

You are the Turbine Building Operator, the plant has experienced a Seismic Event which has caused a Cooling Dam failure. The Control Room has entered OFN SG-003, "Natural Events".

Initiating Cues:

The Control Room Supervisor directs you to close ESW To Aux Feedwater Pumps Inlet Header Drains:

- o AL-V136
- o AL-V137
- o AL-V138
- o AL-V139

Task Standard: Upon Completion of this JPM, the operator will have isolated the leak paths from ESW to the Aux Feedwater System.

WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Elements 1,2 and 3 of this JPM may be performed in any order

Element #	Step #	Element	Standard	Score
1.		Start Time _____  Isolate ESW to TDAFW pump inlet header drains.	Complete elements 1a through 1c.	N/A

Cue: IF examinee discusses looking for flow at tail pipe drain to floor drain, THEN cue **“water is flowing from pipe to drain.”**

Comments: Examinee may not check for flow indication and go straight to valves.

1a. *		Isolate Red Train ESW drain to TDAFW pump suction.	Locate AL-V138 in the TDAFW pump room and close.	S U
-------	--	--	--	-----

Cue: After examinee locates valve and properly discusses closing it cue, **“AL-V138 indicates closed”**.

Comments:

1b. *		Isolate Yellow Train ESW drain to TDAFW pump suction.	Locate AL-V139 in the TDAFW pump room and close.	S U
-------	--	---	--	-----

Cue: After examinee locates valve and properly discusses closing it cue, **“AL-V139 indicates closed”**.

Comments:

1c.		Check for flow from tell tale drain to floor drain..	Locate tell tale drain to floor drain on west side of TDAFW pump and verify flow has stopped.	S U
-----	--	--	---	-----

Cue: IF examinee discusses looking for flow at tail pipe drain to floor drain AND has discussed properly closing both valves, THEN cue **“no water is seen flowing from pipe to drain.”**

Comments: Examinee should check for flow as diverse indication to ensure valves are fully shut.

2.		Isolate Inlet Header drain on Red Train ESW to “A” AFW pump suction.	Complete elements 2a and 2b..	N/A
----	--	--	-------------------------------	-----

Cue: IF examinee discusses looking for flow at tail pipe drain to floor drain, THEN cue **“water is flowing from pipe to drain.”**

Comments: Examinee may not check for flow indication and go straight to valves.

\* Denotes Critical Step

WCGS -SRO/RO/NSO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
2a. *		Isolate drain on Red Train ESW to "A" AFW pump suction.	Locate AL-V136 in the "A" AFW pump room and close.	S U

Cue: After examinee locates valve and properly discusses closing it cue, "**AL-V136 indicates closed**".

Comments:

2b.		Check for flow from tell tale drain to floor drain..	Locate tell tale drain to floor drain on south side of "A" AFW pump and verify flow has stopped.	S U
-----	--	--	--	-----

Cue: IF examinee discusses looking for flow at tail pipe drain to floor drain AND has discussed properly closing valve, THEN cue "**no water is seen flowing from pipe to drain.**"

Comments: Examinee should check for flow as diverse indication to ensure valve is fully shut.

3.		Isolate inlet header drain on Yellow Train ESW to "B" AFW pump suction.	Complete elements 3a and 3b..	
----	--	---	-------------------------------	--

Cue: IF examinee discusses looking for flow at tail pipe drain to floor drain, THEN cue "**water is flowing from pipe to drain.**"

Comments: Examinee may not check for flow indication and go straight to valves.

3a. *		Isolate drain on Yellow Train ESW to "B" AFW pump suction.	Locate AL-V137 in the "B" AFW pump room and close	S U
-------	--	--	---	-----

Cue: After examinee locates valve and properly discusses closing it cue, "**AL-V137 indicates closed**".

Comments:

3b.		Check for flow from tell tale drain to floor drain..	Locate tell tale drain to floor drain on south side of "B" AFW pump and verify flow has stopped..	S U
-----	--	--	---	-----

Cue: IF examinee discusses looking for flow at tail pipe drain to floor drain AND has discussed properly closing valve, THEN cue "**no water is seen flowing from pipe to drain.**"

Comments: Examinee should check for flow as diverse indication to ensure valve is fully shut.

Termination: Closing of all four valves terminates this JPM.

Stop Time \_\_\_\_\_

\* Denotes Critical Step

WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

## Initial Conditions:

You are the Turbine Building Operator, the plant has experienced a Seismic Event which has caused a Cooling Dam failure. The Control Room has entered OFN SG-003, "Natural Events".

## Initiating Cues:

The Control Room Supervisor directs you to close ESW To Aux Feedwater Pumps Inlet Header Drains:

- o AL-V136
- o AL-V137
- o AL-V138
- o AL-V139

## Notes:

Plant equipment should not be operated, if you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

Upon arriving at a component, describe to your evaluator what you expect to see (e.g. how valve, breaker, etc. position is determined), what you will do (e.g. turn switch to run, rotate handwheel clockwise to open, etc.) and what you expect to happen (e.g. pump will start and red light will rotate until valve is open, etc.).

When you have completed the JPM inform your evaluator that you are done by handing the Initial Conditions/Initiating Cues sheet back to him.

When recording data on Data Sheets, indicate the instrument used and vocalize the value you will record for each parameter.

WCGS-SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

TASK: Demonstrate the ability to transfer a vital 120 VAC instrument power supply.

SAFETY FUNCTION: #6

TASK #:05700018

K/A #: 057 AA1.01; AA2.06, AA2.14

References: OFN NN-021, Rev. 6

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_ SRO\_\_ RO\_\_  
NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 12 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Control Room \_\_\_\_\_ Simulator \_\_\_\_\_ Plant X

Method of Performance: Simulate X Perform \_\_\_\_\_

Tools and Equipment: Hard Hat  
Safety glasses  
Hearing Protection

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_



WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

## Notes:

The exam group shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

**For consistency start by the Fire Brigade Lockers.**

READ TO EXAMINEE

Plant equipment should not be operated, if you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

Upon arriving at a component, describe to your evaluator what you expect to see (e.g. how valve, breaker, etc. position is determined), what you will do (e.g. turn switch to run, rotate handwheel clockwise to open, etc.) and what you expect to happen (e.g. pump will start and red light will rotate until valve is open, etc.).

When you have completed the JPM inform your evaluator that you are done by handing the Initial Conditions/Initiating Cues sheet back to him.

When recording data on Data Sheets, indicate the instrument used and vocalize the value you will record for each parameter.

## Initial Conditions:

You are the Turbine Bldg. Operator. The plant is in Mode 3 with all checklist items for going into Mode 2 complete. The Control Room received MCB alarms 25A, "NN01 INST BUS UV" and 25B "NN11 INV UV". Subsequently the Reactor Operator verified from OFN NN-021 "Loss of 120 VAC Instrument Bus" that Bus NN01 is de-energized.

## Initiating Cues:

The Control Room Supervisor directs you to verify no apparent damage to bus NN01 and Inverter output voltage normal.

Do not operate any equipment in the plant.

**TASK STANDARD:** Upon completion of this JPM the operator will have placed NN01 on the Sola Transformer per OFN NN-021.

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
1.	N/A	Start Time _____ Check NN01 Bus – No Apparent Damage	Locate NN01, located on the 2016' level of the Control Bldg.	S U

Cue: After examinee locates bus cue “No apparent damage.”

Comments:

2.	N/A	Verify inverter output voltage NORMAL.	Locate the inverter output voltmeter on NN11.Voltage should be ~ 120 VAC.	S U
----	-----	--	---	-----

Cue: After examinee describes checking the voltage, “*Output voltage is 0 VAC*”.

Comments:

3.	N/A	Notify the Control Room that NN01bus is intact but that the voltage on NN01 is zero.	Contact the Control Room and make the report.	S U
----	-----	--	---	-----

Cue: Acknowledge the report, give cue "*align backup power supply to NN01 by closing backup transformer XNN05 supply breaker NG01ACR3 then open normal feeder breaker NN0101 and close alternate feeder breaker NN0102.*"

Comments: **Ensure 3-way communication is used.**

4.*	N/A	CLOSE backup transformer XNN05 power supply breaker NG01ACR3.	Locate the breaker on NG01A, north of NG03 in the north Class 1E Switchgear room. Turn NG01ACR3 to the ON position.	S U
-----	-----	---	---	-----

Cue: After examinee locates and describes closing the breaker, “*NG01ACR3 indicates ON.*”

Comments:

5.*	N/A	Utilize the Interlock key to operate the interlock mechanism.	Install the key into the lock mechanism and turn.	S U
-----	-----	---	---	-----

Cue: After examinee describes operating the key, “*The pawl is down.*”

Comments: Turning the key will withdraw the pawl that locks the slide bar in place.

---

\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
6.	N/A	OPEN normal feeder breaker NN0101.	The breaker is opened by pushing the switch to the left towards OFF.	S U

Cue: After examinee describes opening the breaker, ***“The breaker indicates off.”***

Comments:

7.*	N/A	CLOSE alternate feeder breaker NN0102	The slide bar is moved to the left and the switch is moved to the left. The White line should be showing on the breaker switch.	S U
-----	-----	---------------------------------------	---	-----

Cue: After examinee describes closing the breaker, ***“Breaker indicates on.”***

Comments: The white line indicates the breaker is on. Examinee should contact the Control Room prior to closing the alternate breaker.

8.	N/A	Notify the Control Room that NN01 is being supplied from alternate power.	Contact the Control Room and make the report.	S U
----	-----	---	---	-----

Cue: Acknowledge report, provide cue ***“ continue your rounds”***.

Comments: **Ensure 3-way communications is used.**

Termination: Re-energizing NN01 completes this JPM.				
Stop Time _____				

\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Initial Conditions:

You are the Turbine Bldg. Operator, the plant is in Mode 3 with all checklist items for going into Mode 2 complete. The Control Room received MCB alarms 25A, "NN01 INST BUS UV" and 25B "NN11 INV UV". Subsequently the Reactor Operator verified from OFN NN-021 "Loss of 120 VAC Instrument Bus" that Bus NN01 was de-energized.

Initiating Cues:

The Control Room Supervisor directs you to verify no apparent damage to bus NN01 and Inverter output voltage normal.

Notes:

Plant equipment should not be operated, if you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

Upon arriving at a component, describe to your evaluator what you expect to see (e.g. how valve, breaker, etc. position is determined), what you expect to do (e.g. turn switch to run, rotate handwheel CCW to open, etc.) and what you expect to happen (e.g. pump will start and red light will light, handwheel will rotate until valve is open, etc.).

When you have completed the JPM inform your evaluator that you are done by handing this Initial Conditions/Initiating Cues sheet back to him.

When recording data on Data Sheets, indicate the instrument used and vocalize the value you will record for each parameter.

WCGS-SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

TASK: Perform Local Actions for Immediate Boration (ASP)

TASK #: APE024003

K/A #s: APE024 AA1.17, AA1.25

References: OFN BG-009, Rev. 8

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_-\_\_\_\_-\_\_\_\_ SRO\_\_ RO\_\_  
NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 6 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Control Room \_\_\_\_\_ Simulator \_\_\_\_\_ Plant X

Method of Performance: Simulate X Perform \_\_\_\_\_

Tools and Equipment: Hard Hat  
Safety glasses  
Ear protection

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

## Notes:

The exam group shall verify that the procedure revision for this JPM is current and that any change against the referenced procedure does not invalidate this JPM.

An \* Denotes a Critical Step.

READ TO EXAMINEE

Plant equipment should not be operated, if you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

Upon arriving at a component, describe to your evaluator what you expect to see (e.g. how valve, breaker, etc. position is determined), what you will do (e.g. turn switch to run, rotate handwheel clockwise to open, etc.) and what you expect to happen (e.g. pump will start and red light will rotate until valve is open, etc.).

When you have completed the JPM inform your evaluator that you are done by handing the Initial Conditions/Initiating Cues sheet back to him.

## Initial Conditions:

You are the Aux. Bldg. Operator, the plant was in Mode 1. A reactor trip has recently occurred.

## Initiating Cues:

The Control Room Supervisor informs you that OFN BG-009, Attachment A, is being performed and that BG FCV-110A, Boric Acid Blending Tee Inlet Isol. Valve, will not open from the Control Room. The CRS directs you to fail open BG FCV-110A by isolating and venting instrument air from the valve operator.

**DO NOT** operate any components in the plant.

**TASK STANDARD:** Upon completion of this JPM the operator will have locally established Emergency Boration by opening BG HV-8104.

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
1. *	A2. RNO a.	Start Time _____  Locally isolate instrument air to valve.	Locate the valve and air isolation on the 1978' level of the Aux. Bldg., in the "A" SI Pump Room. Close the instrument air isolation valves to the positioner and the valve by turning the handles so they are perpendicular to the air lines.	S U

Cue: After examinee describes isolating both air valves report, "***Handles are perpendicular to air lines.***"

Comments: Examinee must isolate both air valves to satisfy this element.

2.*	A2. RNO b.	Locally Vent air pressure from valve.	Vent air off the operator by opening the filter drains located at the bottom of the filters or by any other method that will bleed air off the top of the operator.	S U
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Cue: ***BG FCV-110A does not move.***

Comments: Accept any viable method of venting air from the operator.

3.	N/A	Notify Control Room of inability to open valve.	Contact Control Room and inform them the valve will not open with air isolated and vented.	S U
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Cue: Acknowledge report, direct examinee to, "***locally open BG HV-8104.***"

Comments:

4. *	A8.a	Locally OPEN Emergency Boration Valve.  <ul style="list-style-type: none"> <li>• BG HV-8104.</li> </ul>	Locate valve on the 1978' level of the Aux. Bldg., in the "A" SI Pump Room. Engage the manual operator by pulling gently down on the clutch lever and turning the handwheel several turns until the clutch key is engaged. Then pull the clutch lever all the way down and turn the handwheel in the counter-clockwise direction.	S U
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Cue: As examinee describes opening the valve, "***Valve stem is moving,--- valve indicates open.***"

Comments:

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\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
5.	N/A	Report status of valve to Control Room.	Contact Control Room, report BG HV-8104 is open.	S U

Cue: Acknowledge report, respond, "*immediate boration flow is 37 gpm*", direct examinee to, "*continue your rounds.*"

Comments:

<p>Termination: Opening BG HV-8104 completes the JPM.</p> <p>Stop Time _____</p>
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\* Denotes Critical Step



WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Initial Conditions:

You are the Aux. Bldg. Operator, the plant was in Mode 1. A reactor trip has recently occurred.

Initiating Cues:

The Control Room Supervisor informs you that OFN BG-009, Attachment A, is being performed and that BG FCV-110A, Boric Acid Blending Tee Inlet Isol. Valve, will not open from the Control Room. The CRS directs you to fail open BG FCV-110A by isolating and venting instrument air from the valve operator.

**DO NOT** operate any components in the plant.

Notes:

Plant equipment should not be operated, if you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

Upon arriving at a component, describe to your evaluator what you expect to see (e.g. how valve, breaker, etc. position is determined), what you expect to do (e.g. turn switch to run, rotate handwheel clockwise to open, etc.) and what you expect to happen (e.g. pump will start and red light will light, handwheel will rotate until valve is open, etc.).

When you have completed the JPM inform your evaluator that you are done by handing the Initial Conditions/Initiating Cues sheet back to him.

WCGS-SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

TASK: Conduct a Liquid Radwaste Release

TASK #: 06800004, 2.3-3

**SAFETY FUNCTION : #9**

K/A #s: 068A3.02, 2.3.11

References: SYS SP-121, Rev. 10 ; ALR 61A, Rev. 15; OFN SP-010, Rev. 5.

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_ SRO\_\_ RO\_\_  
NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 20 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Control Room X Simulator \_\_\_\_\_ Plant \_\_\_\_\_

Method of Performance: Simulate \_\_\_\_\_ Perform X

Tools and Equipment: Simulator

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Notes:

The exam group shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

Simulator set-up: **IC 171**.

Ensure Simulator in **RUN**

**ENSURE** Horns are **ON**

From the EXPERT panel input **BAT JPM158A.TXT**

>Batch File For JPM0158A, Radioactive release  
mRMS0326L (1) 5e-3 10

**Provide Examinee an Info Only Copy of Liquid Release Permit #01-001, and a copy of SYS SP-121.**

Cues with brackets, [Cue];, are to be given only if the simulator is inoperable.

\* Denotes a Critical Step

Initial Conditions:

You are the Reactor Operator, the plant is currently stable in Mode 1.

Initiating Cues:

The Control Room Supervisor directs you to perform the actions to release Waste Monitor Tank "A"(THB07A) to the environs. A new Liquid Release Permit for THB07A has been issued. The source Check has been completed and the Radwaste Operator is standing by..

Task Standard: Upon Completion of this JPM, the operator will have entered new setpoint data for the Liquid Rad Monitor and properly verified the termination of a release.

WCGS -SRO/RO/NSO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
1. *	6.3.1  Step 1	Start Time _____  To change the value of a Supervisor RM-80 Database Channel Item, perform the following:  1. Select the desired channel per step 6.1.2.	Reference Procedure Step 6.1.2  Ensure Grid 1 Displayed: a. Key in the three digit Channel Identification Number: <b>(186)</b> b. Press the SEL key. c. Selected Channel outlined in white.	S U

Cue:

Comments:

2.	6.3.1 Step 2	Place Supervisor Master Key in the key slot and turn it to SUPERVISOR position.	Lower right corner of console, key turned clockwise to the SUPERVISOR position.	S U
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Cue:

Comments:

3.	6.3.1  Steps 3,4,5, 6	Display the Supervisor RM-80 Database	At the keyboard: a. Press LIT key. b. Press the Grid 5 key. c. Press the SEL key. d. Verify the Supervisor RM-80 Database Screen is displayed.	S U
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Cue:

Comments:

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\* Denotes Critical Step

WCGS -SRO/RO/NSO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
4. *	6.3.1  Steps 7,8,9, 10	Enter setpoint data for the ALERT channel.	Select desired Channel Item to be changed. At the keyboard:  a. Press the minus (-) key.  b. Key in the desired Channel Item number. <b>(09)</b> .  c. Press the SEL key.  d. Check the selected Channel Item is backlit.	S U

Cue:

Comments:

5. *	6.3.1  Steps 11,12	Enter new setpoint data from Release Permit.	At the keyboard:  a. Key in the desired channel item value in the correct format. . 9.68 E-3 is keyed in as 9, 6, 8, -, 0, 3.  b. Press the ENTER key.	S U
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Cue:

Comments:

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\* Denotes Critical Step

WCGS -SRO/RO/NSO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
6. *	6.3.1 Steps 13,14	Verify setpoint data is correct.	<p>On the CRT screen:</p> <ul style="list-style-type: none"> <li>a. A message area will appear at the bottom of the screen</li> <li>b. IF the data in the message area is correct, THEN press the ENTER key and proceed to step 6.3.1.14.</li> <li>c. IF the entry is accepted, THEN the message at the bottom of the CRT will indicate value accepted and the value for that item will be updated in the RM-80 Column and the Master Column.</li> </ul>	S U

Cue:

Comments:

7.	N/A	Repeat elements 4 through 6 for the High Channel setpoint...	Examinee must realize that they need to repeat the steps required to also enter new setpoint for Channel Item 10.	S U
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Cue:

Comments:

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\* Denotes Critical Step

WCGS -SRO/RO/NSO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
8. *	6.3.1  Steps 7,8,9, 10	Enter setpoint data for the HIGH channel.	Select desired Channel Item to be changed. At the keyboard:  a. Press the minus (-) key. b. Key in the desired Channel Item number. <b>(10)</b> . c. Press the SEL key. d. Check the selected Channel Item is backlit.  OR a. Press the SEL key. b. Check the selected Channel Item is backlit. <b>(10)</b>	S U

Cue:

Comments: Per the NOTE preceding step 11, the examinee may press the SEL key which will advance the selected channel to channel 010.

9. *	6.3.1  Steps 11,12	Enter new setpoint data from Release Permit.	At the keyboard:  a. Key in the desired channel item value in the correct format. 9.68 E-2 is keyed in as 9, 6, 8, -, 0, 2.  b. Press the ENTER key.	S U
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Cue:

Comments:

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\* Denotes Critical Step

WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
10. *	6.3.1 Steps 13,14	Verify setpoint data is correct.	<p>On the CRT screen:</p> <ul style="list-style-type: none"> <li>a. A message area will appear at the bottom of the screen</li> <li>b. IF the data in the message area is correct, THEN press the ENTER key and proceed to step 6.3.1.14.</li> <li>c. IF the entry is accepted, THEN the message at the bottom of the CRT will indicate value accepted and the value for that item will be updated in the RM-80 Column and the Master Column.</li> </ul>	S U

Cue:

Comments:

11.	6.3.1 Step 16	Return Supervisor Master key to the NORMAL position.	Lower right corner of console, key turned counter-clockwise to the NORMAL position	S U
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Cue:

Comments:

N/A	N/A	Release Permit must be verified and authorized by the Shift Manager prior to initiating the release.	<b><u>Sign as Shift Manager on Release Permit for Setpoints Verified and Release Approved</u></b>	N/A
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Cue: Inform Examinee, **“Liquid Release Permit LRP # 01-001 is approved, phone the Radwaste Operator and inform them they can commence the release. A copy of the permit will be sent over later.”**

Comments: Give Permit back to Examinee after signing for release approval.

---

\* Denotes Critical Step



WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
12.	N/A	Calls Ext. 5810 for Simulator Radwaste and provides LRP information.	May use Gaitronics.	

Cue:

Comments: Booth Operator. Wait approximately 30 seconds after examinee has called then enter **EVENT 1** with **TRIGGER 1**. This will cause the activity level to increase on HB RE-18.

13.	N/A	Annunciator Alarms 061B and 061A.	Recognize and acknowledge alarms. Go to ALR 00-061A or Enter OFN SP-010.	S U
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Cue: "Annunciators 61A and 61B are in alarm."

Comments: The "A" tier alarm is a higher priority and should be used even though the "B" tier alarm may come in first.

NOTE: The examinee may recognize this alarm as an entry condition to OFN SP-010. If so N/A JPM elements 14 through 17 and proceed to Element 18.

14.	Step 1	ALR 61A: Determine Affected Process Radiation Monitor: SP056A – Any RED.	Determine HB 186 is RED.	S U N/A
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Cue:

Comments:

15	Steps 2 - 5	2. Check For High Reactor Coolant Activity NO – RNO go to Step 3. 3. Check For RCS Leakage To Containment NO – RNO go to Step 4. 4. Check For Steam Generator Tube Leakage NO – RNO go to Step 5. 5. Check For CCW System Leakage NO – RNO go to Step 6.	Examinee should realize all these answers would be NO and continue down the RNO column to Step 6.	S U N/A
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WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Cue:

Comments:

16*	6	Check For High High Radiation On Normal Release Path.	Examinee should answer YES and proceed ot Step 7.	S U N/A
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Cue:

Comments:

17*	7	Ensure Associated Controlled Realease Path Isolated.	Contact the Radwaste Watch and direct them to ensure HB RV-18 is closed.	S U N/A
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Cue:

Comments: May use telephone or Gaitronics. **Booth Operator:** When contacted report **“I have verified HB RV-18 is closed”**.

NOTE: If the Examinee does not use OFN SP-010 but has completed the actions of ALR 061A, then steps 18 and 19 may be N/A’d.

18	Steps 1-14	OFN SP-010 Step 1-14. Step 1 – NO Step 2 – NO RNO Go To Step 6 Step 6 – NO Step 7 – NO Step 8 – YES Step 9 – NO Step 10 – NO Step 11 – NO Step 12 – NO Step 13 – NO Step 14 – YES	Perform OFN SP-010 to step 14. The RNO column will be followed till step	S U N/A
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Cue:

Comments:

NOTE:Examinee may recognize that a Red Indication on a Process Rad Monitor is an entry condition for OFN SP-010, “ACCIDENTAL RADIOACTIVE RELEASE”, and enter it directly. If so the procedure will work through the RNO column till step 14 where HB RV-18 is verified closed.

\* Denotes Critical Step

WCGS -SRO/RO/NSO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

18*	N/A	OFN SP-010 Step 14	Contact the Radwaste Watch and direct them to ensure HB RV-18 is closed.	S U N/A
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Cue:

Comments: May use telephone or Gaitronics. **Booth Operator:** When contacted report **“I have verified HB RV-18 is closed”**.

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Termination: Contacting the Radwaste Watch to Ensure HB RV-18 is closed completes this JPM.

Stop Time \_\_\_\_\_

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\* Denotes Critical Step

WCGS -SRO/RO/NSO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Initial Conditions:

You are the Reactor Operator, the plant is currently stable in Mode 1.

Initiating Cues:

The Control Room Supervisor directs you to perform the actions to release Waste Monitor Tank "A"(THB07A) to the environs. A new Liquid Release Permit for THB07A has been issued. The source Check has been completed and the Radwaste Operator is standing by.

Notes:

Upon arriving at a component, describe to your evaluator what you expect to see (e.g. how valve, breaker, etc. position is) and what you expect to do (e.g. turn switch to run, rotate handwheel clockwise to open, etc.) and what you expect to happen (e.g. push button, red light will light, handwheel will rotate until valve is open, etc.).

When you have completed the JPM inform your evaluator that you are done by handing the Initial Conditions/Initiating Cues sheet back to him.

When recording data on Data Sheets, indicate the instrument used and vocalize the value you will record for each parameter.

WCGS-SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

TASK: Transfer CCW Service Loop

SAFETY FUNCTION: #8

TASK #: 00800004

K/A #s: 008 A1.01 – A1.04; A3.03,06,10; A4.01,03,05,08,09.

References: SYS EG-201, Rev. 22

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_ SRO\_\_ RO\_\_  
NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 25 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Control Room \_\_\_\_\_ Simulator X Plant \_\_\_\_\_

Method of Performance: Simulate \_\_\_\_ Perform X

Tools and Equipment: Simulator

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Notes:

The examiner shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

**SIMULATOR SETUP: IC 171**

**Any Mode 3 Init.**

**RUN**

Ensure the NCP is in service.

Cues with brackets, [Cue]:, are to be given only if the simulator is inoperable.

\* Denotes a Critical Step

Provide a copy of SYS EG-201 to the examinee.

Initial Conditions:

You are the BOP, the plant is stable at *Mode 3*, the CCW service loop is on the "B" Train CCW. Maintenance is pending on the "B" Train CCW HX. Lake temperature is 65° F.

Initiating Cues:

The Control Room Supervisor directs you to shift the CCW service loop to "A" Train CCW and secure the "B" Train CCW pumps per SYS EG-201 section 6.1 and 6.3. Start the "A" CCW Pump. The Aux Bldg. is performing 6.2. The CRS directs that SFP Cooling will be swapped later. A Reactivity Brief has been provided.

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
1.	6.1.1	Start Time _____ Start the desired Train A CCW Pump. N/A if a Train A CCW Pump is already running.	Recognize a CCW pump will have to be started.	N/A

Cue:

Comments:

1a.	6.1.1.1	Turn off motor space heater supply breaker for the pump to be started. N/A the other breaker.	Contact the Aux. Bldg. Operator to OPEN PG19NJF118.	S U
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Cue: Acknowledge request and report PG19NJF118 is OFF.

Comments:

1b.*	6.1.1.2	Start the desired CCW Pump.	Locate EG HIS-21 on RL019. Start the pump by turning the switch to the RUN position. Verify the Red light is lit and the Green light is out.	S U
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[Cue]: The Red light is lit on EG HIS-21.

Comments:

1c.	6.1.1.3	Verify operating CCW Pump discharge flow > 1.5E6 lbm/hr (3000 gpm). N/A non-running train.	Dispatch Aux Operator to check the "A" CCW Pump flow > 1.5E6 lbm/hr on EG FI-95 <u>Or</u> observe flow on computer point.	S U
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Cue: If paged as Aux Watch report "flow at 1.8E6 lbm/hr."

Comments:

2.	6.1.2	Locally verify CCW Train A Pump room cooler is running.  • SGL11A - RUNNING	Contact the Aux. Bldg. Operator to verify the CCW Pump Room Cooler SGL11A running.	S U
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Cue: Acknowledge request and report that SGL11A is running.

Comments:

---

\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

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•

Element #	Step #	Element	Standard	Score
3.	6.1.3	IF CCW Pump A was started THEN verify proper room cooler damper alignment.	Dispatch Aux Watch to verify GL-D156 open and 157 closed.	S U

Cue: Acknowledge direction and report *GL-D156 is open and 157 is closed.*

Comments:

4.	6.1.5	IF RHR train B is not in service, THEN align SFP HX B CCW Outlet valve is open to provide a flow path for CCW Train B.	Locate EC HIS-12 on RL021. Verify the Red light is lit.	S U
----	-------	--	---	-----

[Cue]: The Red light is lit on EC HIS-12.

Comments:

5.*	6.1.6	Close CCW Surge Tank "A" and "B" Vent Valves. <ul style="list-style-type: none"> <li>• EG HIS-10 - CLOSED</li> <li>• EG HIS-9 - CLOSED</li> </ul>	Locate EG HIS-10 on RL019. Close the valve by pressing the CLOSE P/B. Verify the Green light comes on and the Red light goes out.	S U
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[Cue]: The Green light is lit on EG HIS-10 and EG HIS-9.

Comments:

6.*	6.1.7	OPEN CCW Supply/Return valves . <ul style="list-style-type: none"> <li>• EG HS-15 - OPEN</li> </ul>	Locate EG HIS-15 on RL019. Open the valves by pressing the OPEN P/B. Verify the Red lights come on and the Green lights go out. Annunciator 51F should come in and stay in until the "B" Train Service Loop valves are closed.	S U
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[Cue]: The Red lights are on for EG ZL-15 and EG ZL-53.

Comments:

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\* Denotes Critical Step



WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
7.*	6.1.8	Close CCW Train "B" Supply/Return Valves. <ul style="list-style-type: none"> <li>EG HS-16 - CLOSED</li> </ul>	Locate EG HIS-16 on RL019. Close the valves by pressing the CLOSE P/B. Verify the Green lights come on and the Red lights go out. Verify annunciator 51F clears when both valves indicate closed.	S U

[Cue]: The Green lights are lit on EG ZL-16 and EG ZL-54 and annunciator 51F is clear.

Comments:

8.	6.1.9	Verify CCW to RW and RCS flow indication. <ul style="list-style-type: none"> <li>EG FI-55A - Between 1.6E6 and 4.3E6.</li> </ul>	Locate EG FI-55A on RL019. Verify flow indicated.	S U
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[Cue]: Flow on EG FI-55A is  $3.2 \times 10^6$  lbm/hr.

Comments:

9.*	6.1.10	Open CCW Surge Tank "A" and "B" Vent valves. <ul style="list-style-type: none"> <li>EG HIS-10 - OPEN</li> <li>EG HIS-9 - OPEN</li> </ul>	Locate EG HIS-10 on RL019. Open the valve by pressing the OPEN P/B. Verify the Red light comes on and the Green light goes out.	S U
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[Cue]: Only the Red light is lit on EG HIS-10 and EG HIS-9.

Comments: IF asked , Inform operator that the Aux Watch is aligning PASS.

10.	6.3.1	Ensure all ECCS Train "B" pumps are stopped.	Verify "B" RHR Pump, "B" SIP and "B" CCP are secured.	S U
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Cue:

Comments:

11.	6.3.2	Align SFP Cooling train "A" for operation per SYS EC-120.	Recognize that SFP Cooling lineup is not required for this JPM.	N/A
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Cue:

Comments: It is not required to align SFP Cooling for this JPM.

12.*	6.3.3	Stop the Running Train "B" CCW Pump .	Locate EG HIS-22 or EG HIS-24 on RL019. Stop the pump by turning the switch to the STOP position. Verify the Green light comes on and the Red light is out.	S U
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[Cue]: Only the Green light is lit on EG HIS 22(24).

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
13.	6.3.4	Energize the space heater for the non-running CCW Pumps.	Contact the Aux. Bldg. Operator to verify breakers, PG20GBR240 or PG20GBR241, are ON.	S U

Cue: Acknowledge request and report breakers PG20GBR240 and PG20GBR241 are ON.

Comments:

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Termination: Securing the "B" CCW Pump completes this JPM.

Stop Time \_\_\_\_\_

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\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Initial Conditions:

You are the BOP, the plant is stable, the CCW service loop is on the "B" Train CCW. Maintenance is pending on the "B" Train CCW HX. Lake temperature is 65° F.

Initiating Cues:

The Control Room Supervisor directs you to shift the CCW service loop to "A" Train CCW and secure the "B" Train CCW pumps per SYS EG-201 section 6.1 and 6.3. Start the "A" CCW Pump. The Aux Bldg. is performing 6.2. Spent Fuel Pool cooling will be swapped later.

Notes:

If you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

When you have completed the JPM inform your evaluator that you are done by handing this Initial Conditions/Initiating Cues sheet back to him.

WCGS-SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

TASK: Start H2 Analyzers Post LOCA

SAFETY FUNCTION: #5

TASK #: EPE074008

K/A #s: 028 A4.03

References: EMG FR-C1, Rev. 12, Step 8 RNO

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_-\_\_\_\_-\_\_\_\_ SRO\_\_ RO\_\_  
NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 10 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Control Room \_\_\_\_\_ Simulator X Plant \_\_\_\_\_

Method of Performance: Simulate \_\_\_\_ Perform X

Tools and Equipment: Simulator

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

## Notes:

The examiner shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

Simulator Setup: **IC 177**

NOTE: This JPM may be ran with any other JPM as long as power is available to the valves.

**ANY IC can be used for this JPM**

**RUN**

Cues with brackets, [Cue]:, are to be given only if the simulator is inoperable.

\* Denotes a Critical Step

## Initial Conditions:

You are the Reactor Operator , EMG FR-C1 ,Response to Inadequate Core Cooling , is in effect.

NOTE: The simulator is NOT setup for EMG FR-C1 conditions.(Ignore RCS and CTMT parameters)  
The simulator is running to allow you to change switch positions and receive the proper indication response.

## Initiating Cues:

The Control Room Supervisor directs you to perform Step 8 RNO of EMG FR-C1 for Train A only.  
Provide a "INFO ONLY " copy of page 14 of EMG FR-C1.

**TASK STANDARD:** Upon completion of this JPM the operator will have aligned the Train A Hydrogen Analyzers per EMG FR-C1, step 8 RNO.

## Notes:

JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

Upon arriving at a component, describe to your evaluator what you expect to see (e.g. how valve, breaker, etc. position is determined), what you expect to do (e.g. turn switch to run, rotate handwheel CCW to open, etc.) and what you expect to happen (e.g. pump will start and red light will light, handwheel will rotate until valve is open, etc.).

When you have completed the JPM inform your evaluator that you are done by handing this Initial Conditions/Initiating Cues sheet back to him.

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
1.*	8. RNO a.	Start Time _____ On RL011, place the power lockout switches for the containment sample valves, in the NON-ISO position.  GS HIS-40  GS HIS-42	Locate the switches on RL011. Push down the NON-ISO P/B and ensure the button locks down. Verify the White light is lit.	S U

[Cue]: "White lights are lit", on GS HIS-40 and GS HIS-42.

Comments:

2.*	8. RNO b.	OPEN only one Hydrogen Analyzer Inner Ctmt. Isolation Valve, GS HIS-13 or GS HIS-14.	Locate the switches on RL011. Open the valve by pressing the OPEN P/B. Verify the Red light comes on and the Green light goes out.	S U
-----	-----------------	--	--	-----

[Cue]: "The Red light is lit and the Green light is out", on GS HIS-13 or GS HIS-14.

Comments: Request examinee to locate both switches.

3.	8. RNO c.	Open the remaining Hydrogen Analyzer Ctmt. Isolations for Train A.	Complete elements 3a through 3c.	N/A
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Comments:

3a.*	8. RNO c.	OPEN GS HIS-12.	Locate the switch on RL011. Open the valve by pushing the OPEN P/B. Verify the Red light comes on and the Green light goes out.	S U
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[Cue]: "The Red light is lit and the Green light is out", on GS HIS-12.

Comments:

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\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
3b.*	8. RNO c.	OPEN GS HIS-17.	Locate the switch on RL011. Open the valve by pushing the OPEN P/B. Verify the Red light comes on and the Green light goes out.	S U

[Cue]: "The Red light is lit and the Green light is out", on GS HIS-17.

Comments:

3c*	8. RNO c.	OPEN GS HIS-18.	Locate the switch on RL011. Open the valve by pushing the OPEN P/B. Verify the Red light comes on and the Green light goes out.	S U
-----	-----------------	-----------------	---	-----

[Cue]: "The Red light is lit and the Green light is out", on GS HIS-18.

Comments:

4.*	8. RNO d.	On RL020, place the CTMT Hydrogen Analyzer control switch, GS HIS-16A, to ANALYZE.	Locate the switch on RL020. Rotate the switch until the arrow points to ANALYZE. The Red light should come on.	S U
-----	-----------------	--	--	-----

[Cue]: "The Red light is lit", on GS HIS-16A.

Comments:

4.	8. RNO e.	Monitor CTMT Hydrogen concentration.	Locate GS AI-19 on RL020.	S U
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Cue: "Meter indicates 0% Hydrogen."

Comments:

5.	N/A	Return to step in effect.	Notify the CRS that Hydrogen Analyzer A is in service.	S U
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Comments:

Termination: Hydrogen analyzer A is aligned to sample CTMT hydrogen.  
 Stop Time: \_\_\_\_\_

\* Denotes Critical Step



WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Initial Conditions:

You are the Reactor Operator , EMG FR-C1, Response to Inadequate Core cooling, is in effect.

NOTE: The simulator is NOT setup for EMG FR-C1 conditions. (Ignore RCS and CTMT parameters)  
The simulator is running to allow you to change switch positions and receive the proper indication response.

Initiating Cues:

The Control Room Supervisor directs you to perform Step 8 RNO of EMG FR-C1 for Train A only.

Notes:

JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

Upon arriving at a component, describe to your evaluator what you expect to see (e.g. how valve, breaker, etc. position is determined), what you expect to do (e.g. turn switch to run, rotate handwheel CCW to open, etc.) and what you expect to happen (e.g. pump will start and red light will light, handwheel will rotate until valve is open, etc.).

When you have completed the JPM inform your evaluator that you are done by handing this Initial Conditions/Initiating Cues sheet back to him.

WCGS-SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

TASK: Increase Accumulator Tank Pressure - Modes 1, 2 or 3

TASK #: 00600029

**SAFETY FUNCTION #:3**

K/A #: A1.13, A4.02

References: SYS EP-200, Rev. 23

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_ SRO\_\_ RO\_\_  
NSO\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 10 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Control Room \_\_\_\_\_ Simulator X Plant \_\_\_\_\_

Method of Performance: Simulate \_\_\_\_ Perform X

Tools and Equipment: Simulator

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

## Notes:

The exam group shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

Simulator set-up: **IC 177**  
**INIT 30** or any Mode 3, 2 or 1 INIT.  
**RUN**  
**BAT JPM029.txt**

Contents of Bat JPM029.txt: SET ASISAG (3) = 965

Ensure an "Information Only" copy of SYS EP-200 with cover sheet and initial conditions signed off is available.

Cues with brackets, [Cue]:, are to be given only if the simulator is inoperable.

\* Denotes a Critical Step

## Initial Conditions:

You are the Reactor Operator, the plant is stable in Mode 1. Accumulator "C" pressure is ≈610 psig, annunciator 45B is lit.

\*Provide Mode from Init used.

## Initiating Cues:

The Control Room Supervisor directs you to raise SI Accumulator "C" pressure to 630 psig using section 6.6 of SYS EP-200. Prerequisites have been completed.

Provide the "Info Only" copy of SYS EP-200 to the examinee.

If you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
1.	6.6.1	Start Time _____ Ensure N <sub>2</sub> pressure regulator at the N2 skid is set at 700 psig.	Contact Site Operator, verify regulator setting.	S U

Cue: Acknowledge request, report "**N<sub>2</sub> high pressure regulator is set at 700 psig**".

Comments:

2.	6.6.2	Ensure Accumulator N <sub>2</sub> Supply Vent Valve Control is closed.  • EP HCV-943 - CLOSED.	Locate EP HC-943 on RL018. Verify the pot output meter reads 0%.	S U
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Comments:

3.	6.6.5	IF increasing Accumulator Tank "C" pressure, THEN perform the following:	Complete elements 3a through 3d.	N/A
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Cue:

Comments: The Examinee may use the NPIS computer points or NPIS Graphic display to monitor accumulator pressure.

3a.*	6.6.5.1	OPEN Accumulator Tank N <sub>2</sub> supply valve .  • EP HIS-8875C - OPEN	Locate EP HIS-8875C on RL018. Open the valve by pressing the OPEN P/B. Verify the Red light comes on and the Green light goes out.	S U
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[Cue]: "The Red light is lit" on EP HIS-8875C.

Comments: Valves for other accumulators should be marked N/A.

3b.*	6.6.5.2	OPEN Accumulator Tanks N <sub>2</sub> supply valve.  • EP HV-8880 - OPEN	Locate EP HIS-8880 on RL018. Open the valve by pressing the OPEN P/B. Verify the Red light comes on and the Green light goes out.	S U
------	---------	--	---	-----

[Cue]: "The Red and Green lights are lit", (pause), "the green light is out" on EP HIS-8880, "pressure is increasing on EP PI-964 and EP PI-965."

Comments:

Note: If simulator is inoperable, after a short pause provide [Cue] "pressure is 625 psig and increasing". If examinee does not close EP HV-8880 provide additional [Cue], "pressure is 635 psig and increasing".

\* Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
3c.*	6.6.5.3	WHEN desired pressure is reached, THEN CLOSE Accumulator Tanks N2 supply valve. <ul style="list-style-type: none"> <li>EP HV-8880 - CLOSED</li> </ul>	Locate EP PI-964 and EP PI-965 on RL018. Verify pressure is ≈ 630 psig. Locate EP HIS-8880 on RL018. Close the valve by pressing the CLOSE P/B. Verify the Green light comes on and the Red light goes out.	S U

[Cue]: "The Green and Red lights are lit", (pause), "the Red light is out" on EP HIS-8880, "EP PI-964 and EP PI-965 indicate 630 psig."

Comments:

3d.	6.6.5.4	CLOSE the Accumulator Tank N <sub>2</sub> supply valve. <ul style="list-style-type: none"> <li>EP HIS-8875C - CLOSED</li> </ul>	Locate EP HIS-8875C on RL018. Close the valve by pressing the CLOSE P/B. Verify the Green light comes on and the Red light goes out.	S U
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[Cue]: "The Green and Red lights are lit", (pause), "the Red light is out" on EP HIS-8875C.

Comments: Valves for other accumulators should be marked N/A.

4.	6.6.7	<ul style="list-style-type: none"> <li>Procedure step for section 6.6 complete.</li> </ul>	Sign off step.	S U
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[Cue]:

Comments: Not a critical step or required to complete the JPM.

Termination: Closing EP HIS-8875C completes the JPM.

Stop Time \_\_\_\_\_

\*Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Initial Conditions:

You are the Reactor Operator, the plant is stable in its present Mode. Accumulator "C" pressure is ≈610 psig, annunciator 45B is lit.

Initiating Cues:

The Control Room Supervisor directs you to raise SI Accumulator "C" pressure to 630 psig using section 6.6 of SYS EP-200. The prerequisites have been performed.

Notes:

If you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

When you have completed the JPM inform your evaluator that you are done by handing this Initial Conditions/Initiating Cues sheet back to him.

WCGS-SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

TASK: Restore Charging after a loss of CCP(ASP)

SAFETY FUNCTION: #2

TASK #: 00400028

K/A #s: 004 A1.04, 06,07,08; A2.02, 07,11,22; A3.02,09,10,11,14; A4.05, 06,08,11.

References: SYS BG-201, Rev. 34, ALR 00-042A, Rev. 10, SYS BG-120, Rev. 27

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ SRO\_ RO\_ NSO\_

The examinee's performance was evaluated against the standards in this JPM and determined to be :

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 30 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Control Room \_\_\_\_ Simulator X Plant \_\_\_\_\_

Method of Performance: Simulate \_\_\_\_ Perform X

Tools and Equipment: Simulator

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Notes:

The exam group shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

Ensure an "Information Only" copy of SYS BG-201 with cover sheet and initial conditions signed off is available.

Simulator setup: **IC 177**

Any Mode 1 Init with "B" CCW train in service and "B" CCP L/U to Normal Charging.

**RUN**

**BAT JPM026.txt**

\*Ensure NCP is running.

\*Ensure a CCW pump is running in B Train and "B" CCP lined up to normal charging.

Cues with brackets, [Cue]:, are to be given only if the simulator is inoperable.

\* Denotes a Critical Step

Initial Conditions:

You are the Reactor Operator, the plant is stable in Mode 1.

Initiating Cues:

The Control Room Supervisor directs you to start the "B" CCP and secure the NCP to support maintenance on the NCP next shift. Initial conditions of SYS BG-201 are complete.

Provide the "Info Only" copy of SYS BG-201 to the examinee.



WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
1.	6.2.1	Start Time _____ Verify CCP Flow Control BG FK-121, is in MANUAL and set at 20%.	Locate BG FK-121 on RL001. Depress the MANUAL P/B. Depress either the INCREASE or DECREASE button until the output reads 20% OPEN.	S U

[Cue]: BG FK-121 MANUAL P/B is lit, output meter indicates 20%.

Comments:

2.	6.2.2	Verify CCP B Recirc Valve is OPEN.  • BG HV-8111 -- OPEN	Locate BG HIS-8111 on RL001. Verify the Red light is lit.	S U
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[Cue]: Only the Red light is lit on BG HIS-8111.

Comments:

3.	6.2.3	Verify CCW is being supplied to CCP B.	Locate EG HIS-22 and EG HIS-24 on RL019. START or verify CCW pump B or D running by the Red light lit on the handswitch.	S U
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Cue: If Aux. Bldg. Operator is contacted, acknowledge request and report "**CCW is lined up to CCP "B"**".

[Cue]: Red light is lit on EG HIS-22 or EG HIS-24.

Comments: **Examinee may contact Aux. Bldg. Operator to verify CCW lined up to CCP B. Ensure three-way communications is used.**

4.	6.2.4	IF RCS temperature is greater than or equal to 200°F, THEN ensure CCP A discharge header FCV-121 inlet isolation valve is locked closed.  • BG-V8483A - LOCKED CLOSED	Contact the Aux Watch to verify BG-V8483A is locked closed.	S U
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Cue: Report as the Aux Watch that "**BG-V8483A is locked closed**".

Comments: Ensure 3-way communication is used.

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\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
5.	6.2.5	Lock open CCP B discharge Header FCV-121 Inlet Isolation valve.  <ul style="list-style-type: none"> <li>• BG V8483C -- OPEN</li> </ul>	Contact Aux. Bldg. Operator, verify the status of BG-V8483C.	S U

Cue: Acknowledge direction, report ***BG-V8483C is open.***

Comments: Ensure three-way communications is used.

6.	6.2.6	Ensure CCP B Aux. Lube Oil Pump in AUTO.  <ul style="list-style-type: none"> <li>• BG HIS-2AX -- IN AUTO</li> </ul>	Locate BG HIS-2AX on RL001. Verify the switch in AUTO and the Red light lit.	S U
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[Cue]: *BG HIS-2AX is in AUTO, red light is lit*

Comments:

7.*	6.2.7	Start CCP B (PBG05B).  <ul style="list-style-type: none"> <li>• BG HIS-2A -- STARTED</li> </ul>	Locate BG HIS-2A on RL001. Start the pump by turning the switch to RUN. Verify the Red light comes on and the Green light goes out. Verify a flow increase on BG FI-121 (located on RL002).	S U
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[Cue]: *Red light is lit on BG HIS-2A and flow increased on BG FI-121.*

Comments: A Gaitronics Announcement should be made prior to starting the CCP (Per AP21-001, section 6.4.3).

8.*	6.2.8	Place NCP Flow Controller in MANUAL.  <ul style="list-style-type: none"> <li>• BG FK-462 -- IN MANUAL</li> </ul>	Locate BG FK-462 on RL001. Depress the MANUAL P/B. Verify the MANUAL P/B is lit.	S U
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[Cue]: *BG FK-462 MANUAL P/B is lit.*

9.*	6.2.9	Slowly close NCP Discharge Flow Control valve to 20% while maintaining a constant charging header flow by performing the following simultaneously:  <ul style="list-style-type: none"> <li>• Lower NCP Discharge Flow Controller to 20% output using BG FK-462</li> <li>• Adjust CCP flow control valve as necessary to maintain a constant charging header flow using , BG FK-121.</li> </ul>	Push the LOWER P/B on BG FK-462 while pushing the RAISE P/B on BG FCV-121. Try to maintain a constant flow on BG FI-121.	S U
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[Cue]: *BG FK-462 indicates 20%, BG FI-121 indicates 120 gpm.*

Comments:

\* Denotes Critical Step

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Element #	Step #	Element	Standard	Score
10.*	6.2.10	When the NCP Discharge Flow Controller is at 20%, THEN stop the NCP.  • BG HIS-3 -- STOPPED	Monitor BG FK-462, when the output reads 20%, turn BG HIS-3 (located on RL001) to OFF. Verify the Green light comes on and the Red light goes out..	S U

[Cue]: “Output reads 20%” , after examinee describes stopping the NCP, “Green light is lit on BG HIS-3”.

Comments: A Gaitronics Announcement should be made prior to securing the NCP.

11.	6.2.11	Verify NCP Discharge Flow Controller in MANUAL with 20% output.  • BG FK-462 - MANUAL AT 20%	Same as element.	S U
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[Cue]:

Comments:

**NOTE: If the CCP trips before steps 6.2.12 through 6.2.16 (elements 12 to 16) are performed, circle N/A for score.**

12.	6.2.12	Adjust CCP flow control valve as necessary to maintain PZR level at program value.  • BG FK-121 -- ADJUSTED	Locate BG FK-121 on RL001. Adjust the controller as necessary to obtain the desired flow on BG FI-121.	S U  N/A
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[Cue]:

Comments:

13.	6.2.13	Adjust the charging header backpressure control valve as necessary to maintain RCP Seal Injection Flow between 8 and 13 gpm. N/A if not required.	Locate BG HC-182 on RL001. Adjust the pot to maintain 8 -13 gpm as indicated on BG FR-154, BG FR-155, BG FR-156, BG FR-157 on RL022.	S U  N/A
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[Cue]: The recorders indicate 9 gpm.

Comments:

14.	6.2.14	OPEN CCP B discharge PI-119 isolation valve.  • BG V094 -- OPEN	Direct Aux. Bldg. Operator to open BG-V094.	S U  N/A
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Cue: Report, “BG-V094 is open”.

Comments: Ensure three-way communications is used.

\* Denotes Critical Step

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Element #	Step #	Element	Standard	Score
15.	6.2.15	Close NCP Discharge PI-463 Isolation valve. <ul style="list-style-type: none"> <li>• BG-V803 - CLOSED</li> </ul>	Contact the Aux Watch to close BG-V803.	S U  N/A

Cue: Report , "*BG-V803 is closed*".

Comments: Ensure three-way communications is used.

16.	6.2.16	Close NCP Discharge PI-117 Isolation valve. <ul style="list-style-type: none"> <li>• BG-V014 - CLOSED</li> </ul>	Contact the Aux Watch to close BG-V014.	S U  N/A
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Cue: Report , "*BG-V014 is closed*".

Comments: Ensure three-way communications is used.

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\* Denotes Critical Step

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Element #	Step #	Element	Standard	Score
17.	N/A	Acknowledge alarms.	Depress ANN ACK P/B.	S U N/A

[Cue]: Alarms are acknowledged.

Comments: **Since annunciator horns are turned off during JPMs, examinee may not acknowledge alarms. Notify examinee that annunciators are alarming.**

18.	N/A	Report CCP trip to CRS.	Report CCP B has tripped.	S U
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Cue: **Acknowledge report, direct examinee to respond to ALR 042A and report when charging and letdown are balanced.**

Comments:

19.	N/A	Refer to alarm responses.	Refer to ALR 00-38A, ALR 00-042A and/or ALR 00-042E.	S U NA
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Comments:

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\* Denotes Critical Step

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JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
20.	N/A	(ALR 00-042A, CHARGING FLOW HI/LO)	Complete elements 20a through 21h.	N/A

[Cue]:

Comments:

20a.	1.	Check Charging header flow - Greater Than 150 gpm.  • BG FI-121A	Locate BG FI-121A on RL001. Check if flow is greater than 150 gpm.	S U  N/A
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[Cue]: "BG FI-121A indicates 0 gpm."Comments: **Examinee should go to step 5 per the RNO.**

20a.1	1. RNO	GO TO STEP 5.	Same as element.	S U
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Comments:

20b.	5.	Check if Charging header flow - Less Than 45 gpm.  • BG FI-121A	Check if flow is less than 45 gpm on BG FI-121A. Recognize that in previous step flow was 0 gpm.	S U  N/A
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[Cue]: "BG FI-121A indicates 0 gpm"

\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
20c.	6.	Check Charging Pumps - ANY RUNNING. <ul style="list-style-type: none"> <li>• BG HIS-1A for CCP A</li> <li>• BG HIS-1B for CCP B</li> <li>• BG HIS-3 for NCP</li> </ul>	Recognize that since the NCP was secured and the CCP tripped that no charging pumps are running and go to the RNO.	S U N/A

Comment:

20c.1.*	6. RNO a.	Close Letdown Orifice Isolate valves. <ul style="list-style-type: none"> <li>• BG HIS-8149AA</li> <li>• BG HIS-8149BA</li> <li>• BG HIS-8149CA</li> </ul>	Locate BG HIS-8149AA, 8149BA, 8149CA on RL001. Depress the CLOSE P/B(s). Verify the Green lights come on and the Red light(s) go off.	S U N/A
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[Cue]: **As handswitch(es) are operated "the Green and Red lights are lit"**, (pause), "**the Red light is out**" on BG HIS-8149AA, 8149BA, 8149CA".

Comments:

20c.2	6. RNO b.	Start any available charging pump. <ul style="list-style-type: none"> <li>• BG HIS-1A for CCP A</li> <li>• BG HIS-1B for CCP B</li> <li>• Start NCP</li> </ul>	Start the NCP.	S U
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[Cue]: **BG HIS-3 Red light is lit.**

Comments: A Gaitronics Announcement should be made prior to starting the NCP (Per AP21-001, section 6.4.3).

20d.	7.	Check PZR level - AT PROGRAM VALUE. <ul style="list-style-type: none"> <li>• BB LR-459</li> </ul>	Locate BB LI-459, 460 or 461 on RL002. Verify level is at program level.	S U N/A
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[Cue]: **PZR level is below program and slowly increasing.**

Comments: **Examinee should recognize that with no letdown PZR level will slowly increase and go to the RNO for step 6 to establishing letdown.**

\* Denotes Critical Step

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Element #	Step #	Element	Standard	Score
20d.2	7. RNO a.	Place running charging pump flow controller in manual and adjust charging flow as necessary to establish PZR level at program value.	Place BG FK-462 in manual and control charging flow to establish PZR level at program.	S U

[Cue]: BG FK-462 manual light is lit and PZR level is returning to program value.

Comments:

20d.2	7. RNO b.	Establish desired letdown by performing step 6.5 of SYS BG-120.	Complete elements 20d.2(a) through 20d.2(d)	N/A
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Comments:

20d.2(a)	6.5.1	Ensure PZR level greater than 17%.	Locate BB LI-459, 460 and 461 on RL002. Verify level greater than 17%.	S U
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[Cue]: Level indicates 57% (if at 100% power).

Comments:

20d.2(b)	6.5.2	Ensure letdown hx outlet temperature control valve is in AUTO.  • BG TK-130 - IN AUTO	Locate BG TK-130 on RL001. Verify controller is automatic.	S U
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[Cue]: AUTO lamp is lit.

Comments:

20d.2(c)	6.5.3	IF RCS to letdown regen hx valves, BG HIS-459 and BG HIS-460, are open, THEN perform the following:	Recognize that BG HIS-459 and 460 are open. Complete elements 20d.2(c)1 and 20d.2(c)6.	N/A
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[Cue]: BG HIS-459 and 460 red lights are lit.

Comments:

20d.2(c) 1	6.5.3.1	Place letdown hx outlet pressure controller in manual.  • BG PK-131 - IN MANUAL	Locate BG PK-131 on RL001. Depress the Manual P/B.	S U
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[Cue]: Manual lamp is lit.

Comments:

\* Denotes Critical Step



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Element #	Step #	Element	Standard	Score
20d.2(c) 2	6.5.3.2	Adjust letdown hx outlet pressure controller to between 90% and 100%.	Same as element.	S U

[Cue]: BG FK-131 indicates 95%.

Comments:

20d.2(c) 3*	6.5.3.3	Open letdown orifice isolation valves as necessary to establish desired letdown.	Open BG HIS-8149AA and 8149BA or CA to establish 120 gpm letdown.	S U
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Cue: **If examinee asks, Desired letdown is 120 gpm.**

[Cue]: "Red lamp is lit", "Green lamp is out" on BG HIS 8149AA and 8149 BA or CA.

Comments:

20d.2(c) 4	6.5.3.4	Adjust letdown hx outlet pressure controller to obtain 350 psig.  • BG PK-131 - ADJUSTED TO 350 psig	Using the decrease P/B close BG PV-131 to increase backpressure to 350 psig.	S U
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[Cue]: Letdown hx outlet pressure is 350 psig.

Comments:

20d.2(c) 5*	6.5.3.5	Place letdown hx outlet pressure controller in AUTO.  • BG PK-131 - IN AUTO	Depress the AUTO P/B.	S U
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[Cue]: Auto P/B is lit.

Comments:

20d.2(c) 6*	6.5.3.6	IF NCP is running, THEN place the NCP discharge flow controller in Automatic as directed by the SM/CRS.	Ask CRS if BG FK-462 should be placed in automatic.	S U
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Cue: *"Place BG FK-462 in automatic after Charging and letdown are matched."*

Comments: **Ensure three-way communications is used.**

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\* Denotes Critical Step

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Element #	Step #	Element	Standard	Score
20d.2(d)	6.5.4	IF RCS to letdown regen hx isolation valves, BG HIS-459 and BG HIS-460 are closed, THEN perform the following:	Recognize that BG HIS-459 and BG HIS-460 were open.	S U

Comments:

20e.	8.	Check Letdown Hx Outlet Temperature - LESS THAN 130°F.  • BG TI-130	Locate BG TI-130 on RL002. Check temperature less than 130°F.	S U  N/A
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[Cue]: Temperature is 110°F.

Comments:

20f.	9.	Check charging header flow and letdown flow - BALANCED.	Check the flow indicators to see if charging and letdown are balanced. Recognize that letdown is isolated.	S U  N/A
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[Cue]: **If 120 letdown is in service, Charging flow is 132 gpm. or if 75 letdown is in service, Charging flow is 87 gpm.**

20g.	10.	Verify CCP adequate flow:  • Check CCPs - ANY RUNNING.	Recognize there is no CCP running and go to step 10 per the RNO.	S U  N/A
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Comments:

20h.	11.	Return to procedure and step in effect.	N/A	S U  N/A
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Comments:

<p>Termination: Balancing charging and letdown completes the JPM.</p> <p>Stop Time _____</p>
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\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Initial Conditions:

You are the Reactor Operator, the plant is stable in Mode 1.

Initiating Cues:

The Control Room Supervisor directs you to start the "B" CCP and secure the NCP to support maintenance on the NCP next shift. Initial conditions of SYS BG-201 are complete.

Notes:

If you have a question about the task or need clarification do not hesitate to ask your evaluator. JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

WCGS-SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

**TASK:** Feed Steam Generators using the Turbine Driven Auxiliary Feedwater Pump.

**SAFETY FUNCTION:** #4

**TASK/JTA:** 06100043.

**K/A #s:** 061A1.01, 02,04,05; A3.01, 02,03,04.

**References:** SYS AL-120, Rev. 25

Examinee's Name \_\_\_\_\_ SS No. \_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_ SRO\_\_\_\_  
RO\_\_\_\_

The examinee's performance was evaluated against the standards in this JPM and determined to be:

SATISFACTORY \_\_\_\_ MARGINAL \_\_\_\_ UNSATISFACTORY \_\_\_\_

Reason, if MARGINAL or UNSATISFACTORY:

Estimated JPM completion Time: 25 min.

Actual Performance Time: \_\_\_\_\_ min.

Location of Performance: Control Room \_\_\_\_\_ Simulator X Plant \_\_\_\_\_

Method of Performance: Simulate \_\_\_\_ Perform X

Tools and Equipment: Simulator

Evaluators Signature: \_\_\_\_\_ Date \_\_\_\_\_

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Notes:

The examiner shall verify that the procedure revision for this JPM is current and that any changes against the referenced procedure does not invalidate this JPM.

Ensure an information only copy of SYS AL-120, "Feeding Steam Generators with a Motor Driven or Turbine Driven AFW Pump," with cover sheet and prerequisites signed off, is available.

Simulator set-up:

**IC: 177**

**HORN: On**

**RUN**

*PhD. Expert:* **BAT jpm022a.txt**

Contents of BAT jpm022a.txt:

>De-energizes FC HIS-312A handswitch and indicating lamps.  
IRF rFCH312 1

\* Ensure all steam generators are between 40% and 45% narrow range.

Cues with brackets, [Cue];, are to be given only if the simulator is inoperable.

\* Denotes a Critical Step.

Initial Conditions:

You are the Reactor Operator, the plant is stable in Mode 3. Steam Generator narrow range levels are ~ 40% to 45% with control rod shutdown banks withdrawn.

Initiating Cues:

The Control Room Supervisor directs you to start the turbine driven Auxiliary Feedwater (AFW) pump and increase steam generator levels to ≈50% narrow range using section 6.2 of SYS AL-120, "Feeding Steam Generators with a Motor Driven or Turbine Driven AFW Pump." Feed at a rate of 75,000 lbm/hr per steam generator. Return the turbine driven AFW pump back to standby conditions. The prerequisites have been completed.

Provide an information only copy of SYS AL-120 to the examinee.

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
1.	6.2.1	Start Time _____ Verify Auxiliary Feedwater Pump Turbine Mechanical Trip/Throttle Valve is closed. <ul style="list-style-type: none"> <li>• FC HIS-312A - CLOSED</li> </ul>	Locate handswitch FC HIS-312A on panel RL005. Recognize that the Red and Green lamps are extinguished. Check the Red and Green lamps good. Communicate with the Control Room Supervisor that lamps are good and no power available.	S U

[Cue]: *“Green and Red lamp are extinguished on FC HIS-312A.”*

**BOOTH OPERATOR:** If called as the Turbine Building operator, reply, *“I checked the mechanical overspeed device and it is not tripped.”*

Cue: **Acknowledge the information as the Control Room Supervisor and reply, “Electrical Maintenance has checked the DC disconnect and there is no problem there.” Ask, “What do you think is the probable cause of the failure?”**

Comments: Utilize three-way communication.

1.a	N/A	Determine the location of the control power fuses for handswitch FC HIS-312A.	Locate electrical schematic diagram E-13FC23. Trace the control power to FC HIS-312A. Fuses are located in panel RP-266. Communicate with the <b>Control Room Supervisor</b> the control power fuse panel.	S U
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[Cue]: *“Understand the control power fuses for FC HIS-312A are located in panel RP-266. Electrical Maintenance has repaired the circuit.”*

Cue: **Acknowledge the information as the Control Room Supervisor and reply, “Understand the control power fuses for FC HIS-312A are located in panel RP-266. Electrical Maintenance has repaired the circuit.”**

**BOOTH OPERATOR:** Select *“Action”* for the Action Lists. Choose *Fuse/Brkr (R)* folder, type *RFCH312* and double click on item. Choose *Rack In* from the Remote value and click *Insert*.

Comments: Utilize three-way communication.

2.	6.2.2	Close the turbine driven AFW pump discharge throttle valves to each steam generator.	Complete elements 2.a. through 2.d.	N/A
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Comments:

\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
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Element #	Step #	Element	Standard	Score
2.a.*	6.2.2.1.	S/G A turbine driven AFW pump discharge throttle valve closed. <ul style="list-style-type: none"> <li>• AL HK-8A - CLOSED</li> </ul>	Locate controller AL HK-8A on panel RL006. Move the controller lever to the left and observe the controller meter indicates 0 output and the Close lamp illuminates.	S U

[Cue]: *“Controller AL HK-8A meter indicates 0 output.”*

Comments:

2.b.*	6.2.2.2.	S/G B turbine driven AFW pump discharge throttle valve closed. <ul style="list-style-type: none"> <li>• AL HK-10A - CLOSED</li> </ul>	Locate controller AL HK-10A on panel RL006. Move the controller lever to the left and observe the controller meter indicates 0 output and the Close lamp illuminates.	S U
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[Cue]: *“Controller AL HK-10A meter indicates 0 output.”*

Comments:

2.c.*	6.2.2.3.	S/G C turbine driven AFW pump discharge throttle valve closed. <ul style="list-style-type: none"> <li>• AL HK-12A - CLOSED</li> </ul>	Locate controller AL HK-12A on panel RL006. Move the controller lever to the left and observe the controller meter indicates 0 output and the Close lamp illuminates.	S U
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[Cue]: *“Controller AL HK-12A meter indicates 0 output.”*

Comments:

2.d.*	6.2.2.4.	S/G D turbine driven AFW pump discharge throttle valve closed. <ul style="list-style-type: none"> <li>• AL HK-6A - CLOSED</li> </ul>	Locate controller AL HK-6A on panel RL006. Move the controller lever to the left and observe the controller meter indicates 0 output and the Close lamp illuminates.	S U
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[Cue]: *“Controller AL HK-6A meter indicates 0 output.”*

Comments:

3.	6.2.3	Open at least one steam supply valve to turbine driven AFW pump:	Complete element 3.a. or 3.b.	N/A
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Comments: Examinee may complete either element 3.a. or 3.b.

\* Denotes Critical Step

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Element #	Step #	Element	Standard	Score
3.a.*	6.2.3.1.	Loop 2 Steam To Auxiliary Feedwater Pump Turbine open. <ul style="list-style-type: none"><li>AB HIS-5A - OPEN</li></ul>	Locate handswitch AB HIS-5A on panel RL005. Depress the Open pushbutton. Verify the Red lamp illuminates and the Green lamp extinguishes.	S U N/A

[Cue]: *If the examinee opens AB HIS-5A, then report, "Red lamp is illuminated and the Green lamp is extinguished on AB HIS-5A."*

Comments:

3.b.*	6.2.3.2.	Loop 3 Steam To Auxiliary Feedwater Pump Turbine open. <ul style="list-style-type: none"><li>AB HIS-6A - OPEN</li></ul>	Locate handswitch AB HIS-6A on panel RL005. Depress the Open pushbutton. Verify the Red lamp illuminates and the Green lamp extinguishes.	S U N/A
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[Cue]: *If the examinee opens AB HIS-6A, then report, "Red lamp is illuminated and the Green lamp is extinguished on AB HIS-6A."*

Comments:

4.	6.2.4	Start turbine driven AFW pump:	Complete elements 4.a. through 4.c.	N/A
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Comments:

4.a.*	6.2.4.1	Open Auxiliary Feedwater Pump Turbine Mechanical Trip/Throttle valve. <ul style="list-style-type: none"><li>FC HIS-312A - OPEN</li></ul>	Locate handswitch FC HIS-312A on panel RL005. Depress the Open pushbutton. Verify the Red lamp illuminates and the Green lamp extinguishes. Verify the Green lamp (ZL 312AA) extinguishes and the White (ZL 312AB) and Red (ZL 312AC) lamps illuminate on ZL 312.	S U
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[Cue]: *"Red lamp illuminates and the Green lamp extinguishes on FC HIS-312A. Green lamp extinguishes and the White and Red lamps illuminate on ZL 312."*

Comments: A plant announcement should be made prior to starting the pump (AP 21-001, 6.4.3).

4.b.	6.2.4.2	Time valve opened: _____	Record the time the valve was opened.	S U
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Comments:

\* Denotes Critical Step



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Element #	Step #	Element	Standard	Score
4.c.*	6.2.4.3	Verify pump discharge pressure greater than 1625 psig.  AL PI-21A: _____ psig.	Locate pressure indicator AL PI-21A on panel RL005. Verify and record pressure.	S U

[Cue]: *“Pressure indicator AL PI-21A reads 1700 psig.”*

Comments:

5.	6.2.5	Throttle flow to desired steam generator(s):	Complete elements 5.a. through 5.d.	N/A
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Comments:

5.a.*	6.2.5.1.	Steam Generator A  <ul style="list-style-type: none"> <li>AL HK-8A - THROTTLED</li> </ul>	Locate controller AL HK-8A and flow indicator AL FI-2A on panel RL006. Move the control lever to the right to increase flow. Recognize initiating cue says to flow 75,000 lbm/hr to each steam generator. Verify flow on AL FI-2A.	S U
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[Cue]: *“AL HK-8A meter is moving to the right, flow is increasing, flow indicator AL FI-2A reads 75,000 lbm/hr.”*

Comments:

5.b.*	6.2.5.2.	Steam Generator B  <ul style="list-style-type: none"> <li>AL HK-10A - THROTTLED</li> </ul>	Locate controller AL HK-10A and flow indicator AL FI-3A on panel RL006. Move the control lever to the right to increase flow. Recognize initiating cue says to flow 75,000 lbm/hr to each steam generator. Verify flow on AL FI-3A.	S U
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[Cue]: *“AL HK-10A meter is moving to the right, flow is increasing, flow indicator AL FI-3A reads 75,000 lbm/hr.”*

Comments:

5.c.*	6.2.5.3.	Steam Generator C  <ul style="list-style-type: none"> <li>AL HK-12A - THROTTLED</li> </ul>	Locate controller AL HK-12A and flow indicator AL FI-4A on panel RL006. Move the control lever to the right to increase flow. Recognize initiating cue says to flow 75,000 lbm/hr to each steam generator. Verify flow on AL FI-4A.	S U
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[Cue]: *“AL HK-12A meter is moving to the right, flow is increasing, flow indicator AL FI-4A reads 75,000 lbm/hr.”*

Comments:

\* Denotes Critical Step

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 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
5.d.*	6.2.5.4.	Steam Generator D <ul style="list-style-type: none"> <li>AL HK-6A - THROTTLED</li> </ul>	Locate controller AL HK-6A and flow indicator AL FI-1A on panel RL006. Move the control lever to the right to increase flow. Recognize initiating cue says to flow 75,000 lbm/hr to each steam generator. Verify flow on AL FI-1A.	S U

[Cue]: *“AL HK-6A meter is moving to the right, flow is increasing, flow indicator AL FI-1A reads 75,000 lbm/hr.”*

Comments:

6.	6.2.6	Record turbine driven AFW pump total flow:	Complete element 6.a.	N/A
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Comments:

6.a.*	6.2.6.1.	Total Flow: _____ lbm/hr. <ul style="list-style-type: none"> <li>AL FI-2A for S/G A</li> <li>AL FI-3A for S/G B</li> <li>AL FI-4A for S/G C</li> <li>AL FI-1A for S/G D</li> </ul>	Locate flow indicators AL FI-2A, AL FI-3A, AL FI-4A, and AL FI-1A on panel RL006. Add the four readings from the meters and record the result.	S U
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[Cue]: *Note that 75,000 lbm/hr was given for each steam generator. Total will be 300,000 lbm/hr.*

Comments:

7.	6.2.7	While feeding steam generators, monitor steam generator narrow range and wide range levels.	Locate level indicators AE LI-517, 518, & 519 for S/G A; AE LI-527, 528, & 529 for S/G B; AE LI-537, 538, & 539 for S/G C; AE LI-547, 548, & 549 for S/G D on panel RL026. Locate level indicators AE LI-551 & 501(A), AE LI-552 & 502(B), AE LI-553 & 503(C), and AE LI-554 & 504(D) on panel RL025. Monitor levels.	S U
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[Cue]: *“Narrow range and wide range levels are increasing.”*

Comments: Examinee should recognize that step 6.2.7.1. does not apply and should N/A the step.

\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
8.*	6.2.8	<p><u>WHEN</u> desired steam generator level is obtained, <u>THEN</u> at panel RL006, adjust the associated valve controllers to 25% demand position:</p> <ul style="list-style-type: none"> <li>AL HK-8A, SG A Turbine Driven Auxiliary Feedwater Pump AFW Regulating Valve Control.</li> <li>AL HK-10A, SG B Turbine Driven Auxiliary Feedwater Pump AFW Regulating Valve Control.</li> <li>AL HK-12A, SG C Turbine Driven Auxiliary Feedwater Pump AFW Regulating Valve Control.</li> <li>AL HK-6A, SG D Turbine Driven Auxiliary Feedwater Pump AFW Regulating Valve Control.</li> </ul>	<p>Locate controllers AL HK-8A, AL HK-10A, AL HK-12A, and AL HK-6A on panel RL006. Move the controller lever right or left until the demand is 25% as read on the controller meter.</p>	S U

[Cue]: *“Narrow range level indicators are reading 50%, controllers AL HK-8A, AL HK-10A, AL HK-12A, and AL HK-6A are set at 25% demand as read on the meters.”*

Comments:

9.	6.2.9	Stop the turbine driven AFW pump:	Complete elements 9.a. through 9.d.	N/A
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Comments:

9.a.	6.2.9.1	<p><u>IF</u> the turbine driven AFW pump is running as a result of an auto start, <u>THEN</u> ensure all auto activation signals are reset or blocked by verifying the alarm window 00-128B TD AFP START is clear.</p> <ul style="list-style-type: none"> <li>00-128B TD AFP START is clear</li> </ul>	<p>Recognize the turbine driven AFW pump was started manually and N/A this step.</p>	S U
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Comments:

\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
9.b.*	6.2.9.2	Close Auxiliary Feedwater Pump Turbine Mechanical Trip/Throttle Valve.  <ul style="list-style-type: none"> <li>FC HIS-312A - CLOSED</li> </ul>	Locate handswitch FC HIS-312A on panel RL005. Depress the Close pushbutton. Verify the Red lamp extinguishes and the Green lamp illuminates.	S U

[Cue]: *“Green lamp illuminates and the Red lamp extinguishes on FC HIS-312A. Red and white lamps extinguish and the Green lamp illuminates on ZL 312.”*

Comments:

9.c.	6.2.9.3	Time valve closed: _____	Record the time valve was closed.	S U
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Comments:

9d.*	6.2.9.4	Close steam supply valves to turbine driven AFW pump:  a. Loop 2 Steam To Auxiliary Feedwater Pump Turbine closed. <ul style="list-style-type: none"> <li>AB HIS-5A - CLOSED</li> </ul> b. Loop 3 Steam To Auxiliary Feedwater Pump Turbine closed. <ul style="list-style-type: none"> <li>AB HIS-6A - CLOSED</li> </ul>	Locate handswitches AB HIS-5A and AB HIS-6A on panel RL005. Depress the Close pushbutton for the valve that was opened initially to start the turbine driven auxiliary feedwater pump. Verify <u>both</u> handswitch Green lamps are illuminated and the Red lamps are extinguished.	S U
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[Cue]: *“Green lamps are illuminated and the Red lamps are extinguished on AB HIS-5A and AB HIS-6A.”*

Cue: **If examinee states that the handswitch manipulations need second verified, reply as SO, “I will have a spare Reactor Operator perform the task.”**

Comments:

10.	6.2.10	Return the turbine driven AFW pump discharge throttle valves to safeguards lineup:	Complete element 10.a.	N/A
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Comments:

\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
 JOB PERFORMANCE MEASURE EVALUATION FORM

Element #	Step #	Element	Standard	Score
10.a.*	6.2.10.1	Place the turbine driven AFW pump discharge throttle valves to each steam generator in latched detent open. <ul style="list-style-type: none"> <li>• AL HK-8A for S/G A - LATCHED DETENT OPEN</li> <li>• AL HK-10A for S/G B - LATCHED DETENT OPEN</li> <li>• AL HK-12A for S/G C - LATCHED DETENT OPEN</li> <li>• AL HK-6A for S/G D - LATCHED DETENT OPEN</li> </ul>	Locate controllers AL HK-8A, AL HK-10A, AL HK-12A, and AL HK-6A on panel RL006. Move the control lever to the right and Latch down the lever in the Detent Open position for all four controllers.	S U

Cue: **If examinee states that the controller manipulations need second verified, reply as SO, "I will have a spare Reactor Operator perform the task."**

Comments:

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Termination: Placing the turbine driven AFW pump discharge throttle valves in the safeguards lineup completes this JPM.

Stop Time \_\_\_\_\_

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\* Denotes Critical Step

WCGS -SRO/RO TRAINING PROGRAM  
JOB PERFORMANCE MEASURE EVALUATION FORM

## Initial Conditions:

You are the Reactor Operator, the plant is stable in Mode 3. Steam Generator narrow range levels are ~ 43% with control rod shutdown banks withdrawn.

## Initiating Cues:

The Control Room Supervisor directs you to start the turbine driven Auxiliary Feedwater (TDAFW) pump and increase steam generator levels to  $\approx$ 50% narrow range using section 6.2 of SYS AL-120, "FEEDING STEAM GENERATORS WITH A MOTOR DRIVEN OR TURBINE DRIVEN AFW PUMP." Feed at a rate of 75,000 lbm/hr per steam generator. Return the turbine driven AFW pump back to standby conditions. The prerequisites have been completed.

## Notes:

JPM's are considered "open reference", therefore reference material that is normally available to you in the plant (including the Control Room) is available during this JPM. If you desire to use a reference, ask your evaluator if it is acceptable to do so for the task under consideration. You **may not** solicit technical information from other operators, engineers or technical advisors.

Upon arriving at a component, describe to your evaluator what you expect to see (e.g. how valve, breaker, etc. position is) and what you expect to do (e.g. turn switch to run, rotate handwheel clockwise to open, etc.) and what you expect to happen (e.g. push button will light, handwheel will rotate until valve is open, etc.).

When you have completed the JPM inform your evaluator that you are done by handing the Initial Conditions/Initiating Cues sheet back to him.

When recording data on Data Sheets, indicate the instrument used and vocalize the value you will record for each parameter.



**INITIAL LICENSE EXAM**

**DECEMBER 2001**

**DYNAMIC SCENARIO #1**

Revision 0, 10/08/2001

## Scenario Objectives:

1. Evaluate the ability to perform normal operations by reducing power quickly due to a loss of a 345 KV Switchyard power line.
2. Abnormal actions and Technical Specifications usage are evaluated by diagnosing and correcting:
  - T-Ref Channel failure affecting rod control
  - Steam Pressure Channel failure affecting Steam Generator Level control.
  - Steam Leak in the Turbine Building
3. Emergency actions are evaluated for:
  - A Main Steam Line Break, outside of Containment.
  - Failure of Safety Injection to Automatically actuate.
4. Contingency actions are evaluated for a failure of the Main Steam Line Isolation valves to close with a Main Steam Line Break, outside of Containment, using EMG C-21, “UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS”.



GENERAL REFERENCES

NUREG 1021, Rev. 8, Supplement 1, "OPERATOR LICENSING EXAMINATION STANDARDS FOR POWER REACTORS"

OFN SB-008, Rev. 11, "INSTRUMENT MALFUNCTIONS"

OFN MA-038, Rev. 4, "RAPID PLANT SHUTDOWN"

EMG E-0, Rev. 14, "REACTOR TRIP OR SAFETY INJECTION"

EMG C-21, Rev. 12, "UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS".

ALR 00-111C, Rev. 6, "SG D FLOW MISMATCH"

ILC Scenario #1

RESET TO **IC 171** AND PLACE SIMULATOR IN **RUN** PRIOR TO LOADING BATCH FILE. Ensure simulator is in run or file will not load properly. You may freeze after file is loaded.

Insert Floppy disk and save the batch file **LO01\_001** to **OPENSIM/BATCH**, then open Ph.D. Expert and type "**BAT LO01\_001.txt**"

NOTE: FILE **LO01\_001.txt** preloads all LOAs and/or malfunctions required for this scenario. Simulator commands and other functions to be performed by the booth operator are shown in **BOLD**. Trigger commands are used to initiate events and commands.

**HANG** DNO tag on "A" CCW pump Handswitch, **PLACE** Handswitch in PTL.

**ENSURE** THE HORNS ARE ON

**ENSURE** CONTROL RODS ARE AT 229 STEPS

**ENSURE** placard is on the 'A' CCP.

Reset RM-11 alarms from previous Scenarios

Have the above verified by a second person as being correctly performed.

Core age is Middle of Life

Power is 100%. Xenon equilibrium.

Facility: WCGS Scenario No.: 1 Op-Test No.: \_\_\_\_\_

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

See Examiner/Operator assignment sheet. This Scenario will be seen by multiple crews.

Initial Conditions: 100% Power, MOL, "A" CCW pump OOS for PM's.

Turnover: Continue plant operations, make preps to return "A" CCW pump to service. System Ops reports Grid Stability problems. Weekday Nightshift.

\_\_\_\_\_

\_\_\_\_\_

Event No.	Malf. No.	Event Type*	Event Description
1	mPCS 02A	I (All)	AB PT-505 (T-Ref) fails low, Rods begin Inserting, BOP verifies no Turbine Runback in progress.
2	mMSS 01D2	I -BOP I-CRS	AB PT-545 fails low, affects Steam Flow Channel AB FT-543. BOP take manual Control of "D" SG FRV.
3	mEPS 03A	R-RO N-BOP N-CRS	La Cygne Line in the switchyard opens, System Ops request expedite load reduction due to Grid problems. Load reduction commences to less than 968 Mwe per OFN AF-15. Using OFN MA-038.
4	mMSS 11	C-All	Steam Leak commences in Turbine Building large enough to affect downpower.
5	mMSS 11	M-All	CRS should direct a Reactor Trip, Upon the trip the leak becomes a MSLB. MSIV's will not close.
6		C-RO C-CRS	SI fails to actuate in Automatic. Manual Available. RO/CRS must recognize that an SI will be required or the setpoint has already been reached and SI did not actuate.
7			Uncontrolled de-pressurization of all SG's will require entry into EMG C-21. Scenario terminates after crew establishes 30K Aux Feedwater flow to each SG or at Lead Examiner discretion.

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

Time (min)	Simulator Instructions	Events and Procedures	Applicant Actions or Behaviors	Notes
	<p>Malfunction clock starts when the crew has assumed the watch (T=0)</p> <p>Insert Event 1 with <b>Trigger 1</b> at time T+1.0</p> <p>When called as Work Week Manager (WWM), state you will get a</p>	<p style="text-align: center;"><b><u>Event #1</u></b></p> <p>T AB PT-505 fails low</p> <p>P Rods begin inserting</p> <p>P Turbine Runback NOT in progress.</p> <p>P Ann. 065E Alarms</p> <p>P Ann. 079C Alarms</p> <p>A Recognize Instrument Failure</p> <p><b>OFN SB-008 steps (rev 11)</b></p> <p>1. Check if secondary system instrument channel is malfunctioning <i>Yes go to Attachment D</i></p> <p>D1. Identify failed instrument channel <i>AC PT-505</i></p> <p>D2 Place rod control in manual</p> <p>D3. Check failed Turbine Impulse Pressure channel selected</p> <p>D4. Select alternate channel</p> <p>D5. (<math>\rho</math>) Adjust rods to return <math>T_{avg}</math> to <math>T_{ref}</math> for existing plant power</p> <p>D6. Check <math>T_{avg}</math> within 1°F of <math>T_{ref}</math></p> <p>D7. Place rod control in auto</p> <p>D8. Place steam dump actuation interlock to OFF</p> <p>D9. Monitor rod control response to ensure proper control</p> <p>D10. Check C-7 not lit</p> <p>D11. Select Steam Pressure Mode</p> <p>D12. Place steam dump interlock selector switches to ON</p> <p>D13. Place the trip/safeguards B/S in tripped mode</p>	<p style="text-align: center;"><b><u>Event 1</u></b></p> <p><b>RO:</b> Report control rods stepping in.</p> <p><b>BOP:</b> Reports no turbine runback.</p> <p><b>CRS/RO:</b> Place Rods in Manual.</p> <p><b>CRITICAL TASK:</b> <u>Take manual control of rod control system to prevent a reactor trip.</u></p> <p><b>STANDARD:</b> <u>This action must be taken in time to prevent a reactor trip.</u></p> <p><b>RO/BOP:</b> Recognize AB PT-505 has failed low.</p> <p><b>CRS:</b> Enters and directs OFN SB-008 Attch. D.</p> <p><b>CRS:</b> Conduct Reactivity Brief</p> <p><b>RO:</b> Withdraw Control Rods to restore <math>T_{avg}</math> to within 1°F of <math>T_{ref}</math>.</p> <p><b>BOP:</b> Place Steam Dumps in Steam Pressure Mode.</p> <p>CRS: Contact WWM for</p>	

ILC Scenario #1

	<p>team together.</p> <p>For AMSAC Channel enter <b>Event 6.</b></p>	<p>D14. Check C-16 Not Lit  D15. Check Load 'HOLD' light Not Lit  D16. Place turbine impulse pressure channel in proper condition for AMSAC</p> <p><b>NOTE:</b> AMSAC Panel is not simulated. Inform Crew that the Shift Engineer will take care of AMSAC.</p> <p>D17. Request I&amp;C to repair  D18. Go to T/S 3.3.1 and comply with action statement</p> <p>D19. Return to procedure in effect</p>	<p>Assistance.</p> <p><b>CRS:</b> Comply with T.S. T.S. 3.3.1, Table 3.3.1, Function 18f, - verifying P-13 in its proper state within 1 hour.</p>	
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	<p>Insert Event 2 with <b>Trigger 2</b> at time T+15.</p>	<p style="text-align: center;"><b><u>Event 2</u></b></p> <p>T S/G 'D' AB PT-545 fails low</p> <p>P 'D' S/G Feed flow will decrease</p> <p>P 'D' S/G Level will decrease</p> <p>P ANN 111C Alarms</p> <p>A Recognize FRV failure &amp; Take manual control of AE FCV-540</p> <p><b>Annunciator Response 00-111C</b></p> <ol style="list-style-type: none"> <li>1. Check difference between steam generator D steam flow and feed flow - Greater than 0.7 MPPH</li> <li>2. Check for instrument failure.</li> </ol> <p><b>OFN SB-008 steps: (Rev. 11)</b></p> <ol style="list-style-type: none"> <li>1. Check if secondary system instrument channel is malfunctioning             <ol style="list-style-type: none"> <li>a. Determine appropriate attachment for malfunctioning channel</li> <li>b. Go to Attachment C</li> </ol> </li> </ol> <p>C1. Compare S/G Pressure indications to confirm S/G pressure channel failure.</p> <p>C2. Check if failed S/G pressure channel used for feedwater control.</p>	<p style="text-align: center;"><b><u>Event 2</u></b></p> <p><b>BOP:</b> Report feedflow decreasing on 'D' S/G.</p> <p><b>BOP:</b> Place FRV in manual.</p> <p style="text-align: center;"><b><u>OR</u></b></p> <p><b>CRS:</b> Direct manual control of 'D' S/G FRV.</p> <p><b>CRITICAL TASK:</b> <u>Take manual control of FRV as necessary to prevent reactor trip.</u></p> <p><b>STANDARD:</b> <u>This action must be taken in time to prevent a reactor trip.</u></p> <p><b>CRS:</b> May direct use of ALR 111C or enter OFN SB-008 directly. ALR contains guidance for Manual control of FRV.</p> <p><b>CRS:</b> Enters and directs OFN SB-008</p> <p><b>BOP:</b> Confirms steam flow/feed flow mismatch.</p> <p><b>BOP/RO:</b> Identify failed Steam Pressure Channel Failed and NOT the Steam Flow Channel.</p>	
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	<p>When called as Work Week Manager (WWM), state you will get a team together.</p>	<p>C3. Select the alternate steam flow channel.          C4. Monitor S/G level response to ensure proper control.          Take manual control, if necessary.          C5. Place the reactor trip/safeguards bistables for the failed channel in the TRIPPED mode.          C6. Request I&amp;C to repair failed channel.          C7. Monitor the following Technical Specifications and comply with Action Statements:              3.3.2              3.3.3 Table 3.3.3-1, Function #8              3.3.4 Table 3.3.4-1, Function #7              3.3.6              3.3.7          C8. Review Attach. S for PAMS &amp; Remote SD inst.          C9. Return to procedure and step in effect</p>	<p><b>BOP:</b> Select Alternate Channel    <b>CRS:</b> Contact WWM for assistance.    <b>CRS:</b> Address T.S. issues.            3.3.2 Trip bistables in 6 hours          3.3.3 Attachment S          3.3.4 Attachment S          3.3.6 Verify CTMT Purge closed.          3.3.7 CREVS in 7 Days    <b>CRS:</b> Review Attach. S.</p>	
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	<p>Insert Event #3 with <b>Trigger 3</b> at time T+22</p> <p>IF crew does not notice breakers opening in switchyard, after 30 seconds: <b>Call</b> as System Ops and report "LaCygne Line has a failure. Request reduce load within 25 minutes due to grid stability concerns."</p>	<p style="text-align: center;"><b><u>Event 3</u></b></p> <p>Downpower maneuver due to loss of LaCygne Line using OFN MA-038, "RAPID PLANT S/D" Per OFN AF-025, "UNIT LIMITATIONS", Generator output is limited to 995 Gross Mwe. This would require a load reduction <math>\geq</math> 1% per minute.</p> <p>OFN MA-038 Steps</p> <ol style="list-style-type: none"> <li>1. Reduce Turbine Load:             <ol style="list-style-type: none"> <li>a. Check desired unloading rate-less than or equal to 5%/minute</li> <li>b. Set Loading/Unloading Rate Limit to desired value</li> <li>c. Select Decrease Loading Rate - ON</li> <li>d. Decrease Load Set MW toward desired load</li> <li>e. Continue with this procedure while reducing turbine load</li> </ol> </li> <li>2. Adjust Control Rods as necessary to establish a target Tavg/Tref Temperature Error between 0°f and +5°f</li> <li>3. Energize PZR Backup Heaters BB HIS-51A &amp; BB HIS-52A</li> <li>4. Borate RCS and adjust Control Rods as necessary to establish the following conditions: Maintain delta flux within target band Maintain control rods above rod insertion limits</li> <li>5. Check PZR PORVs.</li> <li>6. Check PZR Pressure - Stable at or trending to</li> </ol>	<p style="text-align: center;"><b><u>Event 3</u></b></p> <p><b>CRS:</b> Direct Crew to reduce power to 80%. Give a rate <math>\geq</math> 1% per minute to the crew for the power reduction.</p> <p><b>BOP:</b> Reduce Turbine load at designated rate</p> <p><b>RO:</b> Maintain Tavg/Tref using rods</p> <p><b>RO:</b> Energize backup heaters</p> <p><b>RO:</b> Maintain Delta I &amp; RIL using boron and rods.</p>	
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<p>Insert Event #4 with <b>Trigger 4</b> after power reduction starts</p> <p>If crew pages building watches to look for leaks, wait 30 seconds then page back as Turbine Bldg watch and report “ there is steam on the 2033’ level of the Turbine Bldg.”</p> <p>Insert Event #5 with <b>Trigger 5</b></p>	<p>2235 Psig                  7. Check PZR level - Stable at or trending to program level.                  8. Check S/G Levels - Controlling between 45% and 55%.                  9. Check AE HV-38 – Open                  10. Check Reactor Power – less than 60%</p> <p style="text-align: center;"><b><u>Event 4</u></b></p> <p>T Steam Leak commences in the Turbine Building.</p> <p>P Reactor Power increases                  P Steam Flow increases                  P Tavg decreases                  P Pressurizer Press and Level decrease</p> <p>A Determine that a steam leak has occurred in the power block.</p> <p><b>EMG E-0 STEPS (REV 14)</b></p> <p>1. Verify Rx trip.                  a. Check all rod bottom lights lit                  b. Ensure reactor trip breakers and bypass breakers open                  c. Check neutron flux decreasing                  d. Transfer NR-45 recorder to intermediate range</p> <p>2. Verify turbine trip.                  a. Check the following:                  Main stop valves all closed</p>	<p><b>BOP:</b> Close AE HV-38</p> <p style="text-align: center;"><b><u>Event 4</u></b></p> <p><b>RO/BOP:</b> Note that parameters are changing in a larger magnitude than expected.</p> <p><b>CRS:</b> Recognize a trip is required and direct the RO to manually trip the reactor.  <b>RO:</b> Manually trip the reactor.</p> <p><b>CRS:</b> Enter and direct E-0.  <b>RO/BOP:</b> Perform Immediate Actions of E-0, Steps 1 through 4.</p> <p><b>RO:</b> Verify Reactor Trip</p> <p><b>BOP:</b> Verify Turbine Trip</p>	
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	<p>at time of reactor trip.</p>	<p style="text-align: center;"><u>OR</u></p> <p>Turbine auto stop bistable lights at least two lit</p> <p>b. Check main generator breakers and exciter breaker open</p> <p>3. Check AC emergency busses at least one energized.</p> <p>4. Check if SI is actuated</p> <ul style="list-style-type: none"> <li>• Annunciator 00-030A LIT</li> <li>• <u>OR</u></li> <li>• Annunciator 00-031A LIT</li> <li>• <u>OR</u></li> <li>• ESFAS Status Panel -- ANY WHITE LIGHT LIT</li> <li>• <u>OR</u></li> <li>• Trip Status Panel -- SI RED LIGHT LIT</li> </ul> <p>5. Check if SI is required:</p> <ul style="list-style-type: none"> <li>• SI manually initiated</li> <li>• RCS press <math>\leq</math> 1830 psig</li> <li>• S/G press <math>\leq</math> 615 psig</li> <li>• CTMT press <math>\geq</math> 3.5 psig</li> <li>• RCS subcooling <math>&lt;</math> 30°F</li> <li>• PZR level <math>&lt;</math> 6%</li> </ul>	<p><b>RO:</b> Check AC Buses</p> <p><b>RO/BOP:</b> Check if SI is required.</p> <p>At completion of Immediate actions BOP should request to Fast Close MSIV's.</p> <p><b>CRS:</b> Direct Fast Closure of MSIV's.</p> <p><b>BOP:</b> Recognize MSIV's would not close and attempt a slow close.</p> <p><b>CREW:</b> May realize SI is inevitable due to steam break and initiate Safety Injection.</p> <p><b>RO:</b> RCS Press <math>&lt;</math> 1400 psig,</p>	
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	<p>Event #5 inserted at time of reactor trip.</p>	<p style="text-align: center;"><b><u>Event 5</u></b></p> <p>T Steam Leak becomes a Main Steam Line Break.</p> <p>P Pressurizer Pressure will decrease.</p> <p>P Main Steam Line Pressures will decrease.</p> <p>P Steam Flow is indicated with all Steam Dumps and Atmospheric Relief Valves closed</p> <p>A Determine setpoints for SI have been exceeded and initiate a Safety Injection</p> <p>6. Verify automatic actions per Attachment F.</p> <p style="text-align: center;">ATTACHMENT F</p> <p>F1. Verify feedwater isolation</p> <ul style="list-style-type: none"> <li>a. Main feedwater pumps tripped</li> <li>b. Main feedwater reg valves closed</li> <li>c. Main feedwater reg bypass valves closed</li> <li>d. Main feedwater isolation valves closed</li> </ul>	<p>RCP Trip Criteria met at approximately two minutes after the steam break. While not a Critical Task, the RO should recognize that a trip criterion has been met.</p> <p style="text-align: center;"><b><u>Event 5</u></b></p> <p><b>RO/BOP:</b> Determine SI is required</p> <p><b>RO:</b> Determine SI did not actuate and initiate a Manual Safety Injection.</p> <p>PZR Press &lt; 1830 psig OR Steam Line Press &lt; 615 psig OR Fold Out Page EMG E-0 - PZR Level &lt; 6%</p> <p><b>CRS:</b> Direct RO/BOP to perform Atch.F of EMG E-0.</p> <p><b>RO/BOP:</b> Perform Attachment F.</p>	
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		<p>e. Main feedwater chemical injection valves closed</p> <p>f. Check ESFAS status panel SGBSIS section all white lights lit</p> <p>F2. Verify CISA</p> <p>a. Check ESFAS status panel CISA section all white lights lit</p> <p>F3. Verify AFW pumps running</p> <p>a. Check motor driven AFW pumps both running</p> <p>b. Check turbine driven AFW pump running</p> <p>F4. Verify ECCS pumps running</p> <p>a. Check CCPs both running</p> <p>b. Check SI pumps both running</p> <p>c. Check RHR pumps Both Running</p> <p>F5. Verify CCW alignment</p> <p>a. Check CCW pumps one running in each train</p> <p>b. Check one pair of CCW service loop supply and return valves for an operating CCW pump open</p> <p>F6. Check ESW pumps both running</p> <p>F7. Verify CTMT fan coolers running in slow speed</p> <p>F8. Verify CPIS</p> <p>a. Check ESFAS status panel CPIS section all white lights lit</p> <p>F9. Verify both trains of CRVIS</p> <p>a. Check ESFAS status panel CRVIS section all white lights lit</p> <p>b. Ensure control room outer door closed</p> <p>F10. Verify main steamline isolation not required</p> <p>a. Check CTMT pressure has remained &lt; 17 psig</p> <p>b. Check either conditions below - satisfied          Low steamline pressure SI - NOT BLOCKED  <u>AND</u> steamline pressure has remained &gt; 615 psig</p>		
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		<p style="text-align: center;">OR</p> <p>Low steamline pressure SI - <b>BLOCKED AND</b> steamline pressure rate has remained &lt; 100 psi/50 sec</p> <p>F11. Verify CTMT spray not required              a. CTMT pressure has remained &lt; 27 psig</p> <p>F12. Verify ECCS flow</p> <p>F13. Verify AFW valves - properly aligned.</p> <p>F14. Verify SI valves - properly aligned.</p> <p>7. Verify AFW flow &gt; 270,000 lbm/hr.</p> <p><u>8.</u> Check RCS cold leg temperature stable.</p> <ul style="list-style-type: none"> <li>• Less than or equal to 557°F for steam dumps.</li> <li>• Less than or equal to 561°F for S/G ARV's.</li> </ul> <p>9. Establish S/G pressure control:</p> <ul style="list-style-type: none"> <li>a. Check condenser - AVAILABLE</li> <li>b. Place AB PK-507 in MANUAL</li> <li>c. Manually set AB PK-507 output to Zero</li> <li>d. Place Steam Dump Select Switch in STEAM PRESS position</li> <li>e. Place Steam Header Pressure Control in Automatic and adjust to maintain existing steam header pressure.             <ul style="list-style-type: none"> <li>o AB PK-507</li> </ul> </li> </ul> <p>10. Check PZR PORVs - closed</p> <p>11. Check normal PZR spray valves closed</p> <p>12. Check PZR safety valves - closed</p> <p>13. Check if RCPs should be stopped.</p> <p>14. Direct operator to monitor CSFSTs</p> <p>15. Check if SGs are not faulted.</p>		
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	<p>To locally isolate steam valves AB V-085 and AB V-087, <b>EVENT 7.</b> Call back after 2 minutes and report valves closed.</p>	<p><b>EMG E-2 steps: (REV 9)</b></p> <ol style="list-style-type: none"> <li>1. Check steamline on All SG isolated             <ol style="list-style-type: none"> <li>a. MSIVs closed</li> <li>b. MSIV bypasses closed</li> <li>c. Main steamline low point drain valves closed</li> </ol> </li> <li>2. Check if fault is inside Area 5</li> <li>3. Check if any SG is not faulted NO – RNO Go to EMG C-21</li> </ol> <p><b>EMG C-21 steps:(Rev. 11)</b></p> <ol style="list-style-type: none"> <li>1. Check steamline on all SGs isolated <i>RNO do ATTs A&amp;B</i> <ol style="list-style-type: none"> <li>a. Ensure MSIVs closed</li> <li>b. Ensure MSIV bypass valves closed</li> </ol> </li> <li>2. Isolate steam flow from all SGs             <ol style="list-style-type: none"> <li>a. Locally close steam supply to turbine driven AFW pump</li> <li>b. Ensure SG ARV closed</li> <li>c. Ensure main steamline low point drain valves closed</li> </ol> </li> <li>3. Verify feedline isolated on all SGs             <ol style="list-style-type: none"> <li>a. Main feed reg valve closed</li> <li>b. Feed reg bypass valve closed</li> <li>c. MFIV closed</li> <li>d. Chemical injection valve closed</li> </ol> </li> <li>4. Verify Blowdown and sampling isolated on all SG's             <ol style="list-style-type: none"> <li>a. S/G Blowdown Containment Iso Valves closed.</li> </ol> </li> </ol>	<p><b>BOP:</b> Report ALL SG's faulted.  <b>CRS:</b> Transition to EMG E-2.</p> <p><b>CRS:</b> Conduct Transition Brief for EMG E-2.</p> <p><b>CRS:</b> Transition to EMG C-21.</p> <p><b>CRS:</b> Conduct Transition Brief for EMG C-21.</p> <p><b>BOP:</b> Contact Aux Bldg Operator to isolate TDAFWP steam supply valves.</p>	
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		<p>b. S/G Upper Sample Isolation valves closed.</p> <p><u>5.</u> Control feed flow to minimize RCS cooldown</p> <p>a. Check cooldown rate in RCS cold legs &lt; 100F/hr RNO - Decrease feed flow to 30,000 lbm/hr to each SG, go to step 5c</p> <p>b. Check SG narrow range levels &lt; 50%</p> <p>c. Check RCS hot leg temperatures stable or decreasing</p> <p><b>Terminate Scenario</b> after crew establishes 30 klbm/hr to each SG or at discretion of lead examiner.</p> <p>&gt;Initial License Exam 01-001 &gt;SI FAILS TO AUTO ACT &gt;LOW PZR PRESS IMF BST-JPB455D 1 IMF BST-JPB456D 1 IMF BST-JPB457D 1 IMF BST-JPB458D 1 &gt;LOW STEAM LINE PRESS IMF BST-JPB514A 1 IMF BST-JPB515A 1 IMF BST-JPB516A 1 IMF BST-JPB524A 1 IMF BST-JPB525A 1 IMF BST-JPB526A 1 IMF BST-JPB534A 1 IMF BST-JPB535A 1 IMF BST-JPB536A 1 IMF BST-JPB544A 1 IMF BST-JPB545A 1 IMF BST-JPB546A 1</p>	<p><b>SRO/BOP:</b> Reduce AFW flow</p> <p>E-Plan Classification: <b>Main Steam Line Break</b> <b>MSLB1 – MSLB2 – MSLB5 – MSLB6 -- ALERT</b></p>	
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	<p>&gt;HI-1 CTMT PRESS  IMF BST-JPB934B 1  IMF BST-JPB935B 1  IMF BST-JPB936B 1  &gt;MSIV's will not close Auto/Man  IMF mMSS02I  IMF mMSS02J  IMF mMSS02K  IMF mMSS02L  &gt;Tag Out "A" CCW pump  IRF NEGP01A 1  IRF NEGP01AX 1  &gt;FAILURE OF AC PT-505 LOW  IMF mPCS02A (1) 0 30  &gt;Fail AB PT-545 Low  &gt;Affects Stm Flow Channel AB FT-543, "D" SG  IMF mMSS01D2 (2) 0 10  &gt;LaCygne Line opens in switchyard  IMF mEPS03A (3)  &gt;Steam Leak in Turb Bldg  IMF mMSS11 (4) 4e+005 240  &gt;Steam Break in Turb Bldg  IMF mMSS04A (5) 1e+7 120  &gt;Set AMSAC Bistable per OFN SB-008  IRF rAMS06 (6) 0  &gt;Isolate Steam Supplies to TDAFWP  IRF rMSS01 (7) 0 60  IRF rMSS01 (7) 0 90  &gt; OVERRIDE ESFAS PANEL LIGHTS - CRVIS  TRGSET 8 "JPPLSI(1)"  IMF SA066Y_C14W (8) 1  IMF SA066Y_C15W (8 35) 1  IMF SA066Y_C16W (8 35) 1  IMF SA066Y_G15W (8) 1  &gt;End of File</p>		
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**INITIAL LICENSE EXAM**

**DECEMBER 2001**

**DYNAMIC SCENARIO #2**

Revision 0, 10/08/2001

## Scenario Objectives:

1. Evaluate the ability to perform normal operations by rapidly shutting down the plant to remove a Main Feed Pump from service.
2. Abnormal actions and Technical Specifications usage are evaluated by diagnosing and correcting
  - VCT level channel failure
  - Power Range Channel failure
  - Steam Generator “C” level controller malfunction
  - Loss of CCW to the RCPs
3. Emergency actions are evaluated for a RCS Loop “A” 300 gpm leak
4. Contingency actions are evaluated for a failure of the Reactor to trip using EMG FR-S1 “RESPONSE TO NUCLEAR POWER GENERATION/ATWT”

GENERAL REFERENCES

NUREG 1021, Rev. 8, Supplement 1, OPERATOR LICENSING EXAMINATION  
STANDARDS FOR POWER REACTORS  
OFN SB-008, Rev. 11, INSTRUMENT MALFUNCTIONS  
OFN MA-038, Rev. 4, RAPID PLANT SHUTDOWN  
EMG E-0, Rev. 14, REACTOR TRIP OR SAFETY INJECTION  
EMG E-1, Rev. 13, LOSS OF REACTOR OR SECONDARY COOLANT  
FR-S1, Rev. 12, RESPONSE TO NUCLEAR POWER GENERATION/ATWT  
OFN BB-007, Rev. 11, RCS LEAKAGE HIGH  
ALR 00-110C, Rev. 6, SG C FLOW MISMATCH  
ALR 00-042B, Rev7, VCT LEV HILO

**RESET TO IC 172 AND PLACE SIMULATOR IN RUN PRIOR TO LOADING BATCH FILE.** Ensure simulator is in run or file will not load properly. You may freeze after file is loaded.

Insert Floppy disk and save the batch file **LO01\_002** to **OPENSIM/BATCH**, then open Ph.D. Expert and type **“BAT LO01\_002.txt”**

NOTE: FILE **LO01\_002.txt** preloads all LOAs and/or malfunctions required for this scenario. Simulator commands and other functions to be performed by the booth operator are shown in **BOLD**. Trigger commands are used to initiate events and commands.

**HANG** DNO tag on DG NE02 KJ HS-108A & NE HIS-26

**HANG** DNO tag on “B” CCP

**HANG** Orange DNO Isolated magnetic tag on “D” ARV.

**ENSURE** Green STS NB-01 Placard is displayed with due time of Today/2045.

**ENSURE** THE HORNS ARE ON

**ENSURE** CONTROL RODS ARE AT 229 STEPS

**ENSURE** placard is on the 'B' CCP.

Reset RM-11 alarms from previous Scenarios

Have the above verified by a second person as being correctly performed.

Core age is Middle of Life

Power is 100%. Xenon equilibrium.

Facility: <u>WCGS</u> Scenario No.: <u>2</u> Op-Test No.: _____ Examiners: _____ Operators: _____ See Examiner/Operator assignment sheet. This Scenario will be seen by multiple crews.  <u>Initial Conditions: The core age is Middle of Life (MOL). The plant has been operating at or near 100% power for the last 42 days. The "B" train Emergency Diesel Generator (EDG) and Centrifugal Charging Pump(CCP) are out of service (OOS) for preventative maintenance. The "D" SG atmospheric relief valve is isolated due to seat leakage.</u>  Turnover: <u>Normal Shift Activities , Weekday Night Shift</u>			
Event No.	Malf. No.	Event Type*	Event Description
1		N(SRO) R(RO) N(BOP)	Downpower maneuver to remove the MFP from service.
2	mCVL-01	C(SRO) C(RO)	VCT divert valve LCV112A-control failure If the operator has begun to borate it will take 6 minutes to reach the low level alarm(first indication). If boration has not commenced an auto makeup will be his first indication within 1-2 minutes.
3	mNIS-03A	I(SRO) I(RO)	Power Range NI-41 fails high
4	mFWM-03C	I(SRO) I(BOP)	Steam Generator "C" level controller fails in automatic causing the feed reg. valve to begin closing. Manual is available.
5	mRCS-06A	M(SRO) M(RO) M(BOP)	RCS loop A 300 gpm leak
6	mPCS-08A&B	C(SRO) C(RO) C(BOP)	The reactor will not trip in manual or automatic. EMG FR-S1 is used to make the reactor subcritical.
7	P19046 D (8) 1 P19046 C (8) 0	C(SRO) C(RO)	Loss of CCW to the RCPs

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

Time (min)	Simulator Instructions	Events and Procedures	Applicant Actions or Behaviors	Notes
	<p>Malfunction clock starts when the crew has assumed the watch (T=0)</p> <p>At time T+1 call the crew and inform them of the following as the Shift Manager. SGFP vibration data indicates imminent bearing failure. You are directed to immediately begin a power reduction and to be below 50% Reactor Power in one hour.</p> <p>Insert Event 2 with <b>Trigger 2</b> as soon as down power is commenced..</p>	<p style="text-align: center;"><b><u>Event #1</u></b></p> <p>Downpower maneuver to remove MFP B from service using OFN MA-038</p> <p>OFN MA-038 Rev 04, Steps:</p> <ol style="list-style-type: none"> <li>1. Reduce Turbine Load:               <ol style="list-style-type: none"> <li>a. Check desired unloading rate-less than or equal to 5%/minute</li> <li>b. Set Loading/Unloading Rate Limit to desired value</li> <li>c. Select Decrease Loading Rate - ON</li> <li>d. Decrease Load Set MW toward desired load</li> <li>e. Continue with this procedure while reducing turbine load</li> </ol> </li> <li>2. Adjust Control Rods as necessary to establish a target Tavg/Tref Temperature Error between 0°F and +5°F</li> <li>3. Energize PZR Backup Heaters BB HIS-51A &amp; BB HIS-52A</li> <li>4. Borate RCS and adjust Control Rods as necessary to establish the following conditions: Maintain delta flux within target band Maintain control rods above rod insertion limits</li> <li>5. Check PZR PORVs.</li> <li>6. Check PZR Pressure - Stable at or trending to 2235 Psig</li> <li>7. Check PZR level - Stable at or trending to program level.</li> <li>8. Check S/G Levels - Controlling between 45% and 55%.</li> <li>9. Check AE HV-38 – Open</li> <li>10. Check Reactor Power – less than 60%</li> </ol>	<p style="text-align: center;"><b><u>Event 1</u></b></p> <p><b>SRO:</b> Direct Crew to reduce power to 50%. Give a rate <math>\geq 1\%</math> to the crew for the power reduction. <b>SRO:</b> Conduct Reactivity Brief.</p> <p><b>BOP:</b> Reduce Turbine load at designated rate</p> <p><b>RO:</b> Maintain Tavg/Tref using rods</p> <p><b>RO:</b> Energize backup heaters</p> <p><b>RO:</b> Maintain Delta I &amp; RIL using boron and rods</p>	

	<p>It will take approximately 15 minutes to get ANN. 42B. If the crew has not started to borate an auto makeup will be the first indication of a problem.</p>	<p style="text-align: center;"><b><u>Event 2</u></b></p> <p>T VCT Divert Valve LCV112A-control failure</p> <p>P ALR 00-42B Alarm Window “VCT LEV HILO” is entered when the following occurs</p> <p>P VCT level is less than 22% on BG LB-149D</p> <p>A Place Divert valve in VCT Position</p> <p>ALR 00-42B</p> <ol style="list-style-type: none"> <li>1. Check VCT Level -Greater than 97% No - RNO Go to step 10</li> <li>10. Check VCT level -Less than 22% BG LI-185 BG LI-11211.</li> <li>11. Check Letdown Divert To VCT &amp; RHT Valve- Full open to VCT position. BG HIS-112A No - RNO Place Divert Valve in VCT position</li> <li>12. Check Makeup to VCT in Progress</li> <li>13. Check Charging Header Flow and Letdown Flow - Balanced</li> <li>14. Check Annunciator 00-42C, VCT Press HILO clear</li> <li>15. Ensure BG HIS-112A, LTDWN TO VOL CONT TK/HDUP TK is in AUTO <u>IF</u> the Plant is in Modes 1 or 2 <u>OR</u> in VCT <u>IF</u> plant is in modes 3, 4, 5 or 6.</li> <li>16. Return to procedure and step in effect.</li> </ol>	<p style="text-align: center;"><b><u>Event 2</u></b></p> <p><b>RO:</b> Recognize Actual VCT level low and Divert Valve in HUT position</p> <p><b>RO:</b> Place Divert valve in VCT position prior to swap to the VCT</p> <p><b>SRO:</b> Direct ALR 00-42B</p> <p><b>RO:</b> Go to step 10.</p> <p><b>RO:</b> Place divert valve in VCT position</p> <p><b>SRO:</b> Recognize BG HIS-112A cannot be returned to Auto.</p>	
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	<p>Insert Event #3 with <b>Trigger 3</b> at time T+33.</p>	<p style="text-align: center;"><b><u>Event 3</u></b></p> <p>T Power Range NI-41 fails to 100%</p> <p>P NI-41 indicates 120% Rods step in ANN Power Range Chan. DEV</p> <p>A Determine NI failure Determine no runback Take manual control of rods</p> <p>OFN SB-008 (Rev. 11)</p> <ol style="list-style-type: none"> <li>1. Check if Secondary System Instrument is Malfunctioning <i>NO</i></li> <li>2. Check if Reactor Coolant System Instrument Channel is Malfunctioning. <i>NO</i></li> <li>3. Check if Containment or RWST Channels is Malfunctioning. <i>NO</i></li> <li>4. Check if Nuclear Instrumentation System Channels is Malfunctioning.             <ol style="list-style-type: none"> <li>a. Determine appropriate attachment for malfunctioning channel</li> <li>b. Go to Attachment R</li> </ol> </li> </ol> <p>Attachment R.</p> <ol style="list-style-type: none"> <li>R1. Identify failed Instrument Channel.</li> <li>R2. Check Load Rejection - Not in Progress</li> <li>R3. Switch rod control bank selector switch to MANUAL.</li> <li>R4. Bypass Failed Power Range Flux Channel BOP or RO should go to NI racks and bypass channel.</li> <li>R5. Check Rod Control Bank Selector Switch in AUTO.</li> <li>R6. Monitor Rod Control System Response to Ensure Proper Control</li> <li>R7. Check Failed Power Range Flux channel Not Used For Recording on NR45 and OPDT and OTDT Recorders</li> </ol>	<p style="text-align: center;"><b><u>Event 3</u></b></p> <p><b>RO:</b> Report problem with Power Range Inst.</p> <p><b>BOP:</b> Verify no turbine runback in progress</p> <p><b>SRO/RO:</b> Take rods to manual</p> <p><b>CRITICAL TASK:</b> <u>Take manual control of rods as necessary to prevent reactor trip.</u></p> <p><b>STANDARD:</b> <u>This action must be taken in time to prevent a reactor trip.</u></p> <p><b>SRO:</b> Enter &amp; Direct OFN SB-008, Attachment Q</p> <p><b>RO:</b> Identify NI channel is malfunctioning</p> <p><b>SRO:</b> Go to Attachment R</p> <p><b>RO:</b> Identify failed PR Inst. SE NI-41</p> <p><b>RO:</b> Take rods to manual, previously performed</p> <p><b>RO/BOP:</b> Perform step R4. To bypass failed channel (5 switches on NI panel)</p> <p><b>RO:</b> Restore rod control to auto and monitor rods, as directed.</p> <p><b>RO/BOP:</b> Ensure SE NI-41 not selected on recorders.</p>	
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	<p>When called as WWM, state you will get a team together to come to the Control Room.</p>	<p>R8. Pull Control Power Fuses In Power Range Drawer For Failed Power Range Flux Channel.</p> <p>R9. Place Appropriate Reactor Trip/Safeguards Bistables For Failed Power Range Flux Channel in TRIPPED Mode.</p> <p>R10. Request INC Repair failed Channel</p> <p>R11. Monitor Tech Specs: 3.3.1 3.2.4, SR 3.2.4.1 &amp; SR 3.2.4.2</p> <p>R12. Return to Procedure &amp; step in effect</p>	<p><b>RO/BOP:</b> Pull control power fuses.</p> <p><b>SRO:</b> Contact WWM to trip bistables and repair channel (Note: Tripping of bistables is not required but may be performed)</p> <p><b>SRO:</b> Evaluate &amp; apply Tech Specs. T.S. 3.3.1 – 6 hours to trip bistables T.S. 3.2.4 – Verify QPTR within 12 hours using incore detectors.</p> <p><b>SRO:</b> Return to procedure and step in effect</p>	
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	<p>Insert Event #4 with <b>Trigger 4</b> at time T+40</p>	<p style="text-align: center;"><b><u>Event 4</u></b></p> <p>T S/G 'C' FRV AE FCV-530 fails closed in auto</p> <p>P 'C' S/G Feed flow will decrease</p> <p>P 'C' S/G Level will decrease</p> <p>P ALR 110C Alarms</p> <p>A Recognize FRV failure &amp; Take manual control of AE FCV-530</p> <p>Annunciator Response 00-110C</p> <ol style="list-style-type: none"> <li>1. Check difference between steam generator C steam flow and feed flow - Greater than 0.7 MPPH</li> <li>2. Check for instrument failure.</li> <li>3. Check secondary plant conditions - Stable</li> <li>4. Restore steam generator C level to program value             <ol style="list-style-type: none"> <li>a. Check feedwater control valve - Inservice to feed S/G C</li> <li>b. Place feedwater control valve in manual</li> <li>c. Adjust feedwater control valve as necessary to maintain program value</li> </ol> </li> <li>5. Check for S/G C tube leakage             <p>No - RNO Return to procedure and step in effect</p> </li> </ol>	<p style="text-align: center;"><b><u>Event 4</u></b></p> <p><b>BOP:</b> Report feedflow decreasing on 'C' S/G.</p> <p><b>SRO:</b> Direct manual control of 'C' S/G FRV.</p> <p><b>SRO:</b> Direct use of ALR 00-110C</p> <p><b>CRITICAL TASK:</b> <u>Take manual control of FRV as necessary to prevent reactor trip.</u></p> <p><b>STANDARD:</b> <u>This action must be taken in time to prevent a reactor trip.</u></p> <p><b>BOP:</b> Confirms steam flow/feed flow mismatch.</p> <p><b>BOP:</b> NO Failure Instrument Failure.</p> <p><b>BOP:</b> Place FRV in manual.</p> <p><b>BOP:</b> Restore 'C' S/G level.</p> <p><b>SRO:</b> Return to procedure and step in effect</p>	
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	<p>Insert Event #5 with <b>TRIGGER 6</b> at time T+43</p>	<p style="text-align: center;"><b><u>Event 5</u></b></p> <p>T 300 gpm RCS Leak ramped in over 5 minutes</p> <p>P Pressurizer Level will decrease  P Pressurizer Pressure will decrease  P Charging flow will increase  P VCT level will decrease</p> <p>A Determine RCS leak in excess of a CCP and initiate a Safety Injection</p> <p><b>OFN BB-007: (Rev. 11)</b></p> <ol style="list-style-type: none"> <li>1. Check Plant in Mode 1, 2, or 3 with Accumulator Outlet Valves Open</li> <li>2. Check PZR level &gt; 6%</li> <li>3. Check PZR level &gt; 17%</li> <li>4. Check PZR level stable or increasing NO - RNO</li> </ol> <p>Maximize Charging Flow  Isolate Letdown</p>	<p style="text-align: center;"><b><u>Event 5</u></b></p> <p><b>RO:</b> Report indications of leak.</p> <p><b>SRO:</b> Direct OFN BB-007</p> <p><b>RO:</b> Maximize flow from the NCP.  <b>RO:</b> Isolate letdown as necessary.  <b>RO:</b> Determine leak rate to be in excess of CCP with Letdown isolated  <b>SRO:</b> Direct manual trip &amp; SI based on fold out page criteria.</p> <p><b>RO:</b> Trip the reactor and initiate Safety Inject</p>	
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	<p>When called as Aux Bldg. Watch wait 60 seconds then Open Reactor Trip breakers with <b>Trigger 7</b></p> <p>Call back to report trip breakers open.</p>	<p><b>EMG E-0 steps:</b></p> <ol style="list-style-type: none"> <li>1. Verify Rx trip.             <ol style="list-style-type: none"> <li>a. Check all rod bottom lights lit No - Manually trip reactor and Go to FR-S1. EMG</li> </ol> </li> </ol> <p style="text-align: center;"><b><u>Event 6</u></b></p> <p>EMG FR-S1 steps:</p> <ol style="list-style-type: none"> <li>1. Verify Reactor trip No - RNO             <ol style="list-style-type: none"> <li>1. Manually trip reactor</li> <li>2. If reactor will not trip then perform the following                 <ol style="list-style-type: none"> <li>a) Insert control rods in auto or manual</li> <li>b) Manually deenergize rod drive motor generators                     <ol style="list-style-type: none"> <li>1) Open the breakers for PG-19 and PG-20</li> <li>2) Dispatch operator to trip &amp; bypass breakers</li> <li>3) When reactor trip breakers and bypass are open or all "Rod Bottom Lights" LIT, reclose the breakers for PG-19 &amp; PG-20</li> <li>4) Continue with step 2</li> </ol> </li> </ol> </li> </ol> </li> <li>2. Verify Turbine trip</li> <li>3. Verify AFW pumps running</li> <li>4. Check SI - NOT in progress RNO - If total ECCS flow from the RWST to the RCS is &gt; 90 gpm then go to step 8.</li> </ol>	<p><b>SRO:</b> Enter and direct E-0.</p> <p><b>RO:</b> Recognize Reactor did not trip</p> <p><b>SRO:</b> Enter &amp; direct EMG FR-S1</p> <p style="text-align: center;"><b><u>Event 6</u></b></p> <p><b>RO:</b> Manually trip the reactor <b>BOP:</b> Manually trip the reactor <b>RO:</b> Insert control rods in manual or automatic. <b>CRITICAL STEP:</b> <u>Insert negative reactivity into the core by at least one of the following methods before the SGs dry out 1) De-energize the control rod drive MG sets 2) Manually insert control rods.</u> <b>STANDARD:</b> <u>The reactor must be made subcritical prior to 3 steam generator wide range levels reaching 8%.</u></p> <p><b>BOP:</b> Open PG HIS-16 and PG HIS-18 breakers that power the rod drive MG sets. <b>RO:</b> Dispatch NSO to locally open reactor trip breakers</p> <p><b>BOP:</b> Verify Turbine Trip</p> <p><b>RO:</b> Determine SI is in progress.</p>	
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		<p>8. Check PRZR pressure &lt; 2335 psig            9. Verify containment purge isolation.</p> <p>10. Check SI not actuated                No - RNO Perform steps 1-6 of E-0 while continuing with this procedure</p> <p>11. Check if the following trips have occurred                a. Reactor trip                b. Turbine trip</p> <p>12. Check SG levels</p> <p>13. Verify all dilution paths isolated</p> <p>14. Check for reactivity insertion from uncontrolled RCS cooldown                No - RNO negative MTC Go to step 20</p> <p>20. Stop any controlled cooldown</p> <p>21. Check core exit TCs - Less than 1200°F</p> <p>22. Verify reactor subcritical</p> <p>23. Check Rx trip breakers open</p> <p>24. Continue boration until adequate shutdown margin is obtained</p> <p>25. Check CRDM fans - All available running</p> <p>26. Return to procedure and step in effect</p> <p>EMG E-0 steps:</p> <p>1. Verify Rx trip.                a. Check all rod bottom lights lit                b. Ensure reactor trip breakers and bypass breakers open                c. Check IR neutron flux decreasing                d. Transfer NR-45 recorder to intermediate range</p> <p>2. Verify turbine trip.                a. Check the following:                    Main stop valves all closed                    OR                    Turbine auto stop bistable lights at least two lit                b. Check main generator breakers and exciter breaker</p>	<p>Should have initiated per CRS.  <b>RO:</b> Verify ECCS flow is &gt; 90 gpm.</p> <p><b>SRO:</b> Direct performance of E-0, Steps 1-6.  <b>RO/BOP:</b> Performs E-0 steps 1-6</p> <p><b>RO:</b> Dispatch NSO to verify dilution paths closed</p> <p><b>BOP:</b> Stop any uncontrolled cooldown.</p> <p><b>RO:</b> Verify CETs &lt; 1200°F on NPIS.</p> <p><b>CREW:</b> Continue boration until SDM is obtained  <b>RO:</b> Start all available CRDM fans.</p> <p><b>SRO:</b> Enters EMG E-0 at Step 1. Will perform steps 1-6.</p>	
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		<p>open</p> <p>3. Check AC emergency busses at least one energized</p> <p>4. Check if SI is actuated  Annunciator 00-030A LIT  OR  Annunciator 00-031A LIT  OR  ESFAS Status Panel ANY WHITE LIGHT LIT  OR  Trip Status Panel SI RED LIGHT LIT</p> <p>5. Check if SI is required:  SI manually actuated  RCS pressure less than or equal to 1830 psig  S/G Pressure less than or equal to 615 psig  Containment pressure greater than or equal to 3.5 psig  RCS subcooling less than 30°F  PZR level less than 6%</p> <p>6. Verify Automatic Actions Using Attachment F, Automatic Signal Verification</p> <p style="text-align: center;">ATTACHMENT F</p> <p>F1. Verify feedwater isolation  a. Main feedwater pumps tripped  b. Main feedwater reg valves closed  c. Main feedwater reg bypass valves closed  d. Main feedwater isolation valves closed  e. Main feedwater chemical injection valves closed  f. Check ESFAS status panel SGBSIS section all white lights lit</p> <p>F2. Verify CISA  a. Check ESFAS status panel CISA section all white lights lit</p> <p>F3. Verify AFW pumps running</p>	<p><b>RO/BOP:</b> Determine SI is required</p> <p><b>SRO:</b> Direct performance of ATT. F in parallel with E-0/FR S.1</p> <p><b>RO/BOP:</b> Perform Att. F</p>	
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		<p>a. Check motor driven AFW pumps both running  b. Check turbine driven AFW pump running</p> <p>F4. Verify ECCS pumps running  a. Check CCPs both running  b. Check SI pumps both running  c. Check RHR pumps Both Running</p> <p>F5. Verify CCW alignment  a. Check CCW pumps one running in each train  b. Check one pair of CCW service loop supply and return valves for an operating CCW pump open</p> <p>F6. Check ESW pumps both running</p> <p>F7. Verify CTMT fan coolers running in slow speed</p> <p>F8. Verify CPIS  a. Check ESFAS status panel CPIS section all white lights lit</p> <p>F9. Verify both trains of CRVIS  a. Check ESFAS status panel CRVIS section all white lights lit  b. Ensure control room outer door closed</p> <p>F10. Verify main steamline isolation not required  a. Check CTMT pressure has remained &lt; 17 psig  b. Check either conditions below - satisfied  * Low steamline pressure SI - NOT  BLOCKED <u>AND</u> steamline  pressure has remained &gt; 615 psig  * Low steamline pressure SI - BLOCKED  <u>AND</u> steamline pressure  rate has remained &lt; 100 psi/50 sec</p> <p>F11. Verify CTMT spray not required  a. CTMT pressure has remained &lt; 27 psig</p> <p>F12. Verify ECCS flow</p> <p>F13. Verify AFW valves - properly aligned.</p> <p>F14. Verify SI valves - properly aligned.</p>	<p><b>RO/BOP:</b> Determine CCP B is tagged out.</p>	
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	<p>Insert <b>EVENT 7</b> with <b>TRIGGER 8</b>, at time T+60.</p> <p>If checked by RO/BOP RCP Frame vibration - 2 mils RCP Shaft vibration - 3 mils</p>	<p style="text-align: center;"><b><u>Event 7</u></b></p> <p>T Loss of CCW to RCPs due to closure of CCW to Containment Isolation valve</p> <p>P Annunciators 00-074A &amp; 00-52A P RCP Motor Temperatures increasing rapidly</p> <p>A Secure RCPs or open the CCW bypass valves</p> <p>OFN BB-005</p> <ol style="list-style-type: none"> <li>1. Monitor RCP temperatures</li> <li>2. Check if RCPs can remain running</li> <li>3. All RCP seal leakoff &lt; 6 gpm</li> <li>4. Check #1 seal D/P &gt; 200 PSID</li> <li>5. Verify CCW to service loop and CTMT</li> </ol> <p>No - RNO Open bypass valve EG HIS-126</p> <ul style="list-style-type: none"> <li>• Press Non-Iso on EG HIS-126A</li> <li>• Press Open on EG HIS-126</li> </ul> <p style="text-align: center;"><b>EMG E-0 Continued</b></p> <ol style="list-style-type: none"> <li>7. Verify AFW flow &gt; 270,000 lbm/hr.</li> <li>8. Check RCS cold leg temperature - stable.             <ol style="list-style-type: none"> <li>a. ≤ 557°F For Steam dumps</li> </ol> </li> </ol>	<p style="text-align: center;"><b><u>Event 7</u></b></p> <p><b>SRO:</b> Direct ALR usage 74A or 52A or OFN BB-005.</p> <p><b>RO/BOP:</b> Identify failed closed CCW isolation valve</p> <p><b>RO:</b> Monitor RCP temperatures on NPIS.</p> <p><b>RO:</b> Identify failed closed CCW isolation valve, EG HIS-71</p> <p><b>SRO:</b> Direct RO to open the CCW isolation valve bypass EG HIS-126 or secure RCPs.</p> <p><b>RO:</b> Press Non-Iso and Open EG HV-126.</p> <p><b>CRITICAL STEP:</b> <u>Open EG HIS-26 or secure the RCP's.</u></p> <p><b>STANDARD:</b> <u>Open EG HIS-26 or secure the RCP's within five minutes.</u></p>	
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	<p>b. <math>\leq 561^{\circ}\text{F}</math> for S/G ARVs.</p> <p>9. Establish S/G pressure control:</p> <ul style="list-style-type: none"> <li>a. Check condenser - AVAILABLE</li> <li>b. Place AB PK-507 in MANUAL</li> <li>c. Manually set AB PK-507 output to Zero</li> <li>d. Place Steam Dump Select Switch in STEAM PRESS position</li> <li>e. Place Steam Header Pressure Control in Automatic and adjust to maintain existing steam header pressure.</li> <li>o AB PK-507</li> </ul> <p>10. Check PZR PORVs</p> <p>11. Check normal PZR spray valves closed</p> <p>12. Check PZR safety valves - closed</p> <p>13. Check if RCPs should be stopped.</p> <p>14. Direct operator to monitor CSFSTs</p> <p>15. Check if SGs are not faulted.</p> <p>16. Check if SG tubes are intact.</p> <p>17. Check SG levels increasing in an uncontrolled manner</p> <p>18. Check if RCS is intact          NO - RNO Ensure BIT Inlet and Outlet valves are open and          Go To EMG E-1</p> <p><b>EMG E-1 Steps:</b></p> <ul style="list-style-type: none"> <li>1. Check if RCPs should be stopped</li> <li>2. Check if SGs are not faulted</li> <li>3. Check intact SG Levels</li> <li>4. Reset SI</li> <li>5. Reset Containment Isolation Phase A and Phase B</li> </ul> <p><b>Terminate Scenario</b> after transition to EMG E1 or at discretion of Lead Examiner.</p>	<p><b>BOP:</b> Establish Steam dump control to prevent heatup.</p> <p><b>RO:</b> Determine RCS not intact</p> <p><b>SRO:</b> Enter and direct EMG E-1  <b>SRO:</b> Conduct Transition Brief.</p> <p><b>RO:</b> Reset SI  <b>RO:</b> Reset CISA/CISB</p> <p><b>E-Plan Classification: -EAL-3,          LRCB-1,2,3,5,6,7 -- ALERT</b></p>	
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		<p>                     &gt;SCENARIO #2                      &gt;INITIAL CONDITIONS                      &gt;OVERRIDE ANN 00-23E                      IMF ANN-E023 0                      &gt;"B" CHARGING PUMP TAGGED                      IRF NBGP05B 1                      &gt;"B" EDG TAGGED                      IMF MDGS02B                      IRF N1NB211 1                      &gt;"D" SG ARV ISOLATED                      IRF rMSS06 0                      &gt;SGFP VIBRATION PROBLEM                      SET CFC25(2)=1.4                      &gt;VCT LEVEL DIVERT                      IMF MCVL01(2) 0                      &gt;OVERRIDE VCT VALVE ANNUNCIATOR                      IMF ANN-B058(2) 1                      &gt;PR N41 FAILURE                      IMF MNIS03A (3) 120 30                      &gt;SG "C" LEVEL CONTROL FAILURE                      IMF MFWM03C (4) 50 10                      &gt;RCS LOOP A LEAK                      IMF MRCS06A (5) 300 120                      &gt;ATWT Event 6                      IMF MPCS08A                      IMF MPCS08B                      &gt;OPEN TRIP BREAKERS                      IRF RCRF05 (7) 1                      IRF RCRF06 (7 3) 1                      &gt;LOSS OF CCW TO RCP'S                      IOR P19046D (8) 1                      IOR P19046C (8) 0                      &gt;OVERRIDE ESFAS PANEL LIGHTS - CRVIS                      TRGSET 1 "JPPLSI(1)"                 </p>		
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ILC Scenario #2

		IMF SA066Y_C14W (1) 1 IMF SA066Y_C15W (1 35) 1 IMF SA066Y_C16W (1 35) 1 IMF SA066Y_G15W (1) 1 >End of File		
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**INITIAL LICENSE EXAM**

**DECEMBER 2001**

**DYNAMIC SCENARIO #3**

Revision 0, 10/08/2001

## Scenario Objectives:

1. Evaluate the ability to perform normal operations by controlling the unit during a power decrease.
2. Abnormal actions and Technical Specifications usage are evaluated by diagnosing and correcting:
  - Failed RCS Temperature Instrument
  - Failed S/G Level Instrument
  - Failed Open S/G Atmospheric Relief Valve
  - Failure of a S/G Feedwater Isolation Valve to close.
3. Emergency actions are evaluated for:
  - A Loss of Offsite Power
4. Contingency actions are evaluated for a failure of the Essential Service Water Pump to automatically start and supply cooling water to the Emergency Diesel Generator.

GENERAL REFERENCES

NUREG 1021, Rev. 8, Supplement 1, OPERATOR LICENSING EXAMINATION  
STANDARDS FOR POWER REACTORS  
OFN SB-008, Rev. 11, "INSTRUMENT MALFUNCTIONS"  
EMG E-0, Rev. 14, "REACTOR TRIP OR SAFETY INJECTION"  
EMG ES-02, REV. 12, "REACTOR TRIP RESPONSE"  
GEN00-004, Rev. 42, "POWER OPERATION"

**RESET TO IC 173 AND PLACE SIMULATOR IN RUN PRIOR TO LOADING BATCH FILE.** Ensure simulator is in run or file will not load properly. You may freeze after file is loaded.

Insert Floppy disk and save the batch file **LO01\_003** to **OPENSIM/BATCH**, then open Ph.D. Expert and type **“BAT LO01\_003.txt”**

NOTE: FILE **LO01\_003.txt** preloads all LOAs and/or malfunctions required for this scenario. Simulator commands and other functions to be performed by the booth operator are shown in **BOLD**. Trigger commands are used to initiate events and commands.

**HANG** DNO tag on FC HIS-118 ‘B’ MFP Trip/Reset push-button.

**ENSURE** ‘LOAD DECREASE’ circuit on.

**ENSURE** that a Current, signed copy of GEN 00-004 is available for the SRO.

**ENSURE** the horns are ON

**ENSURE** Control Rods are at 160 STEPS on Bank D

**ENSURE** placard is on the 'A' CCP.

**ENSURE** both sets of Back up Heaters are ON.

**ENSURE** Rods are in Auto.

Reset RM-11 alarms from previous Scenarios

Have the above verified by a second person as being correctly performed.

Core age is Middle of Life

Power is 48%. Xenon equilibrium.

Coffey County is in a Severe Thunderstorm Watch.

Facility: WCGS Scenario No.: 3 Op-Test No.: \_\_\_\_\_

See Crew Assignments. Multiple Crews will be tested on this Scenario.

Initial Conditions: 48% Power. "B" Main Feed Pump Tagged out for maintenance on control valve linkage. Severe Thunderstorm Watch in effect for Coffey County.

Turnover: Continue power reduction to 33% (400MWe) to remove all heater strings. OFN AF-025 is in effect

Event No.	Malf. No.	Event Type*	Event Description
1		R-RO N-BOP N-CRS	Continue Power reduction to 33% at ½ % per minute.
2	mRCS 01I	I-RO I-CRS	Loop 1 Thot fails high causing a rod insertion.
3	mFWM 02B3	I-BOP I-CRS	"B" SG Level AE LT-529 fails high.
4	mEPS 01A and 1B	M-All	Sequential Loss of Offsite Power, Reactor Trips due to low RCS flow.
5	mWAT 03A	C-RO C-CRS	"A" ESW pump Trips, "B" ESW pump fails to start. RO/CRS must get "B" ESW pump started prior to the EDG overheating causing entry into EMG C-0.
6	mFWM 12C	C-BOP C-CRS	"D" SG FWIV fails to Auto Close
7	mMSS 07E	C-BOP C-CRS	"A" SG ARV fails open.

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



Time (min)	Simulator Instructions	Events and Procedures	Applicant Actions or Behaviors	Notes
	<p>Malfunction clock starts when the crew has assumed the watch (T=0)</p>	<p style="text-align: center;"><b><u>Event #1</u></b></p> <p>T Decrease Power to 40% @ ½ % per minute.</p> <p>P Reactor power &amp; turbine load decrease.</p> <p>A Perform GEN 00-004</p> <p><b>GEN 00-004: steps</b></p> <p>6.2.2.2 Reduce turbine Load using Load limit or Load Set <i>Turnover directs use 'Load Set'</i></p> <p>6.2.3 Decrease turbine load</p> <p>6.2.4 Ensure AE HV-38 is closed.</p> <p>6.2.5 Maintain ΔI &amp; RIL</p> <p>6.2.10 When Rx power &lt; 48% verify P-8 bistables clear.</p> <p>6.2.11 When Rx power &lt;40% S/D one Heater drain pump.</p> <p>6.2.12 When turbine power &lt; 35% for &gt; 6 minutes ensure AMSAC <u>NOT</u> armed.</p>	<p style="text-align: center;"><b><u>Event 1</u></b></p> <p>Crew will review previous steps during pre-brief, crew enters Gen 00-004 at step 6.2.10.</p> <p><b>SRO:</b> Direct a power decrease per GEN 00-004</p> <p><b>SRO:</b> Conduct a Reactivity Brief.</p> <p><b>RO/BOP:</b> Coordinate power reduction.</p> <p><b>BOP:</b> Decrease turbine load</p> <p><b>RO:</b> Adjust rods &amp; boron as necessary</p> <p><b>RO:</b> Maintain Tavg/Tref using rods</p>	

	<p>Insert Event 2 with <b>Trigger 2</b> at T+17.</p>	<p style="text-align: center;"><b><u>Event 2</u></b></p> <p>T Loop 1 T<sub>HOT</sub> Fails to 630°F</p> <p>P Loop 1 Tavg fails high, causing rods to step in ANN 067 thru 069B &amp; D will alarm</p> <p>A Stop Rod Motion</p> <p><b>OFN SB-008 REV 11</b></p> <p><b>ACTIONS:</b></p> <ol style="list-style-type: none"> <li>1. Check if Sec Sys Inst Channel is malfunctioning. <i>NO</i></li> <li>2. Check if RCS Inst Channel is malfunctioning. <i>YES, go to ATT L.</i></li> </ol> <p><b>ATT L:</b></p> <ol style="list-style-type: none"> <li>L1. Check Load Rejection. <i>NONE</i></li> <li>L2. Switch Rod Control to MAN.</li> <li>L3. Check Stm Dumps. <i>CLOSED</i></li> <li>L4. Identify Failed Channel.</li> <li>L5. Remove failed channel from ΔT and Tavg.</li> <li>L6. Check temp error W/I 1°F.</li> </ol>	<p style="text-align: center;"><b><u>Event 2</u></b></p> <p><b>RO:</b> Report Inward Rod Motion <b>BOP:</b> Report <u>NO</u> load rejection</p> <p><b>SRO/RO:</b> Place rods in manual. <b>SRO:</b> Direct RO to place rods in manual <b>OR</b> <b>RO:</b> Place rods in manual and inform SRO.</p> <p><b>CRITICAL TASK:</b> <u>Take manual control of rods as necessary to prevent reactor trip.</u> <b>STANDARD:</b> <u>This action must be taken in time to prevent a reactor trip.</u></p> <p><b>RO:</b> Report Loop 1 Tavg &amp; ΔT failed.</p> <p><b>SRO:</b> Enter &amp; direct OFN SB-008 Attachment L</p> <p><b>BOP:</b> Report STM DMPS closed. <b>RO:</b> Identify Loop 1 Temp. Inst. failed. <b>RO:</b> Defeat failed channel. <b>SRO/RO:</b> Restore Tavg. <b>SRO:</b> Conduct Reactivity Brief <b>RO:</b> Withdraw control rods as directed by SRO. (Crew may not restore Tavg and choose to</p>	
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	<p>When called as Work Week Manager (WWM) state you will get a team together.</p>	<p>L7. Check rod control in AUTO.  L8. Monitor Rod Control for proper response.  L9. Check C-7 INTLK not lit. <i>NOT LIT</i>  L10. Check Steam Dumps BYP-INTLK switches on.  L11. Monitor stm dumps  L12. Check failed inst not used for OPΔT and OTΔT recorders.</p> <p>L13. Place B/S in the tripped condition.  L14. Request INC to repair failed channel.  L15. Check C-16 Hold Circuit - CLEAR  L16. Monitor T.S. 3.3.1</p> <p>L17. Return to procedure and step in effect</p>	<p>reduce Turbine load instead.</p> <p><b>RO:</b> Place rods in mode directed by SRO.</p> <p><b>BOP:</b> Report C-7 not lit &amp; dumps functioning correctly</p> <p>RO/BOP: Select Alternate Channel.</p> <p><b>SRO:</b> Contact WWM for assistance.</p> <p><b>SRO:</b> Evaluate &amp; Apply Tech Specs. T.S. 3.3.1, Table 3.3.3, Functions 6 &amp; 7 Trip Bi-stables within 6 hours.</p> <p><b>SRO:</b> Return to GEN 00-004.</p>	
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<p>Insert Event #3 with <b>Trigger 3</b> at time T+25.</p>	<p style="text-align: center;"><b><u>Event 3</u></b></p> <p>T 'B' S/G Level Channel Fails High AE LI-529</p> <p>P Annunciator 110B SG B Level DEV</p> <p>P 'B' FRV Throttle Shut to Maintain Level</p> <p>A Restore 'B' S/G Level</p> <p><b>OFN SB-008 (Rev. 11)</b></p> <p><b>Actions:</b></p> <ol style="list-style-type: none"> <li>1. Check if secondary system instrument channel is malfunctioning             <ol style="list-style-type: none"> <li>a. Determine appropriate attachment for malfunctioning channel</li> <li>b. Go to Attachment F</li> </ol> </li> <li>F1. Identify failed level channel</li> <li>F2. Check if failed S/G level channel used for feedwater control.</li> <li>F3. Select the alternate S/G level channel.</li> <li>F4. Monitor S/G level response to ensure proper control.</li> <li>F5. Trip bistables</li> <li>F6. Place AMSAC in TRIP condition</li> <li>F7. Request I&amp;C to repair failed channel.</li> </ol>	<p style="text-align: center;"><b><u>Event 3</u></b></p> <p><b>BOP:</b> Report 'B' S/G level problem.</p> <p><b>SRO/BOP:</b> Take manual control of SG "B" FRV.</p> <p><b>SRO:</b> Direct BOP to take Manual Control.</p> <p style="text-align: center;"><b>OR</b></p> <p><b>BOP:</b> Take manual control and inform SRO.</p> <p><b>CRITICAL TASK:</b> <u>Take manual control of "B" FRV or select out failed channel.</u></p> <p><b>STANDARD:</b> <u>This action must be taken in time to prevent a reactor trip.</u></p> <p><b>SRO:</b> Enter &amp; direct OFN SB-008</p> <p><b>RO/BOP:</b> Identify AE LI-529 as failed Instrument.</p> <p><b>BOP:</b> Select Alternate Instrument.</p> <p><b>SRO/BOP:</b> Restore 'B' S/G level.</p> <p><b>SRO:</b> Contact WWM for assistance.</p> <p><b>SRO:</b> This channel does not require tripping for AMSAC</p>	<p>When called as WWM state you will get a team together.</p>
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		<p>F8. Monitor Tech. Specs.          3.3.1          3.3.2          3.3.4, Table 3.3.4-1, Function 8          3.3.3 Table 3.3.3-1, Function 13</p> <p>F9. Review Att. S</p> <p>F10. Return to procedure and step in effect</p>	<p><b>SRO:</b> Evaluate &amp; Apply Tech Specs.          3.3.1 – 6 hours to trip bi-stables          3.3.2 – 6 hours to trip bi-stables          3.3.4 – N/A          3.3.3 – N/A</p> <p><b>SRO:</b> Review attachment ‘S’ &amp; apply          3.3.4, 2of 3 channels required.</p> <p><b>SRO:</b> Return to GEN 00-004.</p>	
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	<p>Insert Event #4 with <b>Trigger 4</b> at time T+31</p> <p><b>NOTE:</b> May have to call as System Ops &amp; inform control room of loss of Benton line.</p>	<p style="text-align: center;"><b><u>Event 4</u></b></p> <p>T Sequential Loss of Off-Site Power</p> <p>P Loss of Power from Benton</p> <p>P Lightning Strike in Switchyard</p> <p>P Rx trip due low RCS flow</p> <p>A Enter EMG E-0</p> <p><b>EMG E-0 STEPS (REV 14)</b></p> <p><b>ACTIONS:</b></p> <ol style="list-style-type: none"> <li>1. Verify Rx trip.             <ol style="list-style-type: none"> <li>a. Check all rod bottom lights lit</li> <li>b. Ensure reactor trip breakers and bypass breakers open</li> <li>c. Check neutron flux decreasing</li> <li>d. Transfer NR-45 recorder to intermediate range</li> </ol> </li> <li>2. Verify turbine trip.             <ol style="list-style-type: none"> <li>a. Check the following:                 <ul style="list-style-type: none"> <li>* Main stop valves all closed</li> <li style="text-align: center;"><u>OR</u></li> <li>* Turbine auto stop bistable lights at least two lit</li> </ul> </li> <li>b. Check main generator breakers and exciter breaker open</li> </ol> </li> </ol>	<p style="text-align: center;"><b><u>Event 4</u></b></p> <p>When the crew is made aware of loss of Benton line the SRO may review OFN AF-025. Maintain gen. load &lt; 995 MWe. (Gross)</p> <p><b>SRO:</b> Enter and direct EMG E-0</p> <p><b>RO/BOP:</b> Perform Immediate Actions</p> <p><b>RO:</b> Verify Reactor Trip</p> <p><b>BOP:</b> Verify Turbine Trip.</p>	
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<p>“B” ESW pump failed to auto start. “A” ESW pump trips.</p>	<p style="text-align: center;"><b><u>Event 5</u></b></p> <p>T “B” ESW pump fails start to supply cooling water to the “B” EDG</p> <p>P Green light lit on Handswitch</p> <p>A Start the “B” ESW pump</p> <p>3. Check AC emergency busses at least one energized</p>	<p style="text-align: center;"><b><u>Event 5</u></b></p> <p><b>RO:</b> Recognize AC bus energized by the EDG, the RO should check that cooling water is supplied.</p> <p><b>SRO/RO:</b> Start ‘B’ ESW pump.</p> <p><b>CRITICAL TASK:</b> <u>Establish Cooling Water to the Emergency Diesel Generator.</u></p> <p><b>STANDARD:</b> <u>Manually start at least one ESW pump in an operating safeguards train before required diesel generator(s).</u></p> <p><b>RO/BOP:</b> Report loss of ‘A’ ESW  <b>SRO:</b> Direct ‘A’ diesel shutdown.  <b>RO/BOP:</b> Shutdown ‘A’ diesel.</p>	
<p>‘D’ MFIV did not auto close.</p>	<p style="text-align: center;"><b><u>Event 6</u></b></p> <p>T MFIV for “D” SG does not auto close</p> <p>P Red light lit on Handswitch</p> <p>A Close AE HV-42</p> <p>4. Check if SI is actuated – NO perform RNO</p> <p>RNO – Check if SI is required  PZR Pressure &lt; 1830 psig  Steam Line Pressure &lt; 615 psig  CTMT Pressure &gt; 3.5 psig  PZR Level &lt; 6%</p>	<p style="text-align: center;"><b><u>Event 6</u></b></p> <p><b>BOP:</b> Report “D” MFIV still open.</p> <p><b>SRO/BOP:</b> Close AE HIS-42</p> <p><b>RO/BOP:</b> Check SI parameters.</p>	

<p>Insert <b>EVENT 7</b> with <b>TRIGGER 7</b>, during transition brief.</p>	<p>Subcooling &lt; 30 degrees Go to EMG ES-02</p>	<p><b>SRO:</b> Enter &amp; direct EMG ES-02</p>
<p>At Step 4 of EMG ES-02: <b>CALL</b> as System Ops and inform SRO that the estimate is 30 minutes to restore power to the Switchyard.</p>	<p style="text-align: center;"><b>EMG ES-02</b></p> <p>T "A" SG ARV fails open P RCS temperature decreases P Steam Flow indication increases A Recognize cooldown and close "A" ARV.</p> <p><b>EMG ES-02 steps:</b></p> <ol style="list-style-type: none"> <li>1. Check RCS cold leg temperatures stable at 557°F or &lt; 557°F</li> <li>2. Establish SG pressure control</li> <li>3. Check feedwater status             <ol style="list-style-type: none"> <li>a. Tavg &lt; 564°F</li> <li>b. Check main feedwater pumps tripped</li> <li>c. Check MFIVs closed</li> <li>d. Check total feed flow to SGs &gt; 270,000 lbm/hr</li> </ol> </li> <li>4. Verify instrument air to containment             <ol style="list-style-type: none"> <li>a. Check ESW to air compressor valves - open</li> <li>b. Check air compressor breaker reset switches - closed</li> <li>c. Check instrument air pressure &gt; 105 psig</li> <li>d. Check KA HIS-29 open</li> </ol> </li> <li>5. Check charging pumps - at least one running</li> <li>6. Verify charging system aligned for normal injection</li> </ol>	<p style="text-align: center;"><b><u>Event 7</u></b></p> <p><b>SRO/BOP:</b> Take manual control of 'A' ARV &amp; close</p> <p><b>CRITICAL TASK:</b> <u>Close t"A" ARV</u></p> <p><b>STANDARD:</b> <u>This action must be taken in time to prevent an unnecessary 'MSLIS'.</u></p> <p><b>BOP:</b> Stabilize RCS Temp. using remaining ARVs.</p> <p>Time required to restore power to the switchyard is required to allow the SRO to Classify the event.</p>



	<p>7. Check charging flow established              8. Check all control rods fully inserted              9. Check PZR level &gt; 17%</p> <p><b>Terminate Scenario</b> after transition to EMG ES-02 or at discretion of Lead Examiner.</p> <p>&gt;INITIAL SIM EXAM 01-03              &gt;              &gt;SET-UP RTD FAILURE              IMF mRCS01I (2) 650 15              &gt;              &gt;SET-UP S/G LEVEL FAILURE              IMF mFWM02B3 (3) 100 20              &gt;              &gt;SET-UP LOSS OF POWER              IMF mEPS01A (4)              IMF mEPS01B (4 90)              &gt;              &gt;SET-UP 'A' ESW PUMP TRIP              IMF mWAT03A              &gt;              &gt;SET-UP 'B' ESW PUMP FAILURE TO AUTO START              IOR p19019B 0              &gt;              &gt;SET-UP 'A' ARV FAILURE              IMF mMSS07A (7) 100 25              &gt;              &gt;SET-UP 'D' MFIV FAILURE TO AUTO CLOSE              IMF mFWM12H              &gt;              &gt;End of File</p>	<p><b>E-Plan Classification:</b>  <b>6-LEP/AC 1,2,5 - ALERT</b></p>	
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**INITIAL LICENSE EXAM**

**DECEMBER 2001**

**DYNAMIC SCENARIO #4**

Revision 0, 10/08/2001

## Scenario Objective

Evaluate the ability to perform normal operations for restoration of letdown and a power reduction.

Diagnosing and correcting the following evaluate abnormal actions and Technical Specifications usage:

- PZR Level Channel failure
- Feedwater Flow channel failure
- RCS Leak
- Loss of NB02 Vital 4160V Bus

Emergency actions are evaluated for a RCS Loop "A" 10000 gpm leak

Contingency actions are evaluated for an Inadequate Core Cooling situation due to loss of all injection flow. (Safety Injection Pump "A" and the Normal Charging Pump trip)

**GENERAL REFERENCES**

NUREG 1021, Rev. 8, Supplement 1, OPERATOR LICENSING EXAMINATION  
STANDARDS FOR POWER REACTORS  
EMG FR-C1, Rev. 12, RESPONSE TO INADEQUATE CORE COOLING  
EMG E-0, Rev. 14, REACTOR TRIP OR SAFETY INJECTION  
EMG E-1, Rev. 13, LOSS OF REACTOR OR SECONDARY COOLANT  
OFN MA-038, Rev. 4, RAPID PLANT SHUTDOWN  
OFN BB-007, Rev. 11, RCS LEAKAGE HIGH  
OFN SB-008, Rev. 11, INSTRUMENT MALFUNCTION

ILC Scenario #4

RESET TO **IC 151** AND PLACE SIMULATOR IN **RUN** PRIOR TO LOADING BATCH FILE. Ensure simulator is in run or file will not load properly. You may freeze after file is loaded.

Insert and save the batch file **LO01\_004.txt** to **OPENSIM/BATCH**, then open Ph.D. Expert and type **“BAT LO01\_004.txt”**

NOTE: FILE **LO01\_004.txt** preloads all LOAs and/or malfunctions required for this scenario. Simulator commands and other functions to be performed by the booth operator are shown in **BOLD**. Trigger commands are used to initiate events and commands.

**HANG DNO** tag on “A” MDAFWP

**HANG DNO** tag on “A” CCP

**CLOSE** PORV Block Valve BB HV-8000A due to seat leakage of BB PCV-455A. Place a follow-up button on BB HV-8000A.

**ENSURE** THE HORNS ARE ON

**ENSURE** CONTROL RODS ARE AT 229 STEPS

**ENSURE** placard is on the 'A' CCP.

Check RM-11 Clear from Last Scenario

Have the above verified by a second person as being correctly performed.

Core age is Middle of Life

Power is 100%. Weekday Nightshift with normal crew manning.

**Establish** a Monitor Screen and **enter regh16**

Facility: WCGS Scenario No.: 4 Op-Test No.: \_\_\_\_\_

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

See Examiner/Operator assignment sheet. This Scenario will be seen by multiple crews.

Initial Conditions: The plant is at 100% power, MOL. The unit has been at power for the last 217 days. "A" MDAFW pump is out of service for preventive maintenance. "A" CCP out of service for a bearing replacement. PORV BB PCV-455A seat leaks and block valve BB HV-8000A is closed. "A" Train H2 Analyzer out of service for PM's.

Turnover: No other maintenance or testing is in progress. Weekday Nightshift, normal crew manning.

Event No.	Malf. No.	Event Type*	Event Description
1	mPRS 02	I (SRO) I (RO)	PZR level instrument BB LT-459 fails low
2		N (RO) N(SRO)	Restore normal letdown
3	mFM W04	I (BOP) I (SRO)	Feed water flow transmitter AE FT-510 fails low
4	mRCS 06A	C (ALL)	RCS leak of 50 gpm
5		N (SRO) N(BOP) R (RO)	Plant shutdown due to RCS leak
6	mRCS 06a	M (ALL)	Earthquake(>SSE) causes 10,000gpm LOCA inserted after observable reactivity change
7	mEPS 06B	C (ALL)	Loss of NB02 Vital Bus at trip
8	mECC 02A	C (SRO) C (RO)	SI pump "A" trips after RCPs are tripped..

Scenario will be terminated in EMG FR-C1 after S/G depressurization is established and CETs start to decrease.

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

Time (Mins)	Simulator Instructions	Events and Procedures	Applicant Actions or Behaviors	Notes
	<p>Insert <b>TRIGGER 1</b> one minute after the Watch has been assumed. (T+01)</p>	<p style="text-align: center;"><b><u>Event 1</u></b></p> <p>T Pressurizer Level Channel BB LI-459 fails low</p> <p>P PZR level alarms</p> <p>P Letdown isolates</p> <p>P Actual PZR level increases</p> <p>A Take Manual Control of PZR Level control.</p> <p><b>OFN SB-008 Steps:</b></p> <p>1. Check if Secondary system instrument channel is malfunctioning. - No - Go to step 2</p> <p>2. Check if RCS instrument channel is malfunctioning - BB LT-459 Go To Attachment J</p> <p>J1. Identify failed Instrument channel - BB LT-459</p> <p>J2. Check failed PZR level channel used to control PZR level.</p> <p>J3. Select alternate PZR level channel for level control.</p>	<p style="text-align: center;"><b><u>Event 1</u></b></p> <p><b>RO:</b> Report problem with PZR level</p> <p><b>SRO/RO:</b> Take manual control of the Master PZR Level Control. <b>SRO:</b> Direct RO to take manual control OR <b>RO:</b> Take manual control and inform SRO.</p> <p><b>CRITICAL TASK:</b> <u>Select alternate PZR level channel or take manual control.</u> <b>STANDARD:</b> <u>This action must be taken in time to prevent a reactor trip.</u></p> <p><b>SRO:</b> Enter and direct OFN SB-008</p> <p><b>RO:</b> Identify failed Instrument BB LT-459 failed low.</p> <p><b>RO:</b> Select Alternate Channel.</p>	

	<p>If called as Work Week Manager (WWM) state you will get a team together.</p>	<p style="text-align: center;"><b><u>Event 2</u></b></p> <p>T Letdown isolated due to low PZR level.</p> <p>A Restore letdown</p> <p>J4. Check Letdown flow - established NO - Perform RNO</p> <p>J5. Manually control Charging and Letdown to stabilize PZR level.</p> <p>J6. Ensure Pzr Ctrl heaters - on</p> <p>J7. Place Charging/Letdown flow control in automatic.</p> <p>J8. Monitor PZR level response to ensure proper control.</p> <p>J9. Check failed PZR level channel - not used for recorder</p> <p>J10. Place appropriate bistables in tripped mode.</p> <p>J11. Request I &amp; C repair channel.</p> <p>J12. Monitor the following Technical Specifications:</p> <ul style="list-style-type: none"> <li>• 3.3.1</li> <li>• 3.3.4</li> <li>• 3.3.3</li> </ul> <p>J13. Review Attachment S</p> <p>J14. Return to procedure and step in effect</p>	<p style="text-align: center;"><b><u>Event 2</u></b></p> <p><b>RO:</b> Establish letdown</p> <p><b>RO:</b> Restore PZR level.</p> <p><b>RO:</b> Place charging/letdown control in automatic.</p> <p><b>RO:</b> Select alternate recorder channel.</p> <p><b>SRO:</b> Contact WWM for assistance.</p> <p><b>SRO:</b> Evaluate and apply Tech Specs.</p> <p>3.3.1 Trip Bistables in 6 hours</p> <p>3.3.4 Repair in 30 Days</p> <p>3.3.3 Repair in 30 Days</p> <p><b>SRO:</b> Review attachment S.</p> <p><b>SRO:</b> Return to procedure and step in effect.</p>	
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<p>Insert <b>TRIGGER 3</b> at time T+ 08 minutes</p>	<p style="text-align: center;"><b><u>Event 3</u></b></p> <p>T     Feed Flow Instrument AE FT-510 Fails to 0</p> <p>P     Indicated Feed Flow decreases</p> <p>P     S/G 'A' Level Increases</p> <p>P     FRV AE FK-510 opens</p> <p>P     Ann. 108C alarms</p> <p>A     Take Manual Control of "A" FRV</p>	<p style="text-align: center;"><b><u>Event 3</u></b></p> <p><b>BOP:</b> Report problem with "A" SG.</p> <p><b>SRO/BOP:</b> Take manual control of the "A" SG FRV.</p> <p><b>CRITICAL TASK:</b> <u>Take manual control of AE FK-510 or select alternate channel.</u></p> <p><b>STANDARD:</b> <u>This action must be taken in time to prevent a reactor trip.</u></p>
<p>WWM called state you will get a team together.</p>	<p><b>ALR 108C</b> – directs manual control of FRV AE FK-510.</p> <p><b>OFN SB-008</b></p> <ol style="list-style-type: none"> <li>1. Check if secondary system instrument channel is malfunctioning - Go to Attachment E</li> </ol> <p>E1. Identify failed instrument channel</p> <p>E2. Check if failed feedwater flow channel selected on feedwater flow selector switch.</p> <p>E3. Select alternate feedwater flow channel for feedwater control.</p> <p>E4. Monitor S/G level response to ensure proper control.</p> <p>E5. Request I&amp;C to repair failed channel.</p> <p>E6. Return to procedure and step in effect</p>	<p><b>SRO:</b> May enter ALR 108C or go directly to OFN SB-008</p> <p><b>SRO:</b> Enter &amp; direct OFN SB-008 Attachment E</p> <p><b>RO/BOP:</b> Identify AE FT-510 failed.</p> <p><b>BOP:</b> Select Alternate Channel</p> <p><b>BOP:</b> Restore 'B' S/G level.</p> <p><b>SRO:</b> Contact WWM for Assistance.</p> <p><b>SRO:</b> Return to procedure and step in effect.</p>

<p>Insert <b>TRIGGER 4</b> at time T+12.</p>	<p style="text-align: center;"><b><u>Event 4</u></b></p> <p>T      RCS Leak at 50 gpm</p> <p>P      Pressurizer Level Decreases</p> <p>P      Pressurizer Pressure Decreases</p> <p>P      Charging/letdown flow mismatch</p> <p>A      Perform steps of OFN BB-007</p> <p><b>OFN BB-007: (Rev. 11)</b></p> <ol style="list-style-type: none"> <li>1. Check Plant in Mode 1, 2, or 3 with Accumulator Outlet Valves Open</li> <li>2. Check PZR level &gt; 6%</li> <li>3. Check PZR level &gt; 17%</li> <li>4. Check PZR level stable or increasing - NO <ul style="list-style-type: none"> <li>• RNO</li> <li>• Maximize Charging</li> <li>• Isolate Letdown Orifices as required</li> </ul> </li> <li>5. Check charging pump suction aligned to VCT</li> <li>6. Check PZR pressure</li> <li>7. Check SG tubes intact.</li> <li>8. Check CTMT conditions Normal NO <ul style="list-style-type: none"> <li>• RNO</li> <li>• RNO 1. Isolate Letdown</li> <li>• RNO 2. Isolate Normal Charging, charge to seals only.</li> </ul> </li> <li>9. Refer to T.S. <ul style="list-style-type: none"> <li>• 3.4.13, RCS Operational Leakage</li> <li>• 3.4.14, RCS Pressure Isolation Valve Leakage</li> </ul> </li> <li>10. Remove BTRS from service</li> </ol>	<p style="text-align: center;"><b><u>Event 4</u></b></p> <p><b>RO:</b> Report PZR level decrease or charging/letdown flow mismatch.</p> <p><b>SRO:</b> Enter and directs OFN BB-007</p> <p><b>RO:</b> Maximize NCP flow and isolate letdown as required to maintain level.</p> <p><b>RO:</b> Reports approximate RCS leak size.</p> <p><b>RO:</b> Isolate Letdown</p> <p><b>RO:</b> Establish charging to Seals only.</p> <p><b>SRO:</b> Determine that leak exceeds that allowed by T.S. 3.4.13  Condition A – Restore in 4 hours.  Condition B – Mode 3 in 6 hours.</p>	
<p>When called as Call Sup. Or Operations Manager prompt a 1%/minute shutdown.</p>			

		<p>11. Check for leakage to PRT, RNO to Step 15</p> <p style="text-align: center;"><b><u>Event 5</u></b></p> <p>T Determine S/D required due to RCS leak</p> <p>A Conduct Plant Shutdown.</p> <p><b><u>OFN MA-038 (Rev. 4)</u></b></p> <ol style="list-style-type: none"> <li>1. Reduce Turbine Load:             <ol style="list-style-type: none"> <li>a. Check desired unloading rate-less than or equal to 5%/minute</li> <li>b. Set Loading/Unloading Rate Limit to desired value</li> <li>c. Select Decrease Loading Rate - ON</li> <li>d. Decrease Load Set MW toward desired load</li> <li>e. Continue with this procedure while reducing turbine load</li> </ol> </li> <li>2. Adjust Control Rods as necessary to establish a target Tavg/Tref Temperature Error between 0°f and +5°F</li> <li>3. Energize PZR Backup Heaters BB HIS-51A &amp; BB HIS-52A</li> <li>4. Borate RCS and adjust Control Rods as necessary to establish the following conditions: Maintain delta flux within target band Maintain control rods above rod insertion limits</li> <li>5. Check PZR PORVs.</li> <li>6. Check PZR Pressure - Stable at or trending to 2235 Psig</li> <li>7. Check PZR level - Stable at or trending to program level.</li> <li>8. Check S/G levels &gt; 45% and &lt; 55%</li> <li>9. Check AE HV-38 – Open</li> <li>10. Check Reactor Power – less than 60%</li> </ol>	<p style="text-align: center;"><b><u>Event 5</u></b></p> <p><b>SRO:</b> Enter OFN MA-038 and Direct Crew to reduce power at a rate <math>\geq</math> 1% per minute.</p> <p><b>SRO:</b> Conduct Reactivity Brief</p> <p><b>BOP:</b> Reduce Turbine load at designated rate</p> <p><b>RO:</b> Maintain Tavg/Tref using rods</p> <p><b>RO:</b> Energize backup heaters</p> <p><b>RO:</b> Maintain Delta I &amp; RIL using boron and rods</p> <p><b>RO:</b> Control charging and letdown as necessary to maintain PZR level</p> <p><b>BOP:</b> Control SG Levels</p> <p><b>BOP:</b> Close AE HV-38</p>	
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	<p>Insert <b>TRIGGER 6</b> for SSE, LOCA and Loss of NB02 after an observable reactivity change.</p>	<p style="text-align: center;"><b><u>Event 6 &amp; 7</u></b></p> <p>T Earthquake &gt;SSE causes LOCA and Loss of Vital Bus NB02</p> <p>P Seismic Annunciators Alarm</p> <p>P Rx Trip and SI on Low RCS Press</p> <p>P NB02 Bus Lock Out Alarm</p> <p>A Enter EMG E-0</p> <p><b>EMG E-0 steps:</b></p> <ol style="list-style-type: none"> <li>1. Verify Rx trip.             <ol style="list-style-type: none"> <li>a. Check all rod bottom lights lit</li> <li>b. Ensure reactor trip breakers and bypass breakers open</li> <li>c. Check IR neutron flux decreasing</li> <li>d. Transfer NR-45 recorder to intermediate range</li> </ol> </li> <li>2. Verify turbine trip.             <ol style="list-style-type: none"> <li>a. Check the following: Main stop valves all closed <u>OR</u> Turbine auto stop bistable lights at least two lit</li> <li>b. Check main generator breakers and exciter breaker open</li> </ol> </li> <li>3. Check AC emergency busses at least one energized</li> <li>4. Check if SI is actuated</li> <li>5. Check if SI is required</li> </ol> <p>Per Fold Out Page:</p>	<p style="text-align: center;"><b><u>Event 6 &amp; 7</u></b></p> <p><b>CREW:</b> Recognize Reactor Trip and enter EMG E-0</p> <p><b>SRO:</b> Enter and direct EMG E-0. <b>RO/BOP:</b> Perform Immediate Actions</p> <p><b>RO:</b> Verify Reactor Trip.</p> <p><b>BOP:</b> Verify Turbine Trip.</p> <p><b>RO:</b> Check AC emergency busses at least one energized and report NB02 de-energized.</p> <p><b>RO:</b> Determine SI is actuated <b>SRO/RO:</b> Determine SI is required.</p> <p><b>SRO/RO:</b> Trip all RCP's.</p>	
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	<p>Insert <b>Trigger 8</b> at 2 minutes after RCPs are secured. This will trip the remaining SI pump and NCP (Event 8).</p> <p>To Close “B” Train CCW valves, on the monitor screen</p>	<ul style="list-style-type: none"> <li>• RCS Press &lt; 1400 psig</li> <li>• CCP or SI pump Running</li> <li>• Trip ALL RCP’s</li> </ul> <p>6. Verify Automatic Actions Using Attachment F, Automatic Signal Verification</p> <p>ATTACHMENT F</p> <p>F1. Verify feedwater isolation</p> <p>F2. Verify CISA</p> <p>F3. Verify AFW pumps running</p> <ul style="list-style-type: none"> <li>a. Check motor driven AFW pumps both running</li> <li>b. Check turbine driven AFW pump running</li> </ul> <p style="text-align: center;"><b><u>Event 8</u></b></p> <p>T SI pump A trip</p> <p>T NCP trip</p> <p>P ECCS status alarm</p> <p>P ANN 049A SI PMP TROUBLE</p> <p>P EM FI 918 no BIT flow indicated</p> <p>P ANN 042E CHG PMP TROUBLE</p> <p>A Recognize pumps tripped</p> <p>F4. Verify ECCS pumps running</p> <ul style="list-style-type: none"> <li>a. Check CCPs both running</li> <li>b. Check SI pumps both running</li> <li>c. Check RHR pumps Both Running</li> </ul> <p>F5. Verify CCW alignment</p> <ul style="list-style-type: none"> <li>a. Check CCW pumps one running in each train</li> </ul>	<p><b>Critical Step:</b> <u>Trip All RCP’s when Trip Criteria is met.</u></p> <p><b>Standard:</b> <u>Complete prior to the end of the scenario.</u></p> <p><b>SRO:</b> Direct performance of ATT. F</p> <p><b>RO/BOP:</b> Perform Attachment. F and report all B train equipment did not start.</p> <p><b>RO/BOP:</b> Reports MDAFW Pump A is tagged and that MDAFW Pump B has no power.</p> <p style="text-align: center;"><b><u>Event 8</u></b></p> <p><b>SRO/RO:</b> Respond to alarms and recognize all High Head and Intermediate Head pumps have been lost.</p> <p><b>RO/BOP:</b> Reports CCP A is tagged out.</p> <p><b>RO/BOP:</b> Reports SI pump A trip.</p> <p><b>RO/BOP:</b> Open “A” Train CCW valves to the service loop. Dispatch operator to locally close “B”</p>	
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	<p><b>Enter ramp regh16 1 0 20.</b></p>	<p>b. Check one pair of CCW service loop supply and return valves for an operating CCW pump open</p> <p>F6. Check ESW pumps both running</p> <p>F7. Verify CTMT fan coolers - running in slow speed</p> <p>F8. Verify CPIS</p> <p>    a. Check ESFAS status panel CPIS section all white lights lit</p> <p>F9. Verify both trains of CRVIS</p> <p>    a. Check ESFAS status panel CRVIS section all white lights lit</p> <p>    b. Ensure control room outer door closed</p> <p>F10. Verify main steamline isolation not required</p> <p>F11. Verify CTMT spray not required</p> <p>F12. Verify ECCS flow</p> <p>F13. Verify AFW valves - properly aligned.</p> <p>F14. Verify SI valves - properly aligned.</p> <p><b>E-0 Steps</b></p> <p>7. Verify AFW flow &gt; 270,000 lbm/hr.</p> <p>8. Check RCS cold leg temperature - stable.</p> <p>9. Establish S/G pressure control:</p> <p>10. Check PZR PORVs</p> <p>11. Check normal PZR spray valves closed</p> <p>12. Check PZR safety valves - closed</p> <p>13. Check if RCPs should be stopped.</p> <p>14. Direct operator to monitor CSFSTs</p> <p>15. Check if SGs are not faulted.</p> <p>16. Check if SG tubes are intact.</p> <p>17. Check SG levels increasing in an uncontrolled manner</p> <p>18. Check if RCS is intact - NO</p> <p>    RNO Ensure BIT Inlet and Outlet valves are open and Go To EMG E-1</p>	<p>Train to service loop valves.</p> <p><b>RO/BOP:</b> Reports the lack of ECCS flow.</p> <p><b>RO/BOP:</b> Establish Steam dump control to prevent heatup.</p> <p><b>RO:</b> Determine RCS not intact</p> <p><b>SRO:</b> Direct transition to E-1.</p>	
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	<p>SI pump trip eventually puts the crew in FR-C1.</p>	<p><b>EMG E-1 Steps:</b></p> <ol style="list-style-type: none"> <li>1. Check if RCPs should be stopped</li> <li>2. Check if SGs are not faulted</li> <li>3. Check intact SG Levels</li> <li>4. Reset SI</li> <li>5. Reset Containment Isolation Phase A and Phase B</li> <li>6. Determine Secondary Radiation Levels</li> <li>7. Check Secondary Radiation - Normal</li> <li>8. Check PZR PORVs and block valves</li> <li>9. Establish Instrument Air to Containment</li> <li>10. Check if ECCS flow should be reduced No - RNO Go to step 11.</li> <li>11. Check if Containment Spray should stopped</li> <li>12. Check if RHR should be stopped</li> <li>13. Check RCS and SG Pressures</li> <li>14. Check if D/Gs should be stopped</li> </ol> <p>NOTE: EMG FR-C1 will eventually be necessary. The crew may first transition to EMG FR-C2, but this will not prevent red path condition from occurring. In this scenario, EMG FR-C2 steps are not critical since insufficient time exists for the operators to take any significant action before entry into EMG FR-C1 will be required.</p>	<p><b>SRO:</b> Enter and direct steps of EMG E-1 <b>SRO:</b> Conduct Transition Brief.</p> <p><b>RO/BOP:</b> Reports all RCPs tripped earlier.</p> <p><b>RO/BOP:</b> Reset SI <b>RO/BOP:</b> Reset CISA/CISB</p> <p><b>RO/BOP:</b> Establish instrument air to CTMT.</p> <p><b>RO/BOP:</b> Stop RHR pumps and place in standby.</p> <p><b>RO/BOP:</b> Stop NE01/NE02</p>	
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	<p>When directed to restore power to accumulator isolation valves: <b>Trigger 9</b> Restore Power to A Train Accumulator Isolation Valves IRF rECC01 (9) 1</p> <p>NOTE: NG02B is not energized.</p>	<p><b>EMG FR C1 steps: (Rev. 12)</b></p> <ol style="list-style-type: none"> <li>1. Verify SI valve alignment</li> <li>2. Verify ECCS flow in all trains</li> <li>3. Check RCP support conditions available</li> <li>4. Check SI Accumulator isolation valve status</li> <li>5. Check core exit TCs less than 1200°F.</li> <li>6. Check RVLIS Nat. Circ. &gt; 45%</li> <li>7. Check core exit TCs less than 712°F.</li> <li>8. Check H<sub>2</sub> analyzers in service.</li> <li>9. Check CTMT H<sub>2</sub> concentration</li> <li>10. Check intact SG levels.</li> <li>11. Check RCS vent paths.</li> <li>12. Check if condenser air removal should be returned to service.</li> <li>13. Check if low steamline pressure should be blocked</li> <li>14. Depressurize all intact SGs to 160 psig.</li> <li>15. Reset SI</li> <li>16. Check if SI accumulators should be isolated</li> <li>17. Stop all RCPs.</li> <li>18. Depressurize all intact SGs to atmospheric pressure</li> <li>19. Verify ECCS flow</li> </ol>	<p><b>SRO:</b> Enter and direct steps of EMG FR-C1 <b>SRO:</b> Conducts Transition Brief</p> <p><b>RO:</b> Reports B train no power. <b>RO:</b> Reports no flow indicated.</p> <p><b>RO/BOP:</b> Dispatch an operator to restore power to accumulator valves.</p> <p><b>RO/BOP:</b> Place H2 analyzers in service.</p> <p><b>BOP:</b> Maintain S/G narrow range level</p> <p><b>RO:</b> Block low steamline pressure SI</p> <p><b>SRO/BOP:</b> Depressurize all intact SGs to 160 psig at maximum rate. <b>CRITICAL TASK:</b> <u>Depressurize the SGs to 160 psig in order to initiate ECCS accumulator injection and to establish RHR injection to the RCS.</u> <b>STANDARD:</b> <u>commencing a successful S/G depressurization satisfies this action.</u></p>	
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	<p>20. Check core cooling</p> <p><b>Terminate Scenario</b> when S/G depressurization is established and Core Exit Thermocouples start to decrease.</p> <p>&gt;INITIAL LICENSE EXAM SCENARIO #4          &gt;OVERRIDE ANN 00-18F          IMF ANN-F018 0          &gt;"A" CCP TAGGED          IRF NBGP05A 1          &gt;"A" MDAFW PUMP TAGGED          IRF NALP01A 1          IRF NALP01AC 1          &gt;PZR LEVEL INSTRUMENT BB LT-459 FAILS LOW          IMF MPRS02A (1) 0          &gt; FEED WATER FLOW TRANSMITTER AE FT 510 FAILS LOW          IMF MFWM04A (3) 0 30          &gt;RCS LEAK 50 GPM          IMF MRCS06B (4) 50 60          &gt;EARTHQUAKE AND LBLOCA 10,000 GPM AND LOSS OF NB02          IMF ANN-A098 (6) 0          IMF ANN-B098 (6) 0          IMF ANN-C098 (6) 0          IMF ANN-D098 (6) 0          IMF ANN-E098 (6) 0          IMF MRCS06A (6 15) 10000          IMF MEPS06B (6 15)          &gt;LOSS OF "A" SI PUMP          IMF MECC02A (8)          IMF MCVC13C (8)          &gt;Restore Power to A Train Accumulator          &gt;Isolation Valves          IRF rECC01 (9) 2          &gt;End of File</p>	<p><b>E-Plan Classification: EAL-3, LRCB.          LRCB 1 – 2 – 3 – 4 - 8 -- SAE</b></p>	
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**INITIAL LICENSE EXAM**

**DECEMBER 2001**

**DYNAMIC SCENARIO #6**

Revision 0, 10/08/2001

Scenario Objectives:

1. Evaluate the ability to perform normal operations by increasing power from  $10^{-8}$  amps to 1%.
2. Abnormal actions and Technical Specifications usage are evaluated by diagnosing and correcting:
  - PZR Pressure Channel failing high
  - SG Level Channel Fails Low
  - Excessive PORV seat leakage requires closure of the associated block valve.
3. Emergency actions are evaluated for a Main Steam Line Break, inside of Containment.
4. Contingency actions are evaluated for a failure of the MSIV's to automatically close and failure of Containment Isolation Phase A.

GENERAL REFERENCES

NUREG 1021, Rev. 8, Supplement 1, "OPERATOR LICENSING EXAMINATION  
STANDARDS FOR POWER REACTORS"

OFN SB-008, Rev. 11, "INSTRUMENT MALFUNCTIONS"

GEN 00-003, Rev. 52, "HOT STANDBY TO MINIMUM LOAD"

EMG E-0, Rev. 14, "REACTOR TRIP OR SAFETY INJECTION"

EMG E-2, Rev. 9, "FAULTED STEAM GENERATOR ISOLATION"

**RESET TO IC 156 AND PLACE SIMULATOR IN RUN PRIOR TO LOADING BATCH FILE.** Ensure simulator is in run or file will not load properly. You may freeze after file is loaded.

Insert Floppy disk and save the batch file **LO01\_006** to **OPENSIM/BATCH**, then open Ph.D. Expert and type "**BAT LO01\_006.txt**"

NOTE: FILE **S LO06\_001.txt** preloads all LOAs and/or malfunctions required for this scenario. Simulator commands and other functions to be performed by the booth operator are shown in **BOLD**. Trigger commands are used to initiate events and commands.

**ENSURE THE HORNS ARE ON**

**ENSURE** Control Rods are at 98 steps on Control Bank D, 213 steps on Control Bank C and 228 on Control Banks A and B.

**ENSURE** placard is on the 'A' CCP.

Reset RM-11 alarms from previous Scenarios

Have the above verified by a second person as being correctly performed.

Core age is Middle of Life

Power is 10-8 amps, Critical rod height data is complete.  
GEN 00-003 is in progress at step 6.25. Provide signed off copy of GEN 00-003.

Facility: WCGS Scenario No.: 6(Spare) Op-Test No.: \_\_\_\_\_

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: The plant is at MOL. Unit startup is in progress after a 7 day outage to resolve a voltage regulator problem. Reactor power is at E<sup>-8</sup> Amps, Rod control in manual, Startup Feedpump in service, GEN 00-003 is complete through step 6.24.

Turnover: All systems normal, resume startup at step 6.25 of Gen 00-003.

Event No.	Malf. No.	Event Type*	Event Description
1		N (SRO) R (RO)	Increase reactor power to 1%
2	mPRS 01B	I (SRO) I (RO)	Pzr pressure channel BB PT-457 fails high
3	mCVC 13C	C (SRO) C(BOP)	"B" SG Level Channel Fails <b>(CHANGE)</b> <b>Old malfunction was used as a JPM</b>
4	mPRS 10A	C (SRO) C (RO)	PORV BB PCV-455A excessive seat leakage. Block valve BB HV-8000B is isolated.
5	mMSS 03B	M (SRO) M (RO) M (BOP)	S/G "B" faulted inside containment
6	mMSS 02E-H	C (SRO) C (BOP)	MSIV's Fail to close in Automatic
7	mPCS 10A & 10B	C (SRO) C (RO)	Failure of containment isolation phase A

Terminate after stabilization of RCS after Steam Generator blowdown.

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

Time (min)	Simulator Instructions	Events and Procedures	Applicant Actions or Behaviors	Notes
	Malfunction clock starts when the crew has assumed the watch (T=0)	<p style="text-align: center;"><b><u>Event #1</u></b></p> <p>T      Increase Reactor Power to 1%.</p> <p>A      Raise Reactor Power to POAH</p> <p><b>Gen 00-003 (rev XX)</b></p> <p>6.22    Stabilize reactor power at 10<sup>-8</sup> amps</p> <p>6.23    Record critical data</p> <p>6.24    Complete a Surveillance Procedure Credit Cross-Reference and Review Sheet for STS SF001 and route to Surveillance Coordinator. <i>NA</i></p> <p>6.25    Increase reactor power to .5%</p> <p>    6.25.1      Ensure steam dumps or ARVs are adjusted to 557°F, ±5°F</p> <p>    6.25.2      Establish desired SUR (not to exceed 1 dpm SS or 1.5 dpm transient)</p> <p>    6.25.3      Let steam dumps or ARVs open until power is 0.5%</p> <p>    6.25.4      Reduce or stop blowdown as necessary to maintain sufficient feed flow.</p> <p>    6.25.5      Stabilize power between 0.5% and 1.0%</p> <p>    6.25.6      Select highest PR on NR45 and go to LO-0 speed (1"/hr)</p>	<p style="text-align: center;"><b><u>Event #1</u></b></p> <p><b>SRO:</b> Direct power increase. <b>SRO:</b> Conduct Reactivity Brief.</p> <p><b>RO:</b> Withdraw Control Rods to establish SUR per CRS directions.. <b>BOP:</b> Monitor DRPI indications.</p>	

<p>Insert Event 2 with <b>Trigger 2</b> at time T+13 min.</p>	<p style="text-align: center;"><b><u>Event 2</u></b></p> <p>T BB PT-457 Fails High, PZR Pressure</p> <p>P PZR Spray valves open</p> <p>P PORV 455A opens</p> <p>P PZR Pressure decreases</p> <p>A Stop the Pressure Transient</p> <p><b>OFN SB-008 steps: (Rev 11)</b></p> <p>2. Check if RCS Inst. failure - YES Go To ATT. K</p> <p>K1. Identify Failed Inst.</p> <p>K2. Check failed inst used for control</p> <p>K3. Check Failed PZR Pressure Channel Failed High</p> <p>K4. Select Alt. PZR Pressure Channel</p> <p>K5. Stop Pressure Transient</p> <p>K6. Return PZR Pressure Control to AUTO</p> <p>K7. Monitor Pressure</p> <p>K8. Check failed inst. not selected to recorder</p> <p>K9. Check failed inst. not selected to OPΔT/OTΔT recorder</p> <p>K10. Trip bistables</p> <p>K11. Request I&amp;C repair failed inst.</p> <p>K12. Monitor T/S:</p> <p>3.3.1</p> <p>3.3.2</p> <p>3.3.4 table 3.3.4-1 function 3</p> <p>3.3.6</p> <p>3.3.7</p> <p>K13. Review attach. S for Post Accident &amp; Remote S/D Inst.</p>	<p style="text-align: center;"><b><u>Event 2</u></b></p> <p><b>RO:</b> Report RCS pressure decreasing.</p> <p><b>SRO/RO:</b> Take Manual Control of Master Pressure Controller and restore RCS pressure.</p> <p><b>CRITICAL STEP:</b> <u>Place PZR Pressure master controller in manual and close spray valves OR select alternate channel.</u></p> <p><b>STANDARD:</b> <u>This action must be taken in time to prevent a reactor trip.</u></p> <p><b>SRO:</b> Enters and directs OFN SB-008</p> <p><b>RO:</b> Identify BB PT-457 has failed high.</p> <p><b>RO:</b> Select Alternate channel.</p> <p><b>SRO:</b> Evaluate and apply T.S.</p> <p>3.3.1 Trip Bi-stables in 6 hours</p> <p>3.3.2 Trip Bi-stables in 6 hours</p> <p>3.3.4 N/A</p> <p>3.3.6 Verify Ctmt Purge Vlvs shut</p> <p>3.3.7 CREVS within 7days</p>	<p>When called WWM state you will get a team together.</p>
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<p>Insert Event #3 with <b>Trigger 3</b> at time xxx</p>	<p>K14. Return to Procedure and Step in effect</p>	<p><b>SRO:</b> Return to GEN 00-003.</p>
<p>When called WWM state you will get a team together.</p>	<p style="text-align: center;"><b><u>Event 3</u></b></p> <p>T 'B' S/G Level Channel Fails Low AE LI-529</p> <p>P 'B' FRV Throttle Shut to Maintain Level</p> <p>A Restore 'B' S/G Level Perform OFN SB-008</p> <p><b>OFN SB-008 (Rev. 11)</b></p> <p><b>Actions:</b></p> <ol style="list-style-type: none"> <li>1. Check if secondary system instrument channel is malfunctioning             <ol style="list-style-type: none"> <li>a. Determine appropriate attachment for malfunctioning channel</li> <li>b. Go to Attachment F</li> </ol> </li> <li>F1. Identify failed level channel</li> <li>F2. Check if failed S/G level channel used for feedwater control.</li> <li>F3. Select the alternate S/G level channel.</li> <li>F4. Monitor S/G level response to ensure proper control.</li> <li>F5. Trip bistables</li> <li>F6. Place AMSAC in TRIP condition</li> <li>F7. Request I&amp;C to repair failed channel.</li> <li>F8. Monitor Tech. Specs.             <ol style="list-style-type: none"> <li>3.3.1</li> <li>3.3.2</li> <li>3.3.4, Table 3.3.4-1, Function 8</li> <li>3.3.3 Table 3.3.3-1, Function 13</li> </ol> </li> <li>F9. Review Att. S</li> <li>F10. Return to procedure and step in effect</li> </ol>	<p style="text-align: center;"><b><u>Event 3</u></b></p> <p><b>BOP:</b> Report 'B' S/G level problem.</p> <p><b>CRITICAL TASK:</b> Take manual control of "B" FRV or select out failed channel. <b>STANDARD:</b> This action must be taken in time to prevent a reactor trip.</p> <p><b>SRO:</b> Enter &amp; direct OFN SB-008</p> <p><b>BOP:</b> Identify AE LI-529 as failed Inst. <b>BOP:</b> Select alternate Inst. <b>BOP:</b> Restore 'B' S/G level.</p> <p><b>SRO:</b> This channel does not require tripping for AMSAC</p> <p><b>SRO:</b> Evaluate &amp; Apply Tech Specs. 3.3.1 Trip Bi-stables in 6 hours 3.3.2 Trip Bi-stables in 6 hours 3.3.4 N/A 3.3.3 N/A</p> <p><b>SRO:</b> Review attachment 'S' &amp; apply <b>SRO:</b> Return to GEN 00-003</p>

	<p>Insert Event #4 with <b>Trigger 4</b> at time xxx</p>	<p style="text-align: center;"><b><u>Event 4</u></b></p> <p>T      PORV Leakage.</p> <p>P      PORV Tail pipe temperature increases</p> <p>P      PRT Pressure increases</p> <p>P      PRT Temperature increases</p> <p>P      RCS Pressure decreases</p> <p>A      Determine that PZR PORV has failed to fully seat and is leaking by to the PRT.</p> <p>The Crew will have to monitor the plant and determine that whenever the Block valve goes closed RCS pressure recovers to the point the Block valve re-opens causing RCS pressure to decrease again.</p>	<p style="text-align: center;"><b><u>Event 4</u></b></p> <p><b>RO/BOP:</b> Note that PRT parameters have began increasing when they were decreasing..</p> <p><b>RO/BOP:</b> Note that RCS Pressure is decreasing.</p> <p><b>SRO/RO:</b> Close Block valve BB HV8000A to isolate POR V</p> <p><b>SRO:</b> Determine T.S. applicability. T.S. 3.4.11 PORV's Condition A: Close the Block valve within 1 hour.</p>	
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<p>Insert Event #5 with <b>Trigger 5</b> at time xxx</p>	<p style="text-align: center;"><b><u>Event 5</u></b></p> <p>T S/G "B" faulted in Containment.</p> <p>P RCS Tavg decreases</p> <p>P Pressurizer Pressure will decrease.</p> <p>P Main Steam Line Pressures will decrease.</p> <p>P CTMT Pressures will increase.</p> <p>P CTMT Humidity will increase.</p> <p>A Determine that a S/G has faulted into CTMT.</p> <p><b>EMG E-0 STEPS (REV 14)</b></p> <ol style="list-style-type: none"> <li>1. Verify Rx trip.             <ol style="list-style-type: none"> <li>a. Check all rod bottom lights lit</li> <li>b. Ensure reactor trip breakers and bypass breakers open</li> <li>c. Check neutron flux decreasing</li> <li>d. Transfer NR-45 recorder to intermediate range</li> </ol> </li> <li>2. Verify turbine trip.             <ol style="list-style-type: none"> <li>a. Check the following:                 <ul style="list-style-type: none"> <li>* Main stop valves all closed</li> <li style="text-align: center;"><u>OR</u></li> <li>* Turbine auto stop bistable lights at least two lit</li> </ul> </li> <li>b. Check main generator breakers and exciter breaker open</li> </ol> </li> <li>3. Check AC emergency busses at least one energized</li> <li>4. Check if SI is actuated</li> <li>5. Check if SI is required:</li> </ol>	<p style="text-align: center;"><b><u>Event 5</u></b></p> <p><b>SRO:</b> Recognize a trip is required and direct the RO to manually trip the reactor.</p> <p><b>RO:</b> Manually trip the reactor.</p> <p><b>SRO:</b> Enter and direct E-0.</p> <p><b>RO/BOP:</b> Perform Immediate Actions of E-0, Steps 1 through 4.</p> <p><b>RO:</b> Verify Reactor Trip.</p> <p><b>BOP:</b> Verify Turbine Trip.</p> <p><b>RO:</b> Verify AC buses energized.</p> <p><b>RO:</b> Check if SI actuated.</p>	
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		<p style="text-align: center;"><b><u>Event 6</u></b></p> <p>T MSIV's fail to auto close</p> <p>P SG Pressure &lt; 615 psig</p> <p>P CTMT Pressure &gt; 17 psig</p> <p>P SG Pressures decreasing rapidly</p> <p>A "Fast Close" MSIV's</p>	<p style="text-align: center;"><b><u>Event 6</u></b></p> <p><b>SRO\BOP:</b> Determine that MSIV's did not close and FAST CLOSE MSIV's. (This action should be done after completion of Immediate Actions.)</p> <p><b>CRITICAL TASK:</b> <u>Manually actuate main steamline isolation before a severe (orange-path) challenge develops to either the subcriticality or the integrity CSF or before transition to EMG C-21, whichever happens first.</u></p> <p><b>STANDARD:</b> <u>All 4 MSIV's Closed.</u></p> <p><b>SRO\BOP:</b> Per Fold Out Page of E-0, isolate AFW to the Faulted S/G</p> <p><b>CRITICAL TASK:</b> <u>Isolate the faulted SG before a severe (orange-path) challenge develops and before the end of the scenario.</u></p> <p><b>STANDARD:</b> <u>Both AFW valves to the faulted S/G are closed and verify Main Feed is isolated.</u></p>	
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		<p>6. Verify automatic actions per Attachment F.</p> <p style="text-align: center;">ATTACHMENT F</p> <p>F1. Verify feedwater isolation  F2. Verify CISA      a. Check ESFAS status panel CISA section all white lights lit  F3. Verify AFW pumps running  F4. Verify ECCS pumps running  F5. Verify CCW alignment  F6. Check ESW pumps both running  F7. Verify CTMT fan coolers running in slow speed.  F8. Verify CPIS      a. Check ESFAS status panel CPIS section all white lights lit  F9. Verify both trains of CRVIS      a. Check ESFAS status panel CRVIS section all white lights lit  F10. Verify main steamline isolation not required  F11. Verify CTMT spray not required  F12. Verify ECCS flow  F13. Verify AFW valves - properly aligned.  F14. Verify SI valves - properly aligned.</p> <p>7. Verify AFW flow &gt; 270,000 lbm/hr.  <u>8.</u> Check RCS cold leg temperature stable.  9. Establish S/G pressure control:      a. Check condenser – AVAILABLE - NO RNO – Use SG ARV’s  10. Check PZR PORVs - closed  11. Check normal PZR spray valves closed  12. Check PZR safety valves - closed  13. Check if RCPs should be stopped.  14. Direct operator to monitor CSFSTs  15. Check if SGs are not faulted. NO - RNO Go</p>	<p><b>BOP/RO:</b> Perform Attachment F.</p> <p style="text-align: center;"><b><u>Event 7</u></b></p> <p><b>RO\BOP:</b> Determine that CIS-A did not actuate on either train and inform CRS. (NOTE: Failure of CIS-A will also cause CPIS\CRVIS to fail to actuate.)</p> <p><b>SRO:</b> Direct actuation of CIS-A.</p> <p>NOTE: CPIS and CRVIS do actuate either with the failure of CIS-A. Once the operator manually actuates CIS-A the rest will actuate normally.</p> <p><b>BOP:</b> Establish SG Pressure control using SG ARV’s.</p>	
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		<p>To EMG E-2.</p> <p><b>EMG E-2 steps: (REV 9)</b></p> <ol style="list-style-type: none"> <li>1. Check steamline on All SG isolated             <ol style="list-style-type: none"> <li>a. MSIVs closed</li> <li>b. MSIV bypasses closed</li> <li>c. Main steamline low point drain valves closed</li> </ol> </li> <li>2. Check if fault is inside Area 5</li> <li>3. Check if any SG is not faulted</li> <li>4. Identify faulted SG(s)</li> <li>5. Isolate faulted SG(s)             <ol style="list-style-type: none"> <li>a. Close AFW flow control valves to faulted SG</li> <li>b. Locally close steam supply to TD AFW pump</li> <li>c. Ensure SG ARV on faulted SG is closed</li> </ol> </li> <li>6. Verify feedline isolated on faulted SG             <ol style="list-style-type: none"> <li>a. Main feed reg valve closed</li> <li>b. Bypass feed reg valve closed</li> <li>c. MFIV closed</li> <li>d. Chemical injection valve closed</li> </ol> </li> </ol> <p><b>Terminate Scenario</b> after crew isolates the Faulted S/G in EMG E-2 or at discretion of Lead Examiner.</p>	<p><b>BOP:</b> Determine SG “B” faulted  <b>SRO:</b> Transition to EMG E-2.</p> <p><b>SRO:</b> Conduct Transition Brief.  <b>SRO:</b> Enter and Direct EMG E-2.</p> <p><b>BOP:</b> Ensure Steam Lines isolated.          (Should already be done)</p> <p><b>BOP:</b> Ensure faulted SG isolated.          Dispatch Operator to isolate TDAFW steam supply valve.</p> <p>BOP: Verify feedline isolated.</p> <p><b>E-PLAN CLASSIFICATION:          EAL-4, Main Steam Line Break          MSLB 1 -2 -5 -7 -NUE.</b></p>	
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ILC Scenario #6

		<p>&gt;Initial License Exam Spare Scenario #6 &gt;LO01_006 (Spare) 10-8 Amps &gt;GEN00-003 step 6.22 complete &gt;Set up MSIV's Fail to Auto Close IMF mMSS02E IMF mMSS02F IMF mMSS02G IMF mMSS02H &gt;Set up Failure of CISA, Both Trains IMF mPCS10C &gt;PZR Press Channel Failure IMF mPRS01b (2) 2505 5 &gt;SET-UP S/G LEVEL FAILURE IMF mFWM02B3 (3) 0 5 &gt;PORV 455A begins leaking IMF mPRS10A (4) 15 &gt;SG "B" Faults inside CTMT IMF mMSS03B (5) 2.0e+6 180 &gt; &gt;End of File</p>		
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**1.0 PURPOSE**

1.1 This procedure provides instructions for responding to actuation of alarm window 00-042A, CHG LINE FLOW HILO.

**2.0 SYMPTOMS OR ENTRY CONDITIONS**

2.1 This procedure is entered when the following occurs:

\* Charging header flow is greater than or equal to 150 gpm.

o BG FB-121A

OR

\* Charging header flow is less than or equal to 45 gpm.

o BG FB-121B

**3.0 REFERENCES AND COMMITMENTS****3.1 References**

a. Total Plant Setpoint Document

b. EN 93-0170

c. CCP 6578, Low Flow Cavitation

d. PMR 4590, PDP Replacement

**3.2 Commitments**

a. RCMS 1988-157 Response to prevent dead-heading pumps[Step

✧

10b RNO]

✧

STE

ACTION/EXPECTED

RESPONSE NOT

1. **Check Charging Header Flow -  
GREATER THAN 150 GPM**

o BG FI-121A

2. **Verify alarm is NOT due to  
plant cooldown.**

3. **Check PZR Level - AT PROGRAM  
VALUE**

o BB LR-459

4. **Go To Step 9**

5. **Check Charging Header Flow -  
LESS THAN 45 GPM**

o BG FI-121A

Go to Step 5.

Return to procedure and step  
in effect.

Perform the following:

- a. IF level less than  
program, THEN go to  
OFN BB-007, RCS LEAKAGE  
HIGH, Step 1 OR  
OFN BB-07A, STEAM  
GENERATOR TUBE LEAKAGE  
Step 1.
- b. IF level greater than  
program, THEN place  
running charging pump flow  
controller in manual and  
decrease charging flow as  
necessary to establish PZR  
level at program value.

- \* BG FK-121 for CCP  
\* BG FK-462 for NCP

Notify I&C to determine cause  
of alarm AND Return to  
procedure and step in effect.

STE

ACTION/EXPECTED

RESPONSE NOT

**6. Check Charging Pumps - ANY RUNNING**

- \* BG HIS-1A for CCP A
- \* BG HIS-2A for CCP B
- \* BG HIS-3 for NCP

Perform the following:

a. Close Letdown Orifice Isolation valves.

- o BG HIS-8149AA
- o BG HIS-8149BA
- o BG HIS-8149CA

b. Start any available charging pump:

\* Start either CCP.

- \* BG HIS-1A for CCP A
- \* BG HIS-2A for CCP B

OR

\* Start NCP:

- o BG HIS-3

**7. Check PZR Level - AT PROGRAM VALUE**

- o BB LR-459

Perform the following:

a. Place running charging pump flow controller in manual and adjust charging flow as necessary to establish PZR level at program value.

- \* BG FK-121 for CCP
- \* BG FK-462 for NCP

b. Establish desired letdown by performing section 6.5 in SYS BG-120 CHEMICAL AND VOLUME CONTROL SYSTEM STARTUP.

**8. Check Letdown Heat Exchanger Outlet Temperature - LESS THAN 130°F**

- o BG TI-130

Bypass CVCS demineralizers.

- o BG HIS-129

**9. Check Charging Header Flow And Letdown Flow - BALANCED**

Adjust charging and letdown as necessary to maintain PZR level at program value.





**1.0 PURPOSE**

1.1 This procedure provides instructions for responding to actuation of alarm window 00-061A, PROCESS RAD HIHI.

**2.0 SYMPTOMS OR ENTRY CONDITIONS**

2.1 This procedure is entered when any process radiation monitor in high high alarm condition.

2.2 The high high alarm setpoints for liquid and gaseous effluents are set as calculated in AP 07B-003, Offsite Dose Calculation Manual (ODCM).

2.3 IF a controlled release is in progress AND the monitor in the release path is high high, THEN the controlled release will automatically be terminated.

**3.0 REFERENCES AND COMMITMENTS****3.1 References**

- a. AP 07B-003, Offsite Dose Calculation Manual (ODCM)
- b. PIR 95-0087
- c. PIR 00-0039

**3.2 Commitments**

- a. LER 90-24, RCMS 90-176, PDR 1991-0445, PIR 90-0234,  
 ✧ Unplanned Release Of Waste Gas Decay Tank Without Prior  
 ✧ Sampling Caused By Personnel Error [Commitment - Procedure  
 ✧ Step, Step 8].  
 ✧

is

STE

ACTION/EXPECTED

RESPONSE NOT

**1. Determine Affected Process Radiation Monitor:**

- o Check panel SP056A - ANY PROCESS MONITOR RED

Perform the following:

- a. IF either gaseous effluent monitor in accident isolation, THEN go to Step 6.

- \* GH RE-10 for Radwaste Building
- \* GT RE-21 for Unit Vent

- b. IF gaseous effluent monitors NOT in accident isolation, THEN return to procedure and step in effect.

- o GH RE-10 for Radwaste Building
- o GT RE-21 for Unit Vent

**2. Check For High High Reactor Coolant System Activity:**

- a. Check Auxiliary Building, CVCS Letdown Monitor - RED

a. Go to Step 3.

- o SJL016

- b. Go to OFN BB-006, HIGH REACTOR COOLANT ACTIVITY, Step 1

**3. Check For RCS Leakage To Containment:**

- a. Check Containment Atmosphere Monitors - ANY RED

a. Go to Step 4.

- \* GTP311
- \* GTI312
- \* GTG313
- \* GTP321
- \* GTI322
- \* GTG323

- b. IF Chemistry cannot verify the signal is a spike THEN go to OFN BB-007, RCS LEAKAGE HIGH, Step 1

STE

ACTION/EXPECTED

RESPONSE NOT

**4. Check For Steam Generator  
Tube Leakage:**

a. Check the following  
monitors - ANY RED:

\* Condenser air discharge  
monitor - RED

o GEG925

OR

\* SG blowdown and sample  
monitors - EITHER RED

\* BML256 for blowdown  
\* SJL026 for sampling

OR

\* SG steamline monitors -  
ANY RED

\* ABS114 for S/G A  
\* ABS113 for S/G B  
\* ABS112 for S/G C  
\* ABS111 for S/G D

b. Go to OFN BB-07A, STEAM  
GENERATOR TUBE LEAKAGE,  
Step 1

a. Go to Step 5.

**5. Check For CCW System Leakage:**

a. Check CCW monitors -  
EITHER RED

\* EGL096 for CCW train A  
\* EGL106 for CCW train B

b. Go to OFN BB-007, RCS  
LEAKAGE HIGH, Step 1

a. Go to Step 6.



STE

ACTION/EXPECTED

RESPONSE NOT

**6. Check For High High Radiation  
On Normal Release Path:**

Return to procedure and step  
in effect.

- o Controlled liquid or  
gaseous release - IN  
PROGRESS

AND

- o Release path monitor on  
controlled release path -  
RED OR HAS BEEN RED

**7. Ensure Associated Controlled  
Release Path - ISOLATED**

**8. Inform Chemistry Of Affected  
Process Radiation Monitor And  
Direct Chemistry To Perform  
Evaluation Of Release**

**9. Go To OFN SP-010, ACCIDENTAL  
RADIOACTIVE RELEASE, Step 1**

-END-



**1.0 PURPOSE**

1.1 This procedure provides instructions for responding to actuation of alarm window 00-061B, PROCESS RAD HI.

**2.0 SYMPTOMS OR ENTRY CONDITIONS**

2.1 This procedure is entered when any process radiation monitor in high alarm (alert) condition.

2.2 The high alarm (alert) setpoints for liquid and gaseous effluents are set as calculated in AP 07B-003, Offsite Dose Calculation Manual (ODCM).

**3.0 REFERENCES AND COMMITMENTS****3.1 References**

a. AP 07B-003, Offsite Dose Calculation Manual (ODCM)

b. Vendor manuals

- o J-361.00072, GA Tech Airborne Radiological Monitoring System
- o J-361.00109, GA Tech Process / Airborne Rad Monitor

c. PIR 95-0087

d. PIR 00-0039

☒

**3.2 Commitments**

a. LER 90-24, RCMS 90-176, PDR 1991-0445, PIR 90-0234,

☒

Unplanned Release Of Waste Gas Decay Tank Without Prior  
☒  
Sampling Caused By Personnel Error [Procedure Steps, Step 6  
☒  
and, Step 8]  
☒

b. ITIP 02488 (SOER 93-01) [Entire Procedure]

is

System

STE

ACTION/EXPECTED

RESPONSE NOT

**1. Determine Affected Process Radiation Monitor:**

- o Check panel SP056A - ANY PROCESS MONITOR YELLOW

Perform the following:

- a. IF either gaseous effluent monitor in accident isolation, THEN go to Step 6.

- \* GH RE-10 for Radwaste Building
- \* GT RE-21 for Unit Vent

- b. IF gaseous effluent monitors NOT in accident isolation, THEN return to procedure and step in effect.

- o GH RE-10 for Radwaste Building
- o GT RE-21 for Unit Vent

**2. Check For High Reactor Coolant System Activity:**

- a. Check Auxiliary Building, CVCS Letdown Monitor - YELLOW

- a. Go to Step 3.

- o SJL016

- b. Go to OFN BB-006, HIGH REACTOR COOLANT ACTIVITY, Step 1

**3. Check For RCS Leakage To Containment:**

- a. Check Containment Atmosphere Monitors - ANY YELLOW

- a. Go to Step 4.

- \* GTP311
- \* GTI312
- \* GTG313
- \* GTP321
- \* GTI322
- \* GTG323

- b. IF Chemistry cannot verify the signal is a spike THEN go to OFN BB-007, RCS LEAKAGE HIGH, Step 1

STE

ACTION/EXPECTED

RESPONSE NOT

**4. Check For Steam Generator  
Tube Leakage:**

a. Check the following  
monitors - ANY YELLOW:

\* Condenser air discharge  
monitor - YELLOW

o GEG925

OR

\* SG blowdown and sample  
monitors - EITHER YELLOW

\* BML256 for blowdown  
\* SJL026 for sampling

OR

\* SG steamline monitors -  
ANY YELLOW

\* ABS114 for S/G A  
\* ABS113 for S/G B  
\* ABS112 for S/G C  
\* ABS111 for S/G D

b. Go to OFN BB-07A, STEAM  
GENERATOR TUBE LEAKAGE,  
Step 1

a. Go to Step 5.

**5. Check For CCW System Leakage:**

a. Check CCW monitors -  
EITHER YELLOW

\* EGL096 for CCW train A  
\* EGL106 for CCW train B

b. Go to OFN BB-007,RCS  
LEAKAGE HIGH, Step 1

a. Go to Step 6.

STE

ACTION/EXPECTED

RESPONSE NOT

**6. Check For High Radiation On Normal Release Path:**

- o Controlled liquid or gaseous release - IN PROGRESS

AND

- o Release path monitor on controlled release path - YELLOW OR HAS BEEN YELLOW

Perform the following:

- a. Notify Chemistry of affected process radiation monitor.
- b. Go to OFN SP-010, ACCIDENTAL RADIOACTIVE RELEASE, Step 1.

**7. Check Affected Process Radiation Monitor Reading - WITHIN LIMITS OF RELEASE PERMIT**

Perform the following:

- a. Direct Chemistry to perform evaluation of release.
- b. Go to OFN SP-010, ACCIDENTAL RADIOACTIVE RELEASE, Step 1.

**8. Check Building Gaseous Effluent Monitors - NONE IN ACCIDENT ISOLATION:**

IF either monitor in accident isolation, THEN perform the following:

- a. Radwaste Building
  - o GHP101 - NOT GRAY
  - o GHI102 - NOT GRAY
  - o At GH RE-10, Accident Isolation red light - NOT LIT

- 1. Notify Chemistry of affected monitor in accident isolation.
- 2. IF associated rate monitor in alarm or alert, THEN perform the following:

- b. Unit Vent
  - \* GTP211 - NOT GRAY
  - \* GTI212 - NOT GRAY
  - \* At GT RE-21, Accident Isolation red light - NOT LIT

- \* WHEN completed with release, THEN locally reset monitor.

OR

- \* Reduce release rate below alarm setpoint and locally reset monitor.

- 3. IF associated rate monitor NOT in alarm or alert, THEN locally reset monitor.

**9. Return To Procedure And Step In Effect**

-END-



**1.0 PURPOSE**

1.1 This procedure provides actions to restore core cooling.

**1.2 Major Action Categories**

- o Establish safety injection flow to the RCS
- o Rapidly depressurize S/Gs to depressurize the RCS
- o Start RCPs and open all RCS vent paths to containment

**2.0 SYMPTOMS OR ENTRY CONDITIONS**

2.1 This procedure is entered from the following procedure on any red path condition:

- o EMG F-0, CRITICAL SAFETY FUNCTION STATUS TREES (CSFST),  
FIGURE 2, CSF F-02 CORE COOLING

2.2 This procedure is entered from the following procedure if stopping RCPs and depressurizing S/Gs results in a red path condition for core cooling:

- o EMG FR-C2, RESPONSE TO DEGRADED CORE COOLING, Step 18



### 3.0 REFERENCES AND COMMITMENTS

#### 3.1 References

- a. Technical Specifications for Wolf Creek Generating Station
- b. Updated Safety Analysis Report for Wolf Creek
- c. As-built plant drawings
- d. Generic Technical Guidelines developed by the Westinghouse Owners Group (WOG). This consists of the following documents:
  - 1) High pressure version of the WOG Optimal Recovery Guidelines, Status Trees, and Functional Restoration Guidelines
  - 2) Background documents for each high pressure version Optimal Recovery Guideline, Status Tree, and Functional Restoration Guideline
  - 3) WOG Emergency Response Guideline Executive Volume
  - 4) WOG Emergency Response Guideline Maintenance Program Summary
- e. CCP 4590, PDP REPLACEMENT
- f. USAR Table 10.4-13B ( Sheet 2 ), AFW supply switchover criteria, ( Foldout page )

#### 3.2 Commitments

- a. None

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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.



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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

**2. Verify ECCS Flow In All Trains:**

a. Check Centrifugal Charging Pumps To Boron Injection Tank Flow meters - FLOW INDICATED

- o EM FI-917A
- o EM FI-917B

b. Check SI Pump Discharge Flow meters - FLOW INDICATED

- o EM FI-918
- o EM FI-922

c. Check RHR To Accumulator Injection Loop Flow meters - FLOW INDICATED

- o EJ FI-618
- o EJ FI-619

Perform the following:

1. Start pumps and align valves as necessary to establish normal ECCS injection.
2. Ensure CCP Discharge To Charging Header isolation valves - AT LEAST ONE OPEN
  - \* BG-8483A for CCP A
  - \* BG-8483C for CCP B
3. IF normal ECCS injection can NOT be established, THEN try to establish alternate high head injection using ATTACHMENT A.
4. IF ECCS flow to cold legs can NOT be established, THEN establish ECCS flow to hot legs as directed by Shift Manager or Control Room Supervisor.

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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

**3. Check RCP Support Conditions  
- AVAILABLE:**

Try to establish support  
conditions.

- a. Ensure power to RCP(s)-  
AVAILABLE
  - \* PA01 for RCPs A and B
  - \* PA02 for RCPs C and D
- b. Ensure annunciator  
00-052A, CCW TO RCP FLOW  
LO - CLEAR
- c. Ensure RCP thermal barrier  
CCW flow annunciator -  
CLEAR
  - \* 00-070C for RCP A
  - \* 00-071C for RCP B
  - \* 00-072C for RCP C
  - \* 00-073C for RCP D
- d. Ensure number 1 seal  $\text{P}$  -  
GREATER THAN 200 PSID
  - \* BB PI-153A for RCP A
  - \* BB PI-152A for RCP B
  - \* BB PI-151A for RCP C
  - \* BB PI-150A for RCP D
- e. Ensure number 1 seal  
leakoff flow - GREATER  
THAN 0.2 GPM
  - \* BG FR-157 for RCP A
  - \* BG FR-156 for RCP B
  - \* BG FR-155 for RCP C
  - \* BG FR-154 for RCP D
- f. Ensure seal injection flow  
- BETWEEN 8 GPM AND 13 GPM
  - \* BG FR-157 for RCP A
  - \* BG FR-156 for RCP B
  - \* BG FR-155 for RCP C
  - \* BG FR-154 for RCP D
- g. Ensure VCT pressure -  
GREATER THAN 15 PSIG
  - o BG PI-115

Revision: 12	RESPONSE TO INADEQUATE CORE COOLING	EMG FR-C1
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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.



STE

ACTION/EXPECTED

RESPONSE NOT

**4. Check SI Accumulator****Isolation Valve Status:**

a. Locally close breakers for SI accumulator outlet valve(s)

- o NG01BGF3 for EP HV-8808A
- o NG02BGF3 for EP HV-8808B
- o NG01BGF2 for EP HV-8808C
- o NG02BHF2 for EP HV-8808D

b. Check Accumulator Tank Outlet Isolation Valves - OPEN

- o EP HV-8808A
- o EP HV-8808B
- o EP HV-8808C
- o EP HV-8808D

b. IF accumulator NOT discharged, THEN open SI accumulator outlet valve(s).

**5. Check Core Exit TCs - LESS THAN 1200°F**

Go to Step 8.

**6. Check RVLIS Natural Circulation Range Indication:**

a. Check RCPS - NONE RUNNING

a. Return to procedure and step in effect.

b. Check RVLIS natural circulation range indication - AVAILABLE

b. Go to Step 7.

c. Check RVLIS natural circulation range - GREATER THAN 45%

c. Perform the following:

- 1) IF RVLIS indication increasing, THEN OBSERVE CAUTION AND NOTE PRIOR TO STEP 1 and return to Step 1.
- 2) IF RVLIS indication NOT increasing, THEN go to Step 7.

d. Return to procedure and step in effect

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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

**7. Check Core Exit TCs:**

a. Core exit temperature -  
LESS THAN 712°F

a. Perform the following:

1) IF core exit temperature decreasing, THEN OBSERVE CAUTION AND NOTE PRIOR TO STEP 1 and return to Step 1.

2) IF core exit temperature NOT decreasing, THEN go to Step 8.

b. Return to procedure and step in effect

Revision: 12	RESPONSE TO INADEQUATE CORE COOLING	EMG FR-C1
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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

**8. Check Hydrogen Analyzers - IN SERVICE**

Place hydrogen analyzers in service:

- a. On RL011, place power lockout switches for containment sample valves in NON-ISO position.
  - o GS HIS-40
  - o GS HIS-41
  - o GS HIS-42
  - o GS HIS-43
- b. On RL011, open one Hydrogen Analyzer Supply Inner Containment Isolation Valve per train.
  - o GS HIS-13 OR GS HIS-14 for red train
  - o GS HIS-4 OR GS HIS-5 for yellow train
- c. On RL011, open remaining hydrogen analyzer containment isolation valves.
  - o GS HIS-12
  - o GS HIS-17
  - o GS HIS-18
  - o GS HIS-3
  - o GS HIS-8
  - o GS HIS-9
- d. On RL020, place containment hydrogen analyzer control switches in ANALYZE position.
  - o GS HIS-16A
  - o GS HIS-11A
- e. On RL020, monitor containment hydrogen concentration.
  - o GS AI-19
  - o GS AI-10

Revision: 12	RESPONSE TO INADEQUATE CORE COOLING	EMG FR-C1
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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.



Revision: 12	RESPONSE TO INADEQUATE CORE COOLING	EMG FR-C1
Continuous Use		Page 17 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.





Revision: 12	RESPONSE TO INADEQUATE CORE COOLING	EMG FR-C1
Continuous Use		Page 19 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

**11. Check RCS Vent Paths:**

- |  |  |
|--|--|
| <p>a. Power to PZR PORV block valves - AVAILABLE</p> <ul style="list-style-type: none"> <li>o BB HIS-8000A</li> <li>o BB HIS-8000B</li> </ul> <p>b. PZR PORVs - CLOSED</p> <ul style="list-style-type: none"> <li>o BB HIS-455A</li> <li>o BB HIS-456A</li> </ul> <p>c. RCS pressure - LESS THAN 2185 PSIG</p> <p>d. Reactor vessel head vents - AT LEAST ONE VALVE CLOSED IN EACH TRAIN</p> <ul style="list-style-type: none"> <li>o BB HIS-8001A <u>OR</u> BB HIS-8002A for red train</li> <li>o BB HIS-8001B <u>OR</u> BB HIS-8002B for yellow train</li> </ul> | <p>a. Restore power to block valves:</p> <ul style="list-style-type: none"> <li>o NG01BBR3 for BB HV-8000A</li> <li>o NG02BDF1 for BB HV-8000B</li> </ul> <p>b. <u>IF</u> PZR pressure less than 2335 psig, <u>THEN</u> manually close PORV. <u>IF</u> any PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.</p> <p>c. <u>IF</u> PZR PORV is closed, <u>THEN</u> ensure associated block valve is open.</p> <ul style="list-style-type: none"> <li>* BB HIS-8000A for BB HIS-455A</li> <li>* BB HIS-8000B for BB HIS-456A</li> </ul> <p>d. Manually close valves.</p> |
|--|--|

Revision: 12	RESPONSE TO INADEQUATE CORE COOLING	EMG FR-C1
Continuous Use		Page 21 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STEP

ACTION/EXPECTED

RESPONSE NOT

**12. Check If Condenser Air Removal Should Be Returned To Normal:**

- |   |  |
|---|--|
| <p>a. Check the following:</p> <ul style="list-style-type: none"> <li>o Main steamline isolation valves - AT LEAST ONE OPEN</li> <li>o Condensate pumps - AT LEAST ONE RUNNING</li> <li>o Circulating water pumps - AT LEAST ONE RUNNING</li> <li>o Condenser vacuum - ESTABLISHED</li> </ul> | <p>a. OBSERVE NOTE PRIOR TO STEP 13 and go to Step 13.</p> |
| <p>b. Open Condenser Air Removal Fan Discharge Dampers</p> <ul style="list-style-type: none"> <li>o GE HIS-103</li> <li>o GE HIS-104</li> </ul>   | <p>b. OBSERVE NOTE PRIOR TO STEP 13 and go to Step 13.</p> |
| <p>c. Start desired number of Condenser Vacuum Pumps</p> <ul style="list-style-type: none"> <li>* CG HIS-1</li> <li>* CG HIS-2</li> <li>* CG HIS-3</li> </ul>   | <p>c. OBSERVE NOTE PRIOR TO STEP 13 and go to Step 13.</p> |
| <p>d. Open Condenser Air Removal Filtration System Supply Dampers</p> <ul style="list-style-type: none"> <li>o GE HIS-101</li> <li>o GE HIS-102</li> </ul>  | <p>d. OBSERVE NOTE PRIOR TO STEP 13 and go to Step 13.</p> |
| <p>e. Start one Condenser Air Removal Fan</p> <ul style="list-style-type: none"> <li>* GE HIS-82</li> <li>* GE HIS-83</li> </ul>  | <p>e. OBSERVE NOTE PRIOR TO STEP 13 and go to Step 13.</p> |

Revision: 12	RESPONSE TO INADEQUATE CORE COOLING	EMG FR-C1
Continuous Use		Page 23 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

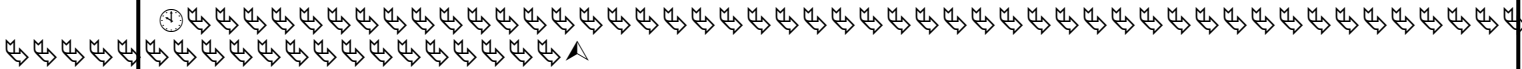
IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
-----	--------------------------	-----------------------



NOTE

If high steam pressure rate setpoint (100 psi/50 sec) is exceeded after low steamline pressure SI signal is blocked, main steamline isolation will occur.



**13. Check If Low Steamline Pressure SI Should Be Blocked:**

- |   |  |
|---|--|
| <p>a. Check RCS pressure - LESS THAN 1970 PSIG</p> <ul style="list-style-type: none"> <li>o P-11 light - LIT</li> </ul>   | <p>a. <u>WHEN</u> RCS pressure is less than 1970 psig, <u>THEN</u> block low steamline pressure SI. OBSERVE NOTE PRIOR TO STEP 14 and continue with Step 14.</p> |
| <p>b. Block low steamline pressure SI</p> <ul style="list-style-type: none"> <li>o SB HS-9</li> <li>o SB HS-10</li> </ul> |  |

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Continuous Use		Page 25 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.





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Continuous Use		Page 27 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.



o NG02BHF2 for EP HV-8808D



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Continuous Use		Page 29 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

**17. Stop All RCPs**

- o BB HIS-37 for RCP A
- o BB HIS-38 for RCP B
- o BB HIS-39 for RCP C
- o BB HIS-40 for RCP D

**18. Depressurize All Intact S/Gs To Atmospheric Pressure:**

- a. Dump steam to condenser at maximum rate

- a. Dump steam at maximum rate using S/G ARVs.

**19. Verify ECCS Flow:**

- \* Check Centrifugal Charging Pumps To Boron Injection Tank Flow meters - FLOW INDICATED

- o EM FI-917A
- o EM FI-917B

OR

- \* Check SI Pump Discharge Flow meters - FLOW INDICATED

- o EM FI-918
- o EM FI-922

OR

- \* Check RHR To Accumulator Injection Loop Flow meters - FLOW INDICATED

- o EJ FI-618
- o EJ FI-619

Perform the following:

- a. Start pumps and align valves as necessary to establish normal ECCS injection.

- b. Ensure CCP Discharge To Charging Header isolation valves - AT LEAST ONE OPEN

- \* BG-8483A for CCP A
- \* BG-8483C for CCP B

- c. IF normal ECCS injection can NOT be established, THEN try to establish alternate high head injection using ATTACHMENT A.

- d. IF ECCS flow to cold legs can NOT be established, THEN establish ECCS flow to hot legs as directed by Shift Manager or Control Room Supervisor.

- e. IF core exit TCs less than 1200°F, THEN return to Step 18.

- f. IF core exit TCs greater than or equal to 1200°F, THEN OBSERVE NOTE PRIOR TO STEP 22 and go to Step 22.

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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.



STE

ACTION/EXPECTED

RESPONSE NOT

**20. Check Core Cooling:**

- |  |   |
|--|---|
| a. Check core exit TCs - LESS THAN 1200°F                              | a. OBSERVE NOTE PRIOR TO STEP 22 and go to Step 22. |
| b. Check RCS hot leg temperatures - AT LEAST TWO LESS THAN 350°F       | b. Return to Step 18.                               |
| c. Check RVLIS natural circulation range indication - AVAILABLE        | c. Go to Step 21.                                   |
| d. Check RVLIS natural circulation range indication - GREATER THAN 69% | d. Return to Step 18.                               |

**21. Go To EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 15.**

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Continuous Use		Page 33 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

NOTE

Normal conditions are desired but not required for starting RCPs.

**22. Check If RCPs Should Be Started**

- a. Core exit TCs - GREATER THAN 1200°F
- b. Check if an idle RCS cooling loop is available:
  - o Narrow range SG level - GREATER THAN 6% [29%]
  - o RCP in associated loop - AVAILABLE AND NOT OPERATING
- c. Start RCP oil lift pumps.
- d. Start RCP in one idle RCS cooling loop.
- e. Return to Step 22a.

- a. Go to Step 23.
- b. Perform the following:
  - 1) Open all PRZR PORVs AND Block valves.
  - 2) IF core exit TCs remain greater than 1200°F, THEN open reactor vessel head vent valves.
    - o BB HIS-8001A
    - o BB HIS-8001B
    - o BB HIS-8002A
    - o BB HIS-8002B
  - 3) Go to Step 23.

**23. Try To Depressurize All Intact S/Gs To Atmospheric Pressure:**

Use faulted or ruptured S/Gs.

- \* Use condenser steam dumps
- OR
- \* Use S/G ARV
- OR
- \* Operate turbine driven AFW pump at maximum load





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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.



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Continuous Use		Page 37 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.



STEP

ACTION/EXPECTED

RESPONSE NOT

**26. Check If SI Accumulators  
Should Be Isolated:**

a. Check RHR To Accumulator  
Injection Loop Flow meters  
- AT LEAST INTERMITTENT  
FLOW INDICATED

- o EJ FI-618
- o EJ FI-619

b. Close Accumulator Tank  
Outlet Isolation Valves

- o EP HIS-8808A
- o EP HIS-8808B
- o EP HIS-8808C
- o EP HIS-8808D

a. OBSERVE NOTE PRIOR TO  
STEP 22 and return to  
Step 22.

b. IF any accumulator can NOT  
be isolated, THEN perform  
the following:

1) Open associated  
accumulator vent  
valve(s).

- \* EP HV-8950A for  
accumulator A
- \* EP HIS-8950B or  
EP HIS-8950C for  
accumulator B
- \* EP HIS-8950D or  
EP HIS-8950E for  
accumulator C
- \* EP HIS-8950F for  
accumulator D

2) DO NOT DEPRESSURIZE RCS  
BELOW UNISOLATED  
ACCUMULATOR PRESSURE  
during subsequent  
recovery actions.

c. Locally open breakers for  
SI accumulator outlet  
valves

- o NG01BGF3 for EP HV-8808A
- o NG02BGF3 for EP HV-8808B
- o NG01BGF2 for EP HV-8808C
- o NG02BHF2 for EP HV-8808D

**27. Check If RCPs Should Be  
Stopped:**

a. Check at least two RCS hot  
leg temperatures - LESS  
THAN 350°F

b. Stop all RCPs

a. Go to Step 28.

Revision: 12	RESPONSE TO INADEQUATE CORE COOLING	EMG FR-C1
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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

**28. Verify ECCS Flow:**

\* Check Centrifugal Charging Pumps To Boron Injection Tank Flow meters - FLOW INDICATED

- o EM FI-917A
- o EM FI-917B

OR

\* Check SI Pump Discharge Flow meters - FLOW INDICATED

- o EM FI-918
- o EM FI-922

OR

\* Check RHR To Accumulator Injection Loop Flow meters - FLOW INDICATED

- o EJ FI-618
- o EJ FI-619

Perform the following:

a. Start pumps and align valves as necessary to establish normal ECCS injection.

b. Ensure CCP Discharge To Charging Header isolation valves - AT LEAST ONE OPEN

\* BG-8483A for CCP A

\* BG-8483C for CCP B

c. IF normal ECCS injection can NOT be established, THEN try to establish alternate high head injection using ATTACHMENT A.

d. IF ECCS flow to cold legs can NOT be established, THEN establish ECCS flow to hot legs as directed by Shift Manager or Control Room Supervisor.

e. OBSERVE NOTE PRIOR TO STEP 22 and return to Step 22.

**29. Check Core Cooling:**

a. Check RCPS - NONE RUNNING

b. Check RCS hot leg temperatures - AT LEAST TWO LESS THAN 350°F

c. Check RVLIS natural circulation range indication - AVAILABLE

d. RVLIS natural circulation range indication - GREATER THAN 69%

a. OBSERVE NOTE PRIOR TO STEP 22 and return to Step 22.

b. OBSERVE NOTE PRIOR TO STEP 22 and return to Step 22.

c. Go to Step 30.

d. OBSERVE NOTE PRIOR TO STEP 22 and return to Step 22.

**30. Go To EMG E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 15.**

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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**  
IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.
2. **AFW SUPPLY SWITCHOVER CRITERIA**  
IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
-----	--------------------------	-----------------------

ATTACHMENT A  
(Page 1 of 8)  
ESTABLISHING ALTERNATE HIGH HEAD INJECTION

- A1. Verify Charging Pump Suction:** Perform the following:
- \* Charging Pump Suction From RWST valves - AT LEAST ONE OPEN
    - \* BN HIS-112D
    - \* BN HIS-112E

OR

  - \* VCT Outlet Valves - BOTH OPEN
    - o BG HIS-112B
    - o BG HIS-112C

- A2. Check CCPs - ANY RUNNING** Perform the following:
- a. Manually start CCPs.
    - o BG HIS-1A for CCP A
    - o BG HIS-2A for CCP B
  - b. IF neither CCP can be started, THEN start NCP on recirc:
    - 1) Start NCP.
      - o BG HIS-3
  - c. IF no charging pump can be started, THEN return to procedure and step in effect.

CAUTION

If offsite power is lost after SI reset, manual action may be required to restore safeguards equipment to the required configuration.

- A3. Reset SI**
- o SB HS-42A

o SB HS-43A



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Continuous Use		Page 43 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.



STE

ACTION/EXPECTED  
RESPONSERESPONSE NOT  
OBTAINEDATTACHMENT A  
(Page 2 of 8)

## ESTABLISHING ALTERNATE HIGH HEAD INJECTION

**A4. Reset Containment Isolation  
Phase A And Phase B**

- o SB HS-56 for phase A
- o SB HS-53 for phase A
- o SB HS-55 for phase B
- o SB HS-52 for phase B

Revision: 12	RESPONSE TO INADEQUATE CORE COOLING	EMG FR-C1
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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

RESPONSE

OBTAINED

## ATTACHMENT A

(Page 3 of 8)

## ESTABLISHING ALTERNATE HIGH HEAD INJECTION

**A5. Establish Instrument Air To Containment:**

- |  |   |
|--|---|
| <p>a. Ensure ESW To Air Compressor Valves - OPEN</p> <ul style="list-style-type: none"> <li>o EF HIS-43</li> <li>o EF HIS-44</li> </ul>            | <p>a. Locally open valve(s). <u>WHEN</u> valves are open, <u>THEN</u> do Steps A5.b, A5.c, A5.d and A5.e. Continue with Step A6.</p>  |
| <p>b. Reset and close Air Compressor Breaker Reset switches</p> <ul style="list-style-type: none"> <li>o KA HIS-2C</li> <li>o KA HIS-3C</li> </ul> |   |
| <p>c. Check Instrument Air Pressure - GREATER THAN 105 PSIG</p> <ul style="list-style-type: none"> <li>o KA PI-40</li> </ul>                       | <p>c. Dispatch operator to perform the following:</p> <ol style="list-style-type: none"> <li>1) Reset alarms.</li> <li>2) Restart compressors.</li> </ol>   |
| <p>d. Check PZR pressure master controller - LESS THAN 50% OUTPUT SIGNAL</p> <ul style="list-style-type: none"> <li>o BB PK-455A</li> </ul>        | <p>d. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Place PZR pressure master controller in manual.</li> <li>2) Set PZR pressure master controller to less than 50% output signal.</li> <li>3) <u>WHEN</u> instrument air has been established to containment, <u>THEN</u> place PZR pressure master controller in automatic.</li> </ol> |
| <p>e. Open Instrument Air Supply Containment Isolation Valve</p> <ul style="list-style-type: none"> <li>o KA HIS-29</li> </ul>                     | <p>e. Locally open valve.</p>   |

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Continuous Use		Page 47 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**  
IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.
2. **AFW SUPPLY SWITCHOVER CRITERIA**  
IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

RESPONSE

OBTAINED

## ATTACHMENT A

(Page 4 of 8)

## ESTABLISHING ALTERNATE HIGH HEAD INJECTION

**A6. Establish Normal Charging Header Flow Path:**

IF flow path through normal charging header can NOT be established, THEN go to Step A11.

- a. Open Charging Header Back Pressure Control valve
  - o BG HC-182
- b. Open Charging Pumps To Regenerative Heat Exchanger Containment Isolation valves
  - o BG HIS-8105
  - o BG HIS-8106
- c. Align Regenerative Heat Exchanger To Loop Cold Leg valves to establish only one open
  - \* BG HIS-8146 for loop 1
  - \* BG HIS-8147 for loop 4

**A7. Check CCPs - ANY RUNNING**

Perform the following:

- a. Open NCP Discharge Flow Control Valve.
  - o BG FK-462
- b. Go to Step A9.

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FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

ATTACHMENT A  
(Page 5 of 8)

ESTABLISHING ALTERNATE HIGH HEAD INJECTION

**A8. Align CCPs To Normal Charging Header:**

Perform the following:

- a. Ensure CCP Discharge To Charging Header isolation valve for running CCP(s) - OPEN

1. Manually or locally align valves as necessary to establish CCP flow through normal charging header.

- \* BG-8483A for CCP A
- \* BG-8483C for CCP B

2. IF flow from CCPs can NOT be established, THEN establish NCP flow:

- b. Reset CCP Recirc Valves

- a) Start NCP.

- o BG HS-8110
- o BG HS-8111

- o BG HIS-3

- c. Open CCP Recirc Valves

- b) IF NCP is running, THEN stop all CCPs.

- o BG HIS-8110
- o BG HIS-8111

- o BG HIS-1A
- o BG HIS-2A

- d. Open CCP Discharge Flow Control valve

- o BG FK-121

**A9. Check Charging Header Flow Meter - FLOW INDICATED**

Go to Step A11.

- o BG FI-121A

**A10. Return To Procedure And Step In Effect**

**A11. Open BIT Inlet Valves**

Perform the following:

- o EM HIS-8803A
- o EM HIS-8803B

- a. Locally open the BIT inlet valves.

- o EM HV-8803A
- o EM HV-8803B

- b. IF a flow path to the BIT can NOT be established, THEN return to procedure and step in effect.

Revision: 12	RESPONSE TO INADEQUATE CORE COOLING	EMG FR-C1
Continuous Use		Page 51 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.



STE

ACTION/EXPECTED

RESPONSE NOT

ATTACHMENT A  
(Page 6 of 8)

ESTABLISHING ALTERNATE HIGH HEAD INJECTION

**A12. Open BIT Outlet Valves**

Perform the following:

- o EM HIS-8801A
- o EM HIS-8801B

- a. Locally open the BIT outlet valves.

- o EM HV-8801A
- o EM HV-8801B

- b. IF a flow path from the BIT can NOT be established, THEN return to procedure and step in effect.

**A13. Check If CCP Flow Through BIT Has Been Established:**

- a. Check CCPs - ANY RUNNING
- b. Check Centrifugal Charging Pumps To Boron Injection Tank Flow Meters - FLOW INDICATED

- a. Go to Step A15.

- b. Perform the following:

- 1) Close normal charging header isolation valves.

- \* EM FI-917A
- \* EM FI-917B

- o BG HC-182
- o BG HIS-8105
- o BG HIS-8106

- 2) IF CCP flow through BIT can NOT be established, THEN go to Step A15.

**A14. Return To Procedure And Step In Effect**

Revision: 12	RESPONSE TO INADEQUATE CORE COOLING	EMG FR-C1
Continuous Use		Page 53 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

ATTACHMENT A  
(Page 7 of 8)

ESTABLISHING ALTERNATE HIGH HEAD INJECTION

**A15. Check NCP - RUNNING**

Start NCP on recirc:

- a. Start NCP.
  - o BG HIS-3
- b. IF NCP is running, THEN ensure all CCPs are stopped.
  - o BG HIS-1A
  - o BG HIS-2A
- c. IF NCP can NOT be started, THEN return to procedure and step in effect.

**A16. Establish NCP Flow Path To BIT:**

- a. Ensure one train of valves from charging header to BIT - OPEN
    - \* BG-8483A and EM HIS-8803A for red train
    - \* BG-8483C and EM HIS-8803B for yellow train
  - b. Open NCP Discharge Flow Control Valve.
    - o BG FK-462
  - c. Open CCP Discharge Flow Control Valve
    - o BG FK-121
- a. Manually or locally open valves. IF a flow path to the BIT can NOT be established, THEN return to procedure and step in effect.
  - c. Return to procedure and step in effect.

Revision: 12	RESPONSE TO INADEQUATE CORE COOLING	EMG FR-C1
Continuous Use		Page 55 of 56

FOLDOUT PAGE FOR EMG FR-C1

1. **COLD LEG RECIRCULATION CRITERIA**

IF RWST level decreases to less than 36%, THEN go to EMG ES-12, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

2. **AFW SUPPLY SWITCHOVER CRITERIA**

IF CST suction pressure decreases to less than 6.9 psig, THEN switch to alternate AFW suction supply.

STE

ACTION/EXPECTED

RESPONSE NOT

ATTACHMENT A  
(Page 8 of 8)

ESTABLISHING ALTERNATE HIGH HEAD INJECTION

**A17. Check Centrifugal Charging  
Pumps To Boron Injection Tank  
Flow Meters - FLOW INDICATED**

- \* EM FI-917A
- \* EM FI-917B

Perform the following:

- a. Close normal charging header isolation valves.
  - o BG HC-182
  - o BG HIS-8105
  - o BG HIS-8106
- b. Locally ensure CCP A/B Discharge Header FCV-121 Outlet Isolation - OPEN
  - o BG-8483B
- c. Locally ensure NCP Discharge Isolation - OPEN
  - o BG-8388

**A18. Return To Procedure And Step  
In Effect**

-END-



COFFEY COUNTY SHERIFF	620-364-2123	STATION RADIO	KHP 785-827-4437	
KANSAS DIVISION OF EMERGENCY MANAGEMENT	785-296-3176 LEAVE MESSAGE	STATE RADIO	STATE EOC ACTIVATED 785-274-1422	
NRC RESIDENT INSPECTOR	OFFICE EXT. 4574	FRANK BRUSH	Cell: 620-343-0577 Home: 620-364-3631 NRC PAGER 816-466-5209	
TOPEKA SYSTEM DISPATCH	785-575-6078			
ANI (ALERT OR HIGHER)	860-561-3433; OFF HOURS LEAVE MESSAGE			
INPO (ALERT OR HIGHER)	800-321-0614			





**1.0 PURPOSE**

- 1.1 To describe the operations necessary to inject boric acid into the RCS whenever conditions exist that require the rapid insertion of negative reactivity without the use of control rods.

**2.0 SYMPTOMS OR ENTRY CONDITIONS**

- 2.1 The following symptoms/entry conditions that require emergency boration:

a. Excessive control rod bank insertion as indicated by:

- o Annunciator 00-081C, ROD BANK LOLO LIMIT, is lit
- o Bank step counters
- o Rod position indicators
- o Core Operating Limits Report, Technical  
   ✧ Specification 3.1.6  
   ✧

b. Failure of two or more control rods to fully insert following a reactor trip or shutdown.

c. Uncontrolled cooldown of the reactor coolant following a reactor trip or shutdown as indicated by two out of four loop Tavg less than 530°F.

d. Unexplained or uncontrolled reactivity increase as indicated by:

- \* Abnormal control bank insertion
- \* Increasing temperature or nuclear power
- \* Increasing neutron flux or count rate on source range while shutdown

e. Shutdown margin less than required as indicated by the following:

- \* Shutdown margin less than 1.3%  $\rho$ k/k in Mode 2 with Keff  
   ✧ less than 1.0 and Modes 3, 4, or 5. Technical  
   ✧ Specification 3.1.1  
   ✧

- \* Keff greater than 0.95 K eff or boron concentration of  
   ✧ filled portions of the RCS and refueling canal less than  
   ✧ 2300 ppm in Mode 6. Technical Specification 3.9.1  
   ✧

indicated

all



### 3.0 REFERENCES AND COMMITMENTS

#### 3.1 References

- a. OFN BG-009 Supplemental Information
- b. ITIP 01969, Reactivity Management Expectations During Plant  
✧ Shutdown  
✧
- c. PMR 4590, PDP REPLACEMENT

#### 3.2 Commitments

- a. SOER 94-02, Recommendation 4a, Monitoring of RCS boron  
✧ concentration and verification of adequate shutdown margin  
✧ [Step 1.1]  
✧
- b. RCMS 1985-113 and SLNRC 84-0070, Flushing the BIT After  
✧ Emergency Boration [Step 14]  
✧

STE

ACTION/EXPECTED

RESPONSE NOT

1. **Check Charging System Aligned As The Operable Boron Injection Flowpath.**

Go to Attachment B, EMERGENCY BORATION USING SI AS BORATION FLOWPATH.

2. **Align Charging Pumps For Emergency Boration:**

a. Ensure one Charging Pump is running

- \* CCP A
- \* CCP B
- \* NCP

b.  Align Boration Flow Path:

- 1) Ensure boric acid transfer pumps - AT LEAST ONE RUNNING
- 2) Open Emergency Borate To Charging Pump Suction Valve
  - o BG HIS-8104

b.  Align RWST to CCP Suction:

- a) Ensure Charging Pump Suction From RWST Valves - AT LEAST ONE OPEN
  - o BN HIS-112D
  - o BN HIS-112E
- b) Ensure VCT Outlet Valves - AT LEAST ONE CLOSED:
  - o BG HIS-112B
  - o BG HIS-112C

✧  
✧  
✧

STE

ACTION/EXPECTED

RESPONSE NOT

**3. Verify Charging Flow Path:**

- a. Ensure Charging Pump to Regenerative Heat Exchanger Isolation valves - OPEN

- o BG HIS-8105
- o BG HIS-8106

- b. Ensure one Regenerative Heat Exchanger To RCS Loop Cold Leg Valve - OPEN

- \* BG HIS-8146 for Loop 1

OR

- \* BG HIS-8147 for Loop 4

- c. Adjust Charging Pump Flow to maintain pressurizer level

- \* BG FK-121 for CCP

OR

- \* BG FK-462 for NCP

- d. Adjust Charging Header Backpress Control Valve as necessary to establish 8 gpm to 13 gpm seal injection flow

- o BG HC-182

Establish charging flow through BIT:

1. Open BIT Outlet Valves.

- o EM HIS-8801A
- o EM HIS-8801B

2. Open BIT Inlet Isolation Valves.

- o EM HIS-8803A
- o EM HIS-8803B

3. IF NCP is running, THEN open Centrifugal Charging Pump Discharge Flow Control Valve.

- o BG FK-121

4. Check Centrifugal Charging Pumps to Boron Injection Flow meters - FLOW INDICATED

- o EM FI-917A for red train
- o EM FI-917B for yellow train

STE

ACTION/EXPECTED

RESPONSE NOT

4. **Verify Emergency Borate Flow  
- GREATER THAN 30 GPM**

o BG FI-183A

Perform the following:

- a. () Align RWST to CCP suction:
- 1) Ensure Charging Pump Suction From RWST Valves - AT LEAST ONE OPEN
    - o BN HIS-112D
    - o BN HIS-112E
  - 2) Ensure VCT Outlet Valves - AT LEAST ONE CLOSED:
    - o BG HIS-112B
    - o BG HIS-112C
- b. Check RWST flow through charging system - GREATER THAN 90 GPM
- \* BG FI-121A
- OR
- \* EM FI-917A
- OR
- \* EM FI-917B
- c. IF RWST flow through charging system less than 90 gpm, THEN establish alternate boration flowpath using ATTACHMENT A, ESTABLISHING ALTERNATE BORATION FLOW PATH.

STE

ACTION/EXPECTED

RESPONSE NOT

ATTACHMENT A  
(Page 1 of 4)  
ESTABLISHING ALTERNATE BORATION FLOWPATH

**A1. Align Makeup System For Manual Boration:**

- a. Place Reactor Coolant Makeup Control Selector Switch in OFF position

o BG HS-25

- b. Manually start at least one boric acid pump

\* BG HIS-5A  
\* BG HIS-6A

- b. IF neither pump can be started, THEN perform the following:

- 1) Continue attempts to establish boration flow from RWST.  
2) Return to procedure, Step 2.

**A2. Open Boric Acid Blending Tee Inlet Isolation Valve**

o BG HIS-110A

Fail open valve:

- a. Locally isolate instrument air to valve.  
b. Locally vent air pressure from valve.  
c. IF valve can NOT be opened, THEN go to step A8.

**A3. Close Reactor Makeup Water To Boric Acid Blending Tee Isolation**

o BG HIS-111A

Perform the following:

- a. Stop both reactor makeup water transfer pumps  
o BL HIS-3  
o BL HIS-4  
b. IF reactor makeup water transfer pump can NOT be stopped, THEN go to Step A8.

STE

ACTION/EXPECTED

RESPONSE NOT

ATTACHMENT A  
(Page 2 of 4)  
ESTABLISHING ALTERNATE BORATION FLOWPATH

**A4. Check VCT Outlet Isolation Valves - BOTH OPEN**

- o BG HIS-112B
- o BG HIS-112C

Perform the following:

- a. Manually open valves.
- b. IF both valves can NOT be opened, THEN go to Step A7.

**A5. () Open Makeup To VCT Outlet Isolation Valve**

- o BG HIS-110B

**() Open Makeup To VCT Inlet Isolation Valve**

- o BG HIS-111B

**A6. Verify Boration Flow:**

- a. Check normal boration flow - GREATER THAN 30 GPM
  - o BG FR-110 red pen
  - o BG FR-110 green pen
- b. Return to procedure, Step 2.

a. Go to Step A7.

**A7. Establish Manual Boration:**

- a. () Locally unlock and open Blended Boric Acid To Charging Pump Suction Isolation Valve
  - o BG-V177
- b. Check normal boration flow - GREATER THAN 30 GPM
  - o BG FR-110 red pen
- c. Return to procedure, Step 2.

a. Go to Step A8.

b. Go to Step A9.



STE

ACTION/EXPECTED

RESPONSE NOT

RESPONSE

OBTAINED

## ATTACHMENT A

(Page 3 of 4)

## ESTABLISHING ALTERNATE BORATION FLOWPATH

**A8. Establish Manual Emergency Boration:**

- a. () Locally open Emergency Boration Valve

o BG HV-8104

- b. Check Emergency Boration flow - GREATER THAN 30 GPM

- c. Return to procedure, Step 2.

**A9. Locally Check Boric Acid Filter P - LESS THAN 20 PSID**

o BG PDI-108

- a. Perform the following:

1) Continue attempts to establish boration flow from RWST.

2) Return to procedure, Step 2.

- b. Go to Step A9.

Bypass boric acid filter:

- a. Open Boric Acid Filter Bypass Upstream Isolation Valve.

o BG-V173

- b. Open Boric Acid Filter Bypass Downstream Isolation Valve.

o BG-V172

- c. Close boric acid filter to BAT "A" throttle valve

o BG-V319

- d. Close Boric Acid Filter Inlet Isolation Valve.

o BG-V149

- e. Close Boric Acid Filter Outlet Isolation Valve.

o BG-V152

- f. Direct Maintenance to change filter as soon as possible.

STE

ACTION/EXPECTED

RESPONSE NOT

ATTACHMENT A  
(Page 4 of 4)  
ESTABLISHING ALTERNATE BORATION FLOWPATH

**A10. Check If Alternate Boration Flow Has Been Established:**

Continue attempts to establish boration flow from RWST.

\* Normal boration flow -  
GREATER THAN 30 GPM

o BG FR-110 red pen

OR

\* Emergency Boration flow -  
GREATER THAN 30 GPM

o BG FI-183A

**A11. Return To Procedure, Step 2**

-END-



**1.0 Purpose**

1.1 To provide operator response for loss of vital 120 VAC instrument bus NN01, NN02, NN03, or NN04 when in Modes 1 or 2. This procedure may be used as a reference in other conditions.

**2.0 Symptoms or Entry Conditions**

2.1 Any of the following vital 120 VAC bus undervoltage annunciators lit.

- \* 00-025A, NN01 INST BUS UV
- \* 00-026A, NN02 INST BUS UV
- \* 00-027A, NN03 INST BUS UV
- \* 00-028A, NN04 INST BUS UV
- \* 00-025B, NN11 INV UV
- \* 00-026B, NN12 INV UV
- \* 00-027B, NN13 INV UV
- \* 00-028B, NN14 INV UV

**3.0 References And Commitments****3.1. References**

- a. OFN NN-021, LOSS OF VITAL 120 VAC INSTRUMENT BUS,  
✧  
Supplemental Information  
✧
- b. SLNRC 84-0016 File: 0278, "Safe Shutdown Following Loss of Instrument Bus," February 2, 1984.
- c. PMR 4590, PDP Replacement

**3.2. Commitments**

- a. LER 92-002, Reactor Trip on Low-Low S/G Water Level  
✧  
Following Loss of an Instrument Bus, RCMS #92-069 [Step 2]  
✧



STE	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBSERVED
-----	--------------------------	-----------------------

**2. Ensure S/G Control Systems Are Using Unaffected Channels:**

	NN01 RED TRAIN S/G STEAM FLOW SELECT SG LEVEL SELECT SELECTOR SWITCH CHANNEL SELECTOR SWITCH			
CHANNEL	S/G A	AB FS-512C	F513	AE LS-519C L519
	S/G B	AB FS-522C	F523	AE LS-529C L552
	S/G C	AB FS-532C	F533	AE LS-539C L553
	S/G D	AB FS-542C	F543	AE LS-549C L549
	NN02 WHITE TRAIN S/G STEAM FLOW SELECT SG LEVEL SELECT SELECTOR SWITCH CHANNEL SELECTOR SWITCH			
CHANNEL	S/G A	AB FS-512C	F512	AE LS-519C L551
	S/G B	AB FS-522C	F522	AE LS-529C L529
	S/G C	AB FS-532C	F532	AE LS-539C L539







STE

ACTION/EXPECTED

RESPONSE NOT

4. (  ) Check RWST Switchover Has Go To Step 5.  
**Occurred:**
- a. Close letdown orifice isolation valves.
    - o BG HIS-8149AA
    - o BG HIS-8149BA
    - o BG HIS-8149CA
  - b. Close charging flow control valve.
    - o BG HC-182
  - c. Ensure CCP A, CCP B, or NCP - AT LEAST ONE RUNNING
  - d. Establish 32 gpm seal injection flow.
    - o BG FCV-121
    - o BG FK-462
5. **Stabilize Plant:**
- a. Stop any plant operations requiring rod motion
  - b. (  ) Adjust Turbine load as necessary to maintain Tavg within 3°F of Tref
6. **Dispatch Operator To Affected Instrument Bus With Backup Breaker Interlock Key**
7. **Go To Appropriate Attachment:**
- o Loss of NN01 - ATTACHMENT A
  - o Loss of NN02 - ATTACHMENT B
  - o Loss of NN03 - ATTACHMENT C
  - o Loss of NN04 - ATTACHMENT D

-END-

STE

ACTION/EXPECTED

RESPONSE NOT

ATTACHMENT A  
(Page 1 of 16)

LOSS OF VITAL INSTRUMENT BUS NN01 (RED TRAIN)

☒  
☒

**A1. Defeat RCS Temperature Control For Loop 1:**

- a. Position Loop Tavg Control  
Signal to - T412
  - o BB TS-412T
- b. Position Loop T Control  
Signal to - T411
  - o BB TS-411F

☒

**A2. Ensure AC PT-506 Selected**

- o AC PS-505Z

**A3. Lock S/G A Atmospheric Relief Valve Manual Drive Lever In Closed Position**

- o AB PIC-1A

☒  
☒

**A4. Locally Restore Power To Bus NN01:**

Go To Step A5.

☒  
☒  
☒

- a. Check NN01 buss - NO  
APPARENT DAMAGE

a. Go to Step A6.

☒  
☒  
☒

- b. Check inverter NN11 output  
voltage - NORMAL

b. Go to Step A5.

☒  
☒

- c. Ensure inverter AC output  
breaker is closed

☒

- o Breaker 4CB - CLOSED

☒  
☒

- d. Ensure normal feeder  
breaker is closed

☒

- o NN0101 - CLOSED

- e. Go To Step A6.

STE

ACTION/EXPECTED

RESPONSE NOT

ATTACHMENT A  
(Page 2 of 16)

LOSS OF VITAL INSTRUMENT BUS NN01 (RED TRAIN)

**A5. Align Backup Power To Bus NN01:**

a. Close backup transformer XNN05 power supply breaker.

o NG01ACR3

b. Verify Backup Power Available white light - LIT.

c. Open Normal Feeder Breaker.

o NN0101

d. Close Alternate Feeder Breaker.

o NN0102

e. Refer to applicable Technical Specification:

o 3.8.7, Inverters - Operating

o 3.8.8, Inverters - Shutdown

**A6. Check VCT level - GREATER THAN 5%**

Perform the following:

a. IF NN01 is energized, THEN  
initiate makeup using  
SYS BG-200, REACTOR MAKEUP CONTROL SYSTEM NORMAL OPERATION.

b. IF NN01 is deenergized, THEN initiate makeup using  
SYS BG-216, REACTOR

MAKE-UP CONTROL SYSTEM

✧

ALTERNATE OPERATION.

✧

c. WHEN VCT level greater than 5%, THEN do Steps A7, A8, A9 and A10.

d. Continue with Step A12.

✧



**1.0 PURPOSE**

1.1 This procedure provides instructions for operator response to any of the following naturally occurring events.

- \* Earthquake
- \* Tornado
- \* Flooding
- \* Loss of cooling lake

**2.0 SYMPTOMS OR ENTRY CONDITIONS**

2.1 This procedure is entered after an earthquake based on any of the following symptoms:

- \* Annunciator 00-098A, R SPCTRM SSE EXCEED - LIT
- \* Annunciator 00-098B, SSE - LIT
- \* Annunciator 00-098C, R SPCTRM OBE EXCEED - LIT
- \* Annunciator 00-098D, OBE - LIT
- \* Annunciator 00-098E, SEISMIC RECORDER ON - LIT
- \* The effects of an earthquake are heard, seen, or felt.

2.2 This procedure is entered to respond to a tornado based on any of the following symptoms:

- \* Tornado warning is in effect for the area.
- \* A tornado has been sighted near or is traveling toward the plant.

2.3 This procedure is entered to respond to flooding based on the following.

- \* Reported flooding
- \* Annunciator 00-097A, COND PIT LEV HI - LIT

2.4 This procedure is entered to respond to loss of cooling lake based on any of the following symptoms:

- \* Reported cooling dam failure.
- \* Cooling lake level less than 1080 feet
- \* Condenser vacuum absolute pressure increasing.
- \* Condenser temperature greater than 130°F.

**3.0 REFERENCES AND COMMITMENTS****3.1 References**

- a. Bechtel Calculation Number FL-05 Rev. 0, "Control Building Flooding"
- b. DCP 07225, Emergency Makeup Water Requirement For AFW From  
☒  
ESW/UHS [Attachment D, Step D8]  
☒

c. CCP 07784, Missile Shield/Hatch Cover Requirement.

✧

[Attachment B, Step B1 NOTE]

✧

### 3.2 Commitments

- a. Letter WO 92-0045 [Attachment A, Step A16]
- b. RCMS #99-073, Spent Fuel Pool Rack Inspection Following  
✧  
Earthquake. [Attachment A, Step A14]  
✧



STE	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
-----	--------------------------	-----------------------

1. Determine Appropriate Attachment For Natural Event From Table Below:

IF a natural event is NOT in progress, THEN return to procedure and step in effect.

▼	EVENT	⊕	ATTACHMENT	⊕
⊕	EARTHQUAKE	⊕	A	⊕
⊕	TORNADO	⊕	B	⊕
⊕	FLOODING	⊕	C	⊕
⊕	COOLING DAM FAILURE	⊕	D	⊕

2. Go To Appropriate Attachment For Natural Event

3. Return To Procedure And Step In Effect

-END-

STE	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
-----	--------------------------	-----------------------

ATTACHMENT D  
(Page 1 of 4)  
COOLING DAM FAILURE RESPONSE



NOTE

☐ Cooling lake level of 1980 feet corresponds to 1080 feet on computer point EFL0027. ☐

**D1. Check Cooling Dam Failure - HAS OCCURRED OR IS IMMINENT:** Return to procedure and step in effect.

\* Reports of dam failure or damage

OR

\* Cooling lake level - LESS THAN 1080 FEET

OR

\* Condenser vacuum - ABSOLUTE PRESSURE INCREASING

OR

\* Condenser temperature - GREATER THAN 130°F

☐ **D2. Begin Plant Shutdown Using The Following Procedures As Directed By SM/CRS**

\* GEN 00-004, POWER OPERATION

OR

\* GEN 00-005, MINIMUM LOAD TO HOT STANDBY

OR

\* OFN MA-038, RAPID PLANT SHUTDOWN

**D3. Notify Coffey County Sheriff Of Plant Status**

o Telephone number 364-2123



STE

ACTION/EXPECTED

RESPONSE NOT

ATTACHMENT D  
(Page 2 of 4)

## COOLING DAM FAILURE RESPONSE

**D4. Place Both ESW Trains In Service**

- a. Start both ESW pumps
- b. Ensure ESW to UHS - OPEN
  - o EF HIS-37 for train A
  - o EF HIS-38 for train B
- c. Ensure ESW to service water isolation - CLOSED
  - o Train A
    - o EF HIS-23
    - o EF HIS-25
    - o EF HIS-39
    - o EF HIS-41
  - o Train B
    - o EF HIS-24
    - o EF HIS-26
    - o EF HIS-40
    - o EF HIS-42
- b. Locally open valves.
- c. Locally close valves.

STE	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
-----	--------------------------	-----------------------

ATTACHMENT D  
(Page 3 of 4)  
COOLING DAM FAILURE RESPONSE

NOTE

☒ Cooling lake level of 1975 feet corresponds to 1075 feet on computer point EFL0027. ☒

D5. Check If Reactor Should Be Tripped:

Perform the following:

- a. Check cooling lake level - GREATER THAN 1075 FEET
- b. Consult Shift Manager/Control Room Supervisor for further direction.

1. Manually trip reactor.
2. Stabilize the plant using EMGs while continuing with this procedure.
3. Stop Circ Water Pumps.
  - o 1HS-CW001A
  - o 1HS-CW002A
  - o 1HS-CW003A
4. At circ water screen house, stop fire pumps.
  - a) In diesel fire pump room, in panel 1PL06J place pump controller control switch to OFF.
  - b) Open fire pumps breakers.
    - o 1SL31 CUB-6 for 1FP001PA
    - o SL4A1RB for 1FP002P
5. Break condenser vacuum using SYS CG-320, BREAKING MAIN CONDENSER VACUUM.
6. Shutdown all equipment cooled by Service Water.
7. Place Service Water Pumps in Pull-To-Lock.
  - o 1HS-WS001A
  - o 1HS-WS002A

- 1HS-WS003A
- 1HS-WS004A

STE

ACTION/EXPECTED

RESPONSE NOT

RESPONSE

OBTAINED

## ATTACHMENT D

(Page 4 of 4)

## COOLING DAM FAILURE RESPONSE

**D6. Determine Emergency Action Level Using EPP 06-005, EMERGENCY CLASSIFICATION**

**D7. Establish Continuous Fire Watches:**

- o In plant areas
- o In areas with operating equipment

**D8. Close ESW To Aux Feedwater Pumps Inlet Header Drains**

- o AL-V136
- o AL-V137
- o AL-V138
- o AL-V139

**D9. Inspect The Integrity Of The Piping Associated With A And B Air Compressors**

- a. At least every 4 hours, inspect all of the non-safety related portions of the service water system associated with air compressors A and B to ensure no pipe breaks have occurred

- o CKA01A
- o CKA01B

- a. Isolate affected air compressor:

- 1) Close service water inlet isolation valve.
  - \* EF HV-43 for train A
  - \* EF HV-44 for train B
- 2) Close service water outlet isolation valve.
  - \* EF-V346 for train A
  - \* EF-V345 for train B

**D10. Direct Fire Protection Specialist To Make Provisions For Backup Fire Protection Equipment**

**D11. Consult Shift Manager/Control Room Supervisor For Further Direction**

☒  
☒  
☒

-END-





**1.0 PURPOSE**

1.1 To provide operator actions in response to an accidental release of radioactive gas or liquid.

**2.0 SYMPTOMS OR ENTRY CONDITIONS**

2.1 The following symptoms are indicative of a gaseous or liquid release:

a. Increased Radiation Monitor readings:

- \* AB RE-111 Steam Line D PORV Discharge
- \* AB RE-112 Steam Line C PORV Discharge
- \* AB RE-113 Steam Line B PORV Discharge
- \* AB RE-114 Steam Line A PORV Discharge
- \* BM RE-25 SG Blowdown
- \* BM RE-52 SG Blowdown
- \* EG RE-09 CCW Hx Train A
- \* EG RE-10 CCW Hx Train B
- \* FB RE-50 Aux. Steam Condensate X-fer Pump
- \* FC RE-381 Aux FDWTR Turbin Disch
- \* GE RE-92 Condenser Air Removal
- \* GG RE-27 Fuel Bldg. Exhaust
- \* GG RE-28 Fuel Bldg. Exhaust
- \* GH RE-10 Radwaste Building
- \* GH RE-22 Radwaste BLDG EXHST PART
- \* GH RE-23 Waste Gas
- \* GK RE-04 Control Bldg. Supply Air
- \* GK RE-05 Control Bldg. Supply Air
- \* GK RE-41 Access Control
- \* GL RE-60 Aux. Bldg. Exhaust Filter
- \* GT RE-21A Unit Vent
- \* GT RE-21B Unit Vent
- \* GT RE-22 Containment Purge
- \* GT RE-31 Containment Atmosphere
- \* GT RE-32 Containment Atmosphere
- \* GT RE-33 Containment Purge
- \* GT RE-59 CNTMT HI Range Area Mon
- \* GT RE-60 CNTMT HI Range Area Mon
- \* HB RE-18 Waste Monitor Tank Pump Disch
- \* HE RE-16 Boron Recycle Evap. Distillate
- \* HF RE-45 Secondary Liquid Waste Disch
- \* HF RE-95 Waste Water Treatment Influent
- \* LE RE-59 Turbine Bldg. Drains
- \* SJ RE-01 CVCS Letdown
- \* SJ RE-02 SG Blowdown

b. Unexplained trends on any of the following recorders:

- \* RR1
- \* RR2
- \* GH RR-10B
- \* GH RR-51
- \* GT RR-21B
- \* GT RR-58

2.2 Any of the following annunciator lit is an indication of a gaseous or liquid release:

- \* Annunciator 00-061B, PROCESS RAD HI
- \* Annunciator 00-061A, PROCESS RAD HIHI
- \* Annunciator 00-107F, GASEOUS RADWASTE TROUBLE
- \* Annunciator 00-108F, SEC LIQ RADWASTE TROUBLE
- \* Annunciator 00-109F, LIQUID RADWASTE TROUBLE

### 3.0 REFERENCES AND COMMITMENTS

#### 3.1 References

- a. AP 07B-003, OFFSITE DOSE CALCULATION MANUAL

#### 3.2 Commitments

- a. None

STE

ACTION/EXPECTED

RESPONSE NOT

**1. Check Listed Gaseous Monitors**      Go to Step 8.  
**- ANY HI-HI ALARM ACTUATED**

- \* GE RE-92 Condenser Air Removal
- \* GG RE-27 Fuel Bldg. Exhaust
- \* GG RE-28 Fuel Bldg. Exhaust
- \* GH RE-10 Radwaste Building
- \* GK RE-04 Control Bldg. Supply Air
- \* GK RE-05 Control Bldg. Supply Air
- \* GT RE-22 Containment Purge
- \* GT RE-31 Containment Atmosphere
- \* GT RE-32 Containment Atmosphere
- \* GT RE-33 Containment Purge

**2. Check If Control Room Ventilation Isolation Required:**

- a. HI-HI alarm on any of the following monitors - ACTUATED      a. Go to Step 6.
- \* GG RE-27 Fuel Bldg. Exhaust
  - \* GG RE-28 Fuel Bldg. Exhaust
  - \* GK RE-04 Control Bldg. Supply Air
  - \* GK RE-05 Control Bldg. Supply Air
  - \* GT RE-22 Containment Purge
  - \* GT RE-31 Containment Atmosphere
  - \* GT RE-32 Containment Atmosphere
  - \* GT RE-33 Containment Purge

STE

ACTION/EXPECTED

RESPONSE NOT

### 3. Verify Control Room Ventilation Isolation

a. Check ESFAS status panel  
CRVIS section - ALL WHITE  
LIGHT LIT

- o Red train
- o Yellow train

a. Perform the following:

- 1) IF control room ventilation isolation has NOT actuated, THEN manually actuate control room ventilation isolation.
  - o SA HS-9
  - o SA HS-13
- 2) IF any CRVIS component NOT properly aligned, THEN manually align component.
- 3) IF neither train of CRVIS is in service, THEN establish one in service train of CRVIS using SYS GK-122, MANUAL CONTROL ROOM VENTILATION CRVIS LINEUP.
- 4) IF only one train of
  - ☒ CRVIS can be placed in
  - ☒ service, THEN within
  - ☒ 90 minutes, isolate out
  - ☒ of service train using
  - ☒ SYS GK-122, MANUAL
  - ☒ CONTROL ROOM
  - ☒ VENTILATION CRVIS
  - ☒ LINEUP.
  - ☒

b. Ensure Control Room Outer  
door - CLOSED

STE

ACTION/EXPECTED

RESPONSE NOT

**4. Check If Containment Purge  
Should Be Isolated:**

a. HI-HI alarm on any of the  
following monitors -  
ACTUATED

- \* GT RE-22 Containment  
Purge
- \* GT RE-31 Containment  
Atmosphere
- \* GT RE-32 Containment  
Atmosphere
- \* GT RE-33 Containment  
Purge

b. Check ESFAS status panel  
CPIS section - ALL WHITE  
LIGHT LIT

- o Red train
- o Yellow train

a. Go to Step 5.

b. Perform the following:

- 1) IF containment purge  
isolation has NOT  
actuated, THEN manually  
actuate containment  
purge isolation.
  - o SA HS-11
  - o SA HS-15
- 2) IF any CPIS component  
NOT properly aligned,  
THEN manually align  
component. IF  
component(s) can NOT be  
aligned, THEN manually  
or locally isolate  
affected containment  
penetration. Refer to  
ATTACHMENT A.

STE

ACTION/EXPECTED

RESPONSE NOT

**5. Check If Fuel Building  
Isolation Should Be Isolated:**

a. HI-HI alarm on any of the  
following monitors -  
ACTUATED

- \* GG RE-27 Fuel Bldg.  
Exhaust
- \* GG RE-28 Fuel Bldg.  
Exhaust

b. Check ESFAS status panel  
FBIS section - ALL WHITE  
LIGHT LIT

- o Red train
- o Yellow train

a. Go to Step 6.

b. Perform the following:

- 1) IF FBIS has NOT  
actuated, THEN manually  
actuate FBIS.
  - o SA HS-10
  - o SA HS-14
- 2) IF any FBIS component  
NOT properly aligned,  
THEN manually align  
component. refer to  
ATTACHMENT B.

STE

ACTION/EXPECTED

RESPONSE NOT

**6. Check If Steam Generator  
Blowdown Should Be Isolated:**

a. HI-HI alarm on Condenser  
Air Removal - ACTUATED

o GE RE-92

b. Perform the following:

1) Check steam generator  
blowdown isolation  
valves - CLOSED

- o BM HIS-1A
- o BM HIS-2A
- o BM HIS-3A
- o BM HIS-4A

2) On panel SJ-143, locally  
ensure SG blowdown  
sample isolation valves  
- CLOSED

- o BM HIS-5
- o BM HIS-6
- o BM HIS-7
- o BM HIS-8

a. Go to Step 7.

b. Manually close valves.

**7. Check If Gas Decay Tank  
Should Be Isolated:**

a. HI-HI alarm on Radwaste  
Building - ACTUATED

o GH RE-10

b. Check 2 Inch Gas Decay  
Tanks Outlet To Radwaste  
Building HVAC Auto  
Isolation - CLOSED

o HA HCV-14

a. Go to Step 8.

b. At Panel HA-116, locally  
close valve.

STE

ACTION/EXPECTED

RESPONSE NOT

**8. Check Listed Liquid Monitors  
- ANY HI-HI ALARM ACTUATED**

Go to Step 18.

- \* BM RE-25 SG Blowdown
- \* BM RE-52 SG Blowdown
- \* EG RE-09 CCW Hx Train A
- \* EG RE-10 CCW Hx Train B
- \* FB RE-50 Aux. Steam  
Condensate X-fer Pp
- \* HB RE-18 Waste Monitor Tank  
Pump Disch
- \* HE RE-16 Boron Recycle  
Evap. Distillate
- \* HF RE-45 Secondary Liquid  
Waste Disch
- \* LE RE-59 Turbine Bldg.  
Drains
- \* HF RE-95 Waste Water  
treatment Influent
- \* SJ RE-02 SG Blowdown

**9. Check If Steam Generator  
Blowdown Should Be Isolated:**

a. HI-HI alarm on the  
following monitor -  
ACTUATED

a. Go to Step 10.

- o SJ RE-02, SG Blowdown
- o BM RE-25, SG Blowdown
- o BM RE-52, SG Blowdown

b. Perform the following:

b. Manually close valves.

1) Check steam generator  
blowdown isolation  
valves - CLOSED

- o BM HIS-1A
- o BM HIS-2A
- o BM HIS-3A
- o BM HIS-4A

2) On panel SJ-143 locally  
ensure SG blowdown  
sample isolation valves  
- CLOSED

- o BM HIS-5
- o BM HIS-6
- o BM HIS-7
- o BM HIS-8



STE

ACTION/EXPECTED

RESPONSE NOT

**10. Check If CCW A Train Should Be Isolated:**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>a. HI-HI alarm on CCW Heat Exchanger Train A - ACTUATED           <ul style="list-style-type: none"> <li>o EG RE-09</li> </ul> </li> <li>b. Check CCW Surge tank A vent - CLOSED           <ul style="list-style-type: none"> <li>o EG HIS-9</li> </ul> </li> <li>c. Check Demineralized water to CCW surge tank A - Closed           <ul style="list-style-type: none"> <li>o EG HIS-1</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>a. Go to Step 11.</li> <li>b. Manually close valve.</li> <li>c. Manually close valve.</li> </ul> |
|---|---|

**11. Check If CCW B Train Should Be Isolated:**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>a. HI-HI alarm on CCW Heat Exchanger Train B - ACTUATED           <ul style="list-style-type: none"> <li>o EG RE-10</li> </ul> </li> <li>b. Check CCW Surge tank B vent - CLOSED           <ul style="list-style-type: none"> <li>o EG HIS-10</li> </ul> </li> <li>c. Check Demineralized water to CCW surge tank B - Closed           <ul style="list-style-type: none"> <li>o EG HIS-2</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>a. Go to Step 12.</li> <li>b. Manually close valve.</li> <li>c. Manually close valve.</li> </ul> |
|--|---|

**12. Check If Waste Monitor Tank Pump Discharge Should Be Isolated:**

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>a. HI-HI alarm on Waste Monitor Tank Pump Discharge - ACTUATED           <ul style="list-style-type: none"> <li>o HB RE-18</li> </ul> </li> <li>b. Check Waste Monitor Tank Pump Disch - CLOSED           <ul style="list-style-type: none"> <li>o HB RV-18</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>a. Go to Step 13.</li> <li>b. Locally close valve.</li> </ul> |
|---|--|

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13.	<b>Check If Boron Recycle Evaporator Distillate Should Be Diverted:</b>	
a.	HI-HI alarm on Boron Recycle Evaporator distillate - ACTUATED	a. Go to Step 14.
o	HE RE-16	
b.	Check Boron Recycle Evaporator Distillate - DIVERTED TO RECYCLE HOLD UP TANK	b. Locally divert boron recycle evaporator to recycle hold up tank.
o	HE HS-16	
c.	Check Recycle Evaporator Feed Demineralizers - BYPASSED	c. Locally bypass recycle evaporator feed demineralizers.
o	HE TCV-250	
14.	<b>Check If Secondary Liquid Waste Disch Should Be Isolated:</b>	
a.	HI-HI alarm on Secondary Liquid Waste Discharge - ACTUATED	a. Go to Step 15.
o	HF RE-45	
b.	Check Secondary Liquid Waste Disch Valve - CLOSED	b. Locally close valve.
o	HF RV-45	
15.	<b>Check If Turbine Building Drains Should Be Isolated:</b>	
a.	HI-HI alarm on Turbine Building Drains - ACTUATED	a. Go to Step 16.
o	LE RE-59	
b.	Check Turbine Building Drains - CLOSED	b. Manually close drain.
o	LE RV-59	

STE

ACTION/EXPECTED

RESPONSE NOT

**16. Check If Waste Water Treatment Influent Should be Isolated:**

- |   |  |
|---|--|
| <p>a. HI-HI alarm on Waste Water Treatment Influent - ACTUATED</p> <ul style="list-style-type: none"> <li>o HF RE-95</li> </ul> <p>b. Check Waste Water Treatment Influent Valve -CLOSED</p> <ul style="list-style-type: none"> <li>o HF RV-95</li> </ul> | <p>a. Go to Step 17.</p> <p>b. Manually close valve.</p> |
|---|--|

**17. Check If Auxiliary Steam Condensate Transfer Pump Should Be Isolated:**

- |   |   |
|---|---|
| <p>a. HI-HI alarm on auxiliary steam - ACTUATED</p> <ul style="list-style-type: none"> <li>o FB RE-50</li> </ul> <p>b. Check Condensate Transfer Pumps - OFF</p> <ul style="list-style-type: none"> <li>o PFB01A</li> <li>o PFB01B</li> </ul> <p>c. Check RADWASTE BUILDING AUX STEAM SUPPLY PRESS CONTROL VALVE CLOSED</p> <ul style="list-style-type: none"> <li>o FBPV029</li> </ul> | <p>a. Go to Step 18.</p> <p>b. Turn off pumps.</p> <p>c. Locally close valve.</p> |
|---|---|

**18. Determine If Release Is Offsite**

- |   |  |
|---|--|
| <p>a. HI-HI alarm on the following monitor - ACTUATED</p> <ul style="list-style-type: none"> <li>* GH RE-10 Radwaste Bldg.</li> <li>* GT RE-21 Unit Vent</li> </ul> | <p>a. Perform the following:</p> <ul style="list-style-type: none"> <li>1) Direct Health Physics to evaluate increased radiation levels.</li> <li>2) Notify Chemistry.</li> <li>3) Go to Step 20.</li> </ul> |
|---|--|

STE

ACTION/EXPECTED

RESPONSE NOT

NOTE

An abnormal release is an unplanned or uncontrolled release of radioactive material from the site boundary.

**19. Evaluate Release**

- a. Direct Chemistry to evaluate for abnormal releases as follows:
  - 1) Sample source of release
  - 2) Perform dose calculations to determine if 10 CFR 20 release limits have been exceeded
- b. Direct Health Physics to evaluate increased radiation levels
- c. Refer to AP 07B-003, OFFSITE DOSE CALCULATION MANUAL, for release limits and remedial actions

**20. Identify Probable Leakage Source Using ATTACHMENT C, RADIATION SOURCE IDENTIFICATION**

**21. Check Leakage Source - ISOLATED** Check need for local area evacuation.

**22. Refer To Emergency Preparedness Procedure EPP 06-005, EMERGENCY CLASSIFICATION**

**23. Consult Shift Supervisor/ Supervising Operator For Further Direction**

**24. Return To Procedure And Step In Effect**

ATTACHMENT A  
(Page 1 of 1)  
VALVES CLOSED BY CONTAINMENT PURGE ISOLATION SIGNAL

NOTE

All of the valves have visible local position indication.

RED TRAIN

YELLOW TRAIN

GT HZ-5	CTMT Mini-Purge	GT HZ-4	CTMT Mini-Purge
	Supply Inside		Supply Outside
	CTMT Iso		CTMT Iso

GT HZ-12	CTMT Mini-Purge	GT HZ-11	CTMT Mini-Purge
	Exh Outside		Exh Inside
	CTMT Iso		CTMT Iso

GT HZ-7	CTMT S/D Purge	GT HZ-6	CTMT S/D Purge
	Supply Inside		Supply Outside
	CTMT Iso		CTMT Iso

GT HZ-9	CTMT S/D Purge	GT HZ-8	CTMT S/D Purge
	Exh Outside		Exh Inside
	CTMT Iso		CTMT Iso

-END-

ATTACHMENT B  
(Page 1 of 1)  
FBIS ACTUATION VERIFICATION

**B1. Ensure Emergency Exhaust Fans - RUNNING**

- o CGG02A
- o CGG02B

**B2. Ensure Fuel Bldg. To Emergency Filter Units - OPEN**

- o GG HZ-40 dampers GG-D025
- o GG HZ-43 dampers GG-D018

**B3. Ensure Fuel Bldg. Air Supply Fans - STOPPED**

- o SGG01A
- o SGG01B

**B4. Ensure Fuel Bldg. Air Supply Fan Discharge Damper - CLOSED**

- o GG HZ-38 dampers GG-D5
- o GG HZ-39 dampers GG-D6

**B5. Ensure Fuel Bldg. Air Inlet Dampers - CLOSED**

- o GG RZ-36 dampers GG-D3
- o GG RZ-37 dampers GG-D4

**B6. Ensure Spent Fuel Pool Discharge To Aux. Bldg. Damper - CLOSED**

- o GG HZ-42 damper GG-D32

**B7. Ensure Fuel Bldg. Exhaust To Aux. Bldg. Vent Damper - CLOSED**

- o GL HZ-62 damper GL-D58

**B8. Align Other Ventilation Systems Discharging To Unit Vent:**

- o Ensure Access Control Exhaust Fans - STOPPED
  - o GK HIS-47 for CGK02A
  - o GK HIS-49 for CGK02B
- o Ensure Main Steam Enclosure Exhaust Fans - STOPPED
  - o GF HIS-17 for CGF03A
  - o GF HIS-18 for CGF03B
- o Ensure Aux/Fuel Normal Exhaust Fans - IN SLOW SPEED
  - o GL HIS-30 for CGL03A
  - o GL HIS-31 for CGL03B

ATTACHMENT C  
(Page 1 of 2)  
RADIATION SOURCE IDENTIFICATION

NOTE

If the source of radioactivity cannot be identified, the possibility of a failed detector should be considered.

GASEOUS MONITOR ALARM SOURCES

DETECTOR

POSSIBLE SOURCES

- GT RE-21A \* Auxiliary Building HVAC
- GT RE-21B \* Turbine Buidling HVAC
- \* Fuel Building HVAC
- \* Miscellaneous Building HVAC
- \* Control Building HVAC
- \* Containment purge

- GT RE-22 \* Primary leak inside containment
- GT RE-33 \* Failed fuel
- GT RE-31 \* Damaged fuel
- GT RE-32
- GT RE-59
- GT RE-60

- GH RE-10 \* Gas decay tank release
- GH RE-22 \* Leaking gas decay tank relief valve
- \* Pipe leak associated with Waste Gas System

- GH RE-23 \* Leak from gas decay tank
- \* Pipe leak associated with Waste Gas System

- GL RE-60 \* Radioactive gas from Auxiliary Building rooms
- \* Coolant leak in Auxiliary Building











STS RE-012

QPTR DETERMINATION

Responsible Manager

Manager Nuclear Engineering

Revision Number	7
Use Category	Reference
Administrative Controls	No
Infrequently Performed Procedure	No
Program Number	29

DC30 11/27/1997

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3.1.4 STS IC-932, POWER RANGE NEUTRON HIGH FLUX TRIP SETPOINT REDUCTION

3.2 Commitments

3.2.1 None

4.0 PRECAUTIONS/LIMITATIONS

4.1 If the Incore Movable Detector System is used for QPTR determination, at least 75% of the thimbles (44 thimbles), with a minimum of two thimbles per core quadrant, are to be operable as required by USAR Section 16.3.1.1 (TR 3.3.10).

4.2 With one excore detector inoperable, the remaining three detectors shall be used for computing the average.

4.3 The recorded reactor power must be from the indication being used to control reactor power (i.e., the highest reading NI channel or the calorimetric).

4.4 STS IC-932, POWER RANGE NEUTRON HIGH FLUX TRIP SETPOINT REDUCTION, shall be used for reduction of the Power Range Neutron Flux-High Trip Setpoints as required by Technical Specification 3.2.4 (ITS 3.2.4.A.4).

5.0 TEST EQUIPMENT

5.1 None

6.0 ACCEPTANCE CRITERIA

6.1 QPTR shall not exceed 1.02.

7.0 PREREQUISITES

7.1 The Reactor is operating at a steady power level above 50% RTP.













INIT/DATE

**NOTE**

**Incore tilts at the time of the most recent excore detector QPTR normalization should be taken into account in this evaluation.**

- 8.6.7 Confirm that the tilts recorded in the previous step are consistent with the indicated QPTR determined per this procedure. \_\_\_\_\_ /
- 8.7 Verification of QPTR within Limits
- 8.7.1 IF QPTR is less than or equal to 1.02, THEN restore system per SS direction. \_\_\_\_\_ /
- 8.7.2 IF QPTR is greater than 1.02 THEN perform the following:
1. Refer to Technical Specification 3.2.4 (ITS 3.2.4). \_\_\_\_\_ /
  2. Contact Reactor Engineering. \_\_\_\_\_ /
  3. Confirm the out-of-limit condition by verifying the method used and by performing other available methods per this surveillance. \_\_\_\_\_ /
  4. Determine if the out-of-limit condition is sustained by performing this surveillance at least every hour. \_\_\_\_\_ /

**9.0 RESTORATION 9.0 RESTORATION**

9.1 None

**10.0 RECORDS 10.0 RECORDS**

- 10.1 The following QA records are generated by this procedure:
- o Sections 7.0 and 8.0
  - o Incore detector plateaus (if Section 8.6 was used)





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## 1.0 PURPOSE

1.1 This procedure provides instructions for the operation of the General Atomics (GA) Process Monitor Systems RM-11R (SP056A) and RM-23.

## 2.0 SCOPE

2.1 This procedure provides instructions to take process monitor readings from the RM-11R (SP056A) or RM-23.

2.2 This procedure provides instructions for Monitor Item operations at the RM-11R (SP056A) or RM-23.

2.3 This procedure provides instructions for Channel Item operations at the RM-11R (SP056A) or RM-23.

2.4 This procedure provides instructions for check source operation.

2.5 This procedure provides instructions for process monitor pump operations.

2.6 This procedure provides instructions to acknowledge a multiple communication failure of the RM-11R (SP056A).

2.7 This procedure provides instructions to place the Unit Vent monitor in Accident mode.

2.8 This procedure provides instructions for special operations such as lamp testing RM-23.

## 3.0 REFERENCES AND COMMITMENTS

### 3.1 References

3.1.1 AP 07B-003, Offsite Dose Calculation Manual

3.1.2 PMR 4701

3.1.3 Vendor Manuals:

- o J-316-00072
- o J-361-00075
- o J-361-0078
- o J-361A-00041

3.1.4 PIR 95-2205

3.1.5 CCP 7860

3.1.6 Technical Specifications



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### 3.2 Commitments

3.2.1 None

## 4.0 PRECAUTIONS/LIMITATIONS

- 4.1 The system must be in the Supervisor Mode to make data base changes from an RM-23 or RM-11R (SP056A). IF the system is NOT in the Supervisor Mode, THEN the changes will not be accepted.
- 4.2 Data base entries made from an RM-23 or RM-11R (SP056A) must be performed in the proper format. Steps to which this applies have an example given for the step describing data entry.
- 4.3 The source check is considered satisfactory when the radiation monitor source check is energized and source activity reaches or exceeds the check source limit. (Channel Item 15)
- 4.4 Refer to AP 07B-003, OFFSITE DOSE CALCULATION MANUAL for the following monitor operability requirements:
- 4.4.1 Liquid Effluent Monitors: (Table 2-2)
- o HB RE-18
  - o BM RE-52
  - o LE RE-59
  - o HF RE-45
  - o HF RE-95
- 4.4.2 Gaseous Effluent Monitors: (Table 3-2)
- o GT RE-21A
  - o GT RE-21B
  - o GT RE-22
  - o GT RE-33
  - o GH RE-10A
  - o GH RE-10B

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4.5 Refer to Technical Specifications or Technical Requirements for the following monitor operability requirements:

- o GK RE-4 (TS 3.3.7)
- o GK RE-5 (TS 3.3.7)
- o GG RE-27 (TS 3.3.8) (TR 3.7.13)
- o GG RE-28 (TS 3.3.8) (TR 3.7.13)
- o GT RE-31 (TS 3.3.6)
- o GT RE-32 (TS 3.3.6)

4.6 IF RM-11R (SP056A) is INOPERABLE, THEN GT RE-10A and GT-RE-21A sample flows should be verified at the sample skids. OPERABILITY status of applicable liquid effluent monitors should be evaluated with the Shift Manager.

4.7 All command function operations of the safety-related monitors (GK RE-4, GK RE-5, GG RE-28, GG RE-27, GT RE-31, GT RE-32, GT RE-33 and GT RE-22) must be performed from the RM-23 on panel SP067.

4.8 WHEN monitors GH RE-10B or GT RE-21B go into alert OR high alarm, THEN the associated monitor, GH RE-10A or GT RE-21A, will go into accident isolate.

4.8.1 Accident isolate must be locally reset at the rad monitor.

4.8.2 Chemistry shall be notified when GH RE-10A or GT RE-21A go into accident isolate.

4.9 IF the RM-80 display (LIT, GRID 5, SELECT) is not used, THEN the Master Database will not update.

4.10 Contact I&C if a monitor loses power to ensure the proper data is reloaded into the monitor.

4.11 Changes made at the RM-23 will not update the RM-11R

☒

Supervisor RM-80 Database Screen, Master Column. Manual

☒

action must be taken to modify this column.

☒

4.12 When using the RM-11R to place or remove monitors from poll

☒

(Monitor Item 100), only use the Monitor Items Screen. Do

☒

not use the Supervisor RM-80 Database Screen (LIT, GRID 5,

☒

SELECT) as an unplanned data transfer could occur.

☒

4.13 Monitor Item 100 relay bypass allows I&C to do testing on the  
✧  
process monitors and receive alarms on the RM-11R. However,  
✧  
this condition blocks the selected monitor alarm from the  
✧  
Main Control Board. This condition is indicated on the  
✧  
RM-11R Grid display by the channel bottom half being white.  
✧

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**5.0 PREREQUISITES**

5.1 Process Monitors are energized.

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## 6.0 PROCEDURE

### 6.1 Process Monitor Readings Using RM-11R (SP056A)

NOTE

Refer to Figure 1 for a visual display of the RM-11R (SP056A) panel key layout.

6.1.1 To select a grid on the CRT, press the corresponding GRID NUMBER KEY.

6.1.2 WHEN desired grid is displayed, THEN select desired channel as follows:

1. Key in the three digit Channel Identification Number displayed on the grid.
2. Press the SEL key.
3. Check the selected channel outlined in White.

6.1.3 To obtain a Process Monitor Activity Reading, perform the following:

1. Select desired channel using Step 6.1.2.
2. Select desired function key. Refer to Attachment C for function key functions.
  - o TREND 10 MIN
  - o TREND HOURLY
  - o TREND DAILY
  - o STATUS

6.1.4 To obtain a Process Monitor Sample Pressure and Activity Reading, perform the following:

1. Place Supervisor Master Key in the key slot and turn it to SUPERVISOR position.
2. Select desired channel using Step 6.1.2.
3. Press the LIT key.
4. Press the STOP LOG key.
5. Press the SEL key.
6. WHEN no further sample pressures AND activity readings are desired, THEN return the Supervisor

Master Key to the NORMAL position.

6.2 Monitor Item Operations Using RM-11R (SP056A)

NOTE

The only Monitor item that is normally changed by Operations is Monitor item 100. All other changes must be directed by another procedure or approved by AI 15E-001, COMPUTER DATA BASE CHANGE REQUEST.

6.2.1 To view the Monitor Items list, perform the following:

1. Select desired channel using Step 6.1.2.
2. Press the MON ITEMS Channel Displays key.
3. The CRT will display the first page of the MONITOR ITEMS and associated values.
4. Press the ENTER key to page thru the Monitor Items.

6.2.2 To change the value of a Monitor Item, perform the following:

1. Page to the desired Monitor Item using Step 6.2.1.
2. Place Supervisor Master Key in the key slot and turn it to SUPERVISOR position.
3. Key in the desired Monitor Item number.
4. Press the SEL key.
5. Check the selected Monitor Item is backlit.

NOTE

The Monitor Item number may be advanced by depressing the SEL key.

6. Key in the desired Monitor Item value in the correct format. Example:  $5.79 \times 10^{-5}$  is keyed in as 5, 7, 9, -, 0, 5.
7. Press the ENTER Key.



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8. IF the entry is accepted, THEN the message at the bottom of the CRT will indicate value accepted and the value for that item will be updated.
9. IF the entry is NOT accepted, THEN an error message will be displayed at the bottom of the CRT. Press the CLEAR key and return to Step 6.2.2.6.
10. WHEN no further changes are desired, THEN turn the Supervisor Master Key to the NORMAL position.

6.2.3 WHEN all Monitor Item operations are complete, THEN press any grid or trend key to exit.



12. Press the ENTER key.

13. A message area will appear at the bottom of the  
✧  
screen,  
✧
- a. IF the data in the message area is correct,  
✧  
THEN press the ENTER key and proceed to  
✧  
step 6.3.1.14.  
✧
- b. IF the data in the message area is incorrect,  
✧  
THEN press the CLEAR key and return to  
✧  
step 6.3.1.11  
✧
14. IF the entry is accepted, THEN the message at  
the bottom of the CRT will indicate value  
accepted and the value for that item will be  
updated in the RM-80 Column and the Master  
Column.
15. IF the entry is NOT accepted, THEN an error  
message will be displayed at the bottom of the  
CRT. Press the CLEAR key and return to  
Step 6.3.1.11.
16. WHEN no further changes are desired, THEN turn  
the Supervisor Master Key to the NORMAL  
position.

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#### 6.4 Process Monitor Readings Using RM-23

6.4.1 On the selected monitor, press the desired Channel Display key.

- \* GAS
- \* PART
- \* IOD

6.4.2 Check the selected Channel Display key is backlit.

- \* GAS
- \* PART
- \* IOD

6.4.3 Check the selected channel indication display for the current activity value.

6.5 Monitor Item Operations Using RM-23

**NOTE**

**Refer to Attachment A for a list of the commonly used Monitor Items.**

- 6.5.1 To obtain a display of the current value for a Monitor Item, perform the following:
1. Press the desired Channel Display key.
  2. Press the MON key
  3. Check the MON key is backlit.
  4. Enter the three digit monitor item number.
  5. Press the ITEM key.
  6. Check the ITEM key backlit and the current value for that Monitor Item is displayed.
  7. IF desired to read another Monitor Item, THEN enter the three digit number and press the ITEM key or sequentially read each item by pressing the plus (+) key to go forward.



5. Verify the SUPV mode red light is lit.
6. Key in the desired Monitor Item value in the correct format. Example:  $5.79 \times 10^{-5}$  is keyed in as 5, 7, 9, -, 0, 5.



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7. Press the ENTER key.
8. IF the entry is accepted, THEN the display will momentarily go blank followed by a display of the new value.
9. IF the entry is NOT accepted, THEN the ERROR light will illuminate. Press the CLEAR key and return to Step 6.5.2.6.
10. WHEN no further changes are desired, THEN perform the following:
  - a. Press any Channel Display key.
    - \* GAS
    - \* PART
    - \* IOD
  - b. Return the Supervisor Master Key to the NORM position.
  - c. Verify the SUPV mode red light goes out.
  - d. Remove the Supervisor Master Key.

6.6 Channel Item & Release Setpoint Operations Using RM-23

6.6.1 To obtain a display of the current value for a Channel Item, perform the following:

1. Press the desired Channel Display key.

- \* GAS
- \* PART
- \* IOD

2. Check the desired channel backlit.

- \* GAS
- \* PART
- \* IOD

**NOTE**

**Refer to Attachment A for a list of the commonly used Channel Items.**

3. Enter the desired three digit channel item number.

4. Press the ITEM key.

5. Check the ITEM key backlit and the current value for that Channel Item is displayed.

6. IF desired to read another Channel Item, THEN enter the three digit number and press the ITEM key or sequentially read each item by pressing the plus (+) key to go forward.

6.6.2 To change the value of a Channel Item, perform the following:

1. Obtain a display of the current value for a Channel Item:

a. Press the desired Channel Display key.

- \* GAS
- \* PART
- \* IOD

b. Check the desired channel backlit.

- \* GAS
- \* PART

\* IOD



position.

5. Verify the SUPV mode red light is lit.

6. Key in the desired Channel Item value in the correct format. Example:  $5.79 \times 10^{-5}$  is keyed in a 5, 7, 9-, 0, 5.
7. Press the ENTER key.
8. IF the entry is accepted, THEN the display will momentarily go blank followed by a display of the new value.
9. IF the entry is NOT accepted, THEN the ERROR light will illuminate. Press the CLEAR key and return to Step 6.6.2.6.
10. WHEN no further changes are desired, THEN perform the following:
  - a. Press any Channel Display key.
    - \* GAS
    - \* PART
    - \* IOD
  - b. Return the Supervisor Master Key to the NORM position.
  - c. Verify the SUPV mode red light goes out.
  - d. Remove the Supervisor Master Key.

- 6.6.3 Verify the RM11R Supervisor RM-80 Database Screen  
 ✧ Master and RM-80 columns are the same. IF not, THEN  
 ✧ update the Master Column at RM-11R as follows:  
 ✧
1. Perform steps 6.3.1.1 thru 6.3.1.11.  
 ✧
  2. Press the ENTER key.  
 ✧

**NOTE**

✧ On Safety related monitors, when the ENTER key is depressed in ✧  
 ✧ the next step, the Master Column will update and the Message ✧  
 ✧ area will indicate the message is accepted, followed by a ✧  
 ✧ rejected message. The rejected message is normal and can be ✧



- b. IF the data in the message area is incorrect,  
✧  
THEN press the CLEAR key and re-enter the  
✧  
correct data and return to step 6.6.3.2.  
✧
4. WHEN no further changes are desired, THEN turn  
✧  
the Supervisor Master key to the NORMAL  
✧  
position.  
✧



6.7 Source Checking Prior To Radioactivity Release

NOTES

- o Safety-related monitors (GK RE-4, GK RE-5, GG RE-28, GG RE-27, GT RE-31, GT RE-32, GT RE-33 and GT RE-22) can not be source checked using RM-11R (SP056A).
- o Source checks performed using RM-11R (SP056A) shall provide a visual display and a printed message. Channels in the Check Source Mode will not generate isolation signals from a monitor possessing the process system automatic isolation on high alarm feature.

6.7.1 Check source using the RM-11R (SP056A):

1. Select the desired grid and channel using Step 6.1.2.
2. Press the CHECK SOURCE key and verify the backlight is on.

NOTE

The Check Source backlight will remain illuminated during the entire check source interval.

3. Check the RM-11R (SP056A) display bar color changes from green to half-intensity cyan.
4. In the lower left-hand corner of the CRT, check the displayed message reads CHECK SOURCE ENERGIZED.
5. Check satisfactory check source:
  - a. WHEN check source is completed, THEN check that tested channel's green operate light is lit.
  - b. IF the display bar color changed to dark blue, THEN the check source is unsatisfactory and the test should be repeated.

c. IF the check source fails repeatedly, THEN a work request should be generated.

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6.7.2 Check source using an RM-23:

1. Select desired channel using Step 6.4.1.
2. Press the selected channel C/S pushbutton and check it is backlit.
3. Check satisfactory check source:
  - a. WHEN check source is completed, THEN check the C/S backlight is off.
  - b. IF the GREEN OPER indicator is off AND the selected channel backlight is blinking, THEN the check source is unsatisfactory and the test should be repeated.
  - c. IF the check source fails repeatedly, THEN a work request should be generated.



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6.9 RM-11R (SP056A) Multiple Communication Failure Acknowledgment

- 6.9.1 Place Supervisor Master Key in the key slot and turn it to SUPERVISOR position.
- 6.9.2 Press 0 three times.
- 6.9.3 Press the SEL key.

6.10 Placing Unit Vent Monitor In Accident Mode

**NOTE**

**The Unit Vent Monitor can not be verified in Accident Mode using RM-11R (SP056A).**

6.10.1 Placing Unit Vent Monitor GT RE-21B in Accident Mode using RM-11R (SP056A):

1. Press the GRID 1 key.
2. Place Supervisor Master Key in the key slot and turn it to SUPERVISOR position.
3. Key in the three digit channel identification number 213.
4. Press the SEL key and check the selected channel is outlined in white.
5. Press the LIT key.
6. Press the GRID 5 key.
7. Press the SEL key.
8. Press 1.
9. Press the SEL key and check Monitor Item 1 is backlit.
10. Press 4.
11. Press the ENTER key.
12. At GT RIC-21B, verify Unit Vent Monitor in Accident Mode as follows:
  - a. Press the MON key.
  - b. Press 139.
  - c. Press the ITEM key.
  - d. Check display reading 000.

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6.10.2 Placing Unit Vent Monitor GT RE-21B in Accident Mode using SP010:

1. At GT RIC-21B, press the MON key and check button for GT RIC-21B is backlit.
2. Press 001.
3. Press the ITEM key and check ITEM button is backlit and monitor item 001 current value is displayed.
4. Place Supervisor Master Key in the key slot and turn it to SUPV position.
5. Check SUPV mode red light is lit.
6. Press 004.
7. Press the ENTER key to display the new value of 004.
8. Turn Supervisory Master Key to NORM.
9. At GT RIC-21B, verify Unit Vent Monitor in Accident Mode as follows:
  - a. Press the MON key.
  - b. Press 139.
  - c. Press the ITEM key.
  - d. Check display reading 000.

6.11 Special Operations

6.11.1 Lamp testing an RM-23:

1. At the desired RM-23 channel, perform lamp test as follows:
  - a. Press 997.
  - b. Press the ITEM key.
  - c. Check the following lights lit:
    - o Top 8 buttons
    - o ITEM button
    - o MON button

d. IF any lamp NOT lit, THEN contact I&C to change light bulbs.

2. Restore from lamp test as follows:

a. Press the CLEAR key

b. Press the ITEM key

c. Press 7

## 7.0 RECORDS

7.1 None

-END-



ATTACHMENT A  
(Page 1 of 1)  
RM-23 MONITOR AND CHANNEL DATA BASE ITEMS

NOTES

o For a list of only monitor items, such as 033 Sample Pressure, refer to vendor manual J-361-00269.

MONITOR ITEMS

ITEM	DESCRIPTION
016	Sample Flow Rate 1 Setpoint
020	Data Base Complete
033	Sample Pressure
048	Purge Control Options
062	Sample Flow Rate Number 2 (WRGM) Setpoint
100	Monitor Polling Status

CHANNEL ITEMS

ITEM	DESCRIPTION
------	-------------



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ATTACHMENT B  
(Page 1 of 4)  
RM-11R (SP056A) CHANNEL DESCRIPTIONS

LIQUID RADIATION MONITORS

MONITOR	ID NUMBER	TYPE	DESCRIPTION
BM RE-25	256	Gamma	Steam Generator Blowdown Process Monitor
BM RE-52	526	Gamma	Steam Generator Effluent Monitor
EA RE-04A	416	Gamma	Service Water Monitor
EA RE-04B	426	Gamma	Service Water Monitor
EG RE-09	096	Gamma	Component Cooling Water Monitor
EG RE-10	106	Gamma	Component Cooling Water Monitor
FB RE-50	506	Gamma	Auxiliary Steam Condensate Tank Monitor
HB RE-18	186	Gamma	Liquid Radwaste Process System Discharge Monitor
HE RE-16	166	Gamma	Boron Recycle Evaporator Distillate Monitor
HF RE-45	456	Gamma	Secondary Liquid Waste Discharge Monitor
HF RE-95	956	Gamma	Turbine Bldg Discharge to Waste Water Treatment
LE RE-59	596	Gamma	Turbine Bldg Drain Effluent Monitor
SJ RE-01	016	Gamma	CVCS Letdown Monitor
SJ RE-02	026	Gamma	Steam Generator Sampling Monitor

ATTACHMENT B  
 (Page 2 of 4)  
 RM-11R (SP056A) CHANNEL DESCRIPTIONS

WIDE RANGE GAS MONITORS

MONITOR	ID NUMBER	TYPE	DESCRIPTION
GH RE-10B	103	NG Activity (Channel #4) Release Rate	Radwaste Building Vent Monitor
	105	Low Range Noble Gas	
	108	Medium Range Noble Gas	
	109	High Range Noble Gas	
GT RE-21B	213	NG Activity (Channel #4) Release Rate	Unit Vent Monitor
	214	Low Range Noble Gas	
	215	Medium Range Noble Gas	
	216	High Range Noble Gas	

ATTACHMENT B  
(Page 3 of 4)  
RM-11R (SP056A) CHANNEL DESCRIPTIONS

PARTICULATE/IODINE/NOBLE GAS CHANNELS

MONITOR	ID NUMBER	TYPE	DESCRIPTION
GK RE-04	041	Particulate	Control Room Air Supply Monitor
	042	Iodine	
	043	Noble Gas	
GK RE-05	051	Particulate	Control Room Air Supply Monitor
	052	Iodine	
	053	Noble Gas	
GT RE-22	221	Particulate	Containment Purge Monitor
	222	Iodine	
	223	Noble Gas	
GT RE-33	331	Particulate	Containment Purge Monitor
	332	Iodine	
	333	Noble Gas	
GG RE-27	271	Particulate	Fuel Building Exhaust Monitor
	272	Iodine	
	273	Noble Gas	
GG RE-28	281	Particulate	Fuel Building Exhaust Monitor
	282	Iodine	
	283	Noble Gas	
GG RE-31	311	Particulate	Containment Air Monitor
	312	Iodine	
	313	Noble Gas	
GG RE-32	321	Particulate	Containment Air Monitor
	322	Iodine	
	323	Noble Gas	

ATTACHMENT B  
(Page 4 of 4)  
RM-11R (SP056A) CHANNEL DESCRIPTIONS

PARTICULATE/IODINE CHANNELS

MONITOR	ID NUMBER	TYPE	DESCRIPTION
GH RE-10A	101	Particulate	Radwaste Building Effluent Monitor
	102	Iodine	
GH RE-21A	2111	Particulate	Radwaste Building Effluent Monitor
	212	Iodine	

PARTICULATE CHANNELS

MONITOR	ID NUMBER	TYPE	DESCRIPTION
GH RE-22	224	Particulate	Radwaste Building Exhaust Monitor
GK RE-41	414	Particulate	Access Control Area Ventilation Exhaust Monitor
GL RE-60	604	Particulate	Auxiliary Building Ventilation Exhaust Monitor

NOBLE GAS CHANNELS

MONITOR	ID NUMBER	TYPE	DESCRIPTION
GH RE-23	235	Noble Gas	Waste Gas Radiation Monitor
GH RE-92	925	Noble Gas	Condenser Air Discharge Monitor

-END-

ATTACHMENT C (Page 1 of 1) RM-11R (SP056A) COLOR CODES AND DEDICATED KEY FUNCTIONS		
COLOR CODES		
COLOR	STATUS	
WHITE	MONITOR OFF LINE	
MAGENTA	COMMUNICATIONS FAILURE	
DARK BLUE	SYSTEM FAILURE	
LIGHT BLUE (CYAN)	EQUIPMENT FAILURE	
HALF INTENSITY CYAN	MONITOR FUNCTIONS	
RED	CHANNEL HIGH ALARM	
YELLOW	CHANNEL ALERT ALARM	
GREEN	NORMAL OPERATIONS	
BOTTOM HALF WHITE	RELAY BYPASS (PREVENTS MCB ALARM)	
DEDICATED KEY FUNCTIONS		
KEY	FUNCTION	
TREND 10 MIN	Trend channel activity over the last 4 hours	





FIGURE 1  
RM-11R (SP056A) NORMAL MODE PANEL KEY LAYOUT

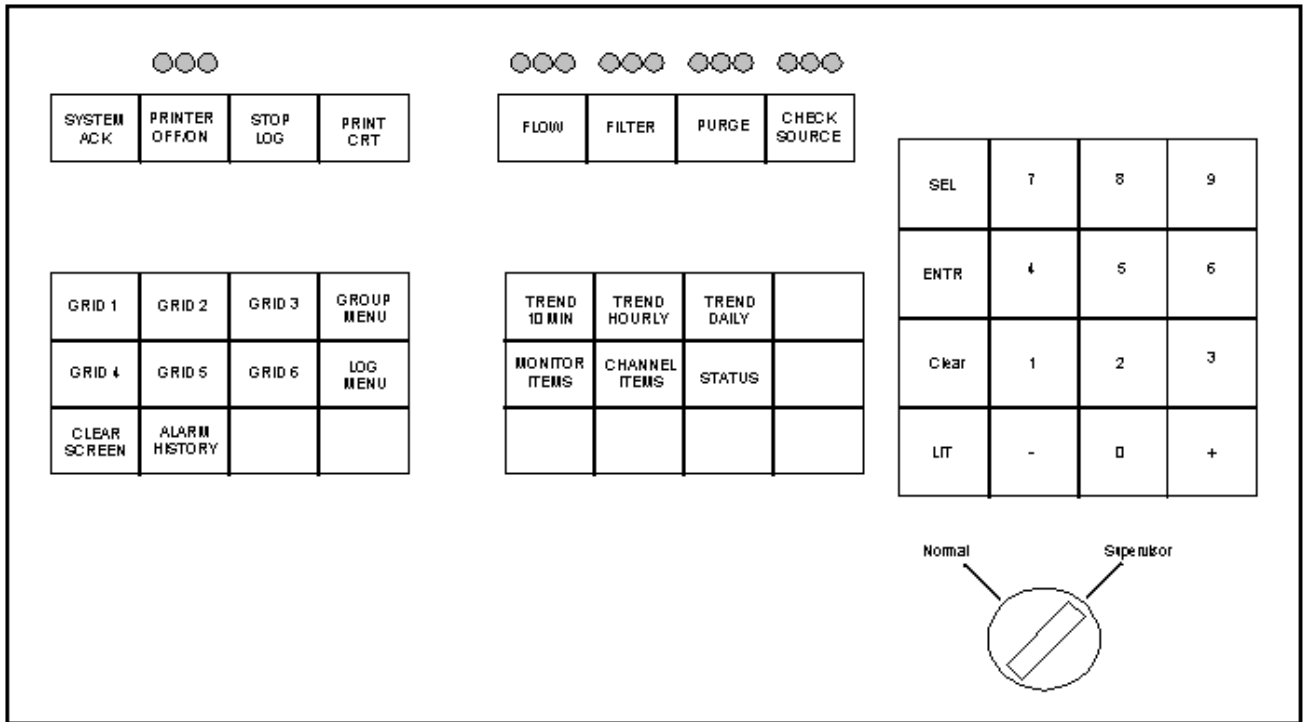
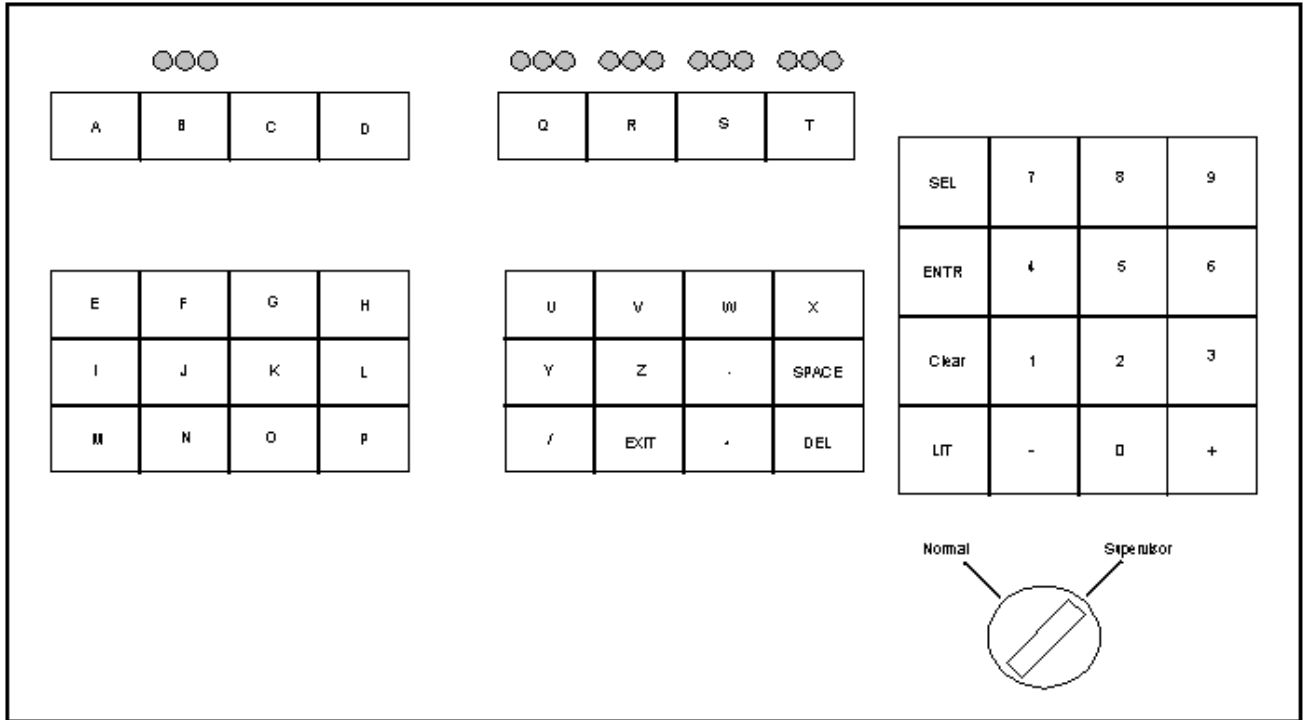


FIGURE 2  
RM-11R (SP056A) SUPERVISOR/LIT MODE (LITERAL DATA MODE)





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## 1.0 PURPOSE

1.1 This procedure provides instructions for feeding steam generators using the Auxiliary Feedwater System.

## 2.0 SCOPE

2.1 Section 6.1 provides instructions to feed steam generators using the motor driven auxiliary feedwater pumps.

2.2 Section 6.2 provides instructions to feed steam generators using the turbine driven auxiliary feedwater pump.

2.3 Applicable portions of this procedure may be used for stopping an AFW pump following an automatic start.

2.4 This procedure is applicable during all Modes of plant operation.

## 3.0 REFERENCES AND COMMITMENTS

### 3.1 References

3.1.1 M-12AL01(Q)

3.1.2 M-02AE02(Q)

3.1.3 WCRE-03

3.1.4 CCP 6578, Low Flow Cavitation in AL, BG and EM Pumps

3.1.5 PIR 97-1302, Turbine Driven Auxiliary Feedwater Pump Controllers Restoration Position of Latched Detent Open

3.1.6 PIR 99-1090, Turbine Driven Auxiliary Feedwater Pump Oil Sampling requirement changed to annual PM.

3.1.7 PIR 97-2126, Lake water intrusion into Condensate Storage Tank

### 3.2 Commitments

3.2.1 ITIP 1720, Large Motor Space Heaters Control Circuit Design

3.2.2 ITIP 00332, SOER 86-01 Recommendation 5, Reliability of PWR Aux Feedwater Systems

3.2.3 PIR 94-1807

✧

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#### 4.0 PRECAUTIONS/LIMITATIONS

- 4.1 The temperature difference between the feedwater and the steam generator should be less than 250°F when feeding the steam generators.
- 4.2 Condensate storage tank level must be maintained greater than  
 ✧  
 281,000 gallons (62%) in Modes 1, 2 and 3 to satisfy  
 ✧  
 Technical Specification 3.7.6.  
 ✧
- 4.3 IF feeding steam generators using AFW pumps in Modes 1, 2, 3 or 4, THEN exercise caution not to exceed RCS cooldown rates or shrinking S/G level below the feed ring.
- 4.4 The motor driven AFW pump manufacturer has stated that operation of the motor with the heater energized is detrimental to motor life. [Commitment Step 3.2.1]
- 4.5 Operation of the MDAFWP at flow rates less than 80,000 lbm/hr should be minimized due to Low Flow Cavitation concerns.
- 4.6 Operation of the TDAFWP at flow rates less than 227,500 lbm/hr should be minimized due to Low Flow Cavitation concerns.
- 4.7 Any one of the following signals will automatically start the turbine driven AFW pump:
- \* Undervoltage on bus NB01 or bus NB02
  - \* S/G low-low level on 2/4 steam generators
  - \* AMSAC actuation
  - \* Manual AFAS-T initiation
- 4.8 Any one of the following signals will automatically start the motor driven AFW pumps:
- \* Shutdown sequencer actuation following undervoltage on bus NB01 or bus NB02
  - \* Safety injection sequencer actuation
  - \* S/G low-low level on 1/4 steam generators
  - \* Trip of both main feedwater pumps
  - \* AMSAC actuation
  - \* Manual AFAS-M initiation
- 4.9 When feeding the steam generators using auxiliary feedwater pumps, the main feed water lines may not be filled, therefore flow should be established slowly to the steam generators to prevent water hammer.







o AL HK-11A - CLOSED



2. For motor driven AFW pump B:

a. S/G A motor driven AFW pump  
discharge throttle valve closed.

o AL HK-7A - CLOSED



INIT/DATE

b. S/G D motor driven AFW pump  
discharge throttle valve closed.

o AL HK-5A - CLOSED

CAUTION

If feeding the S/G's in Modes 1, 2, 3 or 4, DO NOT exceed RCS  
cooldown rates or shrinking S/G level below the feed ring.

NOTE

Temperature difference between feedwater and steam generators  
should be less than 250°F.

6.1.3 Start the desired motor driven AFW

pump(s): (N/A steps not used)

1. For motor driven AFW pump A:

a. Start Motor Driven AFW Pump A

o AL HIS-23A - STARTED

b. Record time started: \_\_\_\_\_ / \_\_\_\_\_

c. Verify pump A discharge pressure  
greater than 1535 psig.

AL PI-18A \_\_\_\_\_ psig. \_\_\_\_\_ / \_\_\_\_\_

d. Turn off motor driven AFW pump A  
motor space heater.

o PG19NJF122 - OFF \_\_\_\_\_ / \_\_\_\_\_

2. For motor driven AFW pump B:

a. Start Motor Driven AFW Pump B

o AL HIS-22A - STARTED

b. Record time started: \_\_\_\_\_ / \_\_\_\_\_

c. Verify pump B discharge pressure  
greater than 1535 psig.

AL PI-15A \_\_\_\_\_ psig.

\_\_\_\_\_/\_\_\_\_



1. IF placing S/Gs in wet layup OR adding water to S/Gs in wet layup, THEN monitor S/G level using wet layup indicators.

- o AB LI-513 for S/G A
- o AB LI-523 for S/G B



INIT/DATE

- o AB LI-533 for S/G C
- o AB LI-543 for S/G D

NOTES

- o When closing any motor driven AFW pump discharge throttle valve from the near-closed throttled position, the force of the flow against the valve plug may be great enough to cause the valve operator torque switch to trip. If this occurs, it will be necessary to either open the affected valve(s) and reclose, or stop the AFW pump(s) to allow the valve(s) to close.
- o To prolong the life of discharge throttle valve limitorque operators, it is necessary to maintain the valves open as much as possible even in Modes 4, 5 or 6. When the controller is in closed position, the field in the motor remains energized. This causes unnecessary wear on valve actuators.

6.1.7 WHEN desired steam generator level is

obtained, THEN close the associated  
throttle valves:(N/A steps not used)

1. S/G A motor driven AFW pump discharge throttle valve closed.

- o AL HK-7A - CLOSED

2. S/G B motor driven AFW pump discharge throttle valve closed.

- o AL HK-9A - CLOSED

3. S/G C motor driven AFW pump discharge throttle valve closed.

- o AL HK-11A - CLOSED

4. S/G D motor driven AFW pump discharge throttle valve closed.

- o AL HK-5A - CLOSED



2. AL-V077 - LOCKED CLOSED

\_\_\_\_/\_\_\_\_

Verified

\_\_\_\_/\_\_\_\_



		<u>INIT/DATE</u>
6.1.10	Return motor driven AFW pump discharge	
✧	throttle valves to safeguards lineup:(N/A	
	✧	
	steps not used)	
	✧	
	1. Open motor driven AFW pump discharge	
	throttle valves to each steam generator	
	and latch switch detent in open	
	position:	
	○ AL HK-7A for S/G A - LATCHED DETENT	
	OPEN	_____ / _____
	Verified	_____ / _____
	○ AL HK-9A for S/G B - LATCHED DETENT	
	OPEN	_____ / _____
	Verified	_____ / _____
	○ AL HK-11A for S/G C - LATCHED DETENT	
	OPEN	_____ / _____
	Verified	_____ / _____
	○ AL HK-5A for S/G D - LATCHED DETENT	
	OPEN	_____ / _____
	Verified	_____ / _____
6.1.11	Section 6.1 complete.	_____ / _____

Revision: 25	FEEDING STEAM GENERATORS WITH A MOTOR DRIVEN OR TURBINE DRIVEN AFW PUMP	SYS AL-120
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		<u>INIT/DATE</u>
6.2	<u>Feeding S/Gs Using Turbine Driven AFW Pump</u>	
6.2.1	Verify Auxiliary Feedwater Pump Turbine Mechanical Trip/Throttle Valve is closed.	
	o FC HIS-312A - CLOSED	<input type="checkbox"/>
6.2.2	Close the turbine driven AFW pump discharge throttle valves to each steam generator.	
	1. S/G A turbine driven AFW pump discharge throttle valve closed.	
	o AL HK-8A - CLOSED	<input type="checkbox"/>
	2. S/G B turbine driven AFW pump discharge throttle valve closed.	
	o AL HK-10A - CLOSED	<input type="checkbox"/>
	3. S/G C turbine driven AFW pump discharge throttle valve closed.	
	o AL HK-12A - CLOSED	<input type="checkbox"/>
	4. S/G D turbine driven AFW pump discharge throttle valve closed.	
	o AL HK-6A - CLOSED	<input type="checkbox"/>
6.2.3	Open at least one steam supply valve to turbine driven AFW pump:(N/A steps not used)	
	o	
	1. Loop 2 Steam To Auxiliary Feedwater Pump Turbine open.	
	o AB HIS-5A - OPEN	<input type="checkbox"/>
	2. Loop 3 Steam To Auxiliary Feedwater Pump Turbine open.	
	o AB HIS-6A - OPEN	<input type="checkbox"/>



o AL HK-10A - THROTTLED



3. Steam Generator C

o AL HK-12A - THROTTLED



		<u>INIT/DATE</u>
4.	Steam Generator D	
	o AL HK-6A - THROTTLED	<input type="checkbox"/>
6.2.6	Record turbine driven AFW pump total flow:	
	1. Total Flow: _____lbm/hr.	_____/____
	o AL FI-2A for S/G A	
	o AL FI-3A for S/G B	
	o AL FI-4A for S/G C	
	o AL FI-1A for S/G D	
6.2.7	While feeding steam generators, monitor steam generator narrow range and wide range levels.	
	1. <u>IF</u> placing S/Gs in wet layup <u>OR</u> adding water to S/Gs in wet layup, <u>THEN</u> monitor S/G level using wet layup indicators.	<input type="checkbox"/>
	o AB LI-513 for S/G A	
	o AB LI-523 for S/G B	
	o AB LI-533 for S/G C	
	o AB LI-543 for S/G D	
6.2.8	<u>WHEN</u> desired steam generator level is obtained, <u>THEN</u> at panel RL006, adjust the associated valve controllers to 25% demand position:	
	o AL HK-8A, SG A Turbine Driven Auxiliary Feedwater Pump AFW Regulating Valve Control.	_____/____
	o AL HK-10A, SG B Turbine Driven Auxiliary Feedwater Pump AFW Regulating Valve Control.	_____/____
	o AL HK-12A, SG C Turbine Driven Auxiliary Feedwater Pump AFW Regulating Valve Control.	_____/____
	o AL HK-6A, SG D Turbine Driven Auxiliary Feedwater Pump AFW Regulating Valve Control.	_____/____

		<u>INIT/DATE</u>
6.2.9	Stop the turbine driven AFW pump:	
	1. <u>IF</u> the turbine driven AFW pump is running as a result of an auto start, <u>THEN</u> ensure all auto activation signals are reset or blocked by verifying the alarm window 00-128B TD AFP START is clear.	
	o 00-128B TD AFP START is clear	<input type="checkbox"/>
	2. Close Auxiliary Feedwater Pump Turbine Mechanical Trip/Throttle Valve. [3.2.2]	
	o FC HIS-312A - CLOSED	<input type="checkbox"/>
	3. Time valve closed: _____	_____ / _____
	4. Close steam supply valves to turbine driven AFW pump:	
	a. Loop 2 Steam To Auxiliary Feedwater Pump Turbine closed.	
	o AB HIS-5A - CLOSED	_____ / _____
	Verified	_____ / _____
	b. Loop 3 Steam To Auxiliary Feedwater Pump Turbine closed.	
	o AB HIS-6A - CLOSED	_____ / _____
	Verified	_____ / _____

		<u>INIT/DATE</u>
6.2.10	Return turbine driven AFW pump discharge throttle valves to safeguards lineup:	
	1. Place the turbine driven AFW pump discharge throttle valves to each steam generator in latched detent open. (Reference Step 3.1.5)	
	o AL HK-8A for S/G A - LATCHED DETENT OPEN	_____/____
	Verified	_____/____
	o AL HK-10A for S/G B - LATCHED DETENT OPEN	_____/____
	Verified	_____/____
	o AL HK-12A for S/G C- LATCHED DETENT OPEN	_____/____
	Verified	_____/____
	o AL HK-6A for S/G D - LATCHED DETENT OPEN	_____/____
	Verified	_____/____
6.2.11	<u>IF</u> stopping the turbine driven AFW pump after auto start, <u>THEN</u> perform the following.	
	1. Open Loop 3 Warmup Steam To AFP Turbine.	
	o AB HIS-49 - OPEN	_____/____
	Verified	_____/____
	2. Open Loop 2 Warmup Steam To AFP Turbine.	
	o AB HIS-48 - OPEN	_____/____
	Verified	_____/____
6.2.12	Section 6.2 complete.	_____/____

**7.0** RECORDS

7.1 The following QA records are generated by this procedure:

7.1.1 Section 5.0

7.1.2 Section 6.0

-END-





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## 1.0 PURPOSE

1.1 This procedure provides instructions for transferring supply of the component cooling water (CCW) service loop between CCW trains.

## 2.0 SCOPE

2.1 This procedure transfers the component cooling water non-safety related service loop from one CCW train to the other CCW train.

2.2 This procedure secures the CCW train that was previously supplying the CCW non-safety related service loop at the discretion of the Shift Supervisor.

2.3 This procedure transfers CCW supplies to PASS sample coolers.

2.4 This procedure will partially satisfy the exercise  
 ✧ requirements associated with ASME Code Case OMN-1 for valves  
 ✧ EGHV0015 and EGHV0016  
 ✧

## 3.0 REFERENCES AND COMMITMENTS

### 3.1 References

3.1.1 M-12EG01(Q)

3.1.2 M-12EG02(Q)

3.1.3 M-02EG03(Q)

3.1.4 M-12EF02(Q)

3.1.5 ED 95-0059, OPERATION OF THE COMPONENT COOLING WATER SYSTEM BELOW 60°F

3.1.6 PMR 2149

3.1.7 E-03EG01A

3.1.8 E-03EG01B

3.1.9 E-03EG01C

3.1.10 E-03EG01D

3.1.11 E-13EG03

3.1.12 E-13EG05A

3.1.13 E-13EG05B



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- 3.1.15 SFR 1-EG-43, "Closing Surge Tank Vent Valves During Switch Over"
- 3.1.16 Calculation EG-24, "CCW Nuclear Auxiliary Component Train Switch Over Single Valve Failure Analysis"
- 3.1.17 STS VT-001, VERIFICATION OF OMN-1, MOV EXERCISE  
✧  
REQUIREMENTS.  
✧

### 3.2 Commitments

- 3.2.1 WM 90-0013 Updated response to NRC Bulletin 88-04, Engineering Disposition CWR 01404-90, Rev. 1 (Low Flow Cavitation)
- 3.2.2 PIR 96-0316, INADEQUATE WARMING LINE DESIGN
- 3.2.3 PIR 97-0958, Unplanned LCO Entry due to CCW Surge Tank Level Indication Concerns During Train Swap

### 4.0 PRECAUTIONS/LIMITATIONS

- 4.1 IF CCW to the service loop is lost, THEN it must be restored before reactor coolant pump motor bearing temperatures increase to 195°F or the reactor coolant pumps must be stopped.
- 4.2 IF a CCW train is being secured, THEN ensure there are no ECCS pumps operating in the train being secured.
- 4.3 WHEN opening OR closing the service loop supply and return valves for either train AND a valve fails to reposition as desired, THEN a condition could exist where one train could empty and the other train overflow. This situation is prevented by closing the surge tank vent valve for the affected train before starting the evolution and opening the valve after the evolution. ( 3.1.15, 3.1.16) [3.2.3]
- 4.4 Component cooling water pump flow must be greater than 1.5 E6 lbs/hr for continuous operation. Refer to Standing Order 17. [3.2.1]
- 4.5 During Modes 5, 6 or Defueled when lake temperature is below 35°F operation of an ESW pump is prohibited unless an associated CCW pump and the corresponding train CCW heat exchanger are in service. [ 3.2.2]

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		<u>INIT/DATE</u>
<b>5.0</b>	<b><u>PREREQUISITES</u></b>	
5.1	Either CCW train A or CCW train B is supplying the service loop and the associated safety loop.	_____
5.2	<u>IF</u> both CCW pumps in a train are to be secured, <u>THEN</u> the following must be met or the ESW pump in that train must be declared inoperable: [3.2.2] N/A if not securing a CCW train.	
	o The plant is in Mode 1, 2, 3 or 4 or lake temperature is greater than 35°F.	_____

		<u>INIT/DATE</u>
<b>6.0</b>	<b><u>PROCEDURE</u></b>	
6.1	<u>Transferring CCW Service Loop To Train A</u>	
6.1.1	Start desired Train A CCW pump: N/A if Train A CCW pump already running.	
	1. Turn off the motor space heater supply breaker for the CCW pump to be started. N/A the other breaker.	
	* PG19NJF118 for CCW Pump A - OFF	<input type="checkbox"/>
	* PG19NJF119 for CCW Pump C - OFF	<input type="checkbox"/>
	2. Start desired CCW pump. N/A other pump.	
	* EG HIS-21 for CCW Pump A - STARTED	<input type="checkbox"/>
	* EG HIS-23 for CCW Pump C - STARTED	<input type="checkbox"/>
	3. Verify operating CCW Pump discharge flow is greater than 1.5 E6 lbs/hr (3000 gpm). N/A non-running train. [3.2.1]	
	* EG FI-95 or EGF0095 for CCW pump A - GREATER THAN 1.5 E6 LBS/HR (3000 GPM)	<input type="checkbox"/>
	* EG FI-97 or EGF0097 for CCW pump C - GREATER THAN 1.5 E6 LBS/HR (3000 GPM)	<input type="checkbox"/>
	4. <u>IF</u> operating CCW pump discharge flow is less than 1.5 E6 lbs/hr, <u>THEN</u> refer to Standing Order 17.	<input type="checkbox"/>
6.1.2	Locally verify CCW Train A Pump Room Cooler running.	
	o SGL11A - RUNNING	<input type="checkbox"/>
6.1.3	<u>IF</u> CCW pump A was started, <u>THEN</u> verify proper room cooler damper alignment:	
	1. Locally check CCW Pump A Room Cooler 11A Discharge Isolation Damper open:	
	o GL-D156 - OPEN	<input type="checkbox"/>
	2. Locally check CCW Pump C Room Cooler 11A Discharge Isolation Damper closed:	
	o GL-D157 - CLOSED	<input type="checkbox"/>

		<u>INIT/DATE</u>
6.1.4	<u>IF</u> CCW pump C was started, <u>THEN</u> verify proper room cooler damper alignment:	
	1. Locally check CCW Pump C Room Cooler 11A Discharge Isolation Damper open:	
	o GL-D157 - OPEN	<input type="checkbox"/>
	2. Locally check CCW Pump A Room Cooler 11A Discharge Isolation Damper closed:	
	o GL-D156 - CLOSED	<input type="checkbox"/>
6.1.5	<u>IF</u> RHR train B is <u>NOT</u> in service, <u>THEN</u> ensure Spent Fuel Pool Heat Exchanger B CCW Outlet Valve is open to provide a flow path for CCW train B.	
	o EC HIS-12 - OPEN	<input type="checkbox"/>
6.1.6	Close CCW Surge Tank A and B Vent Valves. [3.2.3]	
	o EG HIS-9 - CLOSED	<input type="checkbox"/>
	<u>AND</u>	
	o EG HIS-10 - CLOSED	<input type="checkbox"/>
<div style="display: flex; justify-content: space-between;"> <span>⏪</span> <span>⏩</span> </div> <p style="text-align: center;"><b><u>NOTE</u></b></p> <p>⏪ <b>Annunciator 00-051F, CCW SPLY RTN VLVS MISALIGN, will alarm until Step 6.1.8 is completed.</b> ⏩</p> <div style="display: flex; justify-content: space-between;"> <span>⏪</span> <span>⏩</span> </div>		
6.1.7	( <input type="checkbox"/> ) Open CCW Train A Supply/Return Valves.	
	o EG HS-15 - OPEN	<input type="checkbox"/>
6.1.8	Close CCW Train B Supply/Return Valves.	
	o EG HS-16 - CLOSED	<input type="checkbox"/>
6.1.9	Verify CCW To RW and RCS Flow indication.	
	o EG FI-55A - BETWEEN 1.6x10 <sup>6</sup> and 4.3x10 <sup>6</sup> lbm/hr	<input type="checkbox"/>



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		<u>INIT/DATE</u>
6.1.10	Open CCW Surge Tank A and B Vent Valves. [3.2.3]	
	o EG HIS-9 - OPEN	<input type="checkbox"/>
	<u>AND</u>	
	o EG HIS-10 - OPEN	<input type="checkbox"/>
6.1.11	Section 6.1 complete	<hr/>

		<u>INIT/DATE</u>
6.2	<u>Transfer Of CCW Supply To Post Accident Sampling Station Coolers</u>	
6.2.1	Inform Chemistry of a momentary loss of cooling flow to the PASS sample coolers while transfer is taking place.	<input type="checkbox"/>
6.2.2	Locally close and lock CCW Train B Supply To Post Accident Sampling Station Coolers.	
	o EG-V413 - CLOSED AND LOCKED	_____
	Verified	_____
6.2.3	Locally close and lock CCW Train B Return From Post Accident Sampling Station Coolers.	
	o EG-V415 - CLOSED AND LOCKED	_____
	Verified	_____
6.2.4	Locally unlock and open CCW Train A Supply To Post Accident Sampling Station Coolers.	
	o EG-V414 - UNLOCKED AND OPEN	_____
	Verified	_____
6.2.5	Locally unlock and open CCW Train A Return From Post Accident Sampling Station Coolers.	
	o EG-V416 - UNLOCKED AND OPEN	_____
	Verified	_____
6.2.6	Record the above valve manipulations in the "Log of Locked Component Manipulations" as follows:	
	1. Complete the "Installing Locking Device" section of the log for the following valves:	
	o EG-V413 - CLOSED <u>AND</u> LOCKED	<input type="checkbox"/>
	o EG-V415 - CLOSED <u>AND</u> LOCKED	<input type="checkbox"/>
	2. Make an entry in to the "Removing Locking Device" section of the log for the following valves:	
	o EG-V414 - UNLOCKED <u>AND</u> OPEN	<input type="checkbox"/>
	o EG-V416 - UNLOCKED <u>AND</u> OPEN	<input type="checkbox"/>

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6.2.7 Section 6.2 complete.	<u>INIT/DATE</u> _____
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		<u>INIT/DATE</u>
6.3	<u>Securing CCW Train B</u>	
6.3.1	Ensure all train B ECCS pumps - STOPPED	<input type="checkbox"/>
6.3.2	Align Spent Fuel Pool Cooling Train A for operation using SYS EC-120, FUEL POOL COOLING AND CLEANUP SYSTEM STARTUP.	<input type="checkbox"/>
6.3.3	Stop the running train B CCW pump(s). N/A other pump.	
	* EG HIS-22 for pump B - STOPPED	<input type="checkbox"/>
	* EG HIS-24 for pump D - STOPPED	<input type="checkbox"/>
6.3.4	Ensure the motor space heater breakers for the CCW pumps are turned on.	
	* PG20GBR240 for CCW pump B - ON	<input type="checkbox"/>
	* PG20GBR241 for CCW pump D - ON	<input type="checkbox"/>
6.3.5	Section 6.3 complete.	<hr/>

		<u>INIT/DATE</u>
6.4	<u>Transferring CCW Service Loop To Train B</u>	
6.4.1	Start desired Train B CCW pump: N/A if Train B CCW pump already running.	
	1. Turn off the motor space heater supply breaker for the CCW pump to be started. N/A the other breaker.	
	* PG20GBR240 for CCW Pump B - OFF	<input type="checkbox"/>
	* PG20GBR241 for CCW Pump D - OFF	<input type="checkbox"/>
	2. Start desired CCW pump. N/A other pump.	
	* EG HIS-22 for CCW Pump B - STARTED	<input type="checkbox"/>
	* EG HIS-24 for CCW Pump D - STARTED	<input type="checkbox"/>
	3. Verify operating CCW Pump discharge flow is greater than 1.5 E6 lbs/hr (3000 gpm). N/A non-running train. [3.2.1]	
	* EG FI-96 or EGF0096 for CCW pump B - GREATER THAN 1.5 E6 LBS/HR (3000 GPM)	<input type="checkbox"/>
	* EG FI-98 or EGF0098 for CCW pump D - GREATER THAN 1.5 E6 LBS/HR (3000 GPM)	<input type="checkbox"/>
	4. <u>IF</u> operating CCW pump discharge flow is less than 1.5 E6 lbs/hr, <u>THEN</u> refer to Standing Order 17.	<input type="checkbox"/>
6.4.2	Locally verify CCW train B Pump Room Cooler running.	
	o SGL11B - RUNNING	<input type="checkbox"/>
6.4.3	<u>IF</u> RHR train A is <u>NOT</u> in service, <u>THEN</u> ensure Spent Fuel Pool Heat Exchanger A CCW Outlet Valve is open to provide a flow path for CCW train A.	
	o EC HIS-11 - OPEN	<input type="checkbox"/>
6.4.4	Close CCW Surge Tank A and B Vent Valves. [3.2.3]	
	o EG HIS-9 - CLOSED	<input type="checkbox"/>
	<u>AND</u>	
	o EG HIS-10 - CLOSED	<input type="checkbox"/>



		<u>INIT/DATE</u>
6.5	<u>Transfer Of CCW Supply To Post Accident Sampling Station Coolers</u>	
6.5.1	Inform Chemistry of a momentary loss of cooling flow to the PASS sample coolers while transfer is taking place.	<input type="checkbox"/>
6.5.2	Locally close and lock CCW Train A Supply To Post Accident Sampling Station Coolers.	
	o EG-V414 - CLOSED AND LOCKED	_____
	Verified	_____
6.5.3	Locally close and lock CCW Train A Return From Post Accident Sampling Station Coolers.	
	o EG-V416 - CLOSED AND LOCKED	_____
	Verified	_____
6.5.4	Locally unlock and open CCW Train B Supply To Post Accident Sampling Station Coolers.	
	o EG-V413 - UNLOCKED AND OPEN	_____
	Verified	_____
6.5.5	Locally unlock and open CCW Train B Return From Post Accident Sampling Station Coolers.	
	o EG-V415 - UNLOCKED AND OPEN	_____
	Verified	_____
6.5.6	Record the above valve manipulations in the "Log of Locked Component Manipulations" as follows:	
	1. Complete the "Installing Locking Device" section of the log for the following valves:	
	o EG-V414 - CLOSED <u>AND</u> LOCKED	<input type="checkbox"/>
	o EG-V416 - CLOSED <u>AND</u> LOCKED	<input type="checkbox"/>
	2. Make an entry in to the "Removing Locking Device" section of the log for the following valves:	
	o EG-V413 - UNLOCKED <u>AND</u> OPEN	<input type="checkbox"/>
	o EG-V415 - UNLOCKED <u>AND</u> OPEN	<input type="checkbox"/>

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6.5.7 Section 6.5 complete.	<u>INIT/DATE</u> _____
-----------------------------	---------------------------



		<u>INIT/DATE</u>
6.6	<u>Securing CCW Train A</u>	
6.6.1	Ensure all train A ECCS pumps - STOPPED	<input type="checkbox"/>
6.6.2	Align Spent Fuel Pool Cooling Train B for operation using SYS EC-120, FUEL POOL COOLING AND CLEANUP SYSTEM STARTUP.	<input type="checkbox"/>
6.6.3	Stop the running train A CCW pump(s). N/A other pump.	
	* EG HIS-21 for pump A - STOPPED	<input type="checkbox"/>
	* EG HIS-23 for pump C - STOPPED	<input type="checkbox"/>
6.6.4	Ensure the motor space heater breakers for the CCW pumps are turned on.	
	* PG19NJF118 for CCW pump A - ON	<input type="checkbox"/>
	* PG19NJF119 for CCW pump C - ON	<input type="checkbox"/>
6.6.5	Section 6.6 complete.	<hr/>
<b>7.0</b>	<b><u>RECORDS</u></b>	
7.1	The following QA records are generated by this procedure:	
7.1.1	Section 5.0	
7.1.2	Section 6.0	
-END-		



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## 1.0 PURPOSE

1.1 This procedure provides instructions for maintaining SI accumulator tank level and pressure.

## 2.0 SCOPE

2.1 This procedure provides instructions to increase accumulator level in Modes 1, 2, or 3 above 1700 psig.

2.2 This procedure provides instructions to increase accumulator level in Mode 3 below 1700 psig.

2.3 This procedure provides instructions to increase accumulator level in Modes 4, 5, 6, or Defueled using SI pump A.

2.4 This procedure provides instructions to increase accumulator level in Modes 4, 5, 6, or Defueled using SI pump B.

2.5 This procedure provides instructions to decrease accumulator level.

2.6 This procedure provides instructions to increase accumulator pressure.

2.7 This procedure provides instructions to decrease accumulator pressure.

## 3.0 REFERENCES AND COMMITMENTS

### 3.1 References

3.1.1 M-12EP01 (Q)

3.1.2 M-12EM01 (Q)

3.1.3 M-12HE01

3.1.4 M-12HE02

3.1.5 M-12BN01 (Q)

3.1.6 SER 21-87

3.1.7 PIR 99-0429, During the scheduled safety injection pump surveillance run, it was observed that relief valve (EM8851) in the SIP common cold leg injection line had lifted and was passing flow.

3.1.8 CCP 09289 SI Pump discharge relief valve setpoint  
 ✕  
 increase.  
 ✕

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### 3.2 Commitments

3.2.1 LER 86-025, KMLNRC 86-100, Closure Of Valve EM HV-8835 Renders Both Trains Of Safety Injection Inoperable. (RCMS # 86-249)

3.2.2 PIR 97-0143, Entry Into T.S. Due To Low Accumulator Temperature

### 4.0 PRECAUTIONS/LIMITATIONS

4.1 Maintain SI accumulators level, pressure and boron

☒

concentration in accordance with Technical

☒

Specification 3.5.1.

☒

4.2 WHEN RCS temperature is less than or equal to 350°F, THEN the

☒

safety injection pump to be used to fill accumulators must be

☒

isolated from the RCS by a closed isolation valve with power

☒

removed, OR by a manual isolation valve secured in the closed

☒

position in accordance with Technical Specification 3.5.3 or

☒

3.4.12

☒

4.3 The refueling water storage tank shall be operable in

☒

accordance with TR 3.1.9 or TR 3.1.10 and Technical

☒

Specification 3.5.4.

☒

4.4 IF RCS temperature is greater than or equal to 350°F AND accumulator level must be increased, THEN ensure one of the following conditions is met: [3.2.1]

\* Decrease RCS temperature to less than 350°F.

OR

\* Increase RCS pressure to greater than 1700 psig.

OR

\* Enter Technical Specification 3.5.2.

☒

4.5 IF the accumulators are filled from the RWST AND the RWST has

☒

not been diluted since verifying that its boron concentration  
✧  
is within the limits of Technical Specification 3.5.4, THEN  
✧  
Chemistry sample of the accumulators is not required.  
✧

- 4.6 Accumulator level should not be adjusted between accumulators by use of fill lines. The globe valves in the fill lines are not designed for backflow and damage may result. (3.1.6)
- 4.7 Frequent filling of SI Accumulators may indicate improper check valve seating at RCS pressures below 1800 psig. Refer to SYS EP-201, SEATING ACCUMULATOR SAFETY INJECTION LINE CHECK VALVES, to seat the check valves.

- 4.8 IF accumulator leakage is present, THEN running the SI pump on recirc for between 5 minutes and 10 minutes after the accumulators have been filled may reseal the leaking check valve and reduce accumulator leakage.
- 4.9 SI Pump discharge relief valves have been known to lift on  
✧  
pump start. CCP 09289 installed discharge relief valves with  
✧  
a higher lift setpoint. IF the discharge relief valves are  
✧  
still suspected of lifting on pump starts, THEN the pump  
✧  
discharge valves should be closed. Contact the system  
✧  
engineer for clarification.  
✧
- 4.10 Closing SI pump A Discharge Valve, EM HV-8821A will cause SI pump A to be inoperable.
- 4.11 Closing SI pump B Discharge Valve, EM HV-8821B will cause SI pump B to be inoperable.
- 4.12 IF using SI pump B to increase accumulator level in Mode 4, 5, 6, or Defueled, THEN closing EM HIS-8835, SI Pumps To Cold Leg Injection valve will cause both SI pumps to be inoperable.
- 4.13 Accumulator operating temperatures must be maintained between 45°F and 120°F per USAR Table 6.3-1. [3.2.2]

**5.0 PREREQUISITES**

INIT/DATE

5.1 CKL EP-120, ACCUMULATOR SAFETY INJECTION LINEUP, is complete. \_\_\_\_\_

5.2 CKL EM-120, SAFETY INJECTION SYSTEM LINEUP CHECKLISTS, is complete. \_\_\_\_\_

5.3 CKL BN-120, REFUELING WATER STORAGE SYSTEM LINEUP, is complete. \_\_\_\_\_

**NOTE**

Pressurizing accumulators from atmospheric pressure to minimum technical specification pressure of 585 psig will require at least 65 inches of nitrogen.

5.4 IF increasing accumulator tank pressure, THEN the Nitrogen Supply System is available. \_\_\_\_\_

5.5 IF required, THEN the Boron Recycle System is available to decrease accumulator tank level. \_\_\_\_\_

5.6 IF initial level is below indicating range, THEN accumulator vent valves are open prior to filling. \_\_\_\_\_

5.7 IF SI pump will be run, THEN the proper CCW train for the SI pump to be run is in service: (N/A other train).

5.7.1 CCW train A for SIP A - RUNNING \_\_\_\_\_

5.7.2 CCW train B for SIP B - RUNNING \_\_\_\_\_

5.8 IF Section 6.1 or 6.2 is being performed, THEN ensure both SI Train A and B are operable. \_\_\_\_\_



INIT/DATE

**6.0 PROCEDURE**

**6.1 Increasing Accum Level In Modes 1, 2, Or 3 Above 1700 PSIG**

**NOTE**

Step 6.1.1 is intended to minimize high pressure alarms caused by the pressure increase associated with raising accumulator level. If an alarm is received due to high pressure while filling an accumulator, the alarm should clear after the accumulator cools to ambient temperature.

6.1.1 IF accumulator level is less than 45% AND accumulator pressure is greater than 619 psig, THEN adjust accumulator pressure to less than 619 psig using section 6.7, Decreasing Accum Pressure.

6.1.2 Record RCS pressure read on any of the following indicators:  
(N/A indicators not used)

- \* BB PI-455A - \_\_\_\_\_
- \* BB PI-456 - \_\_\_\_\_
- \* BB PI-457 - \_\_\_\_\_
- \* BB PI-458 - \_\_\_\_\_

**NOTE**

Depressurizing the RHR header should reduce back pressure on check valves EP-8818A, B, C and D, allowing the check valves to seat while the SI pump is running. This step should be performed at SM/CRS discretion.

6.1.3 IF desired, THEN depressurize the RHR header as follows:

1. Ensure either RHR To Accumulator  
✧ Injection Test Line Valve is open.

✧ (N/A other valve)  
✧

\* EJ HIS-8890A - OPEN

OR

\* EJ HIS-8890B - OPEN

	<u>INIT/DATE</u>
2. Ensure SI System Test Line Outer Containment Isolation Valve is open.	
o EM HIS-8964 - OPEN	<input type="checkbox"/>
3. Ensure SI System Test Line Inner Containment Isolation Valve is open.	
o EM HIS-8871 - OPEN	<input type="checkbox"/>
6.1.4 <u>IF</u> using SI pump A to fill accumulators, <u>THEN</u> perform the following:	
1. Ensure SI Pump A Recirc To RWST isolation valve is open.	
o EM HIS-8814A - OPEN	<input type="checkbox"/>
2. Ensure SI Pumps Recirc To RWST isolation valve is open.	
o BN HIS-8813 - OPEN	<input type="checkbox"/>
<p>⚠</p> <p><b>NOTE</b></p> <p>✧ Closing EM HIS-8821A, SI PUMP DISCH TO C/L causes the SI Pump A ✧</p> <p>✧ C/L injection path to be inoperable, refer to Tech. Spec. 3.5.2 ✧</p> <p>⚠</p>	
3. <u>IF</u> SI Pump discharge relief valves are	
✧ expected to lift on pump start, <u>THEN</u>	
✧ Close SI Pump A Disch to C/L Inj Iso	
✧ Valve. (3.1.7)	
✧	
o EM HIS-8821A - CLOSED	<input type="checkbox"/>
4. Start SI Pump A.	
o EM HIS-4 - STARTED	<input type="checkbox"/>
5. <u>IF</u> closed to prevent discharge relief	
✧ valve lift, <u>THEN</u> Open SI Pump A Disch	
✧ to C/L Inj Iso Valve. (3.1.7)	
✧	

o EM HIS-8821A - OPEN



INIT/DATE

6.1.5 IF using SI pump B to fill accumulators,  
THEN perform the following:

1. Ensure SI Pump B Recirc To RWST  
isolation valve is open.

o EM HIS-8814B - OPEN

2. Ensure SI Pumps Recirc To RWST  
isolation valve is open.

o BN HIS-8813 - OPEN

NOTE

Closing EM HIS-8821B, SI PUMP DISCH TO C/L causes the SI Pump B

C/L injection path to be inoperable, refer to Tech. Spec. 3.5.2

3. IF SI Pump discharge relief valves are  
expected to lift on pump start, THEN

Close SI Pump B Disch to C/L Inj Iso

Valve. (3.1.7)

o EM HIS-8821B - CLOSED

4. Start SI Pump B.

o EM HIS-5 - STARTED

5. IF closed to prevent discharge relief  
valve lift, THEN Open SI Pump B Disch

to C/L Inj Iso Valve. (3.1.7)

o EM HIS-8821B - OPEN

6.1.6 Open Accumulator Tanks Fill Line Valve.

o EM HIS-8888 - OPEN



o Final level - Initial level = \_\_\_\_\_ %  
level change

\_\_\_\_\_

		<u>INIT/DATE</u>
6.1.8	<p><u>IF</u> filling accumulator tank B, <u>THEN</u> perform the following:</p> <p>1. Record initial Accumulator Tank B Level            ✧            from the highest reading indicator.            ✧            (N/A other indicator)            ✧</p> <p>* EP LI-952 - _____</p> <p style="text-align: center;"><u>OR</u></p> <p>* EP LI-953 - _____</p> <p>2. Open Accumulator Tank B Fill Line Valve.</p> <p>o EP HIS-8878B - OPEN <span style="float: right;"><input type="checkbox"/></span></p> <p>3. <u>WHEN</u> Accumulator Tank B Level is            ✧            between 55% and 58% on the highest            ✧            reading indicator, <u>THEN</u> close            ✧            Accumulator Tank B Fill Line Valve.            ✧            (N/A indicator not used)            ✧</p> <p>* EP LI-952 - BETWEEN 55% AND 58% <span style="float: right;"><input type="checkbox"/></span></p> <p style="text-align: center;"><u>OR</u></p> <p>* EP LI-953 - BETWEEN 55% AND 58% <span style="float: right;"><input type="checkbox"/></span></p> <p style="text-align: center;"><u>AND</u></p> <p>o EP HIS-8878B - CLOSED <span style="float: right;"><input type="checkbox"/></span></p> <p>4. Record change in accumulator tank B level.</p> <p>o Final level - Initial level = _____ %            level change <span style="float: right;">_____</span></p>	
6.1.9	<p><u>IF</u> filling accumulator tank C, <u>THEN</u> perform the following:</p> <p>1. Record initial Accumulator Tank C Level            ✧            from the highest reading indicator.            ✧</p>	



(N/A indicator not used)

✧

\* EP LI-954 - \_\_\_\_\_

\_\_\_\_\_

OR

\* EP LI-955 - \_\_\_\_\_

\_\_\_\_\_

	<u>INIT/DATE</u>
2. Open Accumulator Tank C Fill Line Valve.	
o EP HIS-8878C - OPEN	<input type="checkbox"/>
3. <u>WHEN</u> Accumulator Tank C Level is	
⌘ between 55% and 58% on the highest	
⌘ reading indicator, <u>THEN</u> close	
⌘ Accumulator Tank C Fill Line Valve.	
⌘ (N/A indicator not used)	
⌘	
o EP LI-954 - BETWEEN 55% AND 58%	<input type="checkbox"/>
<u>OR</u>	
* EP LI-955 - BETWEEN 55% AND 58%	<input type="checkbox"/>
<u>AND</u>	
o EP HIS-8878C - CLOSED	<input type="checkbox"/>
4. Record change in accumulator tank C level.	
o Final level - Initial level = _____ % level change	_____
6.1.10 <u>IF</u> filling accumulator tank D, <u>THEN</u> perform the following:	
1. Record initial Accumulator Tank D Level	
⌘ from the highest reading indicator.	
⌘ (N/A indicator not used)	
⌘	
* EP LI-956 - _____	_____
<u>OR</u>	
* EP LI-957 - _____	_____
2. Open Accumulator Tank D Fill Line Valve.	
o EP HIS-8878D - OPEN	<input type="checkbox"/>

INIT/DATE

3. WHEN Accumulator Tank D Level is  
 ✧  
 between 55% and 58% on the highest  
 ✧  
 reading indicator, THEN close  
 ✧  
 Accumulator Tank D Fill Line Valve.  
 ✧  
 (N/A indicator not used)  
 ✧

o EP LI-956 - BETWEEN 55% AND 58%

OR

\* EP LI-957 - BETWEEN 55% AND 58%

AND

o EP HIS-8878D - CLOSED

4. Record change in accumulator tank D level.

o Final level - Initial level = \_\_\_\_\_ %  
 level change \_\_\_\_\_

6.1.11 Close Accumulator Tanks Fill Line Valve.

o EM HIS-8888 - CLOSED

**NOTE**

✧ Running the SI pump on recirc for between 5 minutes and  
 ✧ 10 minutes following accumulator fill may reseal a leaking check  
 ✧ valve and reduce accumulator leakage. ✧

6.1.12 IF accumulator leakage is present, THEN  
 allow the SI pump to run on recirc for  
 between 5 minutes and 10 minutes.

6.1.13 Stop SI pump being used to fill.  
 (N/A other pump)  
 ✧

\* EM HIS-4 for SI pump A - STOPPED

OR

\* EM HIS-5 for SI pump B - STOPPED



6.1.14 Ensure both RHR To Accumulator Injection Test Line Valves are closed.

INIT/DATE

o EJ HIS-8890A - CLOSED

AND

o EJ HIS-8890B - CLOSED

CAUTION

Closing EM HIS-8964 and EM HIS-8871, SI System Test Line Inner and Outer Containment Isolation Valves, may cause RHR discharge relief to lift due to leakage past check valves.

6.1.15 IF SI System Test Line Inner And Outer Containment Isolation Valves are NOT being used for a relief path in accordance with SYS EJ-323, RHR SYSTEM DEPRESSURIZATION, THEN close both SI test line containment isolation valves.

o EM HIS-8964 - CLOSED

AND

o EM HIS-8871 - CLOSED

NOTE

If Chemistry sample is required, satisfactory results must be obtained within 6 hours or the affected accumulator must be declared inoperable per Tech. Spec. 3.5.1

6.1.16 IF any of the following conditions are met, THEN direct Chemistry to sample the affected accumulators.

\* RWST boron concentration can not be verified within USAR limits.

OR

\* RWST boron concentration has been diluted since last Chemistry sample.

6.1.17 Section 6.1, Increasing Accum Level In Modes 1, 2, Or 3 Above 1700 PSIG, is complete.

---

INIT/DATE

6.2 Increasing Accum Level In Mode 3 Below 1700 PSIG

6.2.1 IF RCS temperature is greater than or equal  
 ✧  
 to 350°F AND accumulator level must be  
 ✧  
 increased, THEN ensure one of the following  
 ✧  
 conditions is met: [3.2.1]  
 ✧

\* Decrease RCS temperature to less than  
 350°F and fill the accumulator using  
 either of the following sections of this  
 procedure:

- \* 6.3, Increasing Accum Level In Mode 4,  
 5, 6, Or Defueled Using SI Pump A
- \* 6.4, Increasing Accum Level In Mode 4,  
 5, 6, Or Defueled Using SI Pump B

OR

\* Increase RCS pressure to greater than  
 1700 psig and fill the accumulators using  
 Section 6.1.

OR

\* WHEN SI Pump A Discharge To Cold Leg  
 ✧  
 Injection valve is closed, THEN enter  
 ✧  
 Tech. Spec. 3.5.2.   
 ✧

**NOTE**

✧  
 ✧  
 ✧ Step 6.2.2 is intended to minimize high pressure alarms caused ✧  
 ✧ by the pressure increase associated with raising accumulator ✧  
 ✧ level. If an alarm is received due to high pressure while ✧  
 ✧ filling an accumulator, the alarm should clear after the ✧  
 ✧ accumulator cools to ambient temperature. ✧  
 ✧

6.2.2 IF accumulator level is less than 45%, AND  
 ✧

accumulator pressure is greater than  
⌘  
619 psig THEN adjust accumulator pressure  
⌘  
to less than 619 psig using section 6.7 of  
⌘  
this procedure:  
⌘

6.2.3 Record RCS pressure read on any of the  
following indicators:  
(N/A indicators not used.)

\* BB PI-403 - \_\_\_\_\_  
\* BB PI-405 - \_\_\_\_\_  
\* BB PI-406 - \_\_\_\_\_

\_\_\_\_\_  
,  
\_\_\_\_\_  
,  
\_\_\_\_\_



		<u>INIT/DATE</u>
6.2.4	Ensure SI Pump A Recirc To RWST isolation valve is open.	
	o EM HIS-8814A - OPEN	<input type="checkbox"/>
6.2.5	Ensure SI Pumps Recirc To RWST isolation valve is open.	
	o BN HIS-8813 - OPEN	<input type="checkbox"/>
<p>NOTE</p> <p>Closing EM HIS-8821A, SI PUMP DISCH TO C/L causes the SI Pump A C/L injection path to be inoperable, refer to Tech. Spec. 3.5.2</p>		
6.2.6	Close SI Pump A Discharge To Cold Leg Injection Valve.	
	o EM HIS-8821A - CLOSED	<input type="checkbox"/>
6.2.7	Ensure SI Pump A Discharge To Hot Leg Injection valve is closed.	
	o EM HIS-8802A - CLOSED	<input type="checkbox"/>
6.2.8	Start SI Pump A.	
	o EM HIS-4 - STARTED	<input type="checkbox"/>
6.2.9	Open Accumulator Tanks Fill Line Valve.	
	o EM HIS-8888 - OPEN	<input type="checkbox"/>



o Final level - Initial level = \_\_\_\_\_ %  
level change

\_\_\_\_\_

		<u>INIT/DATE</u>
6.2.11	<u>IF</u> filling accumulator tank B, <u>THEN</u> perform the following:	
1.	Record initial Accumulator Tank B Level ✧ from the highest reading indicator. ✧ (N/A indicator not used) ✧	
	* EP LI-952 - _____	_____
	<u>OR</u>	
	* EP LI-953 - _____	_____
2.	Open Accumulator Tank B Fill Line Valve.	
	o EP HIS-8878B - OPEN	<input type="checkbox"/>
3.	<u>WHEN</u> Accumulator Tank B Level is ✧ between 55% and 58% on the highest ✧ reading indicator, <u>THEN</u> close ✧ Accumulator Tank B Fill Line Valve. ✧ (N/A indicator not used) ✧	
	* EP LI-952 - BETWEEN 55% AND 58%	<input type="checkbox"/>
	<u>OR</u>	
	* EP LI-953 - BETWEEN 55% AND 58%	<input type="checkbox"/>
	<u>AND</u>	
	o EP HIS-8878B - CLOSED	<input type="checkbox"/>
4.	Record change in accumulator tank B level.	
	o Final level - Initial level = _____ % level change	_____
6.2.12	<u>IF</u> filling accumulator tank C, <u>THEN</u> perform the following:	
1.	Record initial Accumulator Tank C Level ✧ from the highest reading indicator. ✧	

(N/A indicator not used)

✧

\* EP LI-954 - \_\_\_\_\_

\_\_\_\_\_

OR

\* EP LI-955 - \_\_\_\_\_

\_\_\_\_\_

	<u>INIT/DATE</u>
2. Open Accumulator Tank C Fill Line Valve.	
o EP HIS-8878C - OPEN	<input type="checkbox"/>
3. <u>WHEN</u> Accumulator Tank C Level is	
⌘ between 55% and 58% on the highest	
⌘ reading indicator, <u>THEN</u> close	
⌘ Accumulator Tank C Fill Line Valve.	
⌘ (N/A indicator not used)	
⌘	
* EP LI-954 - BETWEEN 55% AND 58%	<input type="checkbox"/>
<u>OR</u>	
* EP LI-955 - BETWEEN 55% AND 58%	<input type="checkbox"/>
<u>AND</u>	
o EP HIS-8878C - CLOSED	<input type="checkbox"/>
4. Record change in accumulator tank C level.	
o Final level - Initial level = _____ % level change	_____
6.2.13 <u>IF</u> filling accumulator tank D, <u>THEN</u> perform the following:	
1. Record initial Accumulator Tank D Level	
⌘ from the highest reading indicator.	
⌘ (N/A indicator not used)	
⌘	
* EP LI-956 - _____	_____
<u>OR</u>	
* EP LI-957 - _____	_____
2. Open Accumulator Tank D Fill Line Valve.	
o EP HIS-8878D - OPEN	<input type="checkbox"/>

		<u>INIT/DATE</u>
3.	<p><u>WHEN</u> Accumulator Tank D Level is            ✧            between 55% and 58% on the highest            ✧            reading indicator, <u>THEN</u> close            ✧            Accumulator Tank D Fill Line Valve.            ✧            (N/A indicator not used)            ✧</p> <p>* EP LI-956 - BETWEEN 55% AND 58% <span style="float: right;"><input type="checkbox"/></span></p> <p style="text-align: center;"><u>OR</u></p> <p>* EP LI-957 - BETWEEN 55% AND 58% <span style="float: right;"><input type="checkbox"/></span></p> <p style="text-align: center;"><u>AND</u></p> <p>o EP HIS-8878D - CLOSED <span style="float: right;"><input type="checkbox"/></span></p>	
4.	<p>Record change in accumulator tank D level.</p> <p>o Final level - Initial level = _____ %            level change <span style="float: right;">_____</span></p>	
6.2.14	<p>Close Accumulator Tanks Fill Line Valve.</p> <p>o EM HIS-8888 - CLOSED <span style="float: right;"><input type="checkbox"/></span></p>	
6.2.15	<p>Stop SI Pump A.</p> <p>o EM HIS-4 - STOPPED <span style="float: right;"><input type="checkbox"/></span></p>	
6.2.16	<p>Open SI Pump A Discharge To Cold Leg Injection Valve.</p> <p>o EM HIS-8821A - OPEN</p> <p style="text-align: right;">Verified <span style="float: right;">_____</span></p>	
6.2.17	<p>✧ Position SI Pump A Discharge To Hot Leg Injection valve as directed by the SM/CRS.            ✧            (N/A position not used)            ✧</p> <p>* EM HIS-8802A - OPEN <span style="float: right;"><input type="checkbox"/></span></p> <p style="text-align: center;"><u>OR</u></p> <p>* EM HIS-8802A - CLOSED <span style="float: right;"><input type="checkbox"/></span></p>	





INIT/DATE

6.3 Increasing Accum Level In Mode 4, 5, 6, Or Defueled Using SI Pump A

**NOTE**

When RCS temperature is less than or equal to 350°F, the safety injection pump used to fill accumulators must be isolated from the RCS by a closed isolation valve with power removed, OR by a manual isolation valve secured in the closed position.

- 6.3.1 Ensure SI Pump A Discharge To Cold Leg Injection Valve is closed.
  - o EM HIS-8821A - CLOSED
- 6.3.2 Ensure SI Pump A Discharge Accumulator Injection Isolation Valve EM HV-8821A breaker is off.
  - o NG01ADR1 - OFF
- 6.3.3 Ensure SI Pump A Discharge To Hot Leg Injection valve is closed.
  - o EM HIS-8802A - CLOSED
- 6.3.4 Ensure Power Lockout For EM HV-8802A is in ISO.
  - o EM HIS-8802AA - IN ISO
- 6.3.5 Ensure SI Pump A Recirc To RWST isolation valve is open.
  - o EM HIS-8814A - OPEN
- 6.3.6 Ensure SI Pumps Recirc To RWST isolation valve is open.
  - o BN HIS-8813 - OPEN
- 6.3.7 Remove Clearance Order on SI pump A.
- 6.3.8 Rack up SI Pump A breaker.
  - o NB0103 - RACKED UP
- 6.3.9 Start SI Pump A.
  - o EM HIS-4 - STARTED

		<u>INIT/DATE</u>
6.3.10	Open Accumulator Tanks Fill Line Valve.	
	o EM HIS-8888 - OPEN	<input type="checkbox"/>
6.3.11	<u>IF</u> filling accumulator tank A, <u>THEN</u> perform the following:	
	1. Record initial Accumulator Tank A Level	
	✧	
	from the highest reading indicator.	
	✧	
	(N/A indicator not used)	
	✧	
	* EP LI-950 - _____	_____
	<u>OR</u>	
	* EP LI-951 - _____	_____
	2. Open Accumulator Tank A Fill Line Valve.	
	o EP HIS-8878A - OPEN	<input type="checkbox"/>
	3. <u>WHEN</u> Accumulator Tank A Level is between 55% and 58% on the highest reading indicator <u>OR</u> as directed by SM/CRS <u>THEN</u> close Accumulator Tank A Fill Line Valve.	
	(N/A indicator not used)	
	* EP LI-950-BETWEEN 55% AND 58% <u>OR</u> AS	
	✧	
	DIRECTED BY SM/CRS	<input type="checkbox"/>
	✧	
	<u>OR</u>	
	* EP LI-951-BETWEEN 55% AND 58% <u>OR</u> AS	
	✧	
	DIRECTED BY SM/CRS	<input type="checkbox"/>
	✧	
	<u>AND</u>	
	o EP HIS-8878A - CLOSED	<input type="checkbox"/>
	4. Record change in accumulator tank A level.	
	o Final level - Initial level = _____ %	
	level change	_____

		<u>INIT/DATE</u>
6.3.12	<u>IF</u> filling accumulator tank B, <u>THEN</u> perform the following:	
	1. Record initial Accumulator Tank B Level	
	✧	
	from the highest reading indicator.	
	✧	
	(N/A indicator not used)	
	✧	
	* EP LI-952 - _____	_____
	<u>OR</u>	
	* EP LI-953 - _____	_____
	2. Open Accumulator Tank B Fill Line Valve.	
	o EP HIS-8878B - OPEN	<input type="checkbox"/>
	3. <u>WHEN</u> Accumulator Tank B Level is between 55% and 58% on the highest reading indicator <u>OR</u> as directed by SM/CRS <u>THEN</u> close Accumulator Tank B Fill Line Valve.	
	(N/A indicator not used)	
	* EP LI-952-BETWEEN 55% AND 58% <u>OR</u> AS	
	✧	
	DIRECTED BY SM/CRS	<input type="checkbox"/>
	✧	
	<u>OR</u>	
	* EP LI-953-BETWEEN 55% AND 58% <u>OR</u> AS	
	✧	
	DIRECTED BY SM/CRS	<input type="checkbox"/>
	✧	
	<u>AND</u>	
	o EP HIS-8878B - CLOSED	<input type="checkbox"/>
	4. Record change in accumulator tank B level.	
	o Final level - Initial level = _____ %	
	level change	_____

		<u>INIT/DATE</u>
6.3.13	<u>IF</u> filling accumulator tank C, <u>THEN</u> perform the following:	
	1. Record initial Accumulator Tank C Level	
	✧	
	from the highest reading indicator.	
	✧	
	(N/A indicator not used)	
	✧	
	* EP LI-954 - _____	_____
	<u>OR</u>	
	* EP LI-955 - _____	_____
	2. Open Accumulator Tank C Fill Line Valve.	
	o EP HIS-8878C - OPEN	<input type="checkbox"/>
	3. <u>WHEN</u> Accumulator Tank C Level is between 55% and 58% on the highest reading indicator <u>OR</u> as directed by SM/CRS <u>THEN</u> close Accumulator Tank C Fill Line Valve.	
	(N/A indicator not used)	
	* EP LI-954-BETWEEN 55% AND 58% <u>OR</u> AS	
	✧	
	DIRECTED BY SM/CRS	<input type="checkbox"/>
	✧	
	<u>OR</u>	
	* EP LI-955-BETWEEN 55% AND 58% <u>OR</u> AS	
	✧	
	DIRECTED BY SM/CRS	<input type="checkbox"/>
	✧	
	<u>AND</u>	
	o EP HIS-8878C - CLOSED	<input type="checkbox"/>
	4. Record change in accumulator tank C level.	
	o Final level - Initial level = _____ %	
	level change	_____

	<u>INIT/DATE</u>
6.3.14	
IF filling accumulator tank D, THEN perform the following:	
1. Record initial Accumulator Tank D Level	
✧	
from the highest reading indicator.	
✧	
(N/A indicator not used)	
✧	
* EP LI-956 - _____	_____
<u>OR</u>	
* EP LI-957 - _____	_____
2. Open Accumulator Tank D Fill Line Valve.	
o EP HIS-8878D - OPEN	<input type="checkbox"/>
3. WHEN Accumulator Tank D Level is between 55% and 58% on the highest reading indicator OR as directed by SM/CRS THEN close Accumulator Tank D Fill Line Valve.	
(N/A indicator not used)	
* EP LI-956-BETWEEN 55% AND 58% OR AS	
✧	
DIRECTED BY SM/CRS	<input type="checkbox"/>
✧	
<u>OR</u>	
* EP LI-957-BETWEEN 55% AND 58% OR AS	
✧	
DIRECTED BY SM/CRS	<input type="checkbox"/>
✧	
<u>AND</u>	
o EP HIS-8878D - CLOSED	<input type="checkbox"/>
4. Record change in accumulator tank D level.	
o Final level - Initial level = _____ % level change	_____
6.3.15	
Close Accumulator Tanks Fill Line Valve.	
o EM HIS-8888 - CLOSED	<input type="checkbox"/>
6.3.16	
Stop SI Pump A.	

o EM HIS-4 - STOPPED



		<u>INIT/DATE</u>
6.3.17	Direct Chemistry to sample accumulator ✧ boron concentration to ensure the ✧ requirements of Tech. Spec.3.5.1 are meet prior to going above 1000 psig. ✧	_____
6.3.18	Rack down SI Pump A breaker.  o NB0103 - RACKED DOWN  Verified	_____ _____ /
6.3.19	Place a Clearance Order on SI pump A.	<input type="checkbox"/>
6.3.20	Turn on SI Pump A Discharge Accumulator Injection Isolation Valve EM HV-8821A breaker.  o NG01ADR1 - ON  Verified	_____ _____ /
6.3.21	Open SI Pump A Discharge To Cold Leg Injection Valve.  o EM HIS-8821A - OPEN  Verified	_____ _____ /
6.3.22	Section 6.3, Increasing Accum Level In Mode 4, 5, 6, Or Defueled Using SI Pump A, is complete.	_____

INIT/DATE

6.4 Increasing Accum Level In Mode 4, 5, 6, Or Defueled Using SI Pump B



NOTE

When RCS temperature is less than or equal to 350°F, the safety injection pump used to fill accumulators must be isolated from the RCS by a closed isolation valve with power removed, OR by a manual isolation valve secured in the closed position.



- 6.4.1 Ensure SI Pump A Discharge To Hot Leg Injection valve is closed.
  - o EM HIS-8802A - CLOSED
- 6.4.2 Ensure Power Lockout For EM HV-8802A is in ISO.
  - o EM HIS-8802AA - IN ISO
- 6.4.3 Ensure SI Pump B Discharge To Hot Leg Injection valve is closed.
  - o EM HIS-8802B - CLOSED
- 6.4.4 Ensure Power Lockout For EM HV-8802B is in ISO.
  - o EM HIS-8802BA - IN ISO
- 6.4.5 Ensure SI Pumps To Cold Leg Injection valve is closed.
  - o EM HIS-8835 - CLOSED
- 6.4.6 Ensure Power Lockout For EM HV-8835 is in ISO.
  - o EM HIS-8835A - IN ISO
- 6.4.7 Ensure SI Pump B Recirc To RWST isolation valve is open.
  - o EM HIS-8814B - OPEN
- 6.4.8 Ensure SI Pumps Recirc To RWST isolation valve is open.
  - o BN HIS-8813 - OPEN



		<u>INIT/DATE</u>
6.4.9	<p><u>IF</u> SI Pump discharge relief valves are            ✎ expected to lift on pump start, <u>THEN</u> Close            ✎ SI Pump B Disch to C/L Inj Iso Valve.            ✎ (3.1.7)            ✎</p> <p>o EM HIS-8821B - CLOSED <span style="float: right;"><input type="checkbox"/></span>            ✎</p>	
6.4.10	Remove Clearance Order on SI pump B.	<input type="checkbox"/>
6.4.11	<p>Rack up SI Pump B breaker.</p> <p>o NB0202 - RACKED UP <span style="float: right;"><input type="checkbox"/></span></p>	
6.4.12	<p>Start SI Pump B.</p> <p>o EM HIS-5 - STARTED <span style="float: right;"><input type="checkbox"/></span></p>	
6.4.13	<p><u>IF</u> closed to prevent discharge relief valve            ✎ lift, <u>THEN</u> Open SI Pump A Disch to C/L Inj            ✎ Iso Valve. (3.1.7)            ✎</p> <p>o EM HIS-8821A - OPEN <span style="float: right;"><input type="checkbox"/></span>            ✎</p>	
6.4.14	<p>Open Accumulator Tanks Fill Line Valve.</p> <p>o EM HIS-8888 - OPEN <span style="float: right;"><input type="checkbox"/></span></p>	
6.4.15	<p><u>IF</u> filling accumulator tank A, <u>THEN</u> perform            the following:</p> <p>1. Record initial Accumulator Tank A Level            ✎            ✎ from the highest reading indicator.            ✎            ✎ (N/A indicator not used)            ✎</p> <p>* EP LI-950 - _____ <span style="float: right;">_____</span></p> <p style="text-align: center;"><u>OR</u></p> <p>* EP LI-951 - _____ <span style="float: right;">_____</span></p> <p>2. Open Accumulator Tank A Fill Line            Valve.</p> <p>o EP HIS-8878A - OPEN <span style="float: right;"><input type="checkbox"/></span></p>	







		<u>INIT/DATE</u>
3.	<p><u>WHEN</u> Accumulator Tank C Level is between 55% and 58% on the highest reading indicator, <u>OR</u> as directed by SM/CRS, <u>THEN</u> close Accumulator Tank C Fill Line Valve. (N/A indicator not used)</p> <p>* EP LI-954-BETWEEN 55% AND 58% <u>OR</u> AS ✧ DIRECTED BY SM/CRS <span style="float: right;"><input type="checkbox"/></span> ✧</p> <p style="text-align: center;"><u>OR</u></p> <p>* EP LI-955-BETWEEN 55% AND 58% <u>OR</u> AS ✧ DIRECTED BY SM/CRS <span style="float: right;"><input type="checkbox"/></span> ✧</p> <p style="text-align: center;"><u>AND</u></p> <p>o EP HIS-8878C - CLOSED <span style="float: right;"><input type="checkbox"/></span></p>	
4.	<p>Record change in accumulator tank C level.</p> <p>o Final level - Initial level = _____ % level change <span style="float: right;">_____</span></p>	
6.4.18	<p><u>IF</u> filling accumulator tank D, <u>THEN</u> perform the following:</p> <p>1. Record initial Accumulator Tank D Level ✧ from the highest reading indicator. ✧ (N/A indicator not used) ✧</p> <p>* EP LI-956 - _____ <span style="float: right;">_____</span></p> <p style="text-align: center;"><u>OR</u></p> <p>* EP LI-957 - _____ <span style="float: right;">_____</span></p> <p>2. Open Accumulator Tank D Fill Line Valve.</p> <p>o EP HIS-8878D - OPEN <span style="float: right;"><input type="checkbox"/></span></p>	

	<u>INIT/DATE</u>
<p>3. <u>WHEN</u> Accumulator Tank D Level is between 55% and 58% on the highest reading indicator <u>OR</u> as directed by SM/CRS, <u>THEN</u> close Accumulator Tank D Fill Line Valve. (N/A indicator not used)</p> <p>* EP LI-956-BETWEEN 55% AND 58% <u>OR</u> AS  ✧ DIRECTED BY SM/CRS  ✧ <span style="float: right;"><input type="checkbox"/></span></p> <p style="text-align: center;"><u>OR</u></p> <p>* EP LI-957-BETWEEN 55% AND 58% <u>OR</u> AS  ✧ DIRECTED BY SM/CRS  ✧ <span style="float: right;"><input type="checkbox"/></span></p> <p style="text-align: center;"><u>AND</u></p> <p>o EP HIS-8878D - CLOSED <span style="float: right;"><input type="checkbox"/></span></p>	
<p>4. Record change in accumulator tank D level.</p> <p>o Final level - Initial level = _____ %  level change <span style="float: right;">_____</span></p>	
<p>6.4.19 Close Accumulator Tanks Fill Line Valve.</p> <p>o EM HIS-8888 - CLOSED <span style="float: right;"><input type="checkbox"/></span></p>	
<p>6.4.20 Stop SI Pump B.</p> <p>o EM HIS-5 - STOPPED <span style="float: right;"><input type="checkbox"/></span></p>	
<p>6.4.21 Direct Chemistry to sample accumulator boron concentration to ensure the requirements of Tech. Spec.3.5.1 are meet prior to going above 1000 psig. <span style="float: right;">_____</span></p>	
<p>6.4.22 Rack down SI Pump B breaker.</p> <p>o NB0202 - RACKED DOWN <span style="float: right;">_____</span></p> <p style="text-align: right;">Verified <span style="float: right;">_____</span></p>	
<p>6.4.23 Place a Clearance Order on SI pump B. <span style="float: right;"><input type="checkbox"/></span></p>	
<p>6.4.24 Place Power Lockout For EM HV-8835 in NON ISO.</p> <p>o EM HV-8835 - IN NON ISO <span style="float: right;"><input type="checkbox"/></span></p>	
<p>6.4.25 Open SI Pumps To Cold Leg Injection valve.</p>	

o EM HIS-8835 - OPEN

Verified

\_\_\_\_\_  
,  
\_\_\_\_\_  
,

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		<u>INIT/DATE</u>
6.4.26	Place Power Lockout For EM HV-8835 in ISO.	
	o EM HIS-8835A - IN ISO	
	Verified	_____ , _____
6.4.27	Section 6.4, Increasing Accum Level In Mode 4, 5, 6, Or Defueled Using SI Pump B, is complete.	_____ ,



6.5 Decreasing Accum Level

INIT/DATE

NOTE

RCS pressure must be 100 psig greater than accumulator pressure prior to draining through the accumulator isolation valves.

6.5.1 Check RCS pressure at least 100 psig greater than accumulator pressure.

6.5.2 IF decreasing level in accumulator tank A, THEN perform the following:

1. Ensure Accumulator Tank A Outlet Valve is open.

o EP HIS-8808A - OPEN

2. Open SI System Test Line Inner Containment Isolation Valve.

o EM HIS-8871 - OPEN

3. Open SI System Test Line Outer Containment Isolation Valve.

o EM HIS-8964 - OPEN

4. Open Accumulator Tank A Upstream Test Valve.

o EP HIS-8877A - OPEN

5. WHEN desired accumulator tank A level is obtained, THEN close Accumulator Tank A Upstream Test Valve.

o EP HIS-8808B - CLOSED

6.5.3 IF decreasing level in accumulator tank B, THEN perform the following:

1. Ensure Accumulator Tank B Outlet Valve is open.

o EP HIS-8808B - OPEN

2. Open SI System Test Line Inner Containment Isolation Valve.

o EM HIS-8871 - OPEN



		<u>INIT/DATE</u>
	3. Open SI System Test Line Outer Containment Isolation Valve.	
	o EM HIS-8964 - OPEN	<input type="checkbox"/>
	4. Open Accumulator Tank B Upstream Test Valve.	
	o EP HIS-8877B - OPEN	<input type="checkbox"/>
	5. <u>WHEN</u> desired accumulator tank B level is obtained, <u>THEN</u> close Accumulator Tank B Upstream Test Valve.	
	o EP HIS-8877B - CLOSED	<input type="checkbox"/>
6.5.4	<u>IF</u> decreasing level in accumulator tank C, <u>THEN</u> perform the following:	
	1. Ensure Accumulator Tank C Outlet Valve is open.	
	o EP HIS-8808C - OPEN	<input type="checkbox"/>
	2. Open SI System Test Line Inner Containment Isolation Valve.	
	o EM HIS-8871 - OPEN	<input type="checkbox"/>
	3. Open SI System Test Line Outer Containment Isolation Valve.	
	o EM HIS-8964 - OPEN	<input type="checkbox"/>
	4. Open Accumulator Tank C Upstream Test Valve.	
	o EP HIS-8877C - OPEN	<input type="checkbox"/>
	5. <u>WHEN</u> desired accumulator tank C level is obtained, <u>THEN</u> close Accumulator Tank C Upstream Test Valve.	
	o EP HIS-8877C - CLOSED	<input type="checkbox"/>
6.5.5	<u>IF</u> decreasing level in accumulator tank D, <u>THEN</u> perform the following:	
	1. Ensure Accumulator Tank D Outlet Valve is open.	
	o EP HIS-8808D - OPEN	<input type="checkbox"/>



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		<u>INIT/DATE</u>
6.6	<u>Increasing Accum Pressure</u>	
6.6.1	Ensure N <sub>2</sub> pressure regulator at N <sub>2</sub> skid is set at 700 psig.	<input type="checkbox"/>
6.6.2	Ensure Accumulator N <sub>2</sub> Supply Vent Valve Control is closed.	
	o EP HC-943 - CLOSED	<input type="checkbox"/>
6.6.3	<u>IF</u> increasing accumulator tank A pressure, <u>THEN</u> perform the following:	
	1. Open Accumulator Tank N <sub>2</sub> Supply Valve.	
	o EP HIS-8875A - OPEN	<input type="checkbox"/>
	2. Open Accumulator Tanks N <sub>2</sub> Supply Valve.	
	o EP HIS-8880 - OPEN	<input type="checkbox"/>
	3. <u>WHEN</u> desired pressure is obtained, <u>THEN</u> close Accumulator Tanks N <sub>2</sub> Supply Valve.	
	o EP HIS-8880 - CLOSED	<input type="checkbox"/>
	4. Close Accumulator Tank N <sub>2</sub> Supply Valve.	
	o EP HIS-8875A - CLOSED	<input type="checkbox"/>
6.6.4	<u>IF</u> increasing accumulator tank B pressure, <u>THEN</u> perform the following:	
	1. Open Accumulator Tank N <sub>2</sub> Supply Valve.	
	o EP HIS-8875B - OPEN	<input type="checkbox"/>
	2. Open Accumulator Tanks N <sub>2</sub> Supply Valve.	
	o EP HIS-8880 - OPEN	<input type="checkbox"/>
	3. <u>WHEN</u> desired pressure is obtained, <u>THEN</u> close Accumulator Tanks N <sub>2</sub> Supply Valve.	
	o EP HIS-8880 - CLOSED	<input type="checkbox"/>
	4. Close Accumulator Tank N <sub>2</sub> Supply Valve.	
	o EP HIS-8875B - CLOSED	<input type="checkbox"/>

		<u>INIT/DATE</u>
6.6.5	<u>IF</u> increasing accumulator tank C pressure, <u>THEN</u> perform the following:	
	1. Open Accumulator Tank N <sub>2</sub> Supply Valve.	
	o EP HIS-8875C - OPEN	<input type="checkbox"/>
	2. Open Accumulator Tanks N <sub>2</sub> Supply Valve.	
	o EP HIS-8880 - OPEN	<input type="checkbox"/>
	3. <u>WHEN</u> desired pressure is obtained, <u>THEN</u> close Accumulator Tanks N <sub>2</sub> Supply Valve.	
	o EP HIS-8880 - CLOSED	<input type="checkbox"/>
	4. Close Accumulator Tank N <sub>2</sub> Supply Valve.	
	o EP HIS-8875C - CLOSED	<input type="checkbox"/>
6.6.6	<u>IF</u> increasing accumulator tank D pressure, <u>THEN</u> perform the following:	
	1. Open Accumulator Tank N <sub>2</sub> Supply Valve.	
	o EP HIS-8875D - OPEN	<input type="checkbox"/>
	2. Open Accumulator Tanks N <sub>2</sub> Supply Valve.	
	o EP HIS-8880 - OPEN	<input type="checkbox"/>
	3. <u>WHEN</u> desired pressure is obtained, <u>THEN</u> close Accumulator Tanks N <sub>2</sub> Supply Valve.	
	o EP HIS-8880 - CLOSED	<input type="checkbox"/>
	4. Close Accumulator Tank N <sub>2</sub> Supply Valve.	
	o EP HIS-8875D - CLOSED	<input type="checkbox"/>
6.6.7	Section 6.6, Increasing Accum Pressure, is complete.	<hr/>

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		<u>INIT/DATE</u>
6.7	<u>Decreasing Accum Pressure</u>	
6.7.1	Ensure Accumulator N <sub>2</sub> Supply Vent Valve Control is set at 0%.  o EP HC-943 - SET AT 0%	<input type="checkbox"/>
6.7.2	Ensure Accumulator Tanks N <sub>2</sub> Supply Valve is closed.  o EP HIS-8880 - CLOSED	<input type="checkbox"/>
6.7.3	<u>IF</u> decreasing accumulator tank A pressure, <u>THEN</u> perform the following:  1. Open Accumulator Tank N <sub>2</sub> Supply Valve. o EP HIS-8875A - OPEN  2. Slowly throttle open Accumulator N <sub>2</sub> Supply Vent Valve Control. o EP HC-943 - SLOWLY THROTTLED OPEN  3. <u>WHEN</u> desired accumulator pressure is obtained, <u>THEN</u> close Accumulator Tank N <sub>2</sub> Supply Valve. o EP HIS-8875A - CLOSED  4. Close Accumulator N <sub>2</sub> Supply Vent Valve Control. o EP HC-943 - CLOSED	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6.7.4	<u>IF</u> decreasing accumulator tank B pressure, <u>THEN</u> perform the following:  1. Open Accumulator Tank N <sub>2</sub> Supply Valve. o EP HIS-8875B - OPEN  2. Slowly throttle open Accumulator N <sub>2</sub> Supply Vent Valve Control. o EP HC-943 - SLOWLY THROTTLED OPEN  3. <u>WHEN</u> desired accumulator pressure is obtained, <u>THEN</u> close Accumulator Tank N <sub>2</sub> Supply Valve. o EP HIS-8875B - CLOSED	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

		<u>INIT/DATE</u>
	4. Close Accumulator N <sub>2</sub> Supply Vent Valve Control.	
	o EP HC-943 - CLOSED	<input type="checkbox"/>
6.7.5	<u>IF</u> decreasing accumulator tank C pressure, <u>THEN</u> perform the following:	
	1. Open Accumulator Tank N <sub>2</sub> Supply Valve.	
	o EP HIS-8875C - OPEN	<input type="checkbox"/>
	2. Slowly throttle open Accumulator N <sub>2</sub> Supply Vent Valve Control.	
	o EP HC-943 - SLOWLY THROTTLED OPEN	<input type="checkbox"/>
	3. <u>WHEN</u> desired accumulator pressure is obtained, <u>THEN</u> close Accumulator Tank N <sub>2</sub> Supply Valve.	
	o EP HIS-8875C - CLOSED	<input type="checkbox"/>
	4. Close Accumulator N <sub>2</sub> Supply Vent Valve Control.	
	o EP HC-943 - CLOSED	<input type="checkbox"/>
6.7.6	<u>IF</u> decreasing accumulator tank D pressure, <u>THEN</u> perform the following:	
	1. Open Accumulator Tank N <sub>2</sub> Supply Valve.	
	o EP HIS-8875D - OPEN	<input type="checkbox"/>
	2. Slowly throttle open Accumulator N <sub>2</sub> Supply Vent Valve Control.	
	o EP HC-943 - SLOWLY THROTTLED OPEN	<input type="checkbox"/>
	3. <u>WHEN</u> desired accumulator pressure is obtained, <u>THEN</u> close Accumulator Tank N <sub>2</sub> Supply Valve.	
	o EP HIS-8875D - CLOSED	<input type="checkbox"/>
	4. Close Accumulator N <sub>2</sub> Supply Vent Valve Control.	
	o EP HC-943 - CLOSED	<input type="checkbox"/>
6.7.7	Section 6.7, Decreasing Accum Pressure, is complete.	<hr/>



**7.0** RECORDS

7.1 The following QA records are generated by this procedure:

7.1.1 Section 5.0

7.1.2 Section 6.0

-END-